Il rischio cardiovascolare nel diabete tipo 1

Sandro Inchiostro

Direzione Percorso Aziendale di Cura del Diabete

APSS – Trento

CONVEGNO SID
VENETO - TRENTINO ALTO ADIGE
ortunità terapeutiche e
gli ENDPOINT EPATICI,
VASCOLARI e RENALI
nel DIABETE MELLITO
4 OTTOBRE 2
TRENTO, Grand Hotel Trento

DICHIARAZIONE CONFLITTO DI INTERESSI

Il sottoscritto_____Inchiostro Sandro_____

In ottemperanza alla normativa ECM ed al principio trasparenza delle fonti di finanziamento e dei rapporti con soggetti portatori di interessi commerciali in campo sanitario, il ***docente deve "rilasciare al provider o all'organizzatore la dichiarazione di conflitto d'interessi (ultimi 2 anni rapporti diretti con aziende) e che successivamente debba informare l'aula all'atto della sua presentazione o comunque prima della lezione/relazione dichiarandolo ai discenti".***

Dichiara che negli ultimi due anni sono stato relatore o membro di board scientifico per eventi scientifici ECM, aventi il supporto incondizionato delle seguenti aziende:

Astra Zeneca

Bayer

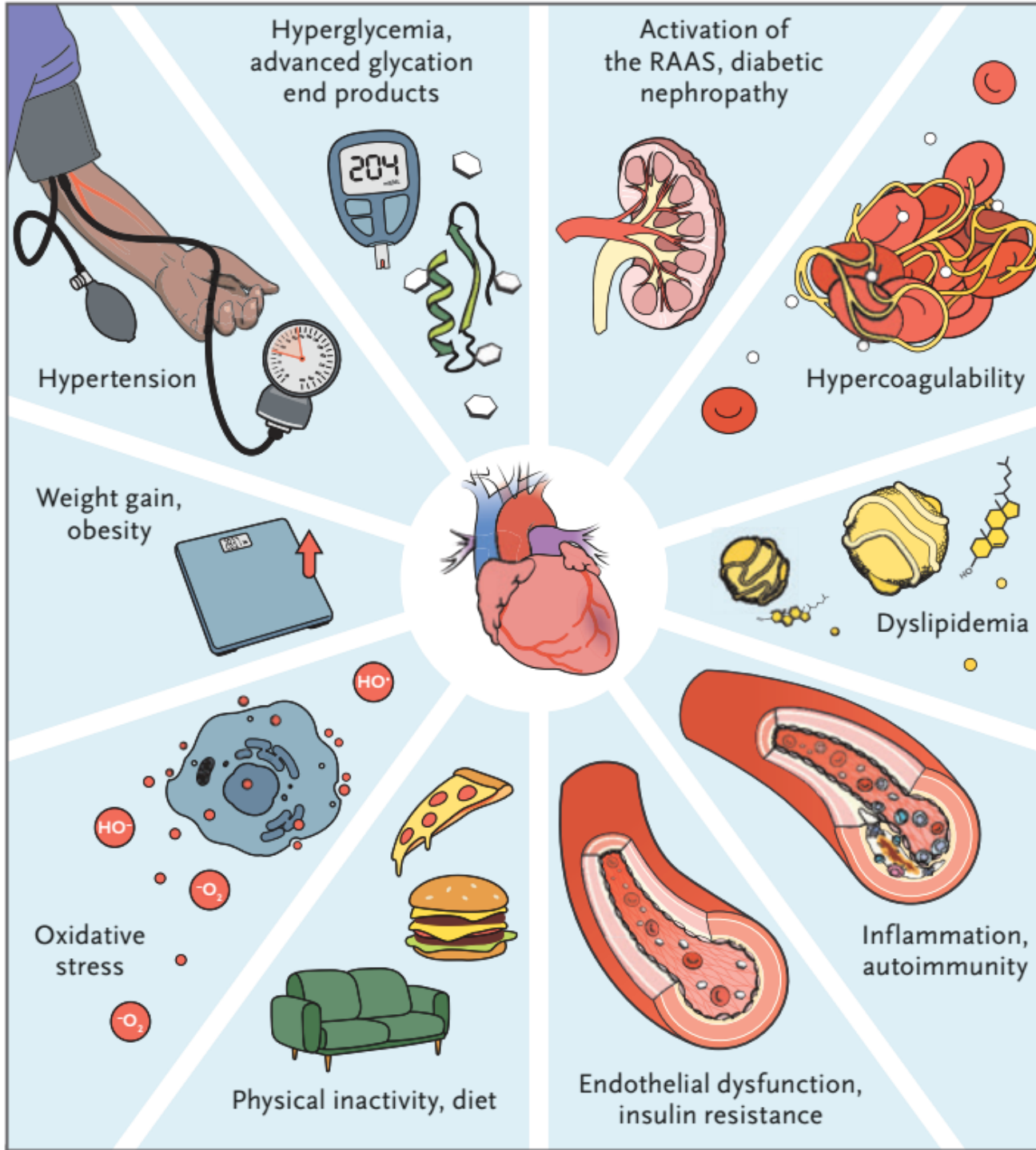
Boehringer Ingelheim

Eli Lilly

Novo Nordisk

Sanofi Aventis

Pathophysiology of Cardiovascular Disease in Patients with Type 1 Diabetes.



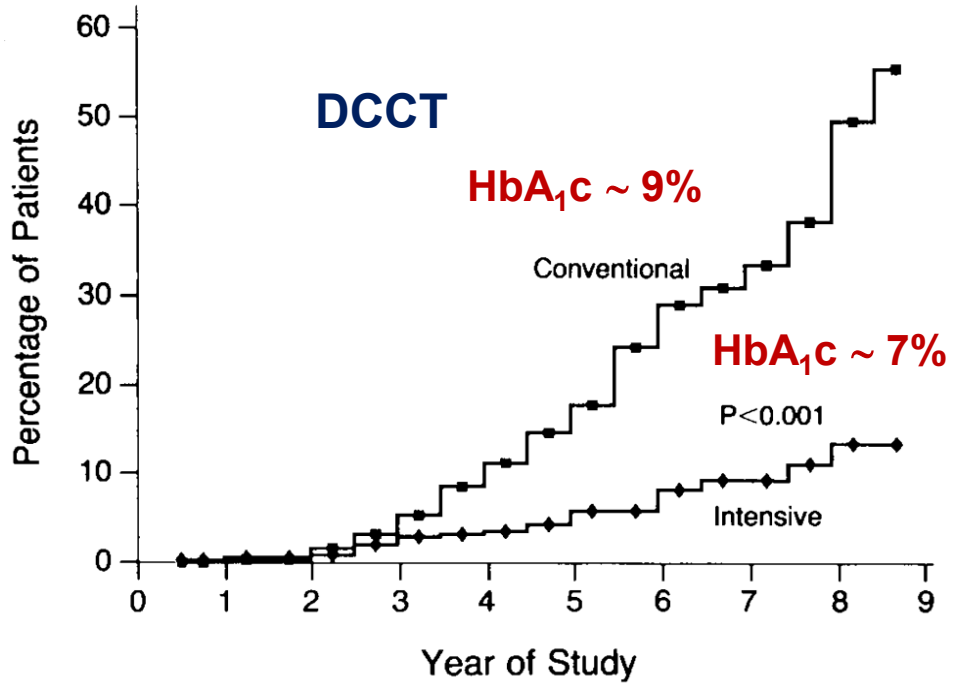
N Engl J Med 2024;390:1207-17

Time course of vascular complications in diabetes

The New England
Journal of Medicine

Volume 329 SEPTEMBER 30, 1993 Number 14

THE EFFECT OF INTENSIVE TREATMENT OF DIABETES ON THE DEVELOPMENT AND PROGRESSION OF LONG-TERM COMPLICATIONS IN INSULIN-DEPENDENT DIABETES MELLITUS



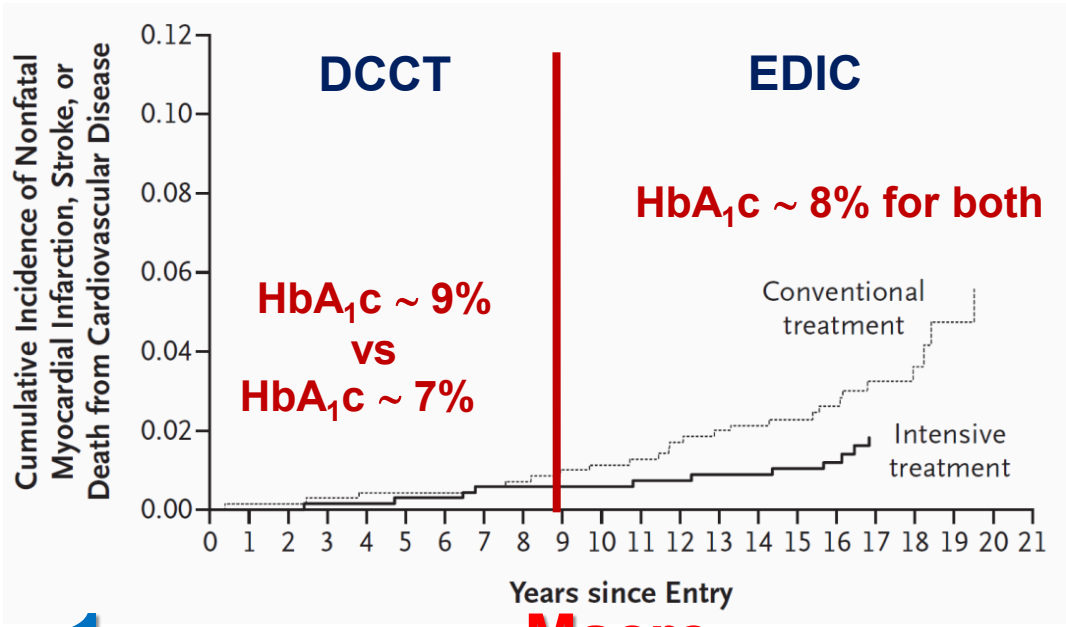
Micro

Type 1

The NEW ENGLAND JOURNAL of MEDICINE
ESTABLISHED IN 1812 DECEMBER 22, 2005 VOL. 353 NO. 25

Intensive Diabetes Treatment and Cardiovascular Disease in Patients with Type 1 Diabetes

The Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) Study Research Group*



Macro

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 13, 2017 VOL. 376 NO. 15

Mortality and Cardiovascular Disease in Type 1 and Type 2 Diabetes

Aidin Rawshani, M.D., Araz Rawshani, M.D., Ph.D., Stefan Franzén, Ph.D., Björn Eliasson, M.D., Ph.D., Ann-Marie Svensson, Ph.D., Mervete Miftaraj, M.Sc., Darren K. McGuire, M.D., M.H.Sc., Naveed Sattar, M.D., Ph.D., Annika Rosengren, M.D., Ph.D., and Soffia Gudbjörnsdottir, M.D., Ph.D.

We included patients registered in the Swedish National Diabetes Register from 1998 through 2012 and followed them through 2014.

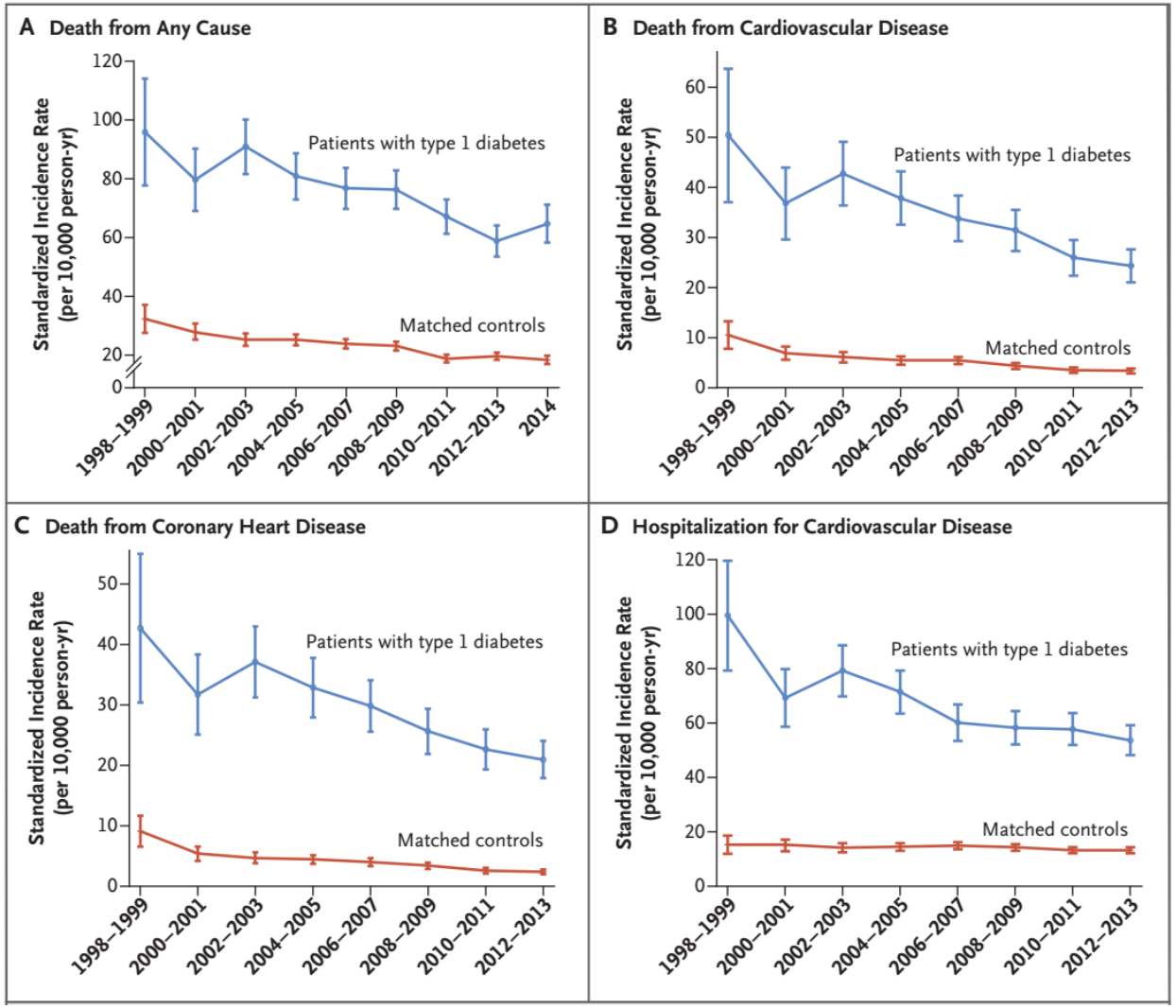
Trends in deaths and cardiovascular events were estimated with Cox regression and standardized incidence rates.

For each patient, controls who were matched for age, sex, and county were randomly selected from the general population.

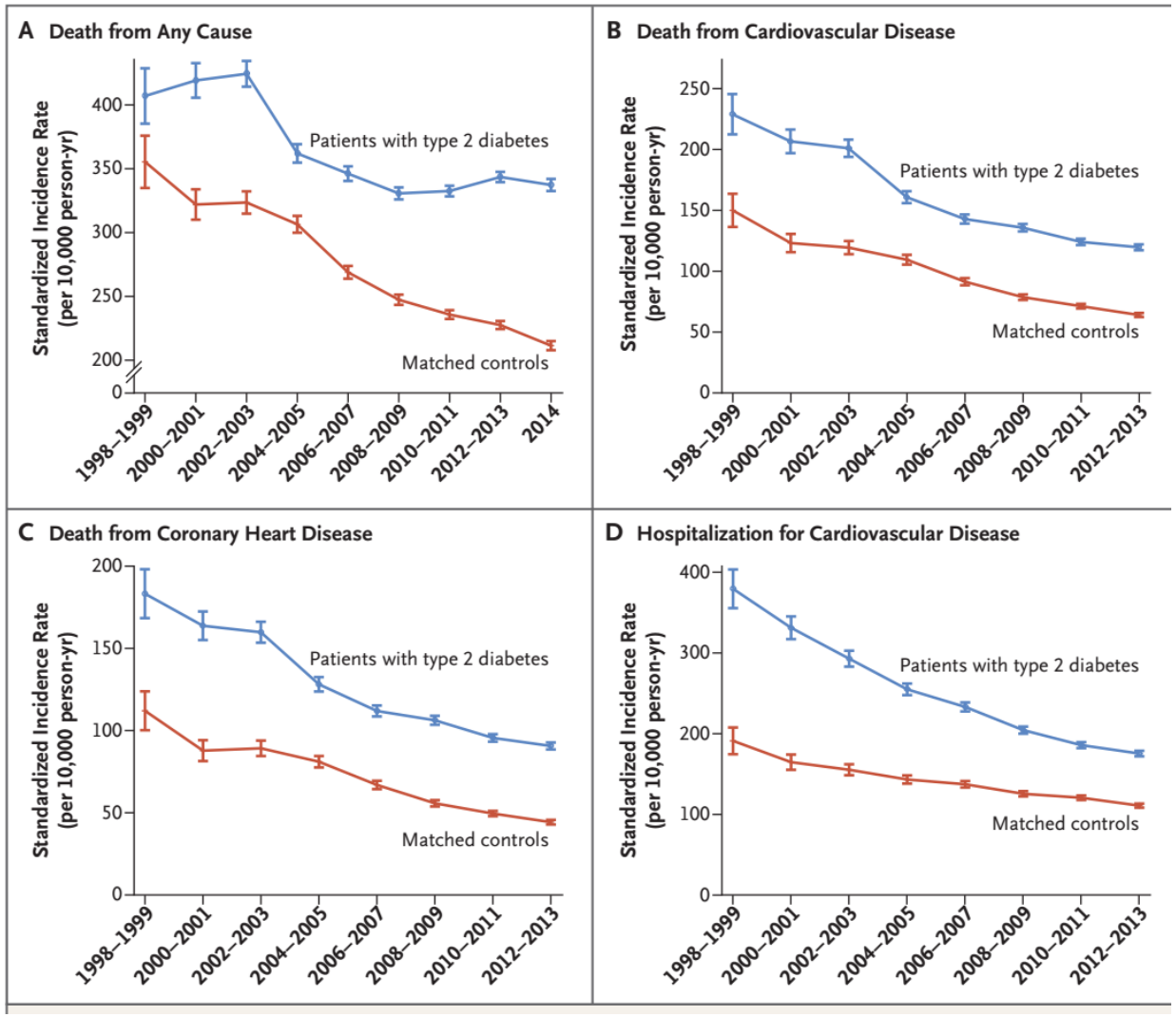
Follow-up: median of 15 years.

Major Cardiovascular Outcomes in Patients with Type 1 and Type 2 Diabetes and Matched Controls

Type 1 Diabetes



Type 2 Diabetes



N Engl J Med 2017;376:1407-18.

Cardiovascular and Renal Disease Burden in Type 1 Compared With Type 2 Diabetes: A Two-Country Nationwide Observational Study

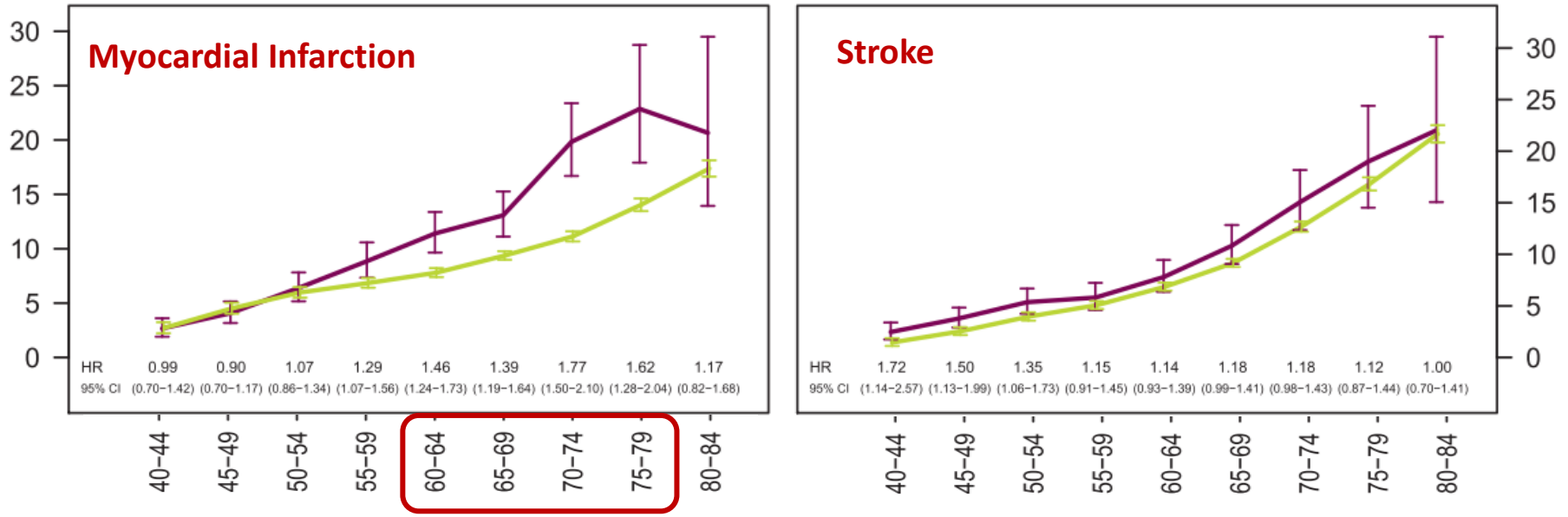
Robin Kristófi,[1] Johan Bodegard,[2] Anna Norhammar,[3,4] Marcus Thuresson,[5] David Nathanson,[6] Thomas Nyström,[7] Kåre I. Birkeland,[8] Jan W. Eriksson[1]

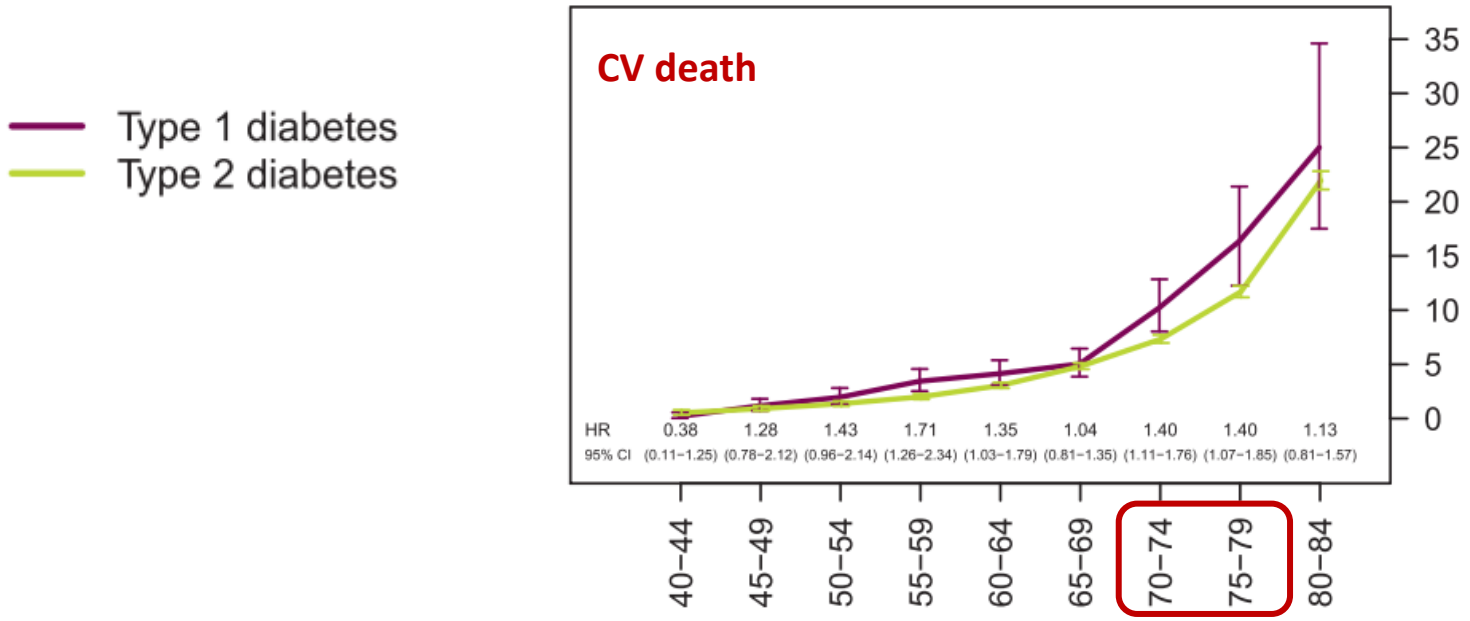
Diabetes Care 2021;44:1211–1218 | https://doi.org/10.2337/dc20-2839

A total of 59,331 patients with T1D and 484,241 patients with T2D, aged 18–84 years, were followed over a mean period of 2.6 years from 31 December 2013.

