

Supplementary Material

Risk of hospital admission or emergency department presentation due to diabetes complications: a retrospective cohort study in Tasmania, Australia

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Appendix 1. Definitions of hospital admissions and emergency department presentations due to diabetes complications

Main groups	Subgroups	ICD-10-AM/ACHI codes
Cardiovascular disease (CVD)	Myocardial infarction (MI)	I21*, I22*, I23*, I25.2
	Heart failure	I50*
	Ischemic heart disease	I24*, I25* (excluding I25.2)
	Angina pectoris	I20*
	Other cardiovascular complications ^a	I46*, I47*, I48*, I49*, I70*, I71*
Cerebrovascular disease	Stroke	I61*, I63*, I65*, I66*
	Transient ischemic attack (TIA)	G45*
Peripheral Vascular Disease	Lower extremity amputations (LEA)	44367-01, 44367-02, 44338-00, 44358-00, 90557-00, 44361-00, 44364-00, 44364-01, 44361-01, 44370-00, 44373-00, 44367-00, 44367-01, 44367-02
	Foot ulcer/gangrene	L97*, S91.3*, E10.73, E11.73, E13.73, E14.73, E10.52, E11.52, E12.52, E13.52, E14.52, A48.0
	Other peripheral vascular complications ^a	E10.51, E11.51, E12.51, E13.51, E14.51, I70.21*, I73.9, I72.4
Renal disease	Transplant	Z94.0, T86.1*
	Dialysis	Z49.0, Z49.1, Z49.2, Z99.2, T82.4
	Kidney failure	N18.0, N18.5, N18.8, N18.90, N19*
	Nephropathy	E10.21, E10.22, E11.21, E11.22, E13.21, E13.22, E14.21, E14.22, N18.91, N18.1, N18.2, N18.3, N18.4
	Other kidney complications ^a	E10.2*, E11.2*, E12.2*, E13.2*, E14.2* (excluding diabetic nephropathy)
		N00*, N03*, N04*, N05*
Ophthalmic complications	Blindness and low vision	H54*
	Vitreous hemorrhage	H43.1*
	Retinopathy	E10.31*, E10.32*, E10.33*, E10.34*, E10.35*, E11.31*, E11.32*, E11.33*, E11.34*, E11.35*, E13.31*, E13.32*, E13.33*, E13.34*, E13.35*, E14.31*, E14.32*, E14.33*, E14.34*, E14.35*, H35.0*, H36.0*, H35.2*
	Other ophthalmic complications ^a	E10.3*, E11.3*, E12.3*, E13.3*, E14.3* (excluding diabetic retinopathy)
		H35.6*, H35.8*, H35.9, H33*, H35.35*
Neuropathy		E10.4*, E11.4*, E12.4*, E13.4*, E14.4*, G90.8, G90.9, G99.0, G56*, G57*, G60.9, G73.3, H49*, I95.1, K59.1, N31.9, M14.6*, S04*
Metabolic complication	Hyperglycemia	E10.0*, E11.0*, E13.0*, E14.0*, E10.65, E11.65, E13.65, E14.65
	Hypoglycemia	E10.64*, E11.64*, E13.64*, E14.64*
	Acidosis	E10.1*, E11.1*, E12.1*, E13.1*, E14.1*

ICD-10-AM, International Statistical Classification of Diseases and Related Health problems 10th Revision Australian Modification; ACHI, Australian Classification of Health Interventions

