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Periodontitis in patients with diabetes and its association with diabetes-related complications. A register-based cohort study

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ABSTRACT

Objective To evaluate the association between type 1 diabetes (T1D)/type 2 diabetes (T2D) and periodontitis and assess the influence of periodontitis on diabetes-related complications.

Design Observational study; longitudinal analysis of register data.

Setting Swedish primary care centres, hospitals and dental clinics reporting to nationwide healthcare registers (2010–2020).

Participants 28 801 individuals with T1D (13 022 women; mean age 42 years) and 57 839 individuals without diabetes (non-T1D; 26 271 women; mean age 43 years). 251 645 individuals with T2D (110 627 women; mean age 61 years) and 539 805 individuals without diabetes (non-T2D; 235 533 women; mean age 60 years). Diabetes and non-diabetes groups were matched for age, gender and county of residence.

Main outcome measures Prevalent periodontitis, diabetes-related complications (retinopathy, albuminuria, stroke and ischaemic heart disease) and mortality.

Results Periodontitis was more common among T2D (22%) than non-T2D (17%). Differences were larger in younger age groups (adjusted RR at age 30–39 years 1.92; 95% CI 1.81 to 2.03) and exacerbated by poor glycaemic control. Periodontitis prevalence was 13% in T1D and 11% in non-T1D; only the subgroup with poor glycaemic control was at higher risk for periodontitis. Periodontitis was associated with a higher incidence of retinopathy (T1D: HR 1.08, 95% CI 1.02 to 1.14; T2D: HR 1.08, 95% CI 1.06 to 1.10) and albuminuria (T1D: HR 1.14, 95% CI 1.06 to 1.23; T2D: HR 1.09, 95% CI 1.07 to 1.11). Periodontitis was not associated with a higher risk for stroke, cardiovascular disease or higher mortality in T1D/T2D.

Conclusions The association between T2D and periodontitis was strong and exacerbated by poor glycaemic control. For T1D, the association to periodontitis was limited to subgroups with poor glycaemic control. Periodontitis contributed to an increased risk for retinopathy and albuminuria in T1D and T2D.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The population-wide approach, including over 800 000 individuals, allowed for solid estimates from real-world data.
⇒ The longitudinal register data covered a 10-year period.
⇒ By matching several registers, we were able to adjust for socioeconomic parameters.
⇒ The periodontitis case definition was based exclusively on clinical recordings of periodontal probing depth.
⇒ Information on tobacco smoking and body mass index were not available for the control group.

INTRODUCTION

Periodontitis is a highly prevalent oral disorder characterised by soft tissue inflammation, loss of periodontal attachment and, ultimately, tooth loss. The typical age of onset lies between 20 and 30 years, and, in its severe forms, periodontitis affects roughly 10% of adults worldwide.[1–3] Observational data suggest that periodontitis is associated with type 2 diabetes (T2D) and contributes to diabetes-related complications.[4 5] This association was highlighted in a recent statement by WHO.[6] However, corresponding data on the association between type 1 diabetes (T1D) and periodontitis are highly limited.[4 7 8]

Register-based research offers the possibility for longitudinal evaluations of population data. There are numerous, well-established healthcare registers in Sweden and their completeness in terms of target populations is generally high.[9] The Swedish National Diabetes Register (NDR) includes 85% of all Swedish adults diagnosed with T2D, while the completeness for T1D is >90%.[10] From 2010 and onwards, the Swedish Quality Registry for Caries and Periodontal Disease (SKaPa) administers data with a high level of completeness based on the daily, automated retrieval of information from electronic patient dental records. To exemplify, during the period 2020–2022, findings from routine dental examinations were recorded for 3.3

million adults.[11] Access to additional population registries, providing medical and socioeconomic data, allows for robust and detailed descriptions of populations with or without diabetes.

The aim of the present register-based study was to evaluate the association between diabetes (T1D and T2D) and periodontitis on a population level. A further aim was to assess the influence of periodontitis on diabetes-related complications.

METHODS

Study design and participants

This retrospective study was based on longitudinal data obtained from multiple Swedish national registers. Using the Swedish NDR, we identified one cohort of individuals with T1D (diagnosis by 2020 and ≥1 prescription of insulin, National Prescribed Drug Registry) and a second cohort with T2D (diagnosis by 2020). Individuals aged ≥18 years in 2010 were considered (online supplemental appendix p. 5). For each cohort, a control sample was randomly selected from a non-diabetes population identified in the Swedish Total Population Register (control/case ratio 2:1; matched for age, gender and county of residence). From these four cohorts, individuals without at least one entry in the national dental registry SKaPa (ie, no dental examination during the period 2010–2020) were excluded (online supplemental tables A1-A6).

Patient and public involvement

There was no direct patient involvement in this study. No funds or time were allocated to patient and public involvement.