Patients were identified in nationwide prescribed drug and hospital registries in Norway and Sweden.

Age-stratified incidence of any CVRD events (including MI, stroke, HF, CKD, or CV death), cardiorenal disease (HF or CKD), HF, CKD, MI,stroke, all-cause death, and CV death.





Diabetes Care 2021;44:1211–1218

Risk differences and underlying factors of cardiovascular events and mortality in patients with type 2 diabetes versus type 1 diabetes: a longitudinal cohort study of Swedish nationwide register data

Vagia Patsoukaki, Lars Lind, Erik Lampa, Sadiq Radhi, Katarina Eeg-Olofsson, Björn Eliasson, Jan W Eriksson

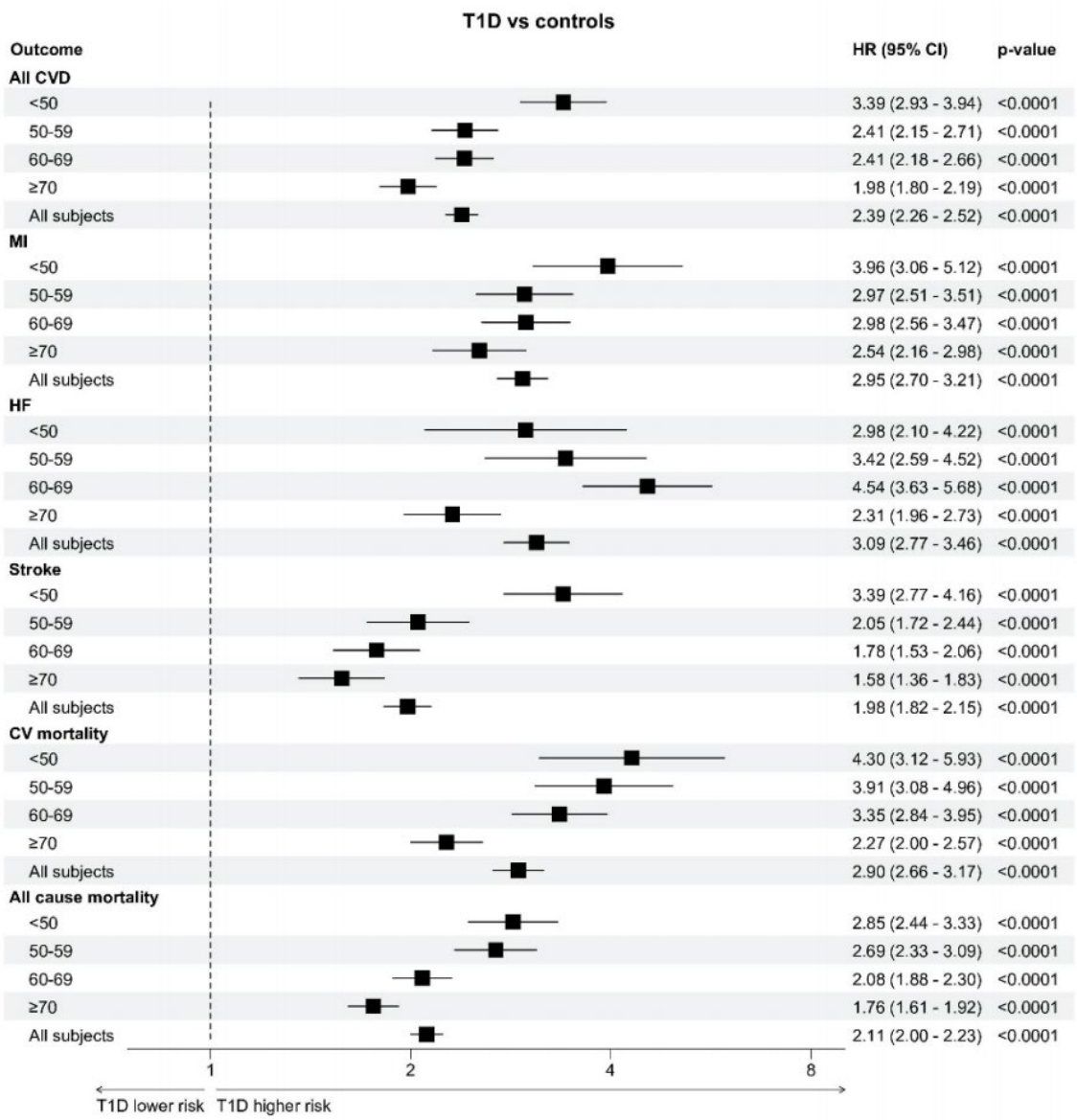
This study aimed to compare the risk of cardiovascular disease and mortality, as well as the contibution of underlying risk factors, between type 1 and type 2 diabetes.

In this nationwide, population-based cohort study, all living people with diabetes aged 18–84 years reported in the Swedish National Diabetes Register (NDR) by Jan 1, 2016, were followed-up over a period of 5 years until Dec 31, 2020.

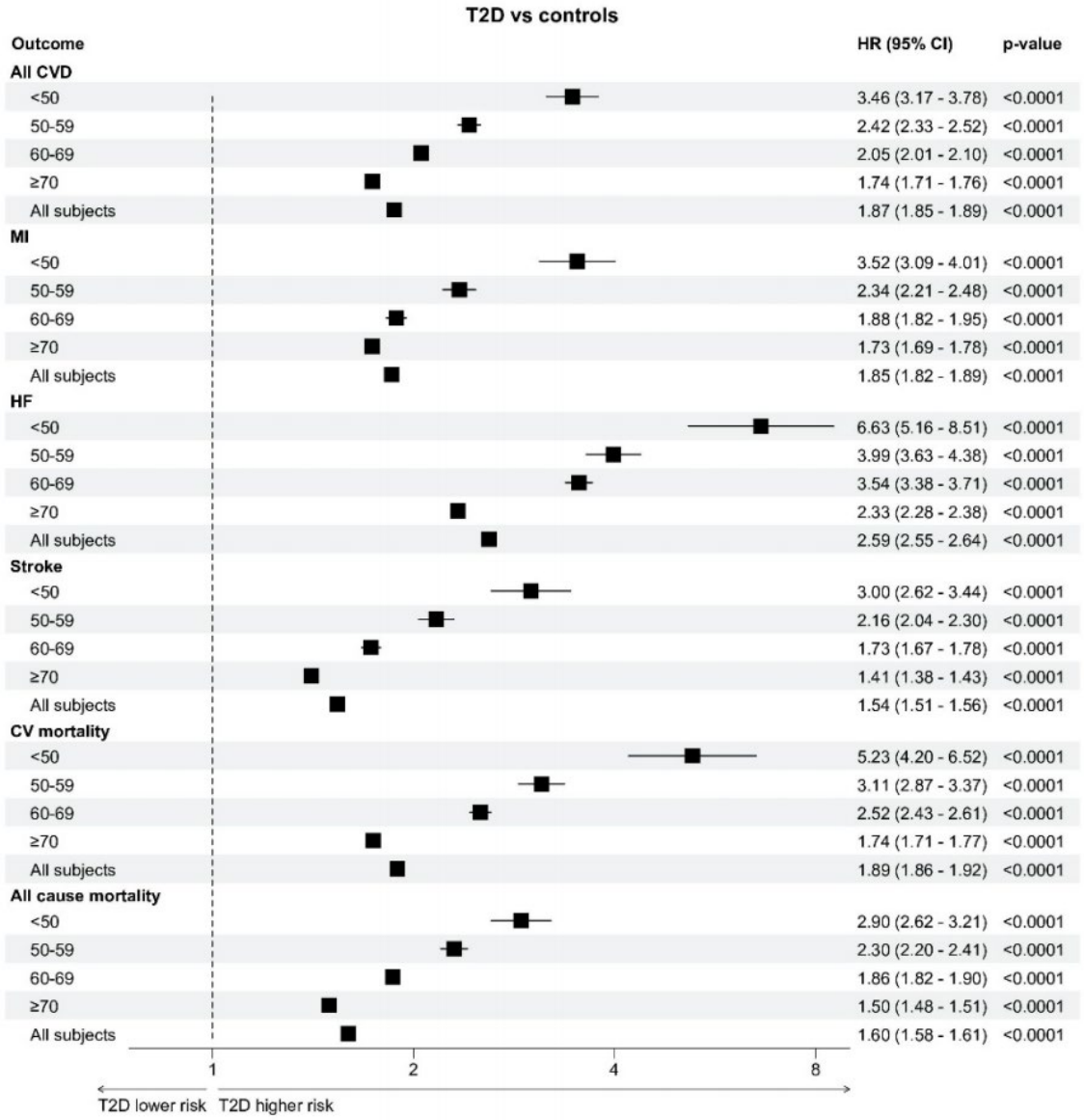
In addition, the type 1 diabetes and type 2 diabetes cohorts were compared with matched control groups with no diabetes.

Lancet Diabetes Endocrinol 2025; 13: 848–62

Comparison of risk for events in T1D vs matched control group in the whole study population



Comparison of risk for events in T2D vs matched control group in the whole study population



HR 2-4 ↑ both in T1D and T2D vs control

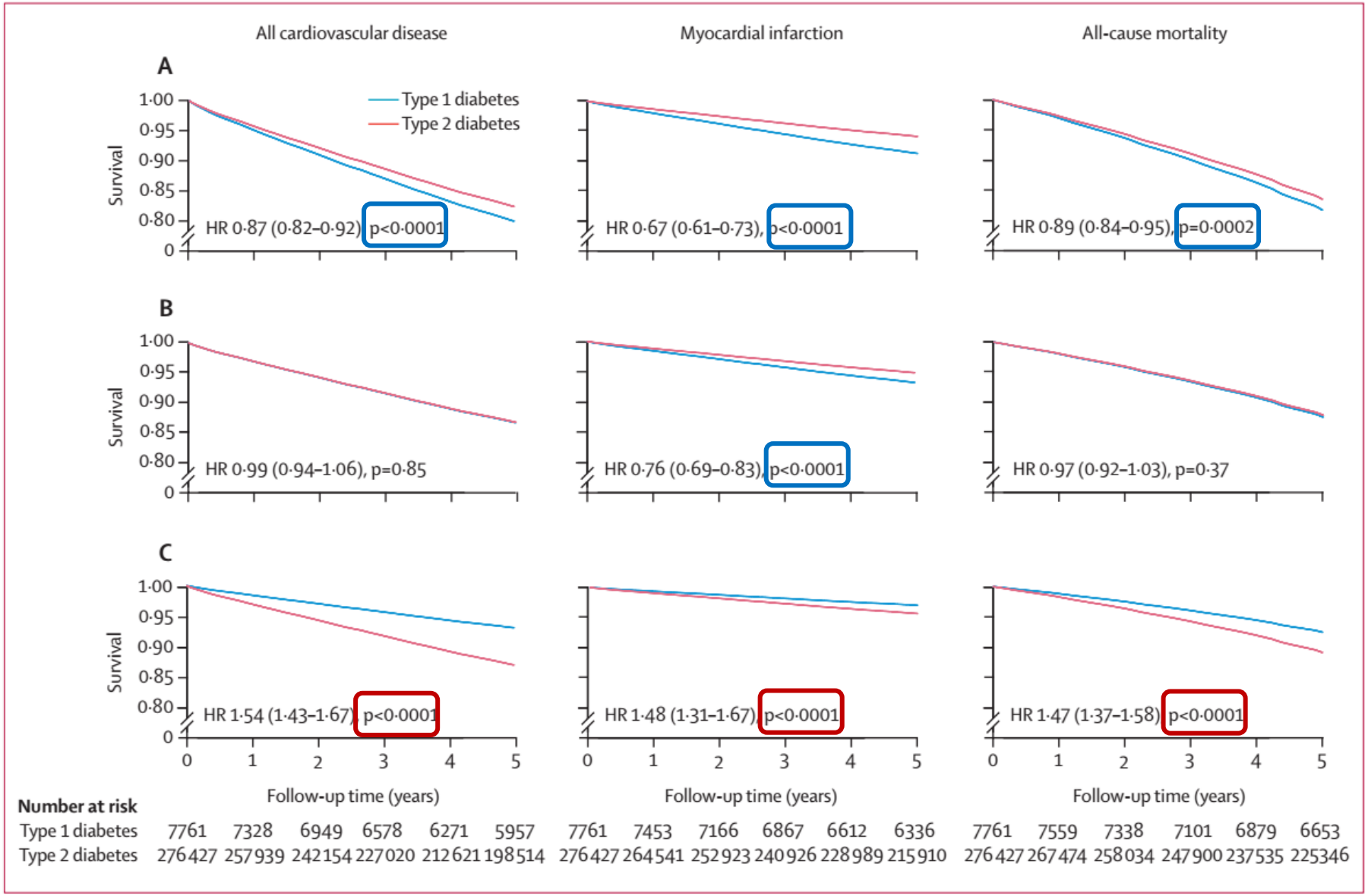
Lancet Diabetes Endocrinol 2025; 13: 848–62

All CV disease, myocardial infarction, and all-cause mortality during follow-up: event-free survival in the type 2 diabetes compared with type 1 diabetes populations older than 60 years

A) age and sex-adjusted

B) A+ HbA1c, LDL, systolic blood pressure, and smoking

C) A+ B + diabetes duration



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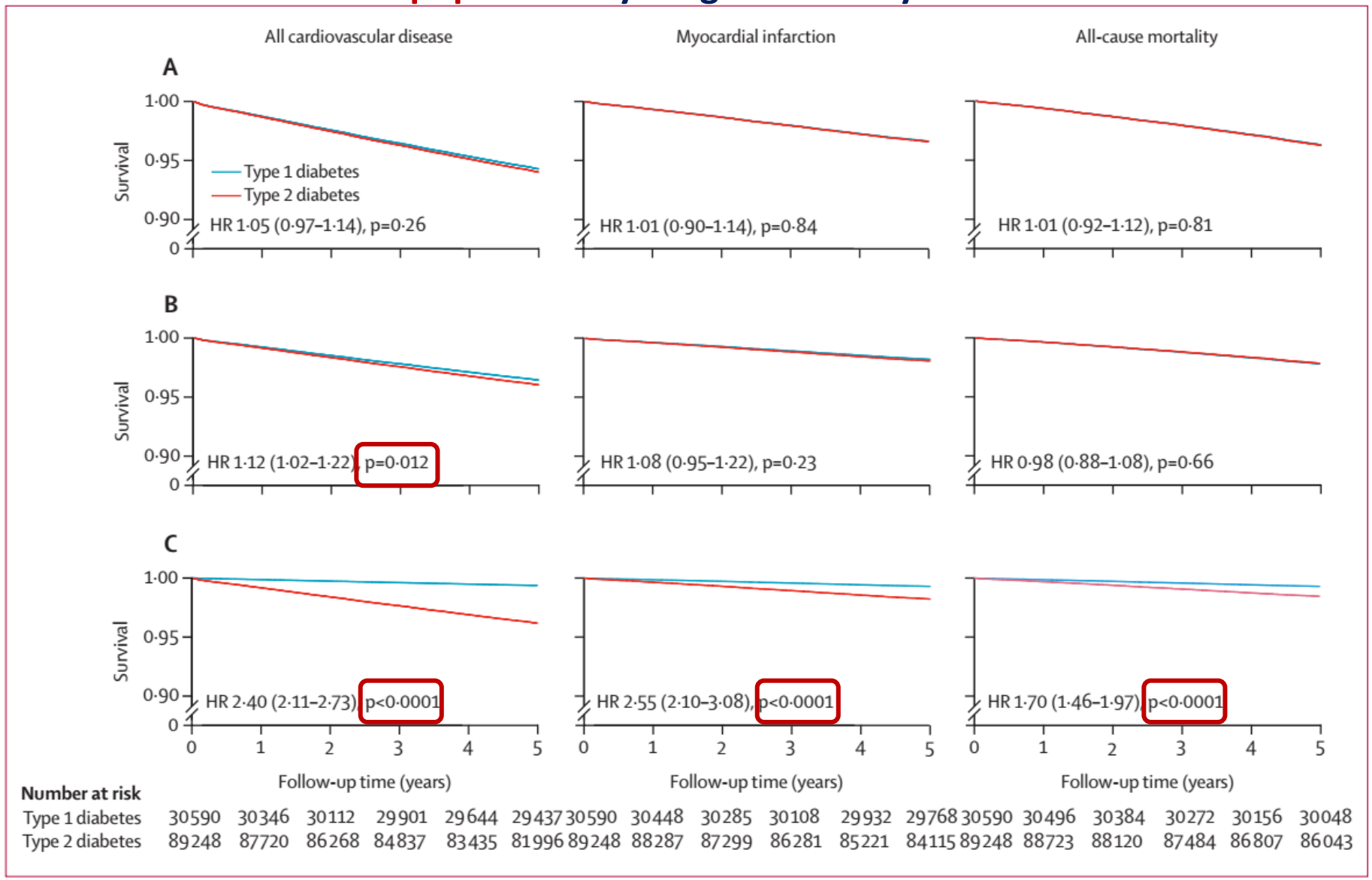

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Risk differences and underlying factors of cardiovascular events and mortality in patients with type 2 diabetes versus type 1 diabetes: a longitudinal cohort study of Swedish nationwide register data

Vagia Patsoukaki, Lars Lind, Erik Lampa, Sadiq Radhi, Katarina Eeg-Olofsson, Björn Eliasson, Jan W Eriksson

In this study, type 1 diabetes was associated with higher overall risk for cardiovascular disease events and all-cause mortality than type 2 diabetes, particularly at ages older than 60 years for the studied outcomes.

Longer diabetes duration seems to be a main contributing factor for higher risk found in people with type 1 diabetes versus those with type 2 diabetes in this age group.

Lancet Diabetes Endocrinol 2025; 13: 848–62

Lancet 2018; 392: 477–86

Excess mortality and cardiovascular disease in young adults with type 1 diabetes in relation to age at onset: a nationwide, register-based cohort study

Araz Rawshani, Naveed Sattar*, Stefan Franzén, Aidin Rawshani, Andrew T Hattersley, Ann-Marie Svensson, Björn Eliasson, Soffia Gudbjörnsdottir*

Individuals with type 1 diabetes in the Swedish National Diabetes Register and matched controls from the general population.
We included patients with at least one registration between Jan 1, 1998, and Dec 31, 2012,
mean age 29 years

Using Cox regression, and with adjustment for diabetes duration, we estimated the excess risk of ……cardiovascular mortality, non-cardiovascular mortality, acute myocardial infarction, stroke, cardiovascular disease (a composite of acute myocardial infarction and stroke), coronary heart disease, …..

Individuals with type 1 diabetes were categorised into five groups, according to age at diagnosis:
0–10 years, 11–15 years, 16–20 years, 21–25 years, and 26–30 years

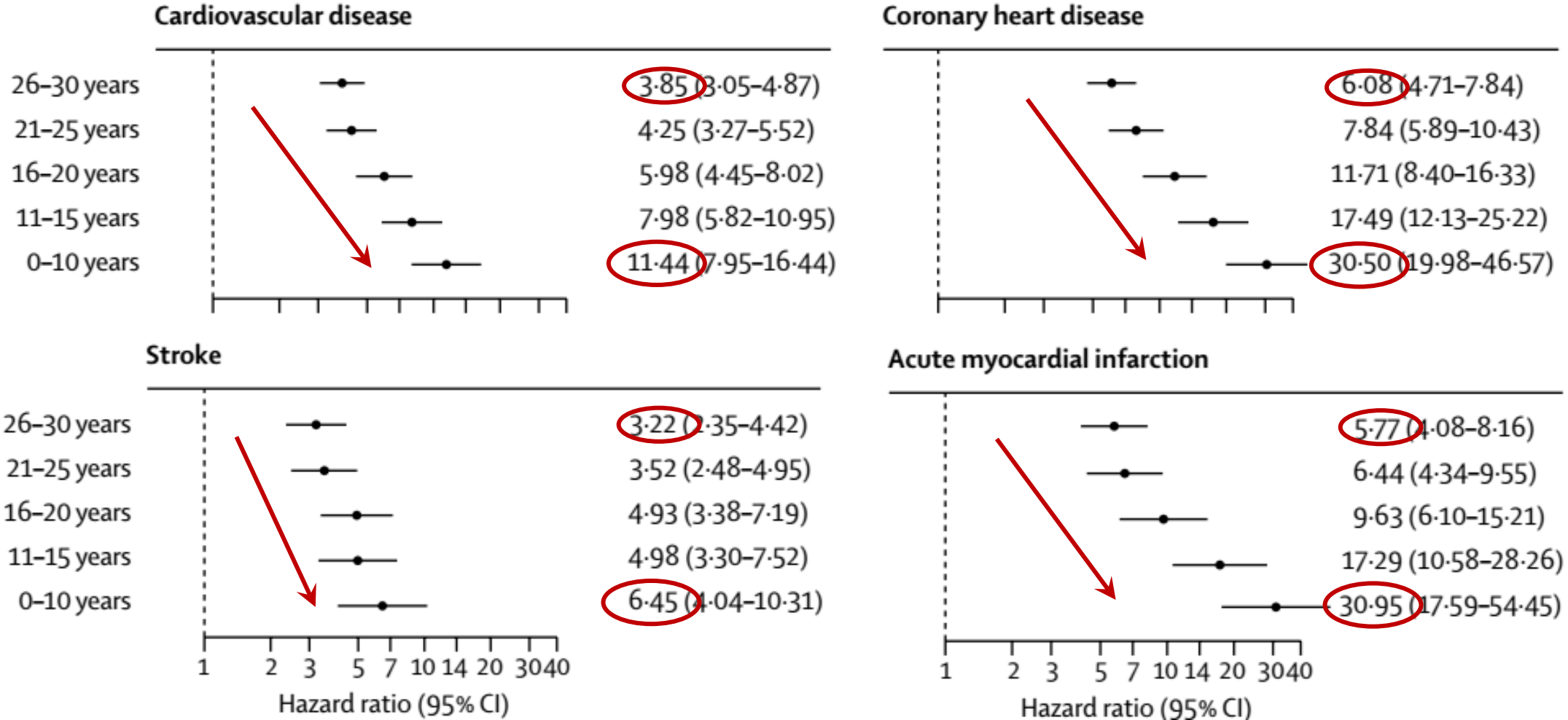
27195 individuals with type 1 diabetes and 135178 matched controls were selected for this study.
Median follow-up ~ 10 years

Excess mortality and cardiovascular disease in young adults with type 1 diabetes in relation to age at onset: a nationwide, register-based cohort study

Araz Rawshani, Naveed Sattar*, Stefan Franzén, Aidin Rawshani, Andrew T Hattersley, Ann-Marie Svensson, Björn Eliasson, Soffia Gudbjörnsdottir*

Lancet 2018; 392: 477–86

Adjusted hazard ratios for CV disease according to age at type 1 diabetes diagnosis