* Zero or more characters

Appendix 2. Risk of hospital admission due to diabetes complications

Main groups	Subgroups	People with diabetes			People without diabetes			Crude IRR (95% CI) ^c
		Number of events	Person-years ^a	IR (95% CI) ^b	Number of events	Person-years ^a	IR (95% CI) ^b	
Cardiovascular disease (CVD)	Fatal MI	103	253,902	5.8 (3.9, 8.6)	92	546,403	1.7 (1.4, 2.1) ^d	2.41 (1.82, 3.19) ^d
	Non-fatal MI	2,605	251,021	109.2 (103.5, 115.3)	2,484	543,070	46.6 (44.3, 49.0)	2.37 (2.20, 2.55)
	Heart failure	3,476	251,849	166.8 (157.0, 177.2)	2,128	544,745	45.4 (42.4, 48.6)	3.95 (3.61, 4.31)
	Ischemic heart disease	1,352	249,986	54.4 (50.9, 58.2)	1,224	541,222	22.4 (20.9, 24.0)	2.43 (2.21, 2.67)
	Angina pectoris	2,558	249,517	102.8 (97.1, 108.8)	2,142	540,438	38.9 (36.7, 41.2)	2.64 (2.43, 2.86)
	Other cardiovascular complications	2,692	248,800	116.7 (110.0, 123.8)	3,555	538,820	67.0 (63.8, 70.3)	1.76 (1.63, 1.90)
Cerebrovascular disease	Fatal stroke	65	253,902	2.6 (2.0, 3.3) ^d	87	546,403	1.6 (1.3, 2.0) ^d	1.61 (1.17, 2.22) ^d
	Non-fatal stroke	1,687	252,614	75.1 (70.0, 80.4)	1,829	544,578	35.7 (33.6, 37.9)	2.14 (1.96, 2.35)
	TIA	594	252,669	23.6 (21.7, 25.8)	759	544,361	14.0 (12.9, 15.2)	1.70 (1.51, 1.91)
Peripheral Vascular Disease	LEA	789	253,902	31.8 (28.5, 35.5)	105	546,403	2.0 (1.6, 2.6)	16.40 (13.03, 20.65)
	Foot ulcer/gangrene	4,322	253,256	173.3 (154.4, 194.4)	532	545,512	9.0 (7.2, 11.2)	18.80 (15.59, 22.67)
	Other peripheral vascular complications	618	253,555	26.3 (22.9, 30.1)	296	545,930	5.6 (4.7, 6.7)	4.80 (3.90, 5.92)
Renal disease (Nephropathy)	Transplant	160	253,632	4.4 (2.6, 7.7)	35	546,271	0.5 (0.2, 1.1)	8.09 (3.44, 19.04)
	Dialysis	68,576	253,564	2747.4 (2053.6, 3675.4)	24,809	546,086	419.0 (264.4, 663.9)	6.53 (3.94, 10.83)
	Kidney failure	243	253,481	10.3 (8.6, 12.3)	95	545,895	2.0 (1.5, 2.7)	5.75 (4.24, 7.80)
	Nephropathy	330	253,376	13.9 (12.0, 16.1)	74	545,919	1.4 (1.1, 1.9)	10.29 (7.72, 13.72)
	Other kidney complications	347	253,749	21.5 (17.8, 26.1)	44	546,294	0.8 (0.5, 1.3)	27.66 (19.05, 40.16)

Main groups	Subgroups	People with diabetes			People without diabetes			Crude IRR (95% CI) ^c
		Number of events	Person-years ^a	IR (95% CI) ^b	Number of events	Person-years ^a	IR (95% CI) ^b	
Ophthalmic complications	Blindness and low vision	7	253,852	0.3 (0.1, 0.6) ^d	12	546,223	0.2 (0.1, 0.4) ^d	1.26 (0.49, 3.19) ^d
	Vitreous hemorrhage	95	253,886	3.7 (2.9, 4.8)	21	546,357	0.4 (0.2, 0.6)	9.70 (5.79, 16.27)
	Retinopathy	213	253,888	8.2 (6.8, 9.9)	4	546,396	0.1 (0.0, 0.6)	112.15 (41.18, 305.48)
	Other ophthalmic complications	989	253,820	39.1 (36.3, 42.2)	125	546,217	2.4 (1.9, 3.0)	17.09 (14.06, 20.77)
Neuropathy	Neuropathy	1,203	252,356	47.6 (44.3, 51.1)	1,040	544,113	19.2 (17.9, 20.7)	2.48 (2.24, 2.75)
Metabolic complication	Hyperglycemia	1,358	253,902	55.1 (51.1, 59.5)	n/a	n/a	n/a	n/a
	Hypoglycemia	915	253,902	36.8 (33.8, 40.0)	n/a	n/a	n/a	n/a
	Acidosis	1,506	253,902	64.6 (57.8, 72.2)	n/a	n/a	n/a	n/a

IR, Incidence rate; IRR, Incidence rate ratio; MI, Myocardial infarction; TIA, Transient ischemic attack; LEA, Lower extremity amputations

^a Number of person-years were different because the number of participants without prior history of each complication varied

^b per 10,000 person-years

^{b,c} Derived from negative binomial regression unless otherwise stated

^d Derived from Poisson regression

Appendix 3. Risk of emergency department presentation due to diabetes complications^a