Data sources and outcome measures

The occurrence of periodontitis and tooth loss (registered tooth extractions, regardless of the reason for extraction) was assessed annually over the 10-year study period in the SKaPa register. A periodontitis case was defined by the presence of ≥3 teeth with probing depths of ≥6 mm, assessed by a dental professional during a routine clinical examination any time between 2010 and 2020 (online supplemental appendix p 6). Third molars were not considered for either outcome.

We used blood haemoglobin A1c (HbA1c) levels to describe glycaemic control (NDR), which was categorised as good (HbA1c <52 mmol/mol for ≥75% of their observation period) or poor (HbA1c >62 mmol/mol for≥75% of their observation period) based on longitudinal readings (at least 5 years). We also explored median glycaemic control as a continuous parameter (online supplemental appendix p 7).

Data on diabetes-related complications were obtained from the NDR (retinopathy and albuminuria) and the National Patient Register (stroke and ischaemic heart disease). Information on mortality was extracted from the Cause of Death Register and socioeconomic parameters were retrieved from the Longitudinal Integrated Database for Health Insurance and Labour Market Studies (online supplemental appendix pp 5–7). Datasets from the different registers were merged using unique national personal identity numbers as identifiers.

The study was approved by the Swedish Ethical Review Authority (Dnr: 2019–04140).

Statistical analysis

Probability estimates for prevalent periodontitis among individuals with T1D, T2D and their respective controls were obtained through multiple logistic regression models. Adjusted risk ratios (RR) were recalculated from ORs based on *margins*.[12] The annual incidence rates for tooth loss and their ratios (IRR) were estimated with Poisson regression models. The extent of tooth loss (no tooth extractions, 1–4 extractions or ≥5 extractions) over the 10-year period was analysed using multinomial logistic regression models (RR). Analyses were repeated, comparing subgroups of T1D and T2D by glycaemic control, using their matched control groups as references.

Within the T1D and T2D cohorts, the effect of periodontitis (at any time during the observation period) on diabetes-related complications and on mortality was described by HR obtained through Cox regression analyses. To account for age and cohort effects, we also used Poisson-based age-period-cohort (APC) modelling[13] (*poprisktime*[14] and *apcspline*[15] functions) to estimate IRRs.

Age categorisation was based on age in 2010 (the start of the observation period). Gender (referring to legal sex, as recorded in the registers) was accounted for, either as a covariate or by stratification. We adjusted for level of education and income due to observed socioeconomic imbalances (table 1). Hence, all models were adjusted for age (and its interaction with diabetes), gender, level of education and income.

All estimates were accompanied by 95% CIs. Full regression models are provided in online supplemental appendix. Multiple sensitivity analyses were carried out (online supplemental tables A7-A8; online supplemental appendix pp. 14–27) and we explored alternative case definitions for periodontitis. All analyses were performed in Stata/SE V.17.0.

RESULTS

The number of individuals in each cohort in the final dataset was 28 801 (T1D), 57 839 (non-T1D controls), 251 645 (T2D) and 539 805 (non-T2D controls), respectively (figure 1; table 1; online supplemental appendix pp 8–13).

Diabetes and periodontitis

Periodontitis was more common in T1D and T2D than in their respective control groups (T1D: 12.6%, 95% CI 12.2 to 13.0; non-T1D: 11.1%, 95% CI 10.9 to 11.4; T2D: 21.6%, 95% CI 21.5 to 21.8; non-T2D: 16.8%, 95% CI 16.7 to 16.9), with RRs of 1.13 (95% CI 1.09, 1.18) and 1.26 (95% CI 1.24, 1.27), respectively. The association

Table 1 Individuals with type 1 and type 2 diabetes and their respective matched controls without diabetes

	Group			
	No diabetes		Type 1 diabetes	
Gender				
Female	26 271	45.4%	13 022	45.2%
Male	31 568	54.6%	15 779	54.8%
Age in 2010	42.9	(16.9)	42.4	(16.5)
Year of birth				
1981–1992	15 984	27.6%	8071	28.0%
1971–1980	10 066	17.4%	5134	17.8%
1961–1970	11 227	19.4%	5757	20.0%
1951–1960	9 253	16.0%	4635	16.1%
1941–1950	7 545	13.0%	3571	12.4%
≤1940	3 764	6.5%	1633	5.7%
Education (latest available)				
Up to lower secondary education	7818	13.6%	4083	14.2%
Upper secondary to post-secondary education <2 years	29 831	51.8%	15 214	53.1%
Post-secondary ≥2 years to tertiary education	19 965	34.7%	9362	32.7%
Annual income (SEK; latest available)	300 900	(275 600)	266 700	(271 600)
Years in lowest fifth percentile of income (2005–2019)	0.7	(1.9)	0.8	(2)
0	45 123	78.0%	22 128	76.8%
1–4 years	9923	17.2%	5081	17.6%
≥5 years	2793	4.8%	1589	5.5%
Systemic conditions (2005–2020)*				
Certain infectious and parasitic diseases (A00–B99)	1702	2.9%	10 768	37.4%
Neoplasms (C00–D48)	15 418	26.7%	10 423	36.2%
Cancer (C00–C97)	6079	10.5%	2684	9.3%
Endocrine, nutritional and metabolic diseases (E00–E90)	7910	13.7%	28 664	99.5%
Obesity (E66)	1761	3%	2205	7.7%
Diseases of the circulatory system (I00–I99)	14 314	24.7%	14 465	50.2%
Ischaemic heart diseases (I20–I25)	2648	4.6%	3000	10.4%
Stroke (I60, I61, I63, I64 and G45)	1298	2.2%	1186	4.1%
Diseases of the genitourinary system (N00–N99)	1	0.0%	9	0.0%
Nephritis, nephrotic syndrome and nephrosis (N00–N07, N17–N19, N25–N27)	1	0.0%	8	0.0%
	Group			
	No diabetes		**Type 2 diabetes**	
Gender				
Female	235 533	43.6%	110 627	44.0%
Male	304 272	56.4%	141 018	56%
Age in 2010	60.1	(13.3)	60.7	(13.1)
Year of birth				
1981–1992	10 348	1.9%	4 217	1.7%
1971–1980	28 120	5.2%	11 576	4.6%

Continued

Table 1 Continued

	Group			
	No diabetes		Type 2 diabetes	
1961–1970	75 431	14.0%	33 536	13.3%
1951–1960	124 714	23.1%	58 104	23.1%
1941–1950	168 295	31.2%	80 540	32.0%
≤1940	132 897	24.6%	63 672	25.3%
Education (latest available)				
Up to lower secondary education	134 919	25.1%	80 780	32.4%
Upper secondary to post-secondary education <2 years	262 874	48.9%	124 894	50.2%
Post-secondary ≥2 years to tertiary education	139 526	26.0%	43 312	17.4%
Annual income (SEK; latest available)	197 400	(202 400)	168 500	(133 200)
Years in lowest fifth percentile of income (2005–2019)	0.5	(1.9)	0.8	(2.3)
0	464 008	86%	203 105	80.7%
1–4 years	53 916	10%	32 265	12.8%
≥5 years	21 880	4.1%	16 267	6.5%
Systemic conditions (2005–2020)*				
Certain infectious and parasitic diseases (A00–B99)	37 332	6.9%	35 971	14.3%
Neoplasms (C00–D48)	208 763	38.7%	104 478	41.5%
Cancer (C00–C97)	121 118	22.4%	57 907	23.0%
Endocrine, nutritional and metabolic diseases (E00–E90)	110 280	20.4%	186 300	74.0%
Obesity (E66)	11 641	2.2%	30 423	12.1%
Diseases of the circulatory system (I00–I99)	253 533	47%	170 748	67.9%
Ischaemic heart diseases (I20–I25)	64 083	11.9%	56 417	22.4%
Stroke (I60, I61, I63, I64 and G45)	31 514	5.8%	23 098	9.2%
Diseases of the genitourinary system (N00–N99)	18	0%	34	0%
Nephritis, nephrotic syndrome and nephrosis (N00–N07, N17–N19 and N25–N27)	12	0%	24	0%

Categorical data are presented as frequencies and percentages. The continuous variables age and number of years in the lowest fifth percentile of income are presented as mean (SD); income is presented as median (IQR).
*Systemic conditions exclude diagnoses only registered in primary care. International Classification of Diseases 10th revision codes provided in parentheses.

with periodontitis was stronger for T2D, as evidenced by risk differences of up to 8% (figure 2 and online supplemental figures A1-A4; online supplemental tables A9-A10; online supplemental appendix pp 28–33).

Glycaemic control had a decisive impact on associations with periodontitis. Poor glycaemic control was associated with an increased risk for periodontitis by up to 67% in T1D (overall RR 1.37, 95% CI 1.28 to 1.47; RR at 40–49 years 1.67, 95% CI 1.45 to 1.92) and up to 172% in T2D (overall RR 1.38, 95% CI 1.33 to 1.43; RR at age 30–39 years 2.72, 95% CI 2.29 to 3.23) compared with non-T1D and non-T2D, respectively (figure 2 and online supplemental figures A5-A8; online supplemental tables A11-A12; online supplemental appendix pp 34–39). Good glycaemic control was associated with a lower risk for periodontitis in T1D (RR 0.71, 95% CI 0.60 to 0.84), but not in T2D (RR 1.23, 95% CI 1.20 to 1.26).

Prevalence and RRs by age category and gender are presented in online supplemental tables A9, A10. Differences in terms of the prevalence of periodontitis between the diabetes cohorts and matched controls were most prominent in younger age categories. Overall, periodontitis was more frequent among males than females. The relative effect of diabetes in young females was stronger than in young males, as illustrated by greater RRs for both T1D and T2D.

Tooth loss was more common in T1D and T2D than in their respective control groups (T1D: 33.9%, 95% CI 33.4 to 34.5; non-T1D: 29.0%, 95% CI 28.6 to 29.4; T2D: 46.2%, 95% CI 46.0 to 46.4; non-T2D: 37.8%, 95% CI 37.7 to 38).

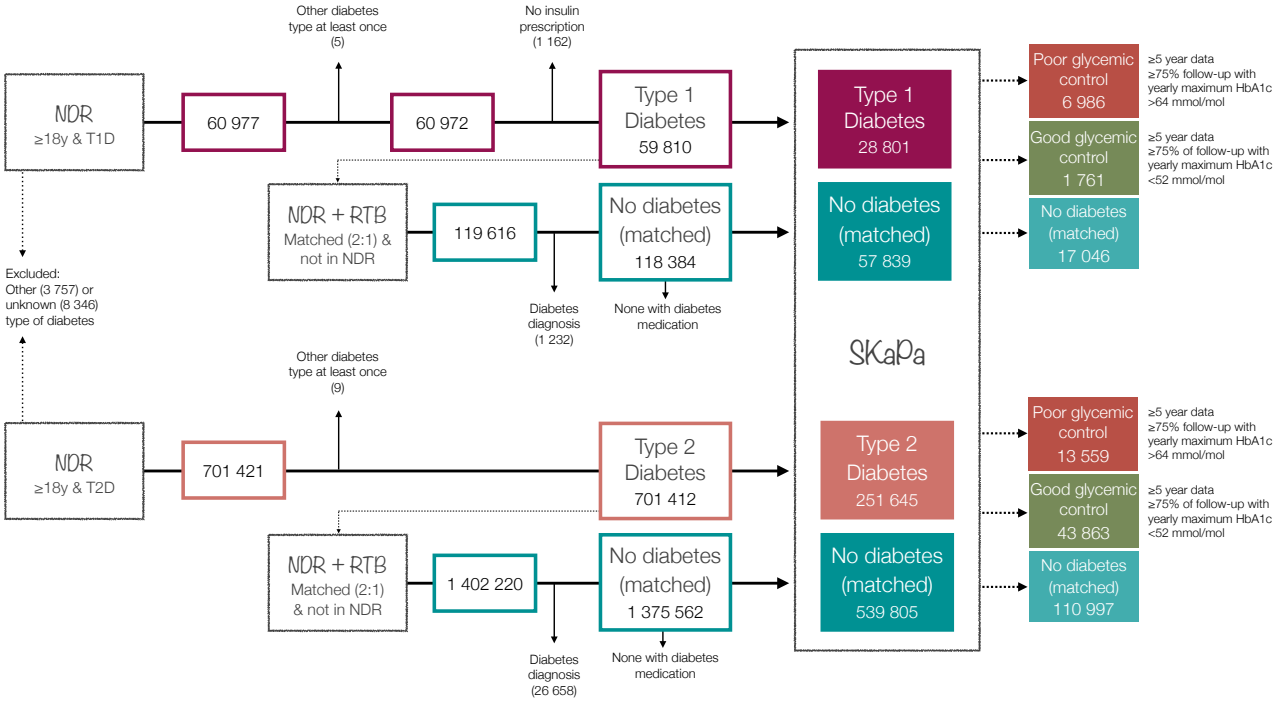

Figure 1 Sample description (number of individuals in the different cohorts and subgroups). For the period 2010–2020, mean follow-up time within SKaPa was 6.1±3.6 years for T1D, 6.1±3.7 years non-T1D, 5.5±3.7 years for T2D and 5.7±3.7 years for non-T2D; mean follow-up time within NDR was 8.4±2.5 years for T1D and 5.7±3.5 years for T2D. See also online supplemental appendix (pp 5, 8–13). NDR, National Diabetes Register; RTB, Swedish Total Population Register; SKaPa, Swedish Quality Registry for Caries and Periodontal Disease; T1D, type 1 diabetes; T2D, type 2 diabetes.

Incident tooth loss was greater in T1D (IRR 1.28; 95% CI 1.26, 1.30) and T2D (IRR 1.37; 95% CI 1.36 to 1.38) than in control groups (figure 3, online supplemental figures A9-A12; online supplemental appendix pp 40–45). Poor glycaemic control was associated with a higher risk for tooth loss in T1D and T2D compared with non-T1D/non-T2D. Well-controlled individuals were at higher risk only in T2D (figure 3 and online supplemental figures A1-A18; online supplemental appendix pp 46–51).

Diabetes-related complications

In both T1D and T2D, periodontitis was associated with a higher risk for retinopathy (T1D HR 1.08, 95% CI 1.02 to 1.14; T2D HR 1.08, 95% CI 1.06 to 1.10) and albuminuria (T1D HR 1.14, 95% CI 1.06 to 1.23; T2D HR 1.09, 95% CI 1.07 to 1.11), as confirmed by both adjusted Cox regression analyses and APC modelling (tables 2 and 3 and online supplemental tables A13-A14; online supplemental figures A19-A38; online supplemental appendix pp 52–63). Periodontitis was not associated with a higher risk for ischaemic heart disease, stroke or death in either T1D or T2D.

DISCUSSION

In this large population-based register study, we demonstrated an association between T2D and periodontitis. The association was strongest in younger age categories and exacerbated by poor glycaemic control. For T1D, only the subgroup with poor glycaemic control was at higher risk for periodontitis. Our results also indicated that periodontitis contributes to some diabetes-related complications, namely retinopathy and nephropathy (albuminuria). Periodontitis was not, however, associated with a higher risk for ischaemic heart disease, stroke or death in T1D/T2D.

Our findings on the association between T2D and periodontitis are in line with previous evidence and position papers presented by dental and medical professional associations.[16] Evidence on the relationship between T1D and periodontitis is limited, as illustrated by study samples including no more than a few hundred patients.[5 7 17–19] In a study on 1114 cases and 7253 controls without diabetes, Sun *et al*[20] reported an adjusted HR of 1.7 for periodontitis in young individuals with T1D (20–40 years).[20] Our study not only included a considerably larger number of individuals but also covered a larger age span. In this sense, the new evidence from the present study suggests that the association between T1D and periodontitis was largely dependent on glycaemic control rather than the diagnosis per se. In addition, good glycaemic control in this group may reflect healthcare attitudes in general, extending to better compliance levels also in terms of oral care. Regardless of potential mechanisms, the present data confirm the relevance of glycaemic control for oral and periodontal health.[21 22]

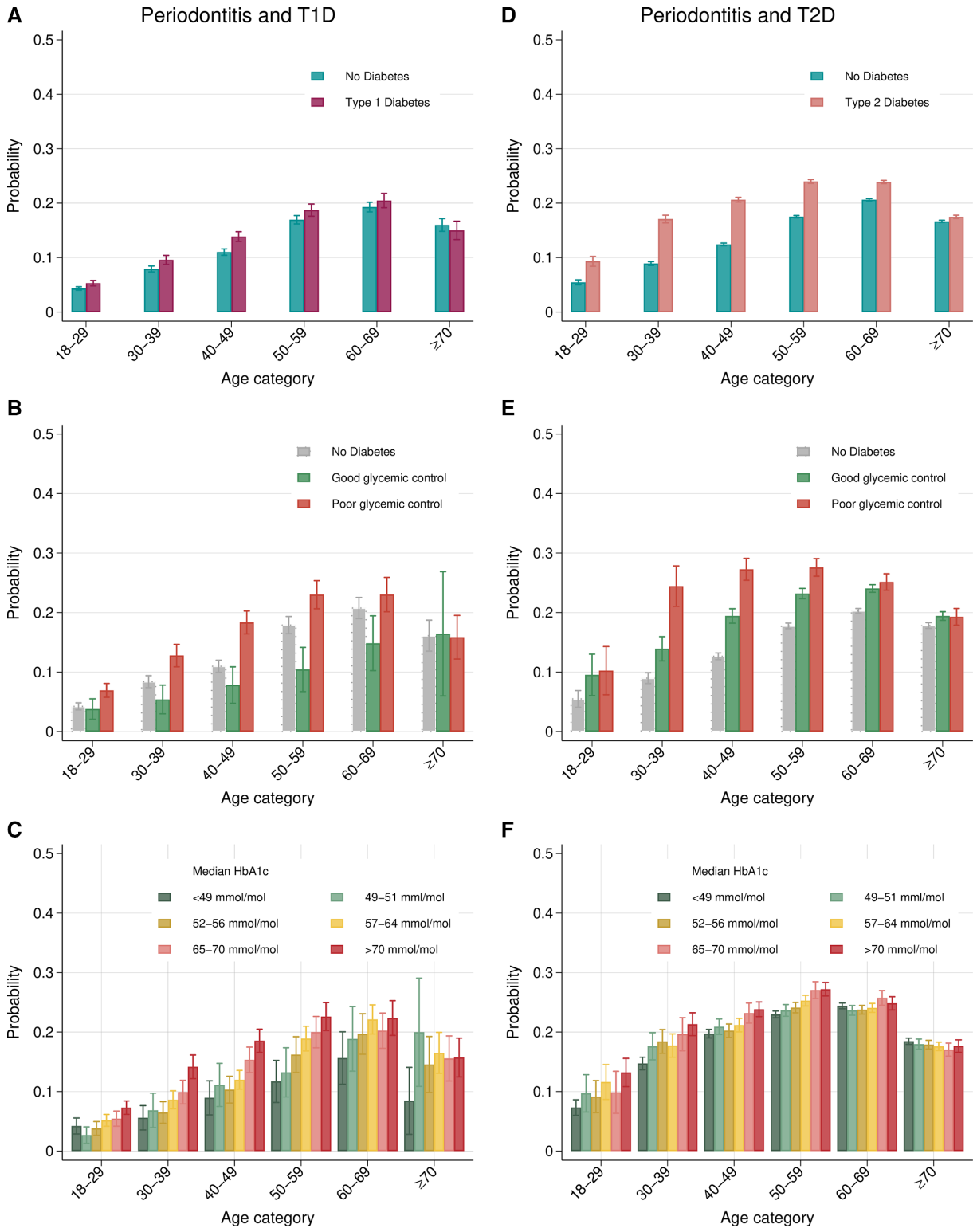

Figure 2 Probability estimates for periodontitis by age category. Periodontitis and T1D models are based on (A) 85 042 individuals (T1D 28 241 and non-T1D 56 801), (B) 25 302 individuals (good glycaemic control 1740, poor glycaemic control 6812, no diabetes 16 750) and (C) 28 130 individuals with T1D. Periodontitis and T2D models are based on (D) 770 672 individuals (T2D 243 900 and non-T2D 526 772), (E) 163 981 individuals (good glycaemic control 42 660, poor glycaemic control 13 038 and no diabetes 108 283) and (F) 240 307 individuals with T2D. Models were adjusted for age (categorical), gender, level of education and income.

The association between periodontitis and diabetes (T1D and T2D) in the present study was most prominent up to the age of 50 years, particularly among females. Interestingly, other studies demonstrated that associations between periodontitis and cardiovascular diseases were also stronger in younger groups[23] and females.[24] We

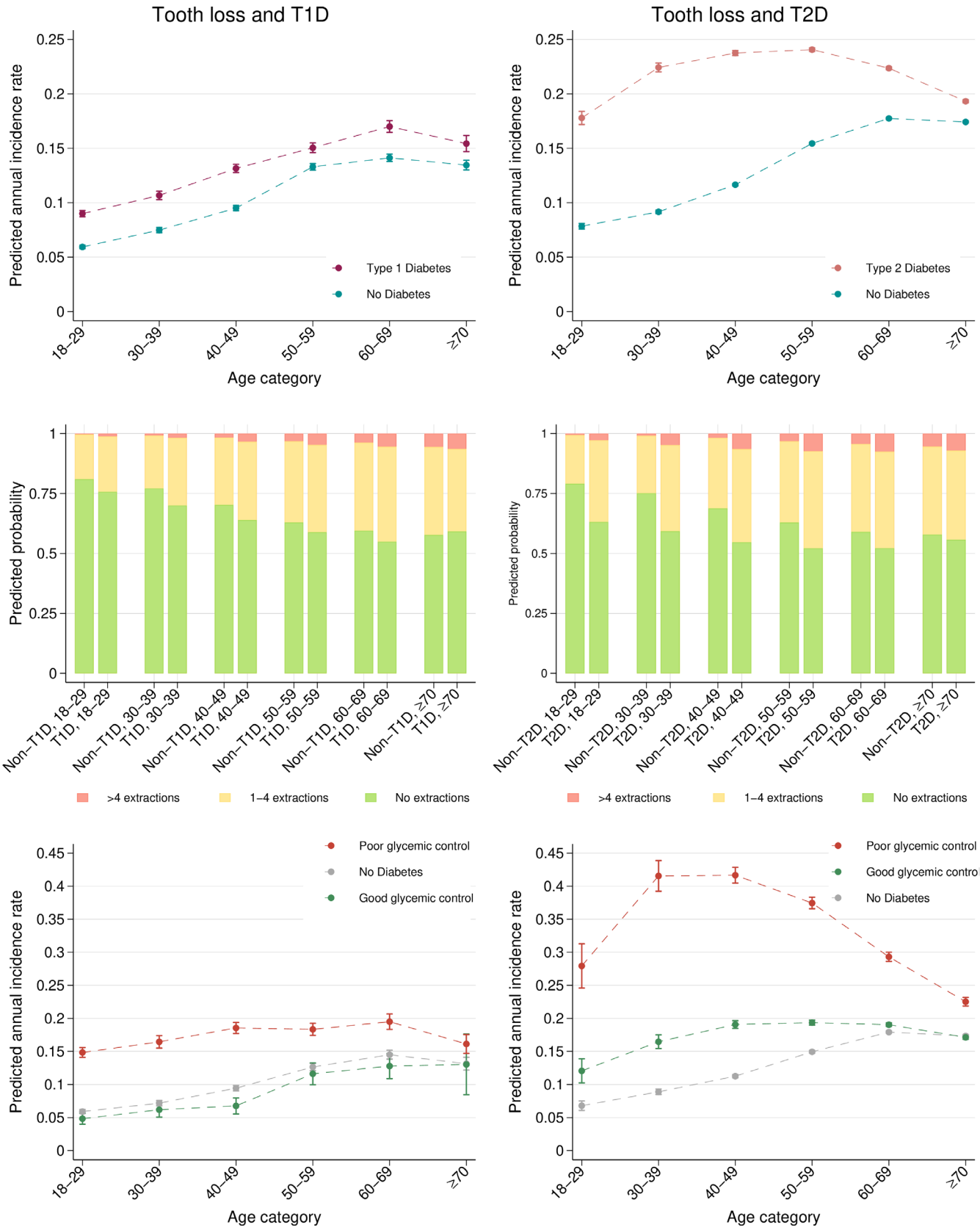

Figure 3 Estimated annual incidence rates of tooth loss and probability estimates for the extent of tooth loss during the 10-year observation period by age category. The tooth loss and T1D models are based on 86 273 individuals (T1D 28 659 and non-T1D 57 614) and 25 683 individuals (good glycaemic control 1756, poor glycaemic control 6947 and no diabetes 16 980). The tooth loss and T2D models are based on 786 305 individuals (T2D 248 986 and non-T2D 537 319) and 167 362 individuals (good glycaemic control 43 544, poor glycaemic control 13 321 and no diabetes 110 497). Models were adjusted for age (categorical), gender, level of education and income.

Table 2 Diabetes-related complications in individuals with type 1 diabetes (comparing periodontitis to no periodontitis).

		Age						
		18–29	**30–39**	**40–49**	**50–59**	**60–69**	**≥70**	**Overall**
Retinopathy (2010–2020)	No periodontitis	5342/7418 (72.0%)	3611/4528 (79.7%)	3935/4778 (82.4%)	2976/3613 (82.4%)	2273/2668 (85.2%)	981/1204 (81.5%)	19 118/24 209 (79.0%)
	Periodontitis	313/404 (77.5%)	366/456 (80.3%)	644/781 (82.5%)	766/868 (88.2%)	625/742 (84.2%)	209/255 (82.0%)	2923/3506 (83.4%)
								Adjusted HR (95% CI): 1.08 (1.02 to 1.14)
Albuminuria (2010–2020)	No periodontitis	1135/7426 (15.3%)	962/4531 (21.2%)	1353/4782 (28.3%)	1280/3617 (35.4%)	1202/2697 (44.6%)	660/1238 (53.3%)	6592/24 291 (27.1%)
	Periodontitis	91/403 (22.6%)	132/459 (28.8%)	276/783 (35.2%)	340/870 (39.1%)	314/748 (42.0%)	135/258 (52.3%)	1288/3521 (36.6%)
								Adjusted HR (95% CI): 1.14 (1.06 to 1.23)
Ischaemic heart disease (2010–2020)	No periodontitis	22/7594 (0.3%)	82/4595 (1.8%)	345/4855 (7.1%)	630/3673 (17.2%)	694/2748 (25.3%)	490/1342 (36.5%)	2263/24 807 (9.1%)
	Periodontitis	2/415 (0.5%)	13/465 (2.8%)	69/790 (8.7%)	141/880 (16.0%)	168/757 (22.2%)	97/268 (36.2%)	490/3575 (13.7%)
								Adjusted HR (95% CI): 0.96 (0.86 to 1.08)
Stroke (2010–2020)	No periodontitis	21/7594 (0.3%)	57/4595 (1.2%)	138/4855 (2.8%)	184/3673 (5.0%)	205/2748 (7.5%)	197/1342 (14.7%)	802/24 807 (3.2%)
	Periodontitis	3/415 (0.7%)	8/465 (1.7%)	28/790 (3.5%)	43/880 (4.9%)	59/757 (7.8%)	40/268 (14.9%)	181/3575 (5.1%)
								Adjusted HR (95% CI): 1.05 (0.89 to 1.25)
Mortality (2010–2020)	No periodontitis	67/7594 (0.9%)	63/4595 (1.4%)	163/4855 (3.4%)	251/3673 (6.8%)	466/2748 (17.0%)	638/1342 (47.5%)	1648/24 807 (6.6%)
	Periodontitis	3/415 (0.7%)	6/465 (1.3%)	24/790 (3.0%)	75/880 (8.5%)	117/757 (15.5%)	118/268 (44.0%)	343/3575 (9.6%)
								Adjusted HR (95% CI): 0.91 (0.81 to 1.02)

Prevalence is presented as frequency/n (%)

Adjusted HRs originate from Cox regression models, which included periodontitis, age category, gender, level of education and number of years in the fifth lowest percentile of income.

Table 3 Diabetes-related complications in individuals with type 2 diabetes (comparing periodontitis to no periodontitis).

		Age						
		18–29	**30–39**	**40–49**	**50–59**	**60–69**	**≥70**	**Overall**
Retinopathy (2010–2020)	No periodontitis	688/2748 (25.0%)	2260/7520 (30.1%)	7315/22 012 (33.2%)	13 520/37 659 (35.9%)	21 636/53 201 (40.7%)	18 037/41 983 (43.0%)	63 456/165 123 (38.4%)
	Periodontitis	89/299 (29.8%)	551/1561 (35.3%)	2272/5950 (38.2%)	4927/12 221 (40.3%)	7391/17 205 (43.0%)	4257/9438 (45.1%)	19 487/46 674 (41.8%)
							Adjusted HR (95% CI):	1.08 (1.06 to 1.10)
Albuminuria (2010–2020)	No periodontitis	823/3096 (26.6%)	2207/8200 (26.9%)	6895/23 378 (29.5%)	12 793/39 270 (32.6%)	22 009/55 027 (40.0%)	22 212/44 491 (49.9%)	66 939/173 462 (38.6%)
	Periodontitis	89/348 (25.6%)	545/1718 (31.7%)	2138/6296 (34.0%)	4852/12 826 (37.8%)	7859/17 860 (44.0%)	5214/9973 (52.3%)	20 697/49 021 (42.2%)
							Adjusted HR (95% CI):	1.09 (1.07 to 1.11)
Ischaemic heart disease (2010–2020)	No periodontitis	26/3757 (0.7%)	284/9363 (3.0%)	2005/25 967 (7.7%)	6323/42 932 (14.7%)	13 444/59 634 (22.5%)	17 581/51 519 (34.1%)	39 663/193 172 (20.5%)
	Periodontitis	6/390 (1.5%)	91/1930 (4.7%)	675/6884 (9.8%)	2351/13 851 (17.0%)	4504/19 182 (23.5%)	3554/11 080 (32.1%)	11 181/53 317 (21.0%)
							Adjusted HR (95% CI):	0.96 (0.94 to 0.99)
Stroke (2010–2020)	No periodontitis	23/3757 (0.6%)	131/9363 (1.4%)	678/25 967 (2.6%)	1852/42 932 (4.3%)	4623/59 634 (7.8%)	7480/51 519 (14.5%)	14 787/193 172 (7.7%)
	Periodontitis	2/390 (0.5%)	23/1930 (1.2%)	182/6884 (2.6%)	669/13 851 (4.8%)	1597/19 182 (8.3%)	1625/11 080 (14.7%)	4098/53 317 (7.7%)
							Adjusted HR (95% CI):	0.99 (0.95 to 1.03)
Mortality (2010–2020)	No periodontitis	29/3757 (0.8%)	115/9363 (1.2%)	516/25 967 (2.0%)	1967/42 932 (4.6%)	6283/59 634 (10.5%)	20 617/51 519 (40.0%)	29 527/193 172 (15.3%)
	Periodontitis	6/390 (1.5%)	19/1930 (1.0%)	134/6884 (1.9%)	619/13 851 (4.5%)	1989/19 182 (10.4%)	3606/11 080 (32.5%)	6373/53 317 (12.0%)
							Adjusted HR (95% CI):	0.81 (0.79 to 0.83)

Prevalence is presented as frequency/n (%)

Adjusted HRs originate from Cox regression models, which included periodontitis, age category, gender, level of education and number of years in the fifth lowest percentile of income.

speculate that the interplay between the two conditions at a later stage in life may be masked by the accumulation of additional risk factors. The observed gender effect is not understood.

Previous evidence has linked periodontitis to an increase in incidence of micro- and macrovascular complications in patients with T2D (predominantly cross-sectional data)[4] and T1D (one cross-sectional and one case-control study).[25 26] In contrast, we noted an increased risk only for microvascular complications (retinopathy and albuminuria). Differences may be explained by characteristics of the study populations (eg, ethnicity), but potentially also by differences in access to healthcare.

The strengths of this study reside in the population-wide approach, facilitated by patient registers with high levels of coverage and the solid exposures and endpoints (diagnosis T1D/T2D, diabetes-related complications and mortality) captured by registered healthcare professionals. Also, matching to population registers through the unique national personal identity numbers allowed for adjustment for socioeconomic parameters. Some limitations need to be considered. The categorisation of a periodontitis case was extrapolated from the data available in SKaPa, that is, clinical recordings of periodontal probing depth, rather than a diagnostic code or detailed assessments of attachment levels. The direction of the associations was consistent when using alternative case definitions for periodontitis.

We had no information for the control group on tobacco smoking and body mass index, two well-established risk factors in the current context. However, smoking in T1D (13%) and T2D (14%) was not notably different from 2010 population estimates provided by the Swedish national public health survey (13% of 9933 respondents age 16–84 years were daily smokers).[27] And finally, while we do have data on 'first' recordings of diabetes and periodontitis diagnoses, these may not necessarily correspond to actual onset of disease. Therefore, we avoided making assumptions on directionality and rather focused on comorbidity over the study period.

Implications for clinicians and policymakers

Our focus on periodontitis as a primary target of our analysis is motivated by its negative impact on quality of life[28] and the resulting economic burden on society and the individual.[29] Economic aspects are particularly relevant in light of the already disadvantaged socioeconomic status of the T2D group in our study. Cost may act as a barrier to adequate periodontal care, which may improve glycaemic control.[30] From a public health point of view, preventive strategies in risk groups should therefore consider including dental care.

CONCLUSION

The present data demonstrate a strong association between T2D and periodontitis, exacerbated by poor glycaemic control. For T1D, the association to periodontitis was limited to subgroups with poor glycaemic control. Periodontitis contributed to