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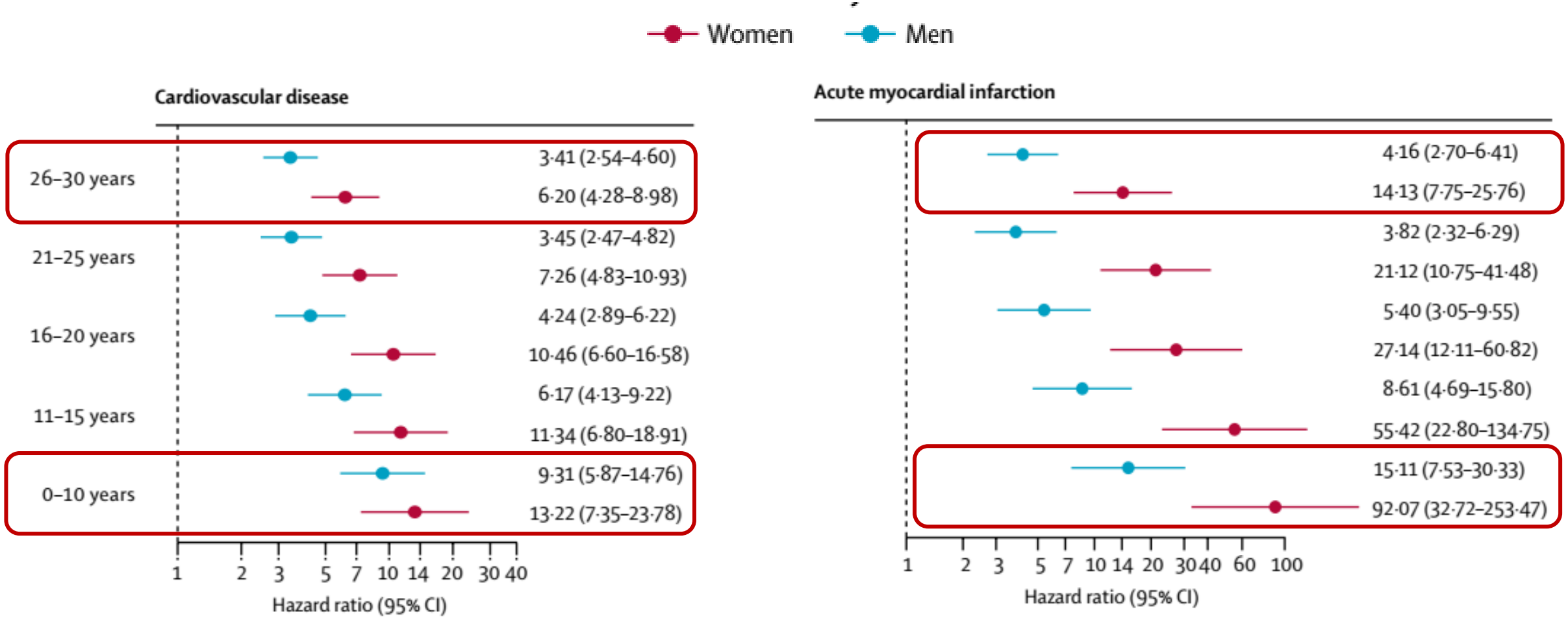
Lancet 2018; 392: 477–86

Adjusted hazard ratios for CV disease and Acute myocardial infarction, according to age at type 1 diabetes diagnosis and sex



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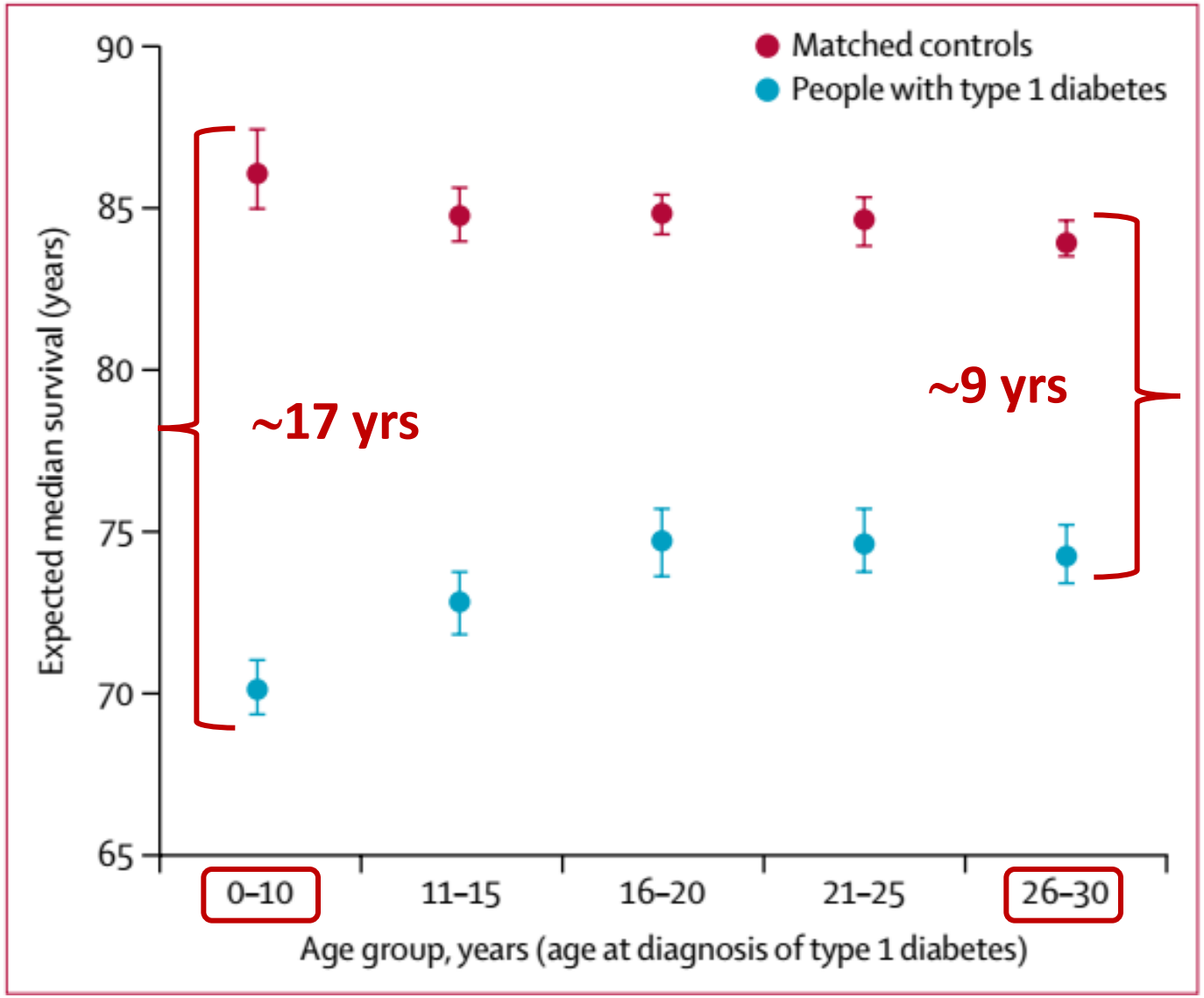

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Lancet 2018; 392: 477–86

Although the explanations for our findings are likely to be multifaceted, diabetes duration is likely to have a key role; even though we adjusted for duration more robustly than other studies, complete adjustment is impossible.

Circulation

Circulation. 2019;139:1900–1912

ORIGINAL RESEARCH ARTICLE

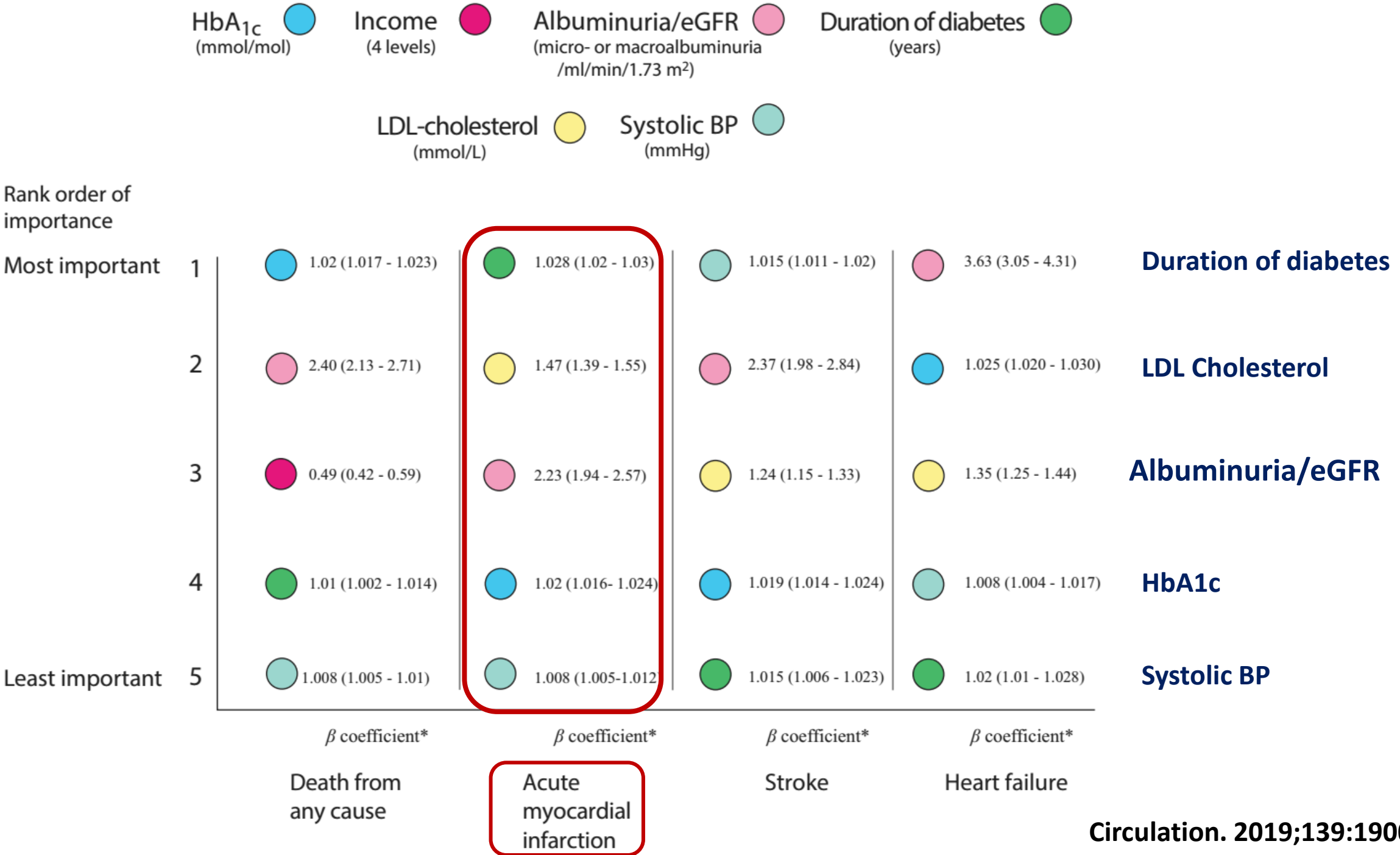
Relative Prognostic Importance and Optimal Levels of Risk Factors for Mortality and Cardiovascular Outcomes in Type 1 Diabetes Mellitus

Swedish National Diabetes Register from 1998 to 2014

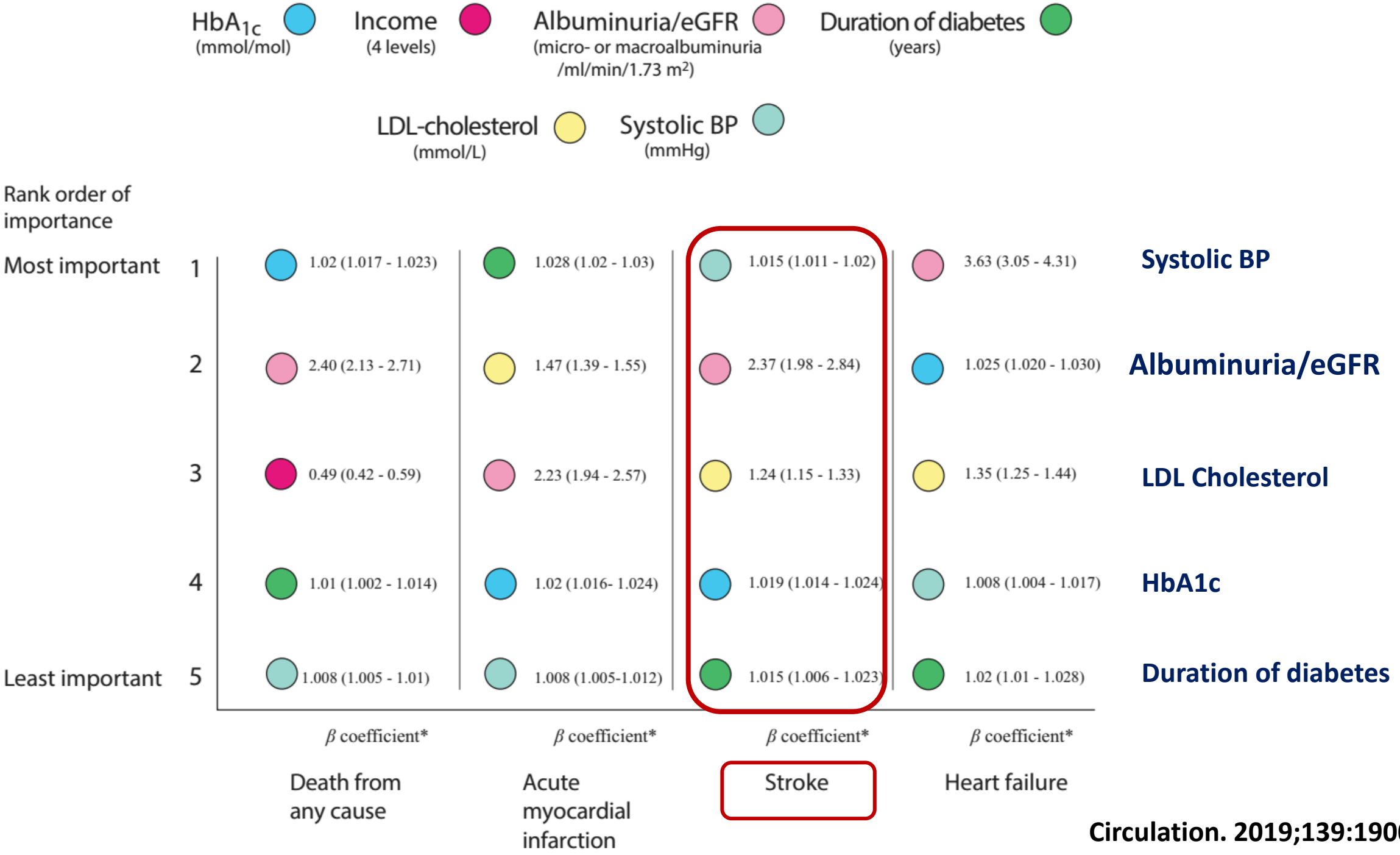
Relative prognostic importance of 17 risk factors for death and cardiovascular outcomes

Analysis: Cox regression and machine learning analyses.

32611 patients with type 1 diabetes mellitus
Follow-up of 10.4 years.



Circulation. 2019;139:1900–1912



Circulation. 2019;139:1900–1912

Risk Factors for First and Subsequent CVD Events in Type 1 Diabetes: The DCCT/EDIC Study

Diabetes Care 2020;43:867–874 | https://doi.org/10.2337/dc19-2292

*Ionut Bebu,[1] David Schade,[2] Barbara Braffett,[1] Mikhail Kosiborod,[3,4] Maria Lopes-Virella,[5] Elsayed Z. Soliman,[6] William H. Herman,[7] David A. Bluemke,[8] Amisha Wallia,[9] Trevor Orchard,[10] and John M. Lachin,[1] on behalf of the DCCT/EDIC Research Group**

The Diabetes Control and Complications Trial (DCCT) and its observational follow-up Epidemiology of Diabetes Interventions and Complications (EDIC) demonstrated the dominant role of glycemia, second only to age, as a risk factor for a first cardiovascular event in type 1 diabetes (T1D).

We now investigate the association between established risk factors and the total cardiovascular disease (CVD) burden, including subsequent (i.e., recurrent) events.

1,441 DCCT/EDIC participants, mean age at baseline 27 years.
Over a median follow-up of 29 years, 239 participants had 421 CVD events, and 120 individuals had 149 MACE.

Risk Factors for First and Subsequent CVD Events in Type 1 Diabetes: The DCCT/EDIC Study

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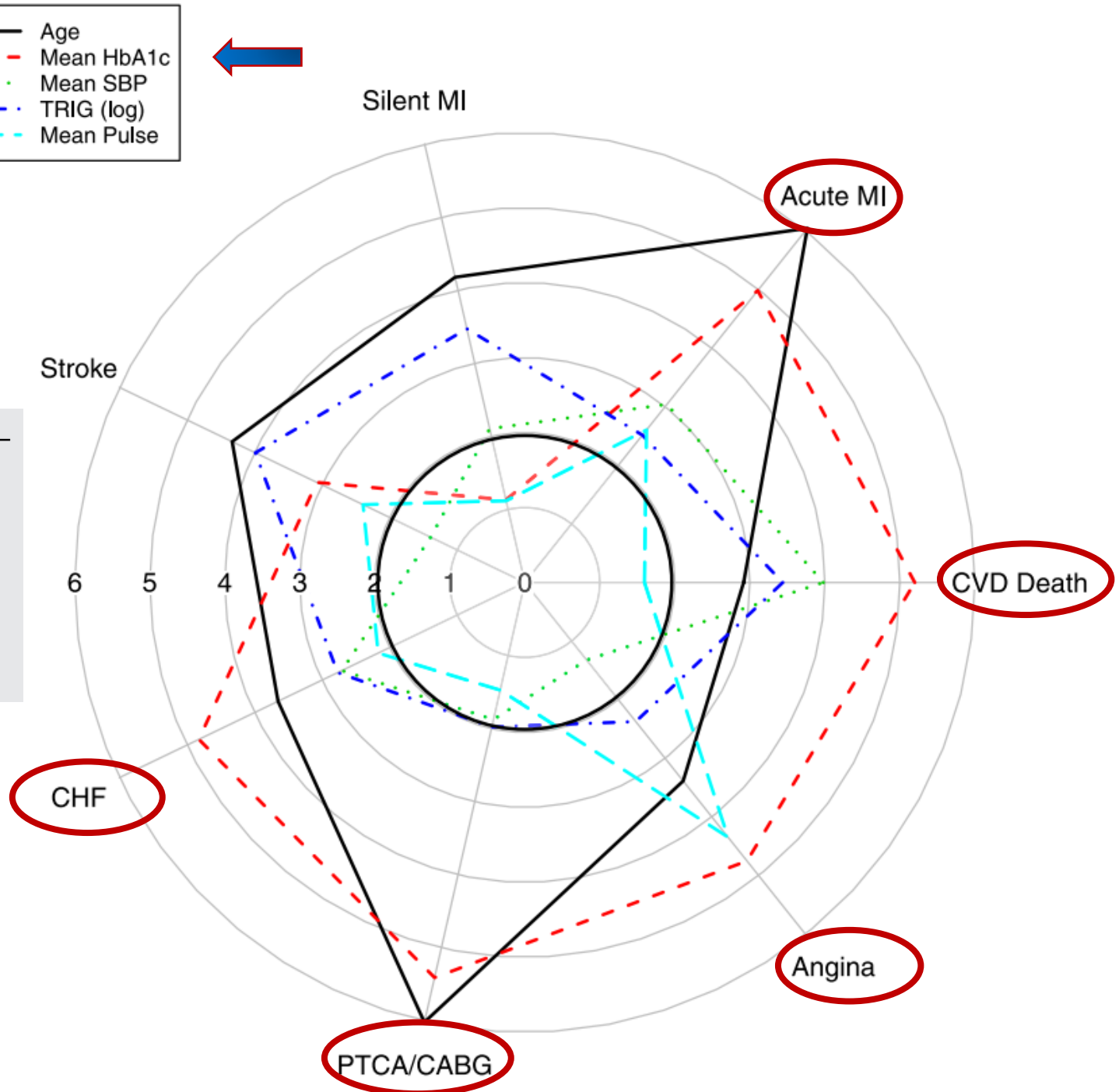
Multivariable proportional rate models for all (including recurrent) CVD events

	Type*	IR (95% CI)	*z* score	*P* value
CVD				
Age (per 5 years)	C	1.51 (1.35, 1.68)	7.325	**<0.001**
Mean HbA_{1c} (per 1% or 11 mmol/mol)	M	1.53 (1.30, 1.80)	5.165	**<0.001**
Mean SBP (per 10 mmHg)	M	1.28 (1.07, 1.53)	2.736	**0.006**
Triglycerides (log) (per 10 mg/dL)	C	1.47 (1.13, 1.92)	2.883	**0.004**
Mean pulse (per 10 bpm)	M	1.41 (1.08, 1.85)	2.530	**0.011**
Duration of T1D (per 5 years)	C	1.25 (1.04, 1.50)	2.388	**0.017**
ACE inhibitor (yes vs. no)	C	0.67 (0.51, 0.88)	−2.821	**0.005**
Family history of MI (yes vs. no)	B	1.48 (1.08, 2.04)	2.449	**0.014**
Mean LDLc (per 10 mg/dL)	M	1.03 (0.96, 1.11)	1.018	0.309



ESC European Society of Cardiology
European Heart Journal (2025) **00**, 1–11
https://doi.org/10.1093/eurheartj/ehaf304

CLINICAL RESEARCH
Diabetes and metabolic disorders

Adult-onset type 1 diabetes: predictors of major cardiovascular events and mortality

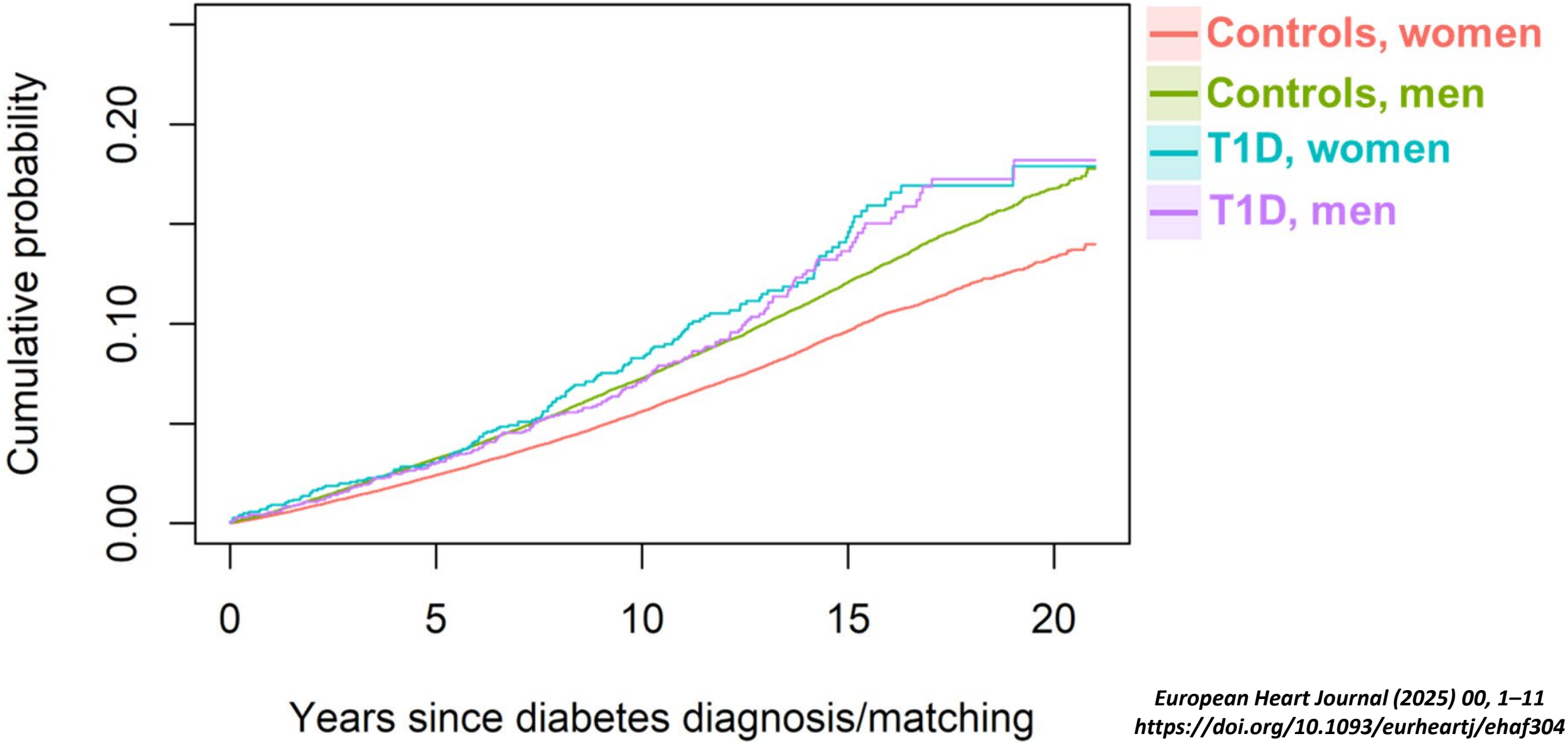
Yuxia Wei [1,*], Tomas Andersson [1], Tiinamaija Tuomi [2,3,4,5], Thomas Nyström [6], and Sofia Carlsson [1,*]

The prognosis of adult-onset type 1 diabetes (T1D) and prognostic factors are sparsely investigated. This study assessed mortality, major adverse cardiovascular events (MACE), and prognostic factors in adult-onset T1D, particularly focusing on those diagnosed at age ≥40.

Participants were people diagnosed with adult-onset T1D (n = 10 184) or type 2 diabetes (T2D, n = 375 523) in 2001–2020 from the Swedish National Diabetes Register and 509 172 population controls from the Total Population Register, followed until 2022.
Hazard ratios (HR) and population attributable risk fraction (PAR%) were estimated.
Median follow-up of 10.2 years.

European Heart Journal (2025) 00, 1–11
https://doi.org/10.1093/eurheartj/ehaf304

Cumulative probability of MACE in T1D diagnosed after age 40 years and matched controls by sex



European Heart Journal (2025) 00, 1–11
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Hazard ratios for all-cause mortality and MACE in adult-onset type 1 diabetes by baseline prognostic factors

Table 2 Hazard ratios for all-cause mortality and MACE in adult-onset type 1 diabetes by baseline prognostic factors

Lifestyle and clinical characteristics	Overall				T1D diagnosed at age ≥40 years			
	Proportion, %	Main model	Mutually adjusted model	PAR %	Proportion, %	Main model	Mutually adjusted model	PAR %
MACE								
Smoking vs. non-smoking	15.4	1.60 (1.12, 2.28)	1.62 (1.12, 2.32)	8.4	18.8	1.50 (1.01, 2.23)	1.52 (1.01, 2.28)	8.9
Being physically inactive vs. active	5.6	1.42 (0.88, 2.29)	1.24 (0.76, 2.01)	1.2	5.5	1.54 (0.99, 2.39)	1.34 (0.86, 2.08)	1.8
BMI								
Underweight	2.6	1.71 (0.73, 3.99)	1.86 (0.80, 4.33)	2.3	1.9	1.53 (0.63, 3.72)	1.71 (0.70, 4.17)	1.3
Overweight	31.3	1.56 (1.16, 2.10)	1.47 (1.06, 2.03)	12.1	35.4	1.50 (1.10, 2.05)	1.41 (0.99, 1.99)	12.2
Obesity	10.2	2.15 (1.50, 3.09)	1.82 (1.18, 2.82)	7.7	12.5	2.09 (1.44, 3.04)	1.76 (1.10, 2.81)	8.6
HbA1c out of target	49.5	1.33 (1.04, 1.69)	1.19 (0.91, 1.54)	8.8	52.4	1.26 (0.98, 1.63)	1.13 (0.86, 1.49)	7.3
Blood pressure out of target	39.4	1.30 (1.01, 1.68)	1.16 (0.89, 1.51)	5.6	54.1	1.20 (0.91, 1.58)	1.07 (0.81, 1.42)	4.0
Triglycerides out of target	13.5	1.72 (1.26, 2.35)	1.31 (0.91, 1.90)	4.2	18.3	1.73 (1.20, 2.49)	1.33 (0.86, 2.06)	5.7
eGFR out of target	2.2	1.46 (1.00, 2.14)	1.39 (0.95, 2.02)	0.7	5.3	1.46 (1.00, 2.15)	1.39 (0.95, 2.03)	1.8
Albuminuria	5.2	1.40 (0.98, 2.00)	1.17 (0.83, 1.65)	0.9	8.8	1.43 (0.99, 2.05)	1.20 (0.85, 1.71)	0.7

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Adult-onset type 1 diabetes: predictors of major cardiovascular events and mortality

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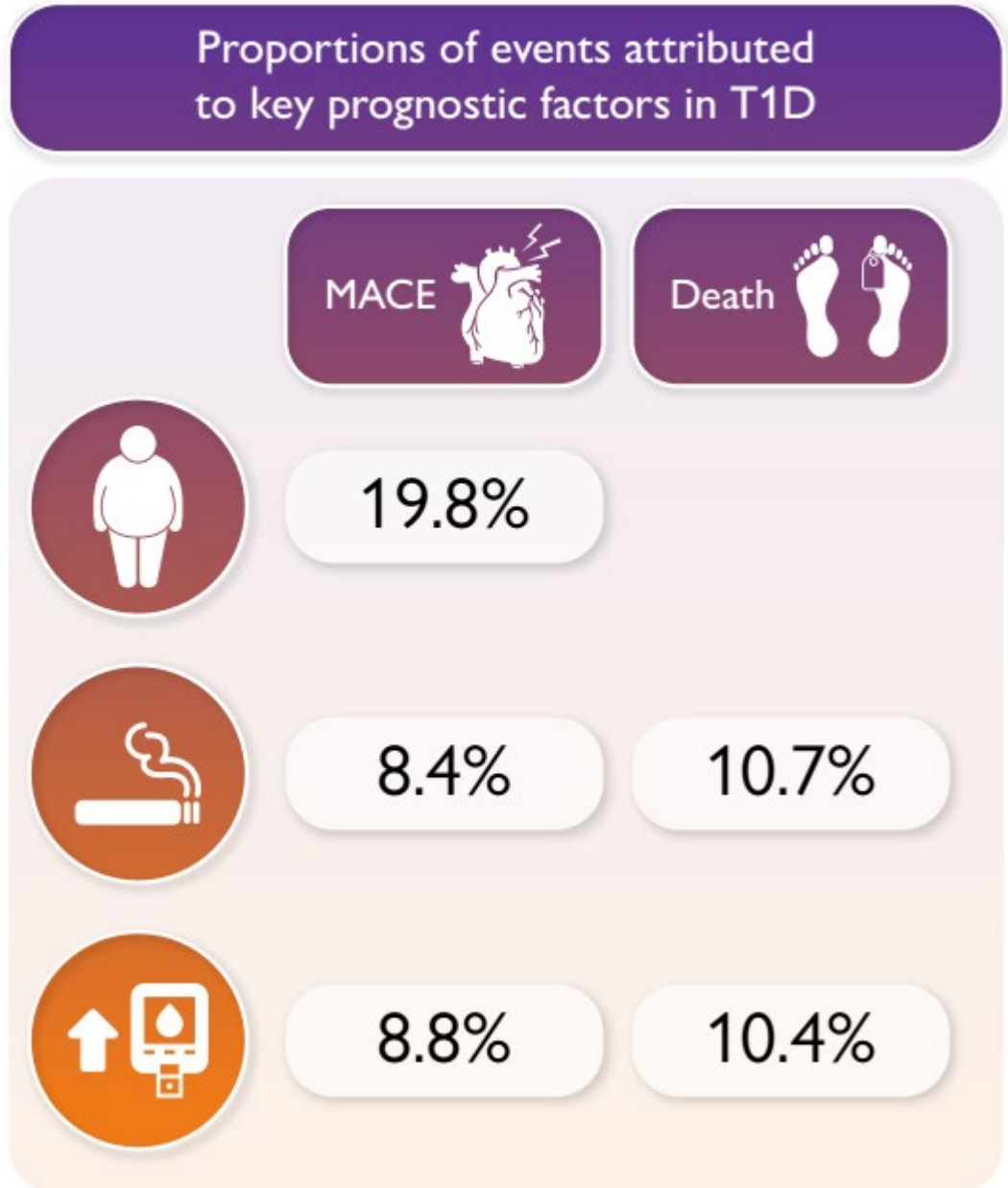

JAMA Network Open. 2022;5(9):e2230710.

Original Investigation | Diabetes and Endocrinology

Cardiometabolic Risk Factors and Incident Cardiovascular Disease Events in Women vs Men With Type 1 Diabetes

Barbara H. Braffett, PhD; Ionut Bebu, PhD; Laure El ghormli, MS; Catherine C. Cowie, PhD; William I. Sivitz, MD; Rodica Pop-Busui, MD, PhD; Mary E. Larkin, MS, RN; Rose A. Gubitosi-Klug, MD, PhD; David M. Nathan, MD; John M. Lachin, ScD; Samuel Dagogo-Jack, MD, DSc; for the DCCT/EDIC Research Group

To evaluate cardiometabolic risk factors and their management in association with CVD events in women vs men with type 1 diabetes enrolled in the Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) study

JAMA Network Open

Original Investigation | Diabetes and Endocrinology

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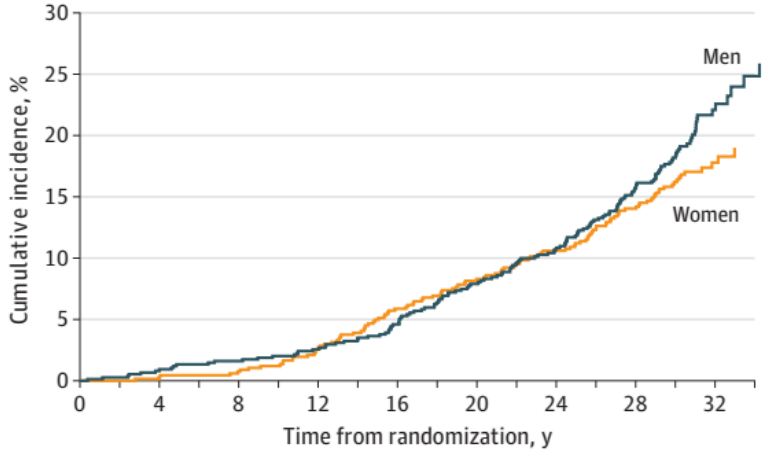
JAMA Network Open. 2022;5(9):e2230710.

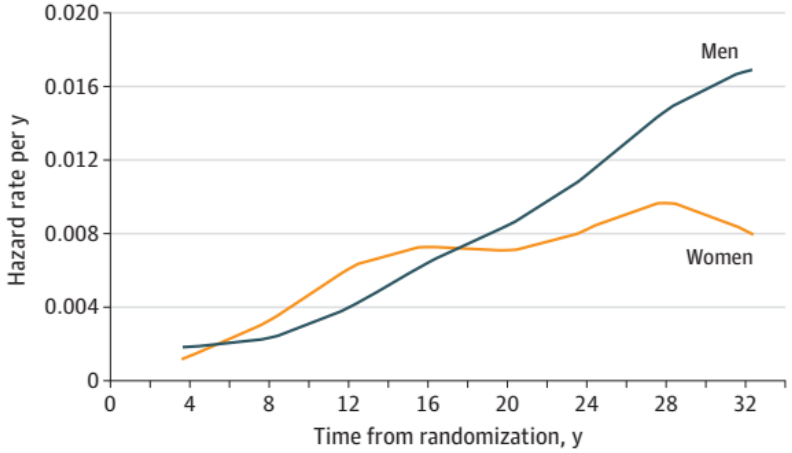
A Incidence of any CVD



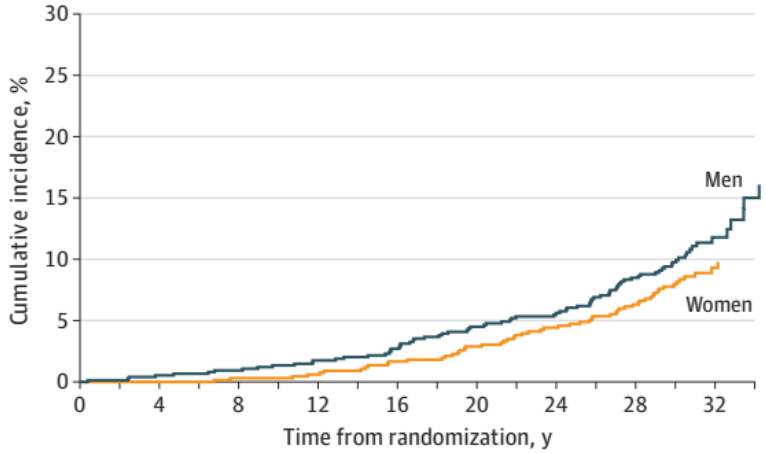
No. at risk

Women	667	666	664	651	626	601	578	544	198
Men	751	743	726	719	702	670	636	588	186

B Hazard rate of any CVD



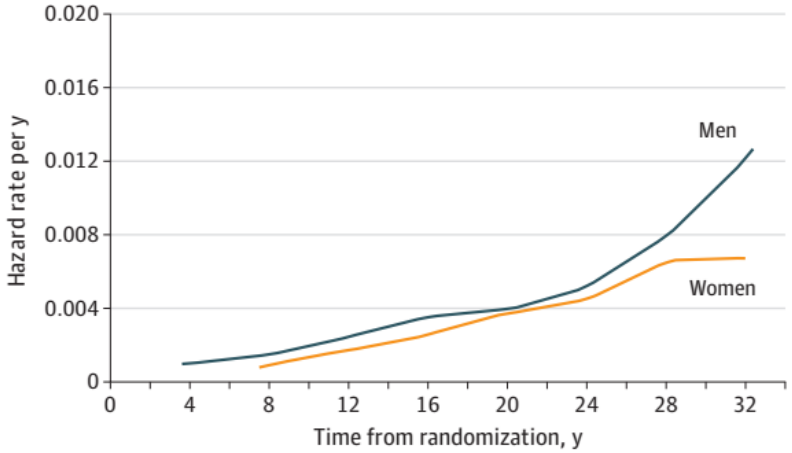
C Incidence of MACE



No. at risk

Women	665	665	664	659	650	632	617	592	214
Men	750	744	730	725	713	693	668	633	204

D Hazard rate of MACE



JAMA Network Open

Original Investigation | Diabetes and Endocrinology

Cardiometabolic Risk Factors and Incident Cardiovascular Disease Events in Women vs Men With Type 1 Diabetes

Barbara H. Braffett, PhD; Ionut Bebu, PhD; Laure El ghormli, MS; Catherine C. Cowie, PhD; William I. Sivitz, MD; Rodica Pop-Busui, MD, PhD; Mary E. Larkin, MS, RN; Rose A. Gubitosi-Klug, MD, PhD; David M. Nathan, MD; John M. Lachin, ScD; Samuel Dagogo-Jack, MD, DSc; for the DCCT/EDIC Research Group

JAMA Network Open. 2022;5(9):e2230710.

Table 2. Mean Differences in Longitudinal Cardiometabolic Risk Factors and HbA_{1c} Between Women and Men During Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications

Measure	Mean (SD)		Women vs men comparison[a]		
	Women (n = 680)	Men (n = 761)	β (SE)	*t* value/*z* value[b]	*P* value
BMI	25.1 (3.0)	25.6 (3.0)	−0.43 (0.16)	−2.75	.006
Waist circumference, cm	82.5 (10.0)	93.1 (10.1)	−10.56 (0.52)	−20.43	<.001
Blood pressure, mm Hg					
Systolic	113.1 (6.9)	118.9 (6.9)	−5.77 (0.35)	−16.55	<.001
Diastolic	72.3 (5.1)	75.5 (5.2)	−3.23 (0.26)	−12.41	<.001
Pulse pressure	40.9 (5.1)	43.5 (5.2)	−2.58 (0.26)	−9.94	<.001
Pulse rate, bpm	75.2 (6.8)	71.8 (6.9)	3.41 (0.35)	9.85	<.001
Any hypertension, % (95% CI)[c]	90.5 (88.2-92.4)	95.3 (93.8-96.4)	−0.75 (0.16)	−4.62	<.001
Lipids, mg/dL					
Total cholesterol	186.0 (26.0)	179.4 (26.0)	6.63 (1.37)	4.83	<.001
HDL cholesterol	58.8 (11.1)	49.4 (11.2)	9.36 (0.57)	16.35	<.001
LDL cholesterol	111.4 (23.1)	112.2 (23.2)	−0.76 (1.22)	−0.62	.53
Triglycerides[d]	79.4 (39.4)	89.5 (39.7)	−10.10 (1.98)	−5.11	<.001
Any hyperlipidemia, % (95% CI)[c]	58.9 (55.2-62.5)	57.1 (53.8-60.2)	0.07 (0.11)	0.70	.49
Medications, % (95% CI)					
ACEIs or ARBs	29.6 (25.7-33.9)	40.0 (36.1-44.0)	−0.46 (0.14)	−3.20	.001
β-blockers	4.4 (3.5-5.6)	5.1 (4.1-6.3)	−0.14 (0.16)	−0.86	.39
Calcium channel blockers	5.2 (4.1-6.6)	5.9 (4.7-7.5)	−0.14 (0.19)	−0.74	.46
Lipid-lowering	25.3 (22.1-28.7)	39.6 (36.1-43.2)	−0.66 (0.12)	−5.75	<.001
Kidney disease, % (95% CI)[c]					
Any sustained eGFR<60 mL/min/1.73 m^2	2.4 (1.7-3.5)	2.9 (2.1-4.1)	−0.19 (0.20)	−0.93	.35
Any sustained AER ≥30 mg/24 h	16.2 (12.8-20.4)	23.8 (20.3-27.8)	−0.48 (0.20)	−2.40	.02
Any AER ≥300 mg/24 h	6.0 (4.6-7.8)	12.5 (10.5-14.9)	−0.80 (0.17)	−4.71	<.001
Glycemic control					
HbA_{1c}, %	8.3 (1.0)	8.1 (1.0)	0.13 (0.05)	2.46	.01
HbA_{1c}, mmol/mol	66.7 (10.8)	65.3 (10.9)	1.41 (0.57)	2.46	.01

JAMA Network Open

JAMA Network Open. 2022;5(9):e2230710.

Original Investigation | Diabetes and Endocrinology

Cardiometabolic Risk Factors and Incident Cardiovascular Disease Events in Women vs Men With Type 1 Diabetes

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Compared with men with type 1 diabetes, women with type 1 diabetes

- ✓ **may have a lower burden of cardiometabolic risk factors,**
- ✓ **receive less aggressive cardioprotective medications (despite current guidelines),**
- ✓ **have no advantage associated with sex in CVD outcomes**

Diabetologia (2017) 60:2084–2091
DOI 10.1007/s00125-017-4374-4

ARTICLE

The relationship of blood glucose with cardiovascular disease is mediated over time by traditional risk factors in type 1 diabetes: the DCCT/EDIC study

Ionut Bebu[1] · Barbara H. Braffett[1] · Rodica Pop-Busui[2] · Trevor J. Orchard[3] · David M. Nathan[4] · John M. Lachin[1] · the DCCT/EDIC Research Group

Our aim was to describe the degree to which the effect of HbA1c on the risk of CVD is mediated by its effect on traditional risk factors over time, and how these mediation pathways change over time

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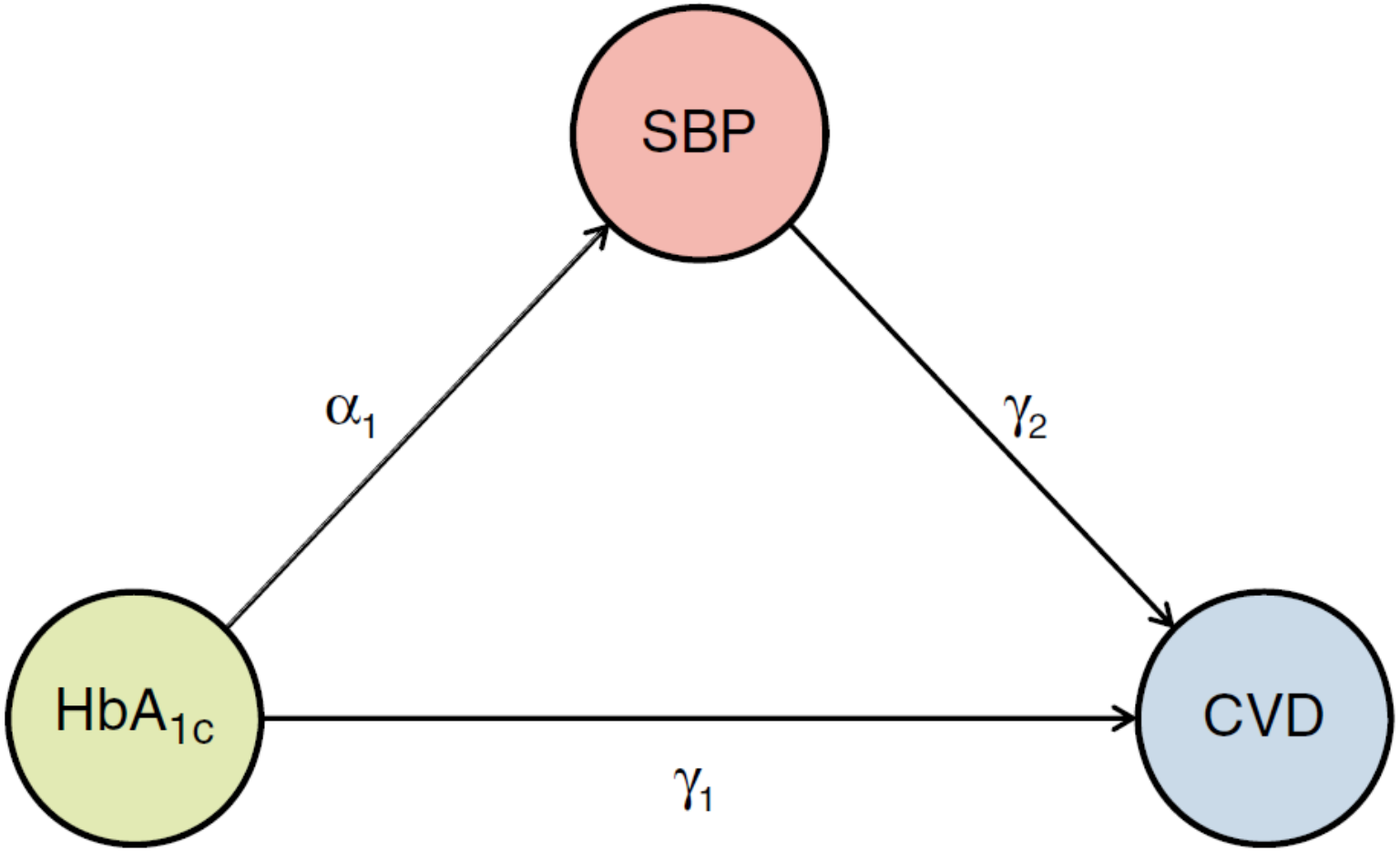

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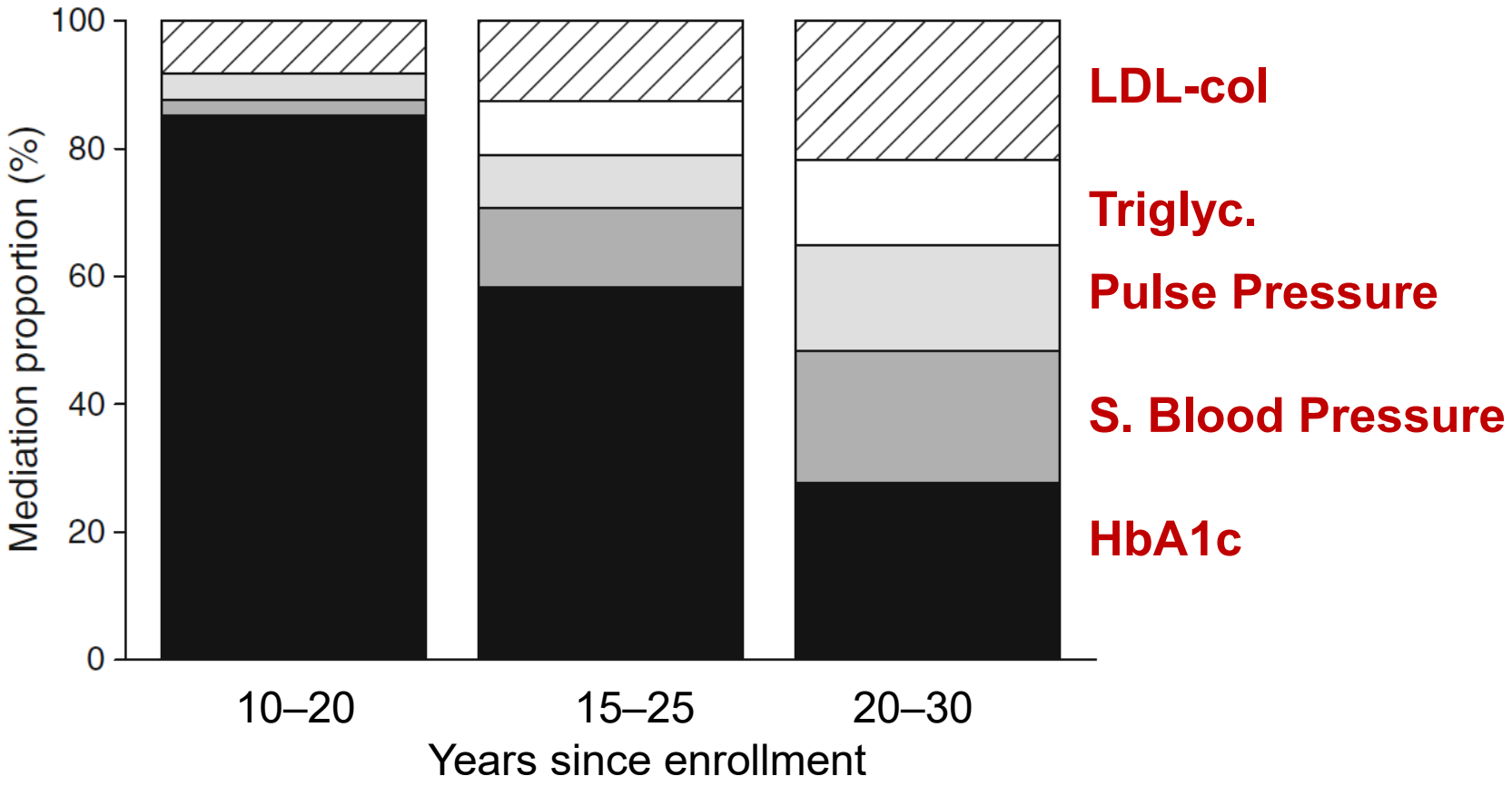
Decomposition of the total effect of HbA1c on CVD risk into the direct and indirect effects



Associations of Microvascular Complications With the Risk of Cardiovascular Disease in Type 1 Diabetes

*Rose Gubitosi-Klug,[1] Xiaoyu Gao,[2] Rodica Pop-Busui,[3] Ian H. de Boer,[4] Neill White,[5] Lloyd P. Aiello,[6] Ryan Miller,[7] Jerry Palmer,[8] William Tamborlane,[9] Amisha Wallia,[10] Mikhail Kosiborod,[11] John M. Lachin,[2] Ionut Bebu,[2] and the DCCT/EDIC Research Group**

Diabetes Care 2021;44:1499–1505 | https://doi.org/10.2337/dc20-3104

We examined whether the presence of microvascular complications was associated with increased subsequent risk of cardiovascular disease (CVD) among participants with type 1 diabetes in the Diabetes Control and Complications Trial and Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) study followed for >35 years.

Table 3—Associations (HRs, 95% CIs, and *P* values) of prior microvascular complication with outcomes of CVD (*A*) and MACE (*B*)

	Unadjusted models		Minimally adjusted models*		Fully adjusted models^	
	HR (95% CI)	*P* value	HR (95% CI)	*P* value	HR (95% CI)	*P* value
A. CVD						
Eyes: PDR and/or CSME	**1.98 (1.51, 2.58)**	**<0.0001**	**1.47 (1.11, 1.94)**	**0.0069**	1.13 (0.84, 1.53)	0.4033
Eyes: PDR	**1.91 (1.44, 2.55)**	**<0.0001**	**1.44 (1.06, 1.95)**	**0.0187**	1.09 (0.79, 1.51)	0.5852
Eyes: CSME	**1.86 (1.40, 2.46)**	**<0.0001**	1.33 (0.99, 1.77)	0.0562	1.03 (0.77, 1.40)	0.8244
Eyes: Three-step progression	1.18 (0.90, 1.55)	0.2391	0.89 (0.66, 1.19)	0.4329	0.76 (0.56, 1.03)	0.0816
Kidney: Sustained AER ≥30 mg/24 h and/or eGFR <60 mL/min/1.73 m^2	**2.36 (1.82, 3.05)**	**<0.0001**	**1.99 (1.51, 2.61)**	**<0.0001**	**1.54 (1.15, 2.07)**	**0.0038**
Kidney: AER ≥300 mg/24 h	**2.13 (1.51, 3.01)**	**<0.0001**	**1.67 (1.16, 2.41)**	**0.0059**	1.15 (0.78, 1.70)	0.4884
Kidney: Sustained AER ≥30 mg/24 h	**2.22 (1.71, 2.87)**	**<0.0001**	**1.91 (1.45, 2.52)**	**<0.0001**	**1.47 (1.09, 1.97)**	**0.0119**
Kidney: eGFR <60 mL/min/1.73 m^2	**3.18 (2.15, 4.69)**	**<0.0001**	**2.12 (1.43, 3.15)**	**0.0002**	1.48 (0.97, 2.23)	0.0658
Nerves: CAN	**1.91 (1.45, 2.51)**	**<0.0001**	**1.36 (1.03, 1.80)**	**0.0313**	1.11 (0.83, 1.49)	0.4767
Nerves: Presence of retinal and kidney disease+	**1.81 (1.54, 2.12)**	**<0.0001**	**1.55 (1.30, 1.85)**	**<0.0001**	**1.28 (1.05, 1.56)**	**0.0127**
B. MACE						
Eyes: PDR and/or CSME	**2.45 (1.69, 3.56)**	**<0.0001**	**1.61 (1.09, 2.40)**	**0.0178**	1.29 (0.85, 1.95)	0.2342
Eyes: PDR	**2.09 (1.41, 3.11)**	**0.0002**	1.34 (0.88, 2.04)	0.1735	1.00 (0.64, 1.56)	0.9877
Eyes: CSME	**2.22 (1.52, 3.25)**	**<0.0001**	1.39 (0.93, 2.07)	0.1087	1.16 (0.77, 1.75)	0.4695
Eyes: Three-step progression	1.49 (0.99, 2.23)	0.0541	1.00 (0.65, 1.54)	0.9866	0.88 (0.56, 1.36)	0.5561
Kidney: Sustained AER ≥30 mg/24 h and/or eGFR <60 mL/min/1.73 m^2	**2.59 (1.80, 3.72)**	**<0.0001**	**1.93 (1.31, 2.85)**	0.0009	1.43 (0.94, 2.18)	0.0913
Kidney: AER ≥300 mg/24 h	**2.99 (1.94, 4.61)**	**<0.0001**	**2.12 (1.33, 3.38)**	**0.0015**	1.56 (0.94, 2.59)	0.0878
Kidney: Sustained AER ≥30 mg/24 h	**2.51 (1.74, 3.61)**	**<0.0001**	**1.93 (1.30, 2.85)**	**0.0010**	1.41 (0.92, 2.14)	0.1134
Kidney: eGFR <60	**3.63 (2.20, 5.97)**	**<0.0001**	**2.06 (1.23, 3.44)**	**0.0058**	1.54 (0.90, 2.65)	0.1182
Nerves: CAN	**2.23 (1.52, 3.26)**	**<0.0001**	**1.49 (1.01, 2.20)**	**0.0471**	1.14 (0.76, 1.73)	0.5195
Nerves: Presence of retinal and kidney disease+	**2.03 (1.62, 2.54)**	**<0.0001**	**1.59 (1.24, 2.04)**	**0.0003**	1.31 (0.99, 1.73)	0.0572

Garofolo *et al. Cardiovasc Diabetol* (2019) 18:159
https://doi.org/10.1186/s12933-019-0961-7

Cardiovascular Diabetology

ORIGINAL INVESTIGATION Open Access

Microvascular complications burden (nephropathy, retinopathy and peripheral polyneuropathy) affects risk of major vascular events and all-cause mortality in type 1 diabetes: a 10-year follow-up study

Monia Garofolo[1], Elisa Gualdani[2], Rosa Giannarelli[1], Michele Aragona[1], Fabrizio Campi[1], Daniela Lucchesi[1], Giuseppe Daniele[1], Roberto Miccoli[1], Paolo Francesconi[2], Stefano Del Prato[1*] and Giuseppe Penno[1]

We evaluated the relationship between microvascular complications burden and incidence of major cardiovascular events and all-cause mortality in subjects with type 1 diabetes.

We recruited 774 participants with type 1 diabetes in a single-center observational study over a follow-up of 10.8±2.5 years.

Garofolo et al. Cardiovasc Diabetol (2019) 18:159
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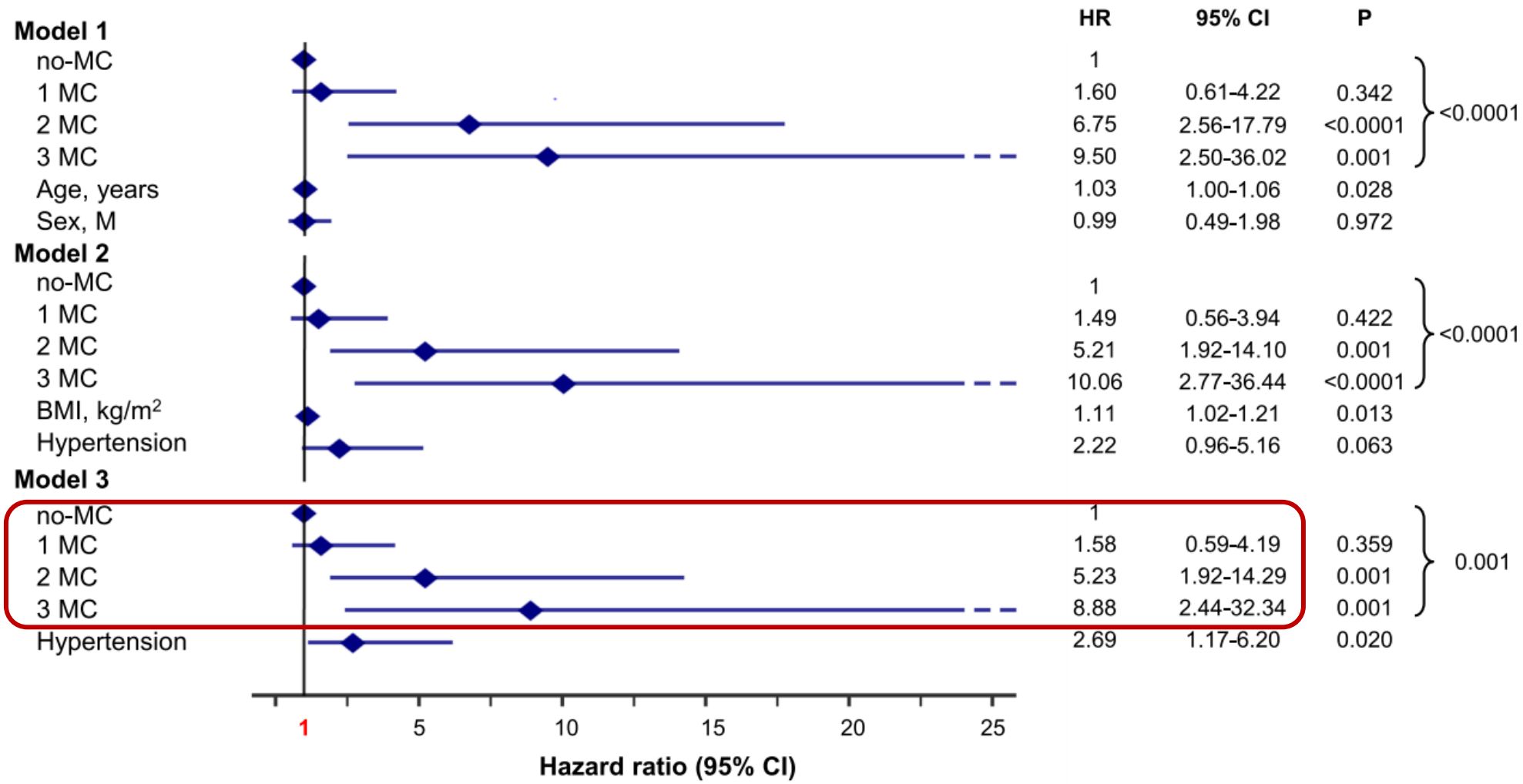
Adjusted HR for major vascular events by microvascular complications in CVD–



Genetic Risk Factors for CVD in Type 1 Diabetes: The DCCT/EDIC Study

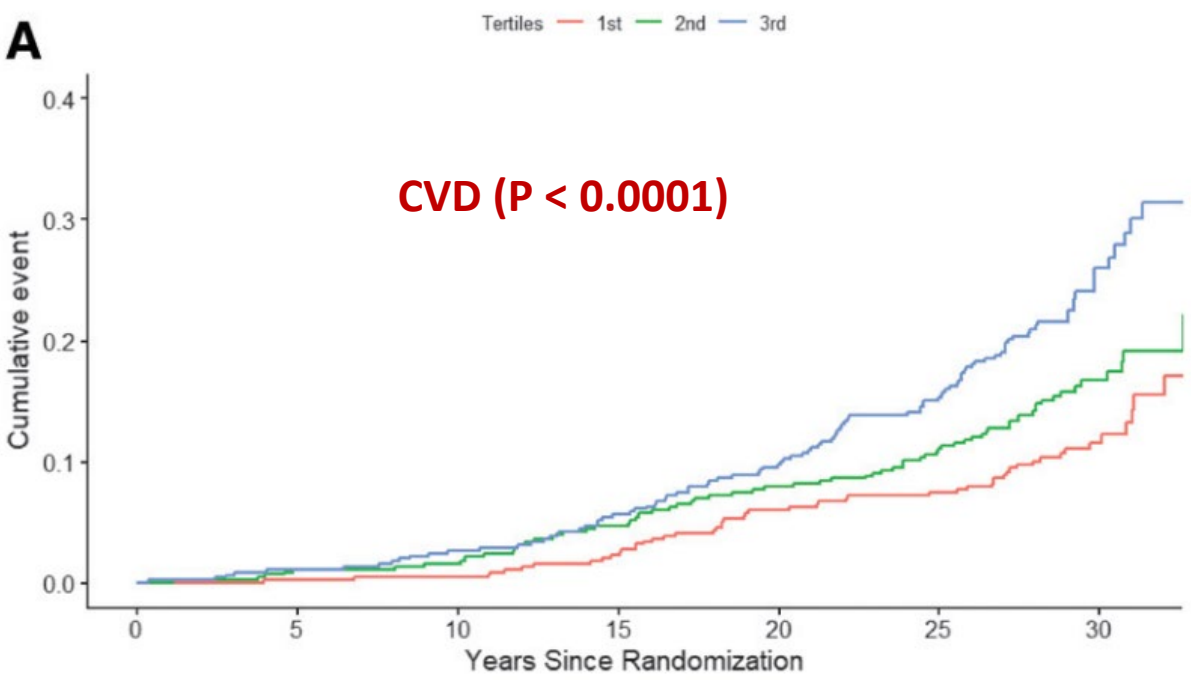
Diabetes Care 2021;44:1309–1316 | https://doi.org/10.2337/dc20-2388

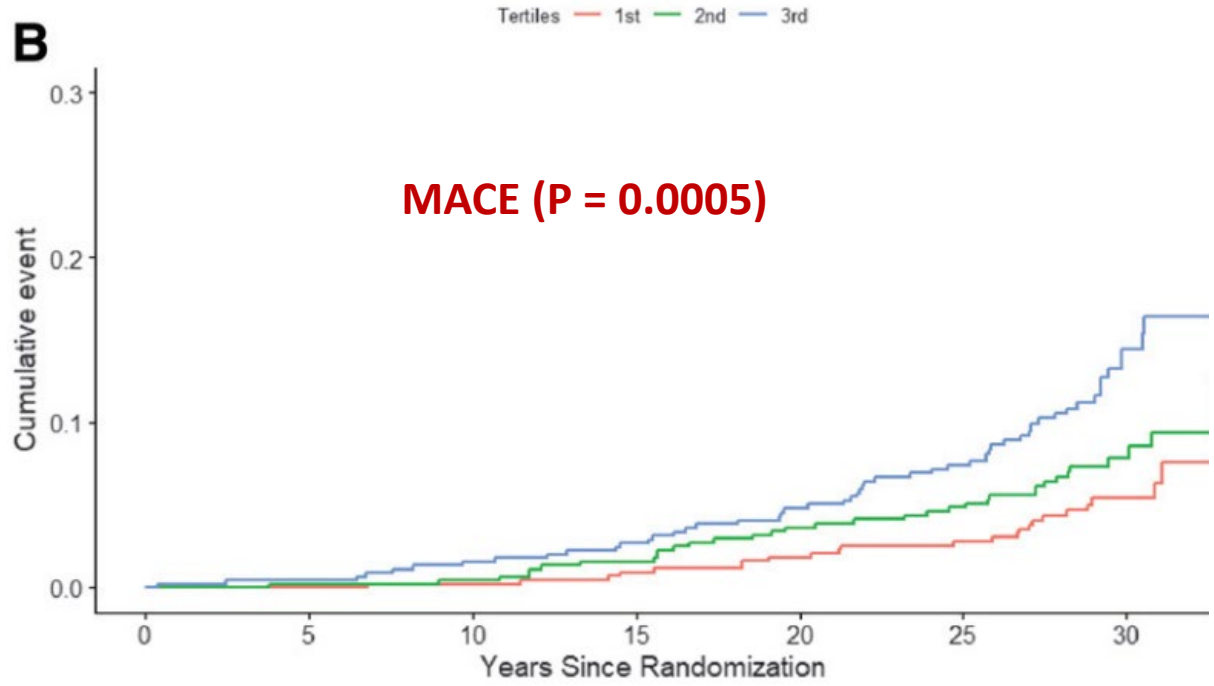
We examined whether previously identified genetic factors for coronary artery disease (CAD) are associated with the risk of CVD above and beyond established demographic and clinical factors in the Diabetes Control and Complications Trial (DCCT)/Epidemiology of Diabetes Interventions and Complications (EDIC) study.

Genetic Risk Factors for CVD in Type 1 Diabetes: The DCCT/EDIC Study

Diabetes Care 2021;44:1309–1316 | https://doi.org/10.2337/dc20-2388

Cumulative incidence of CVD and MACE differed by CAD PRS tertile





Genetic Risk Factors for CVD in Type 1 Diabetes: The DCCT/EDIC Study

Diabetes Care 2021;44:1309–1316 | https://doi.org/10.2337/dc20-2388

Table 2—Cox proportional hazards models assessing association between CAD PRS and risk of CVD and MACE

	Unadjusted			Adjusted for age and HbA_{1c}			Fully adjusted*		
	HR (95% CI)	*z* score	*P*	HR (95% CI)	*z* score	*P*	HR (95% CI)	*z* score	*P*
CVD									
Highest 33%†	1.83 (1.41, 2.37)	4.52	6.1E−6	1.80(1.38, 2.34)	4.40	1.1E−5	1.75 (1.34, 2.28)	4.10	4.1E−5
Per SD increase	1.42 (1.25, 1.62)	5.26	1.4E−7	1.42 (1.25, 1.62)	5.34	9.2E−8	1.38 (1.21, 1.58)	4.81	1.5E−6
MACE									
Highest 33%†	1.96 (1.36, 2.85)	3.57	3.6E−4	1.89 (1.31, 2.74)	3.37	7.4E−4	1.80 (1.24, 2.62)	3.07	2.1E−3
Per SD increase	1.50 (1.25, 1.80)	4.31	1.7E−5	1.47 (1.23, 1.76)	4.23	2.3E−5	1.40 (1.17, 1.67)	3.73	1.9E−4

ESC European Society of Cardiology
European Heart Journal (2024) **45**, 3912–4018
https://doi.org/10.1093/eurheartj/ehae178

ESC GUIDELINES

2024 ESC Guidelines for the management of elevated blood pressure and hypertension

Developed by the task force on the management of elevated blood pressure and hypertension of the European Society of Cardiology (ESC) and *endorsed by the European Society of Endocrinology (ESE) and the European Stroke Organisation (ESO)*

BP < 130/80 mmHg

ESH Guidelines

2023 ESH Guidelines for the management of arterial hypertension

The Task Force for the management of arterial hypertension of the European Society of Hypertension

Endorsed by the International Society of Hypertension (ISH) and the European Renal Association (ERA)

American Diabetes Association
Professional Practice Committee*

10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025

Diabetes Care 2025;48(Suppl. 1):S207–S238 | https://doi.org/10.2337/dc25-S010

ESC European Society of Cardiology
European Heart Journal (2023) **00**, 1–98
https://doi.org/10.1093/eurheartj/ehad192

2023 ESC Guidelines for the management of cardiovascular disease in patients with diabetes

Developed by the task force on the management of cardiovascular disease in patients with diabetes of the European Society of Cardiology (ESC)

Recommendation Table 12 — Recommendations for patients with diabetes without a history of symptomatic atherosclerotic cardiovascular disease or revascularization

Recommendation	Class[a]	Level[b]
In adults with T2DM without a history of symptomatic ASCVD or revascularization, ASA (75–100 mg o.d.) may be considered to prevent the first severe vascular event, in the absence of clear contraindications.[c,292,293]	IIb	A

ASA, acetylsalicylic acid; ASCVD, atherosclerotic cardiovascular disease; o.d., once daily; T2DM, type 2 diabetes mellitus.
[a]Class of recommendation.
[b]Level of evidence.
[c]High risk of bleeding due to gastrointestinal haemorrhage or peptic ulcer within the previous 6 months, active hepatic disease (such as cirrhosis, active hepatitis), or history of ASA allergy.

American Diabetes Association
Professional Practice Committee*

10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025

Diabetes Care 2025;48(Suppl. 1):S207–S238 | https://doi.org/10.2337/dc25-S010

ESC GUIDELINES

2025 Focused Update of the 2019 ESC/EAS Guidelines for the management of dyslipidaemias

Developed by the task force for the management of dyslipidaemias of the European Society of Cardiology (ESC) and the European Atherosclerosis Society (EAS)

LDL -Chol

< 55 mgdl (< 40 mg/dl)

< 70 mg/dl

< 100 mg/dl

Table 3 Cardiovascular risk categories

Very high risk	People with any of the following: • Documented ASCVD, either clinical or unequivocal on imaging. Documented ASCVD includes previous ACS (MI or unstable angina), chronic coronary syndromes, coronary revascularization (PCI, CABG, and other arterial revascularization procedures), stroke and TIA, and peripheral arterial disease. Unequivocally documented ASCVD on imaging includes those findings that are known to be predictive of clinical events, such as significant plaque[a] on coronary angiography or CT scan or on carotid or femoral ultrasound or markedly elevated CAC score by CT[b] • DM with target organ damage,[c] or at least three major risk factors, or early onset of T1DM of long duration (>20 years) • Severe CKD (eGFR <30 mL/min/1.73 m^2) • A calculated SCORE2 or SCORE2-OP ≥20% for 10 year risk of fatal or non-fatal CVD • FH with ASCVD or with another major risk factor
High risk	People with any of the following: • Markedly elevated single risk factors, in particular TC >8 mmol/L (>310 mg/dL), LDL-C >4.9 mmol/L (>190 mg/dL), or BP ≥180/110 mmHg • Patients with FH without other major risk factors • Patients with DM without target organ damage,[c] with DM duration ≥10 years or another additional risk factor • Moderate CKD (eGFR 30–59 mL/min/1.73 m^2) • A calculated SCORE2 or SCORE2-OP ≥10% and <20% for 10 year risk of fatal or non-fatal CVD
Moderate risk	People with any of the following: • Young patients (T1DM <35 years; T2DM <50 years) with DM duration <10 years, without other risk factors • Calculated SCORE2 or SCORE2-OP ≥2% and <10% for 10 year risk of fatal or non-fatal CVD
Low risk	• Calculated SCORE2 or SCORE2-OP <2% for 10 year risk of fatal or non-fatal CVD

ASCVD, atherosclerotic cardiovascular disease; ACS, acute coronary syndromes; BP, blood pressure; CABG, coronary artery bypass graft surgery; CAC, coronary artery calcium; CKD, chronic kidney disease; CT, computed tomography; CVD, cardiovascular disease; DM, diabetes mellitus; eGFR, estimated glomerular filtration rate; FH, familial hypercholesterolaemia; LDL-C, low-density lipoprotein cholesterol; MI, myocardial infarction; PCI, percutaneous coronary intervention; SCORE2, Systematic Coronary Risk Evaluation 2; SCORE2-OP, Systematic Coronary Risk Evaluation 2-Older Persons; T1DM, type 1 DM; T2DM, type 2 DM; TC, total cholesterol; TIA, transient ischaemic attack.

[a]Typically defined by >50% stenosis.

[b]e.g. CAC score >300.

[c]Target organ damage is defined as microalbuminuria, retinopathy, or neuropathy.

Risk Factors: Age, hypertension, dyslipidemia, smoking, obesity

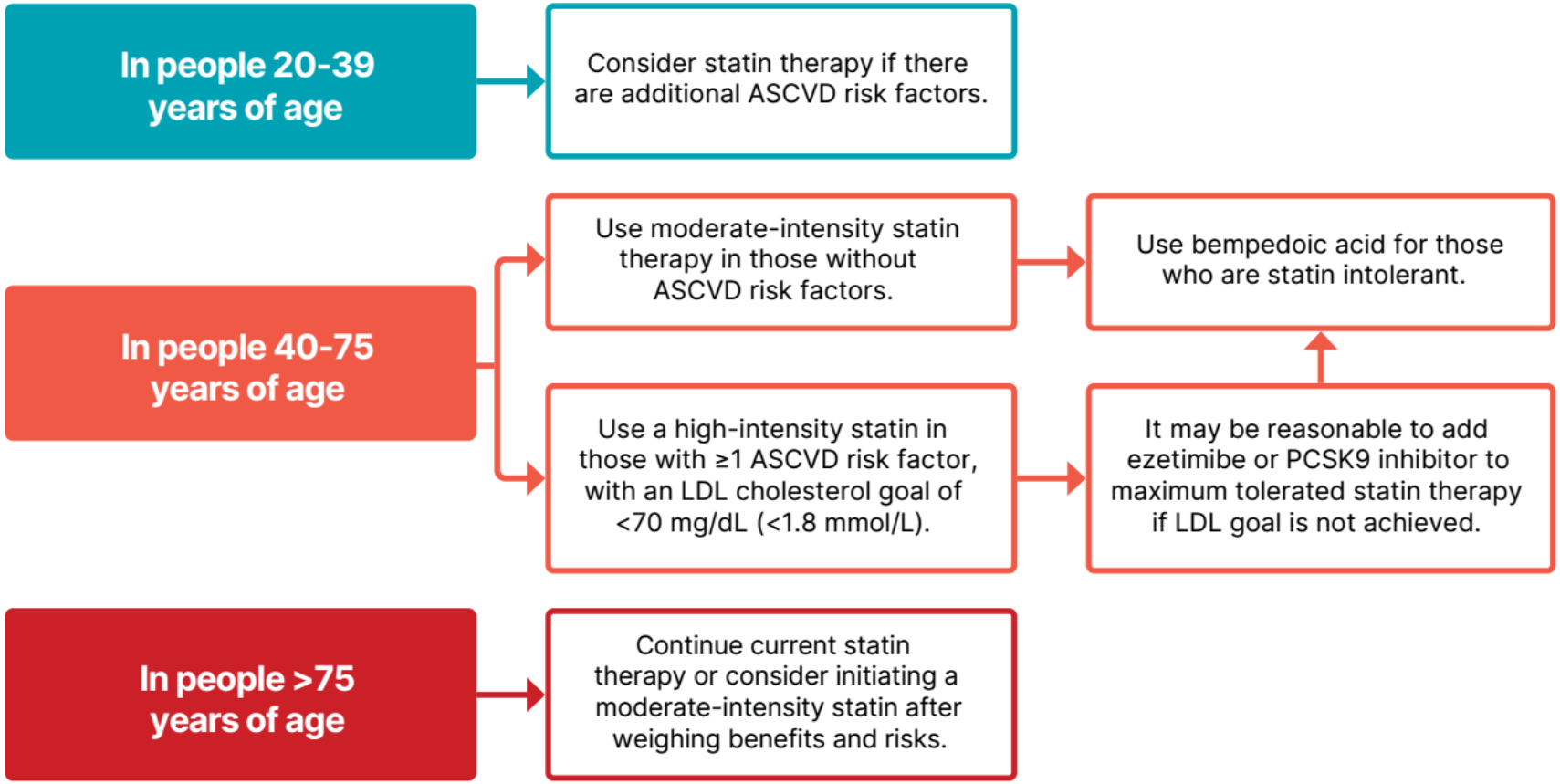
European Heart Journal (2025) 00, 1–20

American Diabetes Association
Professional Practice Committee*

10. Cardiovascular Disease and Risk Management: Standards of Care in Diabetes—2025

Diabetes Care 2025;48(Suppl. 1):S207–S238 | https://doi.org/10.2337/dc25-S010

Lipid Management for Primary Prevention of Atherosclerotic Cardiovascular Disease Events in People With Diabetes in Addition to Healthy Behavior Modification



CV Risk Score/Engine for Type 1 Diabetes

Pittsburgh CHD in T1DM risk model

Swedish T1D Risk Score

Steno Type 1 Risk Score

EURODIAB risk engine (EURO-RE)

…….

High discriminative performance → pooled C-statistic of 0.81

JACC: ADVANCES, VOL. 4, NO. 1, 2025 JANUARY 2025:101462

RIASSUNTO 1

- ✓ Nel T1D il rischio relativo di andare incontro ad malattia cardiovascolare è:
  - ✓ due-quattro volte superiore rispetto alla popolazione generale,
  - ✓ tanto più elevato quanto più precoce è l'insorgenza del diabete,
  - ✓ Il rischio assoluto è simile a quello riscontrato nel T2D, e tende ad essere superiore nell'età più avanzata.

- ✓ Il rischio assoluto nelle donne con T1D tende a essere simile a quello del sesso maschile.

RIASSUNTO 2

- ✓ Accanto all'età, il maggior fattore clinico associato alla malattia cardiovascolare nel T1D è rappresentato dal «carico glicemico», espresso dal livello dell'iperglicemia e dalla sua durata nel tempo (durata del diabete).

- ✓ I classici fattori di rischio cardiovascolare contribuiscono ad aumentare il rischio di CVD nel T1D.

- ✓ Il continuum di danno micro/macrovascolare è espresso pienamente anche nel T1D.

TAKE HOME MESSAGE

La malattia cardiovascolare è una complicanza molto frequente e invalidante nel diabete tipo 1.

La prevenzione della malattia cardiovascolare deve essere estremamente precoce attraverso il controllo di tutti i fattori di rischio che possono portare al danno micro e macroangiopatico, presupposti fisiopatologici della malattia cardiovascolare nel diabete di tipo 1.

Grazie per l'attenzione!

The NIDDK Takes on the Complications of Type 1 Diabetes: The Diabetes Control and Complications Trial/ Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) Study

*Barbara H. Braffett,[1] Ionut Bebu,[1] Gayle M. Lorenzi,[2] Catherine L. Martin,[3] Bruce A. Perkins,[4] Rose Gubitosi-Klug,[5] and David M. Nathan,[6] for the DCCT/EDIC Research Group**

Diabetes Care 2025;48:1089–1100 | https://doi.org/10.2337/dc24-2885

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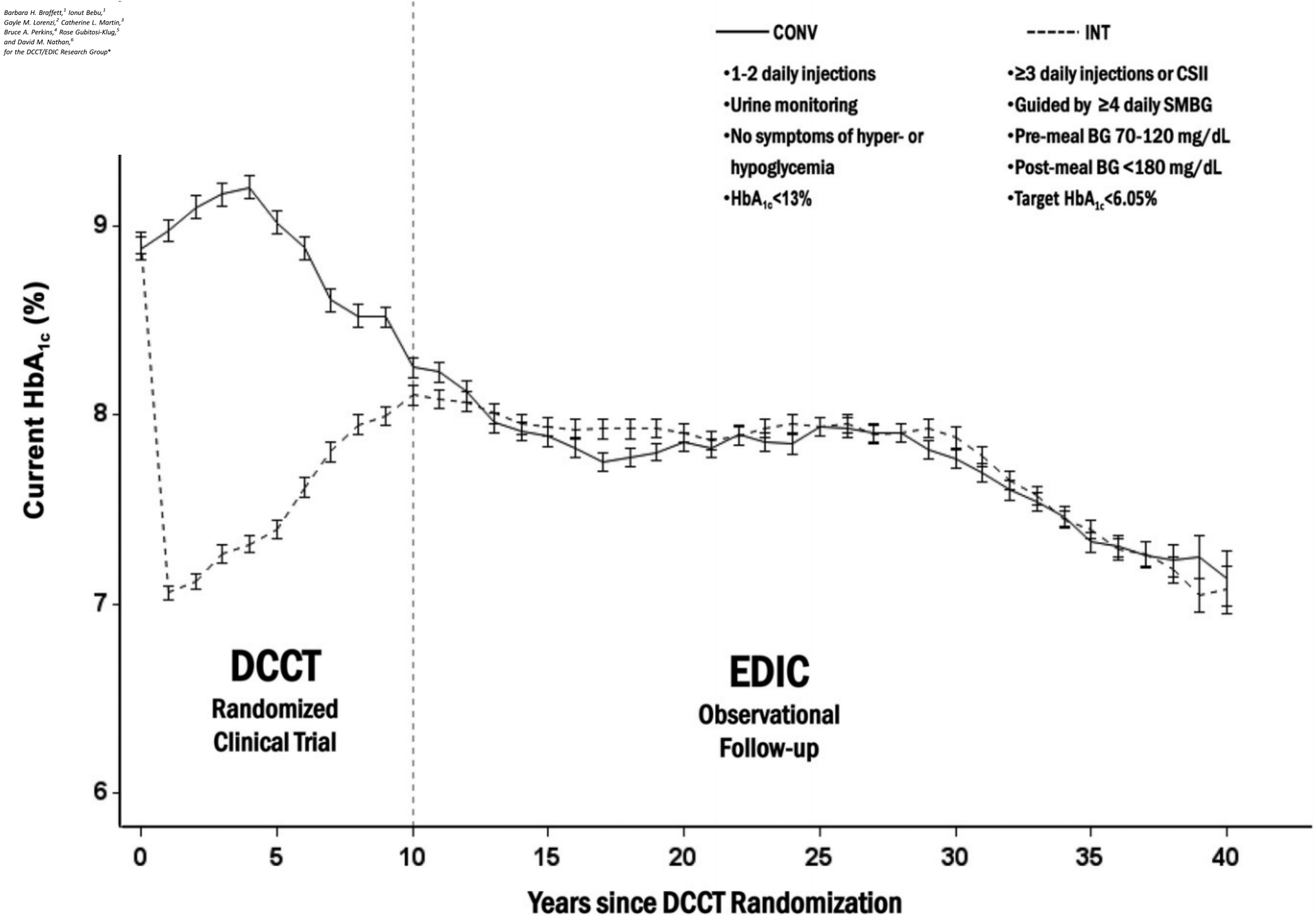
Diabetes Care 2025;48:1089–1100 | https://doi.org/10.2337/dc24-2885



The NIDDK Takes on the Complications of Type 1 Diabetes: The Diabetes Control and Complications Trial/ Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) Study

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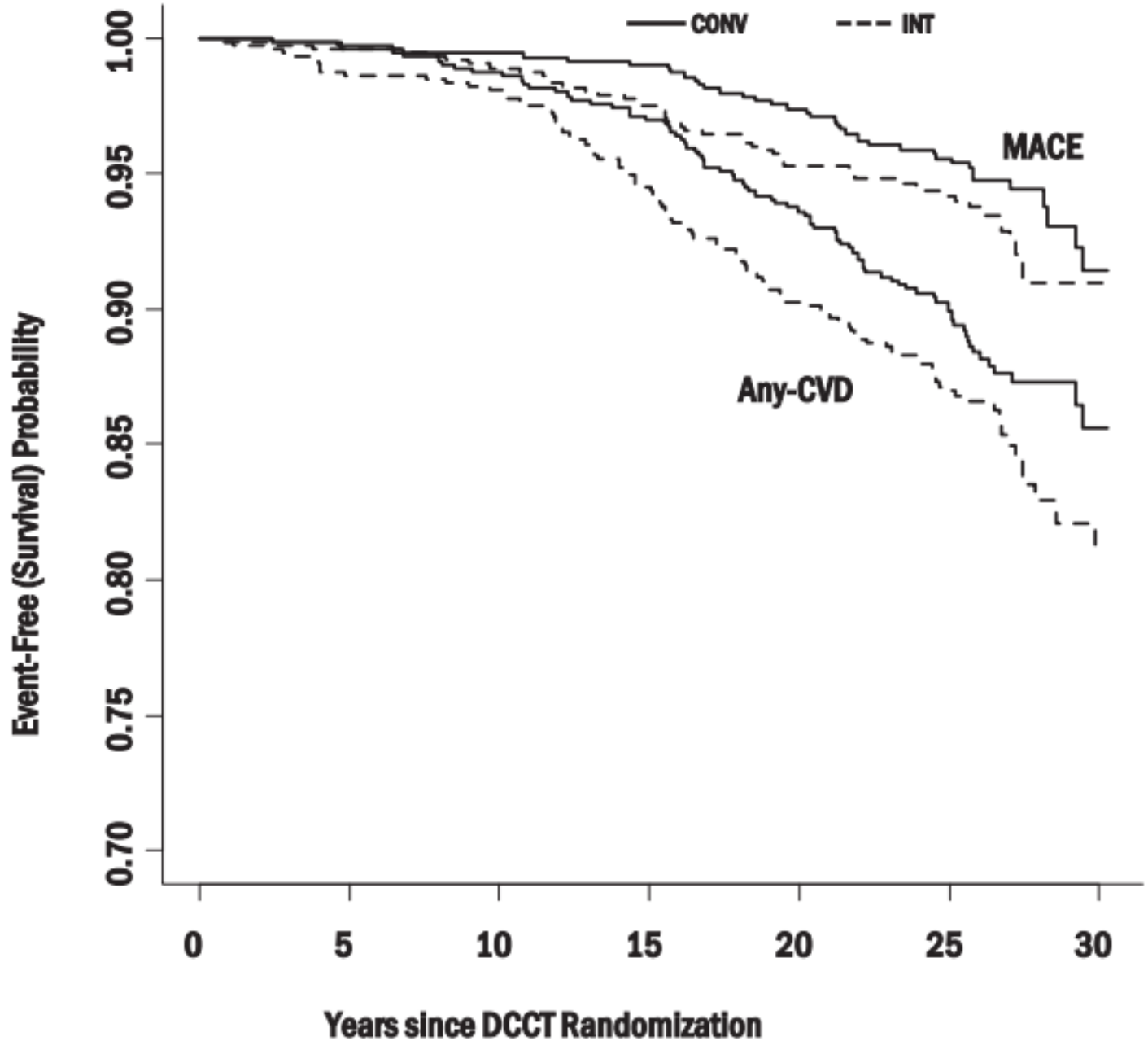
Diabetes Care 2025;48:1089–1100 | https://doi.org/10.2337/dc24-2885



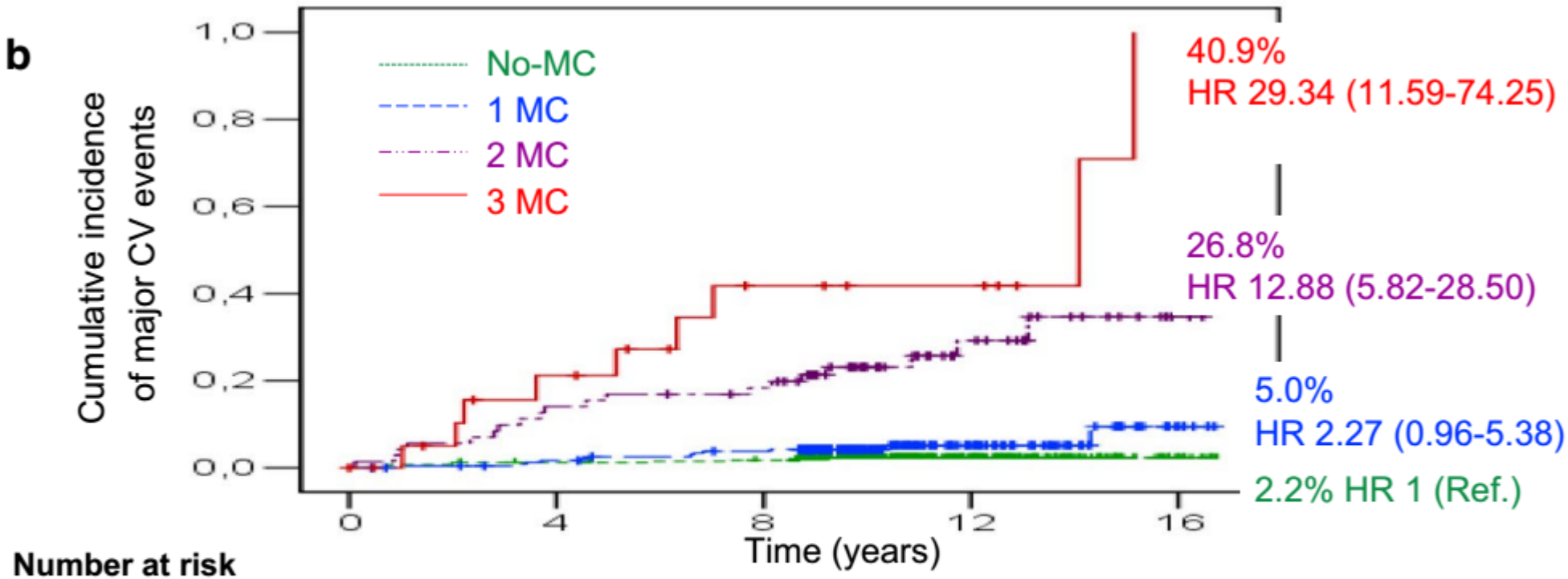
Garofolo et al. Cardiovasc Diabetol (2019) 18:159
https://doi.org/10.1186/s12933-019-0961-7

Cardiovascular Diabetology

ORIGINAL INVESTIGATION Open Access

Microvascular complications burden (nephropathy, retinopathy and peripheral polyneuropathy) affects risk of major vascular events and all-cause mortality in type 1 diabetes: a 10-year follow-up study

Monia Garofolo[1], Elisa Gualdani[2], Rosa Giannarelli[1], Michele Aragona[1], Fabrizio Campi[1], Daniela Lucchesi[1], Giuseppe Daniele[1], Roberto Miccoli[1], Paolo Francesconi[2], Stefano Del Prato[1*] and Giuseppe Penno[1]



Number at risk

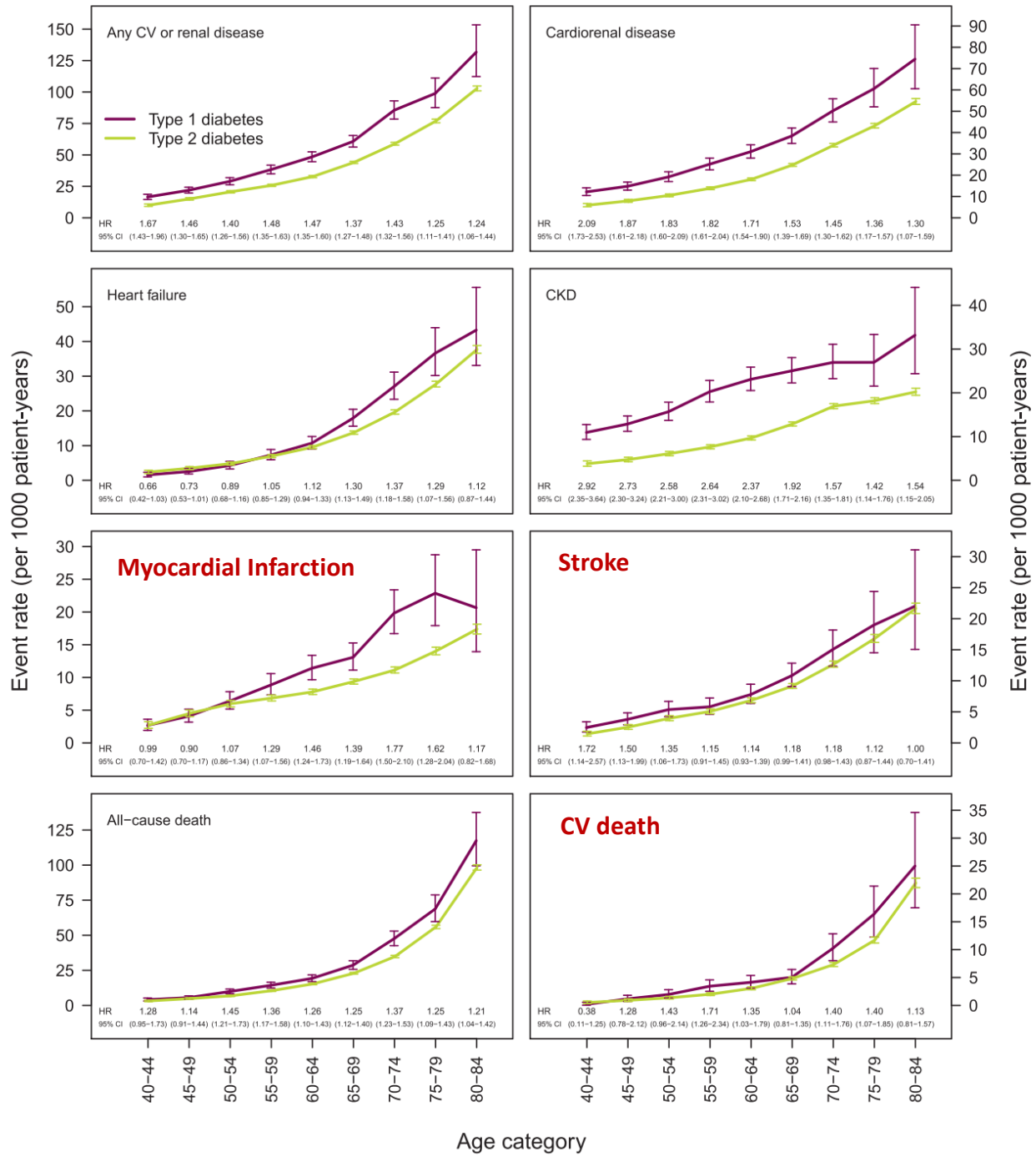
No-MC	402	395	391	105	9
1 MC	241	233	225	60	6
2 MC	71	61	56	20	2
3 MC	22	14	7	5	0
Total	**736**	**703**	**679**	**190**	**17**

Cardiovascular and Renal Disease Burden in Type 1 Compared With Type 2 Diabetes: A Two-Country Nationwide Observational Study

Robin Kristófi,[1] Johan Bodegard,[2] Anna Norhammar,[3,4] Marcus Thuresson,[5] David Nathanson,[6] Thomas Nyström,[7] Kåre I. Birkeland,[8] Jan W. Eriksson[1]

Diabetes Care 2021;44:1211–1218 | https://doi.org/10.2337/dc20-2839

Age-stratified incidence of any CVRD events (including MI, stroke, HF, CKD, or CV death), cardiorenal disease (HF or CKD), HF, CKD, MI,stroke, all-cause death, and CV death.



Risk Factors for First and Subsequent CVD Events in Type 1 Diabetes: The DCCT/EDIC Study

Diabetes Care 2020;43:867–874 | https://doi.org/10.2337/dc19-2292

*Ionut Bebu,[1] David Schade,[2] Barbara Braffett,[1] Mikhail Kosiborod,[3,4] Maria Lopes-Virella,[5] Elsayed Z. Soliman,[6] William H. Herman,[7] David A. Bluemke,[8] Amisha Wallia,[9] Trevor Orchard,[10] and John M. Lachin,[1] on behalf of the DCCT/EDIC Research Group**

1,441 DCCT/EDIC participants, mean age at baseline 27 years

Median follow-up of 29 years

17 partecipants had 22 episodes of CHF

The Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) Research Group*

Risk Factors for Cardiovascular Disease in Type 1 Diabetes

Diabetes 2016;65:1370–1379 | DOI: 10.2337/db15-1517

We assessed risk factors in the long-term (mean 27 years) follow-up of the Diabetes Control and Complications Trial (DCCT) cohort with T1DM.

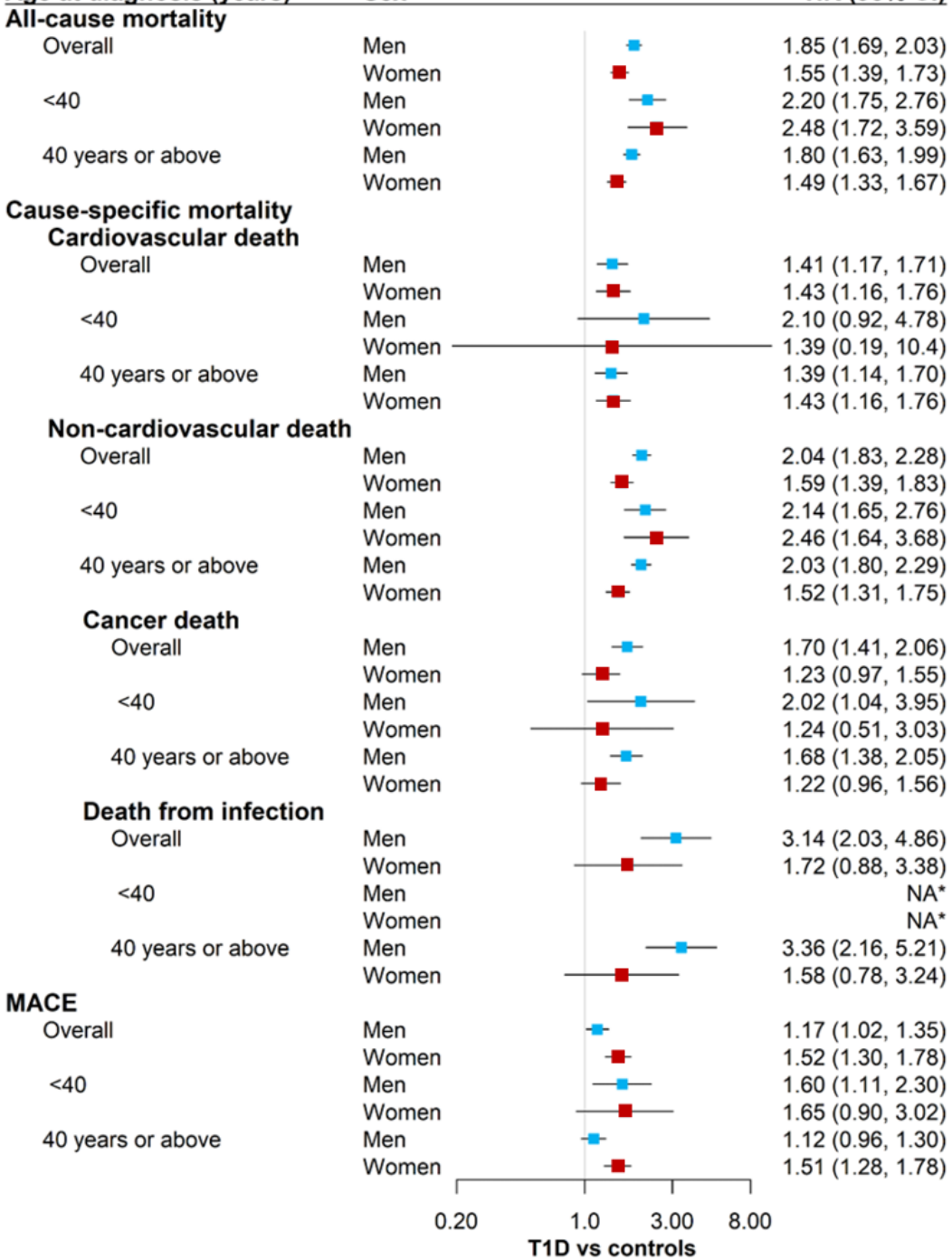
The Diabetes Control and Complications Trial/Epidemiology of Diabetes Interventions and Complications (DCCT/EDIC) Research Group*

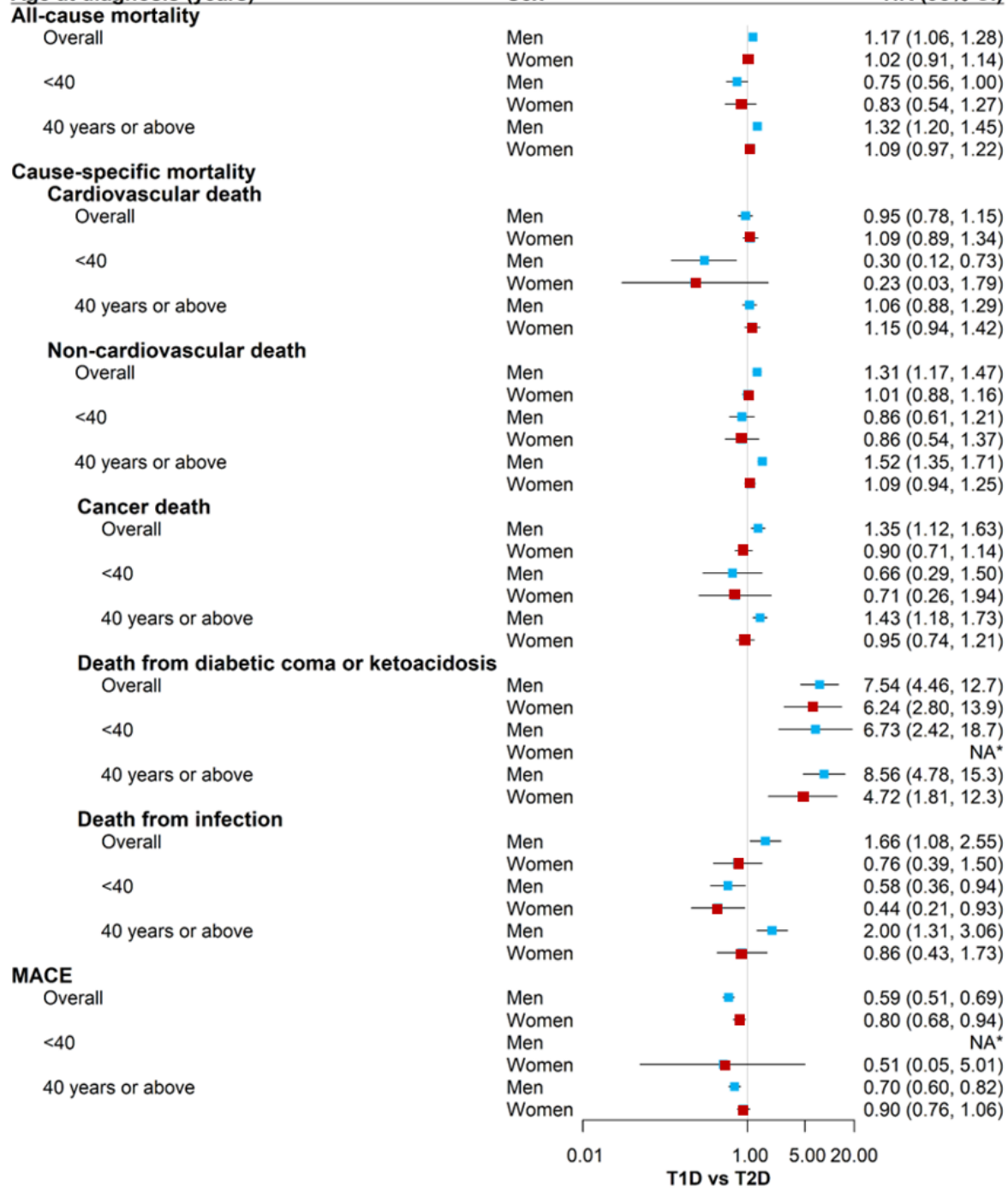
Diabetes Volume 65, May 2016

Risk Factors for Cardiovascular Disease in Type 1 Diabetes

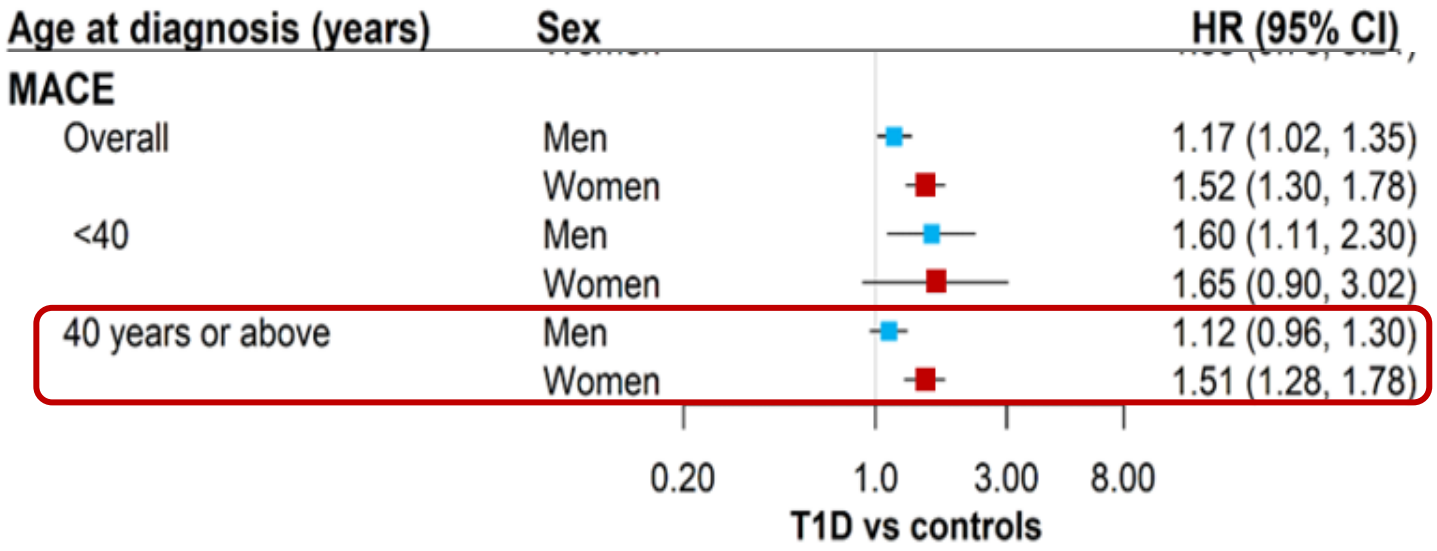
Diabetes 2016;65:1370–1379 | DOI: 10.2337/db15-1517

	HR (95% CI)*	*Z*-test value	*P* value
Any-CVD model			
covariate			
Baseline age (per 5 years)	1.5366 (1.3641, 1.731)	7.0711	<0.001
Mean HbA_{1c} (per 1%)	1.3115 (1.1488, 1.4972)	4.0133	<0.001
Mean systolic blood pressure (per 10 mmHg)	1.3186 (1.1096, 1.567)	3.1419	0.002
Current triglycerides (log)	1.5536 (1.1688, 2.065)	3.0346	0.003
Mean pulse rate (per 10 bpm)	1.3855 (1.1051, 1.737)	2.8267	0.005
Baseline duration of diabetes (per 5 years)	1.247 (1.0514, 1.4789)	2.5364	0.02
Current use of ACE inhibitor (yes vs. no)	0.6732 (0.4777, 0.9486)	−2.2611	0.03
Baseline family history of MI (yes vs. no)	1.3866 (1.0294, 1.8678)	2.1507	0.04
Mean LDLc (per 10 mg/dL)	1.0721 (1.0037, 1.1451)	2.0697	0.04
MACE model			
covariate			
Baseline age (per 5 years)	1.7748 (1.4872, 2.1179)	6.3613	<0.001
Mean HbA_{1c} (per 1%)	1.4186 (1.1785, 1.7077)	3.6965	<0.001
Mean pulse rate (per 10 bpm)	1.5975 (1.1576, 2.2046)	2.8509	0.005
Current triglycerides (log)	1.7844 (1.1909, 2.6737)	2.8071	0.005
Mean systolic blood pressure (per 10 mmHg)	1.3863 (1.0929, 1.7583)	2.6931	0.007
Current smoking (yes vs. no)	1.8686 (1.1647, 2.9978)	2.5924	0.01
Baseline duration of diabetes (per 5 years)	1.3334 (1.0399, 1.7098)	2.2685	0.03
Current use of ACE inhibitor (yes vs. no)	0.5819 (0.3553, 0.9529)	−2.1515	0.04
Current LDLc (per 10 mg/dL)	1.0692 (1.0035, 1.1392)	2.0685	0.04

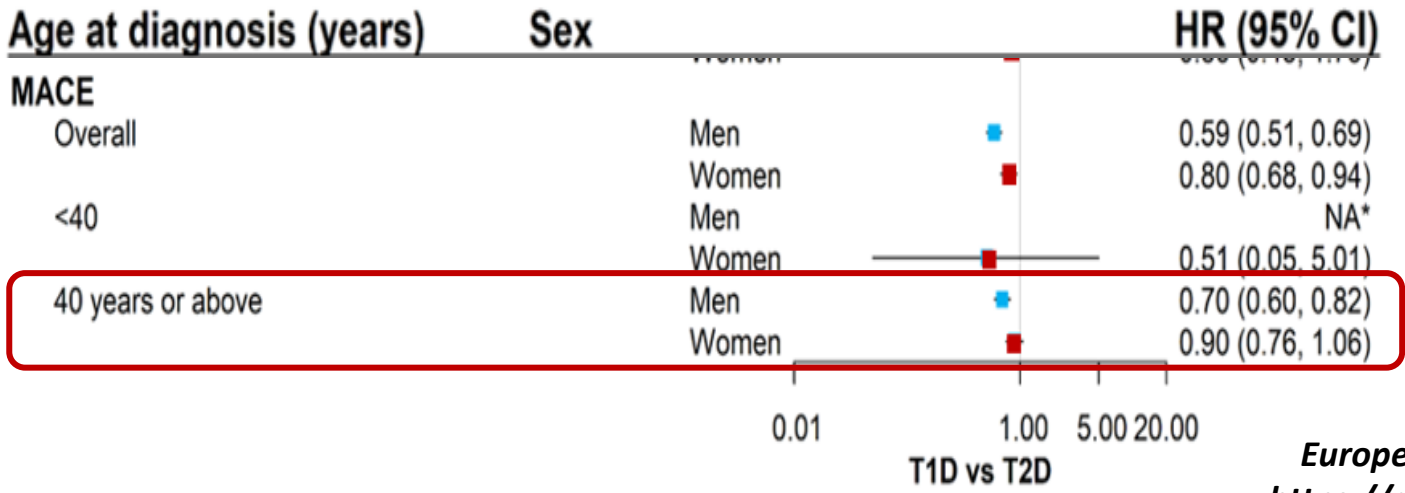

Age at diagnosis (years)
Sex
HR (95% CI)
All-cause mortality
Overall
Men
1.85 (1.69, 2.03)
Women
1.55 (1.39, 1.73)
<40
Men
2.20 (1.75, 2.76)
Women
2.48 (1.72, 3.59)
40 years or above
Men
1.80 (1.63, 1.99)
Women
1.49 (1.33, 1.67)
Cause-specific mortality
Cardiovascular death
Overall
Men
1.41 (1.17, 1.71)
Women
1.43 (1.16, 1.76)
<40
Men
2.10 (0.92, 4.78)
Women
1.39 (0.19, 10.4)
40 years or above
Men
1.39 (1.14, 1.70)
Women
1.43 (1.16, 1.76)
Non-cardiovascular death
Overall
Men
2.04 (1.83, 2.28)
Women
1.59 (1.39, 1.83)
<40
Men
2.14 (1.65, 2.76)
Women
2.46 (1.64, 3.68)
40 years or above
Men
2.03 (1.80, 2.29)
Women
1.52 (1.31, 1.75)
Cancer death
Overall
Men
1.70 (1.41, 2.06)
Women
1.23 (0.97, 1.55)
<40
Men
2.02 (1.04, 3.95)
Women
1.24 (0.51, 3.03)
40 years or above
Men
1.68 (1.38, 2.05)
Women
1.22 (0.96, 1.56)
Death from infection
Overall
Men
3.14 (2.03, 4.86)
Women
1.72 (0.88, 3.38)
<40
Men
NA*
Women
NA*
40 years or above
Men
3.36 (2.16, 5.21)
Women
1.58 (0.78, 3.24)
MACE
Overall
Men
1.17 (1.02, 1.35)
Women
1.52 (1.30, 1.78)
<40
Men
1.60 (1.11, 2.30)
Women
1.65 (0.90, 3.02)
40 years or above
Men
1.12 (0.96, 1.30)
Women
1.51 (1.28, 1.78)
0.20
1.0
3.00
8.00
T1D vs controls


Age at diagnosis (years)
Sex
HR (95% CI)
All-cause mortality
Overall
Men
1.17 (1.06, 1.28)
Women
1.02 (0.91, 1.14)
<40
Men
0.75 (0.56, 1.00)
Women
0.83 (0.54, 1.27)
40 years or above
Men
1.32 (1.20, 1.45)
Women
1.09 (0.97, 1.22)
Cause-specific mortality
Cardiovascular death
Overall
Men
0.95 (0.78, 1.15)
Women
1.09 (0.89, 1.34)
<40
Men
0.30 (0.12, 0.73)
Women
0.23 (0.03, 1.79)
40 years or above
Men
1.06 (0.88, 1.29)
Women
1.15 (0.94, 1.42)
Non-cardiovascular death
Overall
Men
1.31 (1.17, 1.47)
Women
1.01 (0.88, 1.16)
<40
Men
0.86 (0.61, 1.21)
Women
0.86 (0.54, 1.37)
40 years or above
Men
1.52 (1.35, 1.71)
Women
1.09 (0.94, 1.25)
Cancer death
Overall
Men
1.35 (1.12, 1.63)
Women
0.90 (0.71, 1.14)
<40
Men
0.66 (0.29, 1.50)
Women
0.71 (0.26, 1.94)
40 years or above
Men
1.43 (1.18, 1.73)
Women
0.95 (0.74, 1.21)
Death from diabetic coma or ketoacidosis
Overall
Men
7.54 (4.46, 12.7)
Women
6.24 (2.80, 13.9)
<40
Men
6.73 (2.42, 18.7)
Women
NA*
40 years or above
Men
8.56 (4.78, 15.3)
Women
4.72 (1.81, 12.3)
Death from infection
Overall
Men
1.66 (1.08, 2.55)
Women
0.76 (0.39, 1.50)
<40
Men
0.58 (0.36, 0.94)
Women
0.44 (0.21, 0.93)
40 years or above
Men
2.00 (1.31, 3.06)
Women
0.86 (0.43, 1.73)
MACE
Overall
Men
0.59 (0.51, 0.69)
Women
0.80 (0.68, 0.94)
<40
Men
NA*
Women
0.51 (0.05, 5.01)
40 years or above
Men
0.70 (0.60, 0.82)
Women
0.90 (0.76, 1.06)
0.01
1.00
5.00
20.00
T1D vs T2D

T1D vs controls

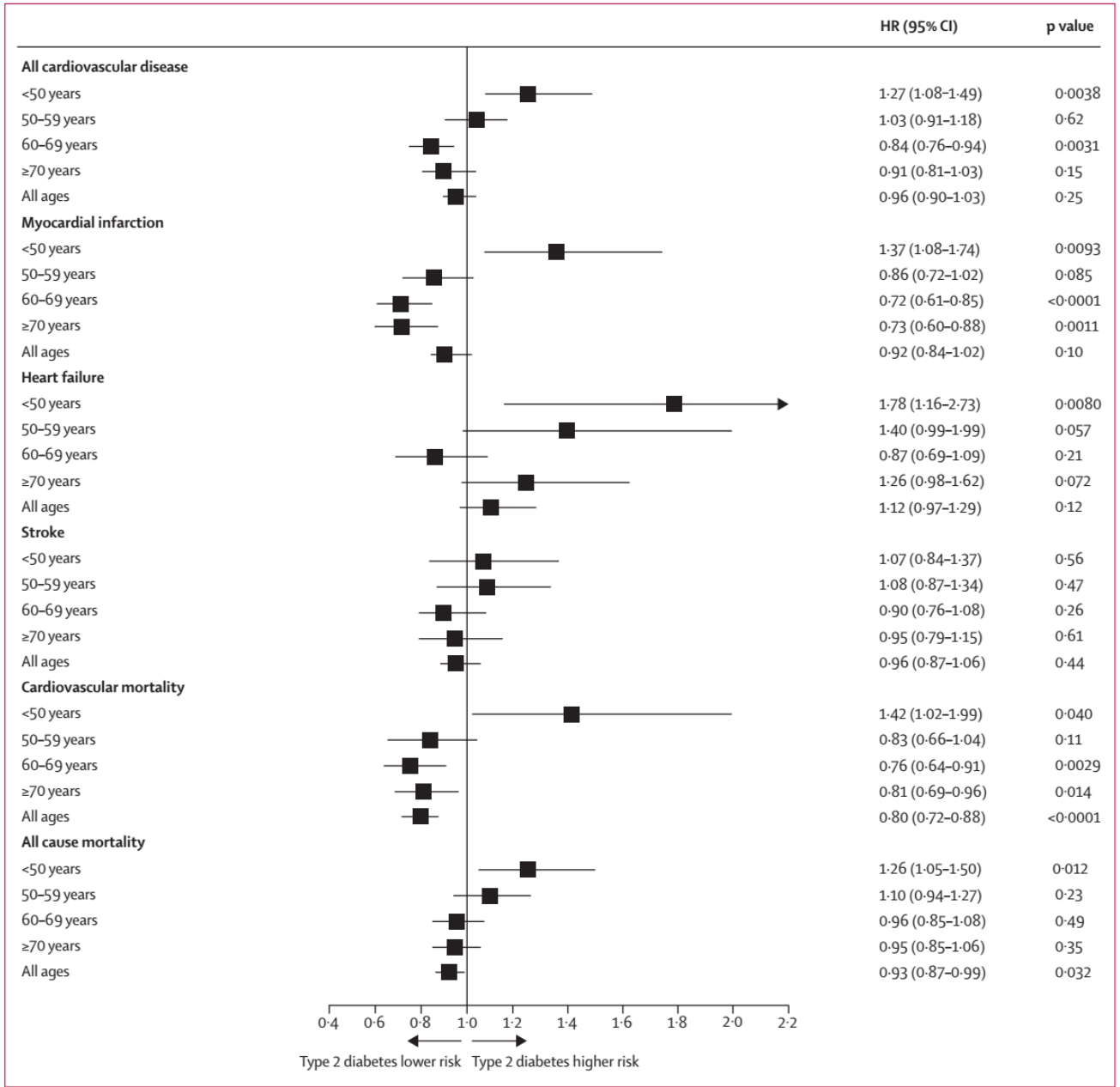


T1D vs T2D

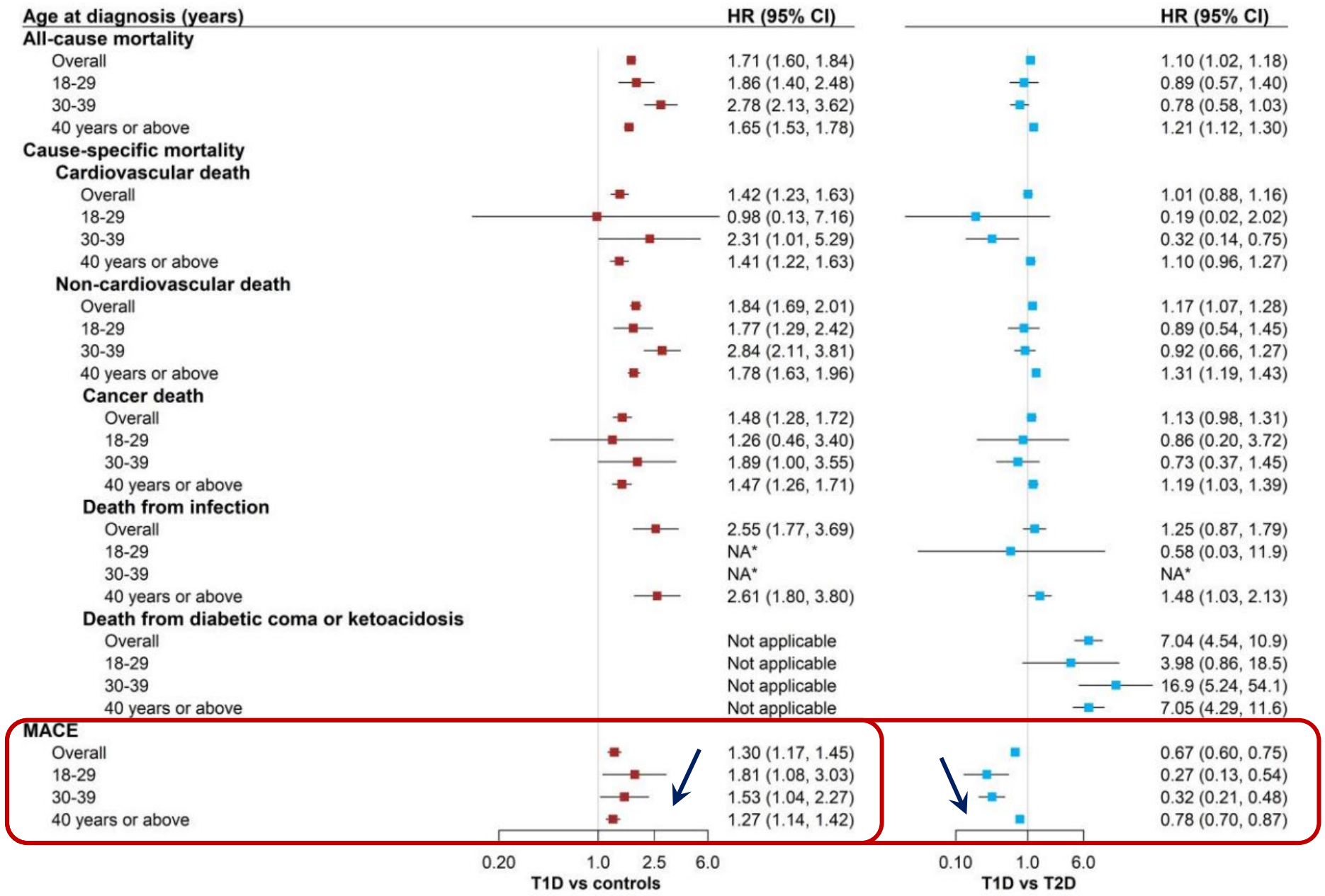


European Heart Journal (2025) 00, 1–11
https://doi.org/10.1093/eurheartj/ehaf304

Comparison of risk for events in type 2 diabetes versus type 1 diabetes in the study population with no previous cardiovascular disease events



Lancet Diabetes Endocrinol 2025; 13: 848–62

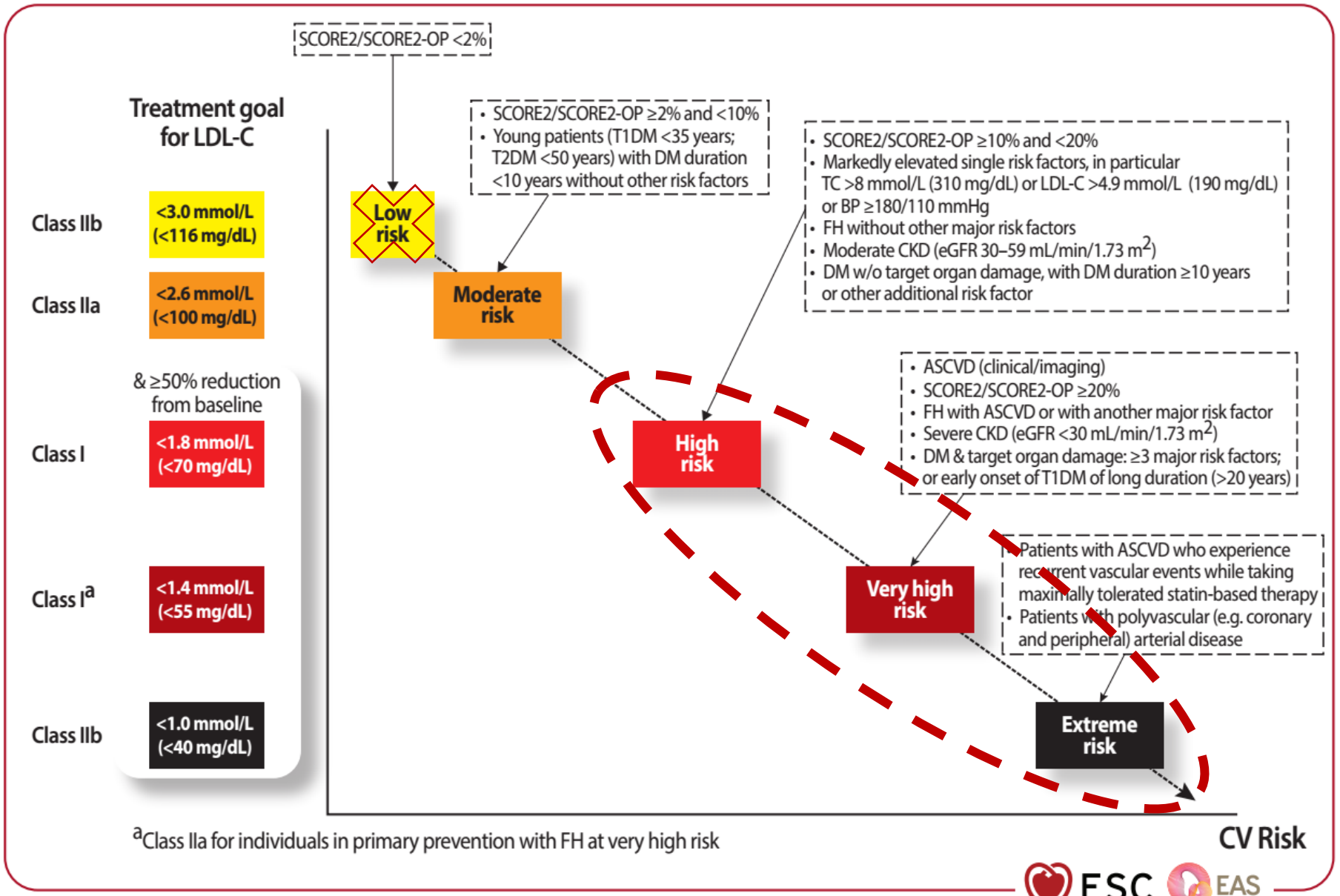


European Heart Journal (2025) 00, 1–11
https://doi.org/10.1093/eurheartj/ehaf304

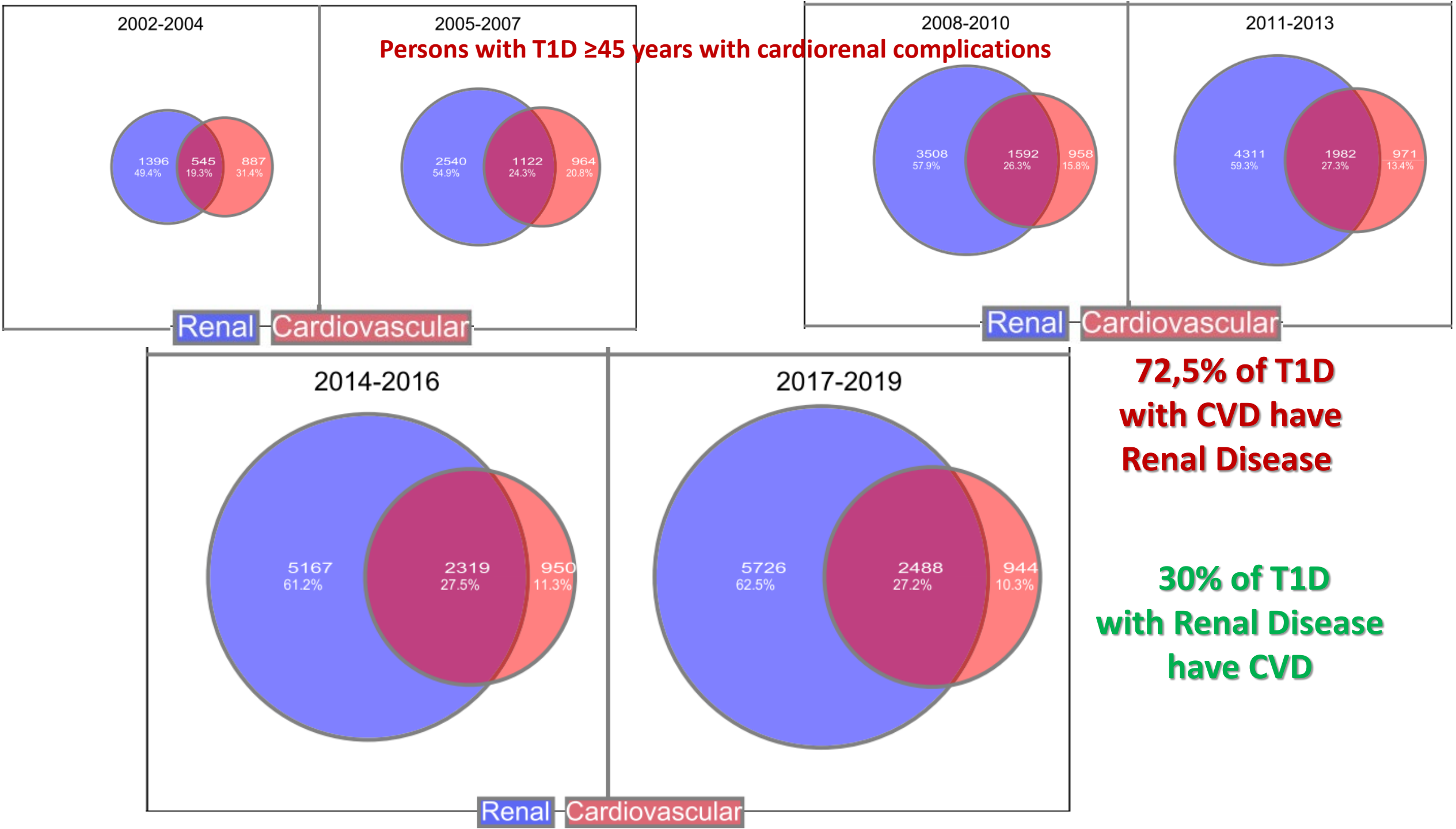
ESC European Society of Cardiology European Heart Journal (2025) 00, 1–20 https://doi.org/10.1093/eurheartj/ehaf190

2025 Focused Update of the 2019 ESC/EAS Guidelines for the management of dyslipidaemias

Developed by the task force for the management of dyslipidaemias of the European Society of Cardiology (ESC) and the European Atherosclerosis Society (EAS)



Persons with T1D ≥45 years with cardiorenal complications



72,5% of T1D with CVD have Renal Disease

30% of T1D with Renal Disease have CVD

Risk factors, mortality trends, and cardiovascular diseases in people with Type 1 diabetes and controls in Sweden: An observational cohort study

Sara Hallström,[a,b]* Magnus Olof Wijkman,[c] Johnny Ludvigsson,[d] Per Ekman,[e] Marc Alan Pfeffer,[f] Hans Wedel,[g] Annika Rosengren,[b] and Marcus Lind[a,b,h]

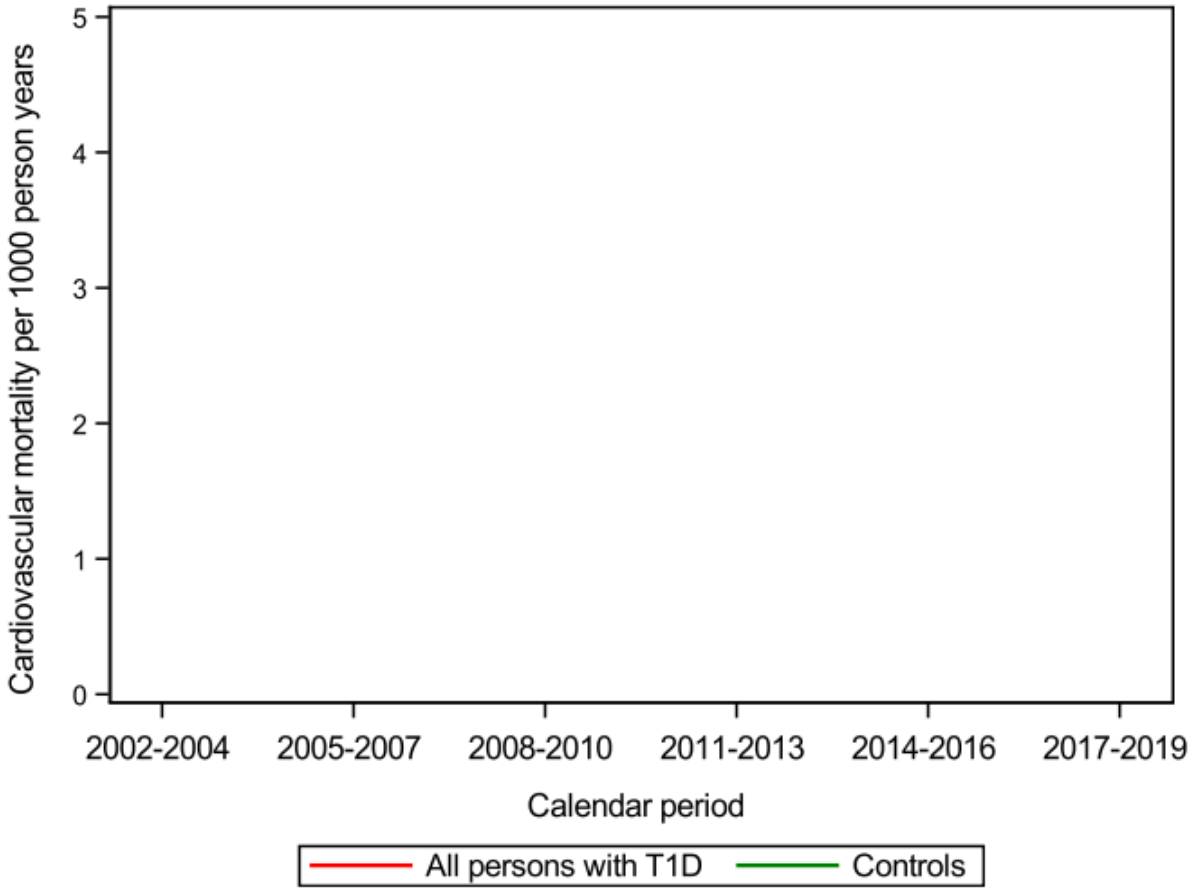
The Lancet Regional Health – Europe 2022;21: 100469

Risk factors, mortality trends, and cardiovascular diseases in people with Type 1 diabetes and controls in Sweden: An observational cohort study

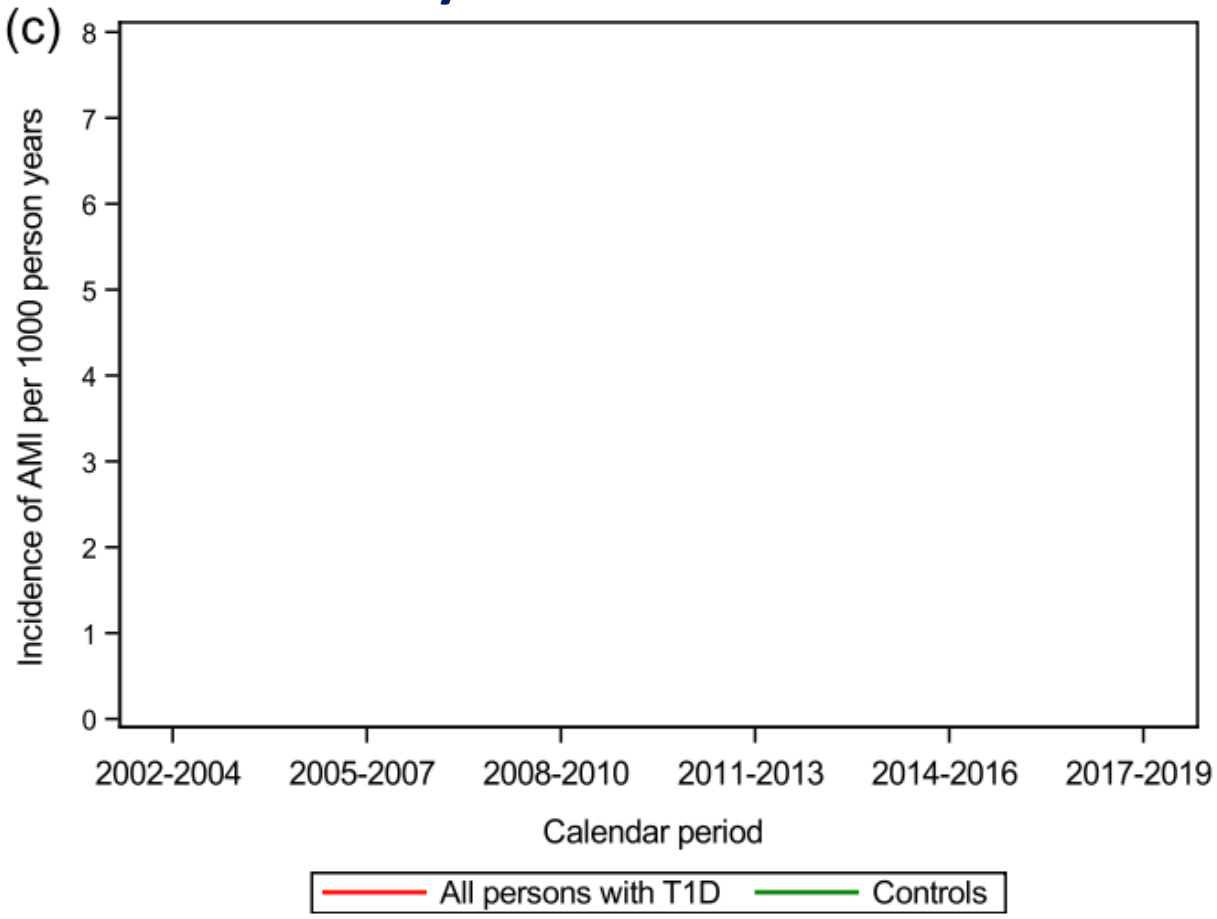
Sara Hallström,[a,b,*] Magnus Olof Wijkman,[c] Johnny Ludvigsson,[d] Per Ekman,[e] Marc Alan Pfeffer,[f] Hans Wedel,[g] Annika Rosengren,[b] and Marcus Lind[a,b,h]

Standardized incidence rates per 1000 person years of CV mortality and AMI. All T1D and Controls

Cardiovascular mortality

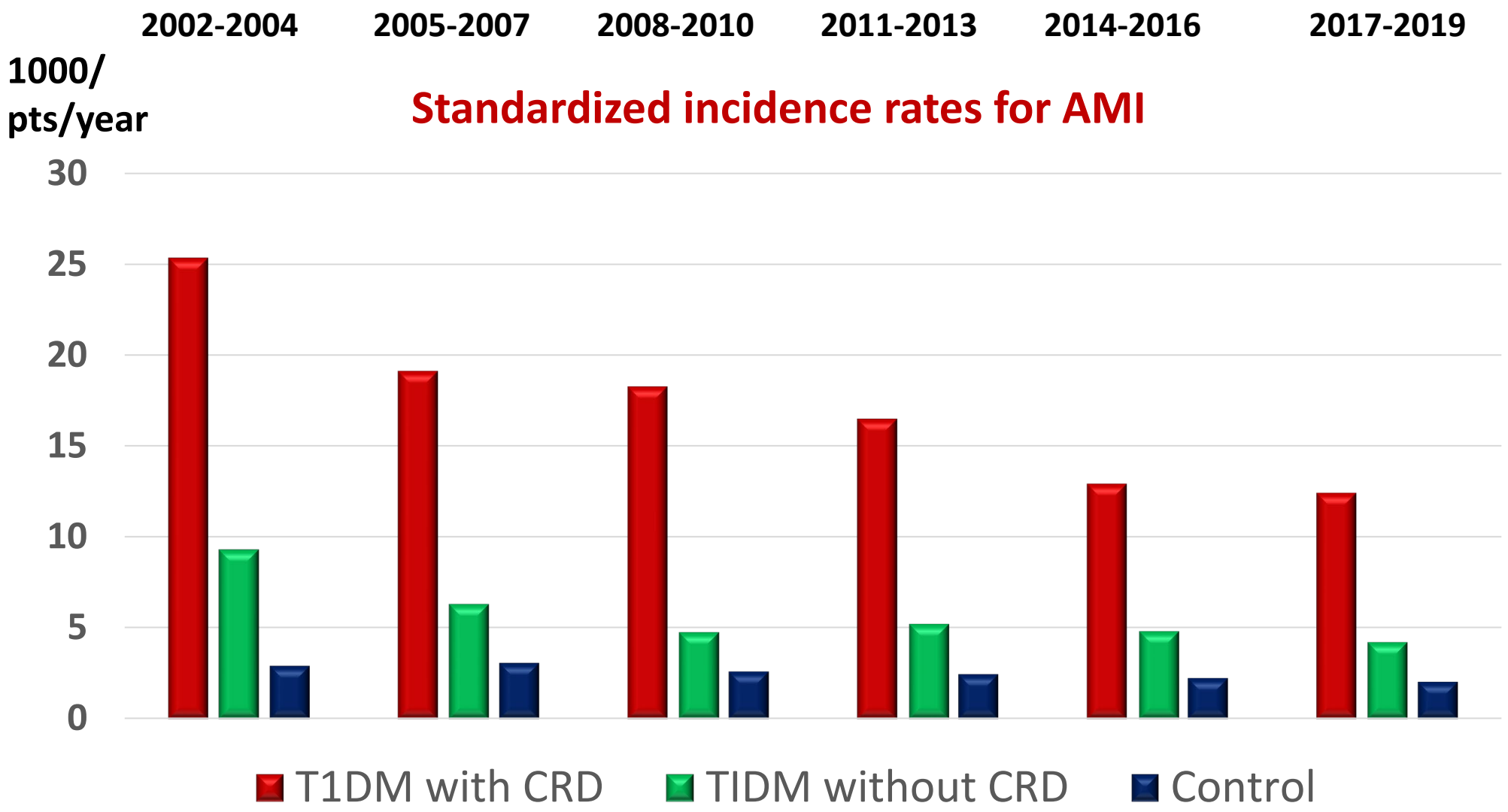


Acute myocardial infarction



The Lancet Regional Health – Europe 2022;21: 100469

IMPACT OF CARDIORENAL DISEASE ON INCIDENCE OF AMI



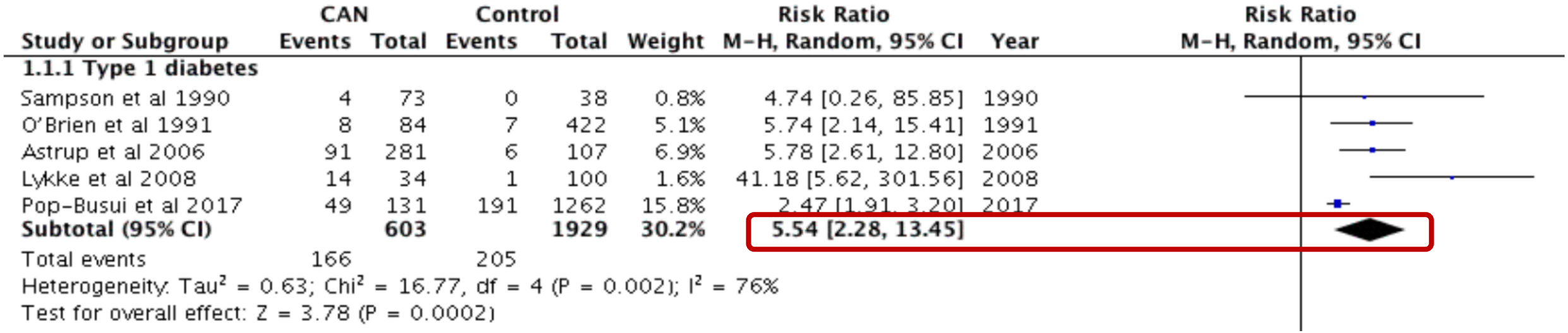
The Lancet Regional Health – Europe 2022;21: 100469

BMJ Open Diabetes Research & Care

Cardiac autonomic neuropathy and risk of cardiovascular disease and mortality in type 1 and type 2 diabetes: a meta-analysis

Mahin Chowdhury [1], Sarah Nevitt,[2] Aikaterini Eleftheriadou,[1] Prathap Kanagala,[1,3] Hani Esa,[1,3] Daniel J Cuthbertson,[1,3] Abd Tahrani,[4,5,6] Uazman Alam[1,3,7,8]

Relative risk of cardiovascular disease in DMT1 with cardiac autonomic neuropathy



BMJ Open Diab Res Care 2021;9:e002480.

Scaletta

Meccanismi di azione
Epidemiologia con età insorgenza, durata confronto con tipo 2 fattori di rischio e loro peso, microangiopatia neuropatia autonomica, nefropatia, genetica, durata diabete
amnesia metabolica come rene in fioretto dcct

Linee guida EAS e ESC e ADA

Score di rischio