Main groups	Subgroups	People with diabetes			People without diabetes			Crude IRR (95% CI) ^d
		Number of events	Person-years ^b	IR (95% CI) ^c	Number of events	Person-years ^b	IR (95% CI) ^c	
Cardiovascular disease (CVD)	Fatal MI	70	253,902	2.8 (2.2, 3.5) ^e	54	546,403	1.0 (0.8, 1.3) ^e	2.79 (1.96, 3.98) ^e
	Non-fatal MI	2448	251,021	101.1 (95.9, 106.5)	2542	543,070	47.6 (45.3, 50.0)	2.15 (2.00, 2.31)
	Heart failure	2959	251,849	136.4 (128.6,	1887	544,745	38.2 (35.9, 40.8)	3.73 (3.43, 4.07)
	Ischemic heart disease	84	249,986	3.4 (2.7, 4.2)	75	541,222	1.4 (1.1, 1.7) ^e	2.42 (1.78, 3.31) ^e
	Angina pectoris	2867	249,517	117.0 (110.7, 123.6)	2318	540,438	42.6 (40.3, 44.9)	2.76 (2.55, 2.98)
	Other cardiovascular complications	2257	248,800	97.8 (92.0, 104.0)	3729	538,820	70.8 (67.4, 74.3)	1.40 (1.29, 1.52)
Cerebrovascular disease	Fatal stroke	37	253,902	1.5 (1.1, 2.0) ^e	51	546,403	0.9 (0.7, 1.2) ^e	1.56 (1.02, 2.38) ^e
	Non-fatal stroke	1141	252,614	46.6 (43.6, 49.8)	1306	544,578	24.5 (23.1, 26.0)	1.92 (1.75, 2.10)
	TIA	949	252,669	38.1 (35.4, 41.0)	1368	544,361	25.4 (23.9, 27.0)	1.51 (1.37, 1.66)
Peripheral Vascular Disease	LEA	0	253,902		0	546,403		
	Foot ulcer/gangrene	766	253,256	30.6 (27.7, 33.7)	333	545,512	6.2 (5.5, 7.1)	4.94 (4.23, 5.76)
	Other peripheral vascular complications	201	253,555	8.7 (7.3, 10.4)	94	545,930	1.8 (1.4, 2.2)	5.03 (3.78, 6.68)
Renal disease (Nephropathy)	Transplant	1	253,632	0.04 (0.01, 0.28) ^e	0	546,271		
	Dialysis	2	253,564	0.07 (0.01, 0.66)	1	546,086	0.02 (0.00, 0.13) ^e	4.01 (0.20, 81.83)
	Kidney failure	30	253,481	1.2 (0.8, 1.7)	20	545,895	0.4 (0.2, 0.6) ^e	3.22 (1.81, 5.72)
	Nephropathy	12	253,376	0.5 (0.3, 0.8) ^e	2	545,919	0.04 (0.01, 0.15) ^e	12.93 (2.89, 57.76) ^e
	Other kidney complications	12	253,749	0.5 (0.2, 1.0)	13	546,294	0.2 (0.1, 0.5)	2.04 (0.79, 5.29)

Main groups	Subgroups	People with diabetes			People without diabetes			Crude IRR (95% CI) ^d
		Number of events	Person-years ^b	IR (95% CI) ^c	Number of events	Person-years ^b	IR (95% CI) ^c	
Ophthalmic complications	Blindness and low vision	31	253,852	1.2 (0.9, 1.7) ^e	34	546,223	0.7 (0.4, 1.0)	1.96 (1.18, 3.26)
	Vitreous hemorrhage	4	253,886	0.2 (0.1, 0.4) ^e	5	546,357	0.09 (0.03, 0.27)	1.66 (0.38, 7.23)
	Retinopathy	4	253,888	0.2 (0.1, 0.4) ^e	3	546,396	0.05 (0.02, 0.17) ^e	2.87 (0.64, 12.82) ^e
	Other ophthalmic complications	71	253,820	2.8 (2.2, 3.5)	121	546,217	2.2 (1.8, 2.7)	1.26 (0.93, 1.71)
Neuropathy	Neuropathy	452	252,356	18.0 (16.3, 20.0)	535	544,113	9.9 (9.0, 10.8)	1.83 (1.60, 2.10)
Metabolic complication	Hyperglycemia	94	253,902	3.8 (3.0, 4.7)	n/a	n/a	n/a	n/a
	Hypoglycemia	68	253,902	2.7 (2.0, 3.5)	n/a	n/a	n/a	n/a
	Acidosis	1388	253,902	59.3 (53.0, 66.4)	n/a	n/a	n/a	n/a

IR, Incidence rate; IRR, Incidence rate ratio; LEA, Lower extremity amputations; MI, Myocardial infarction; TIA, Transient ischemic attack

^a When investigating ED presentations only, ED presentations were defined as all ED presentations (both the ones that resulted in hospital admissions and the ones that did not)

^b Number of person-years were different because the number of participants without prior history of each complication varied

^c per 10,000 person-years

^{c, d} Derived from negative binomial regression unless otherwise stated

^e Derived from Poisson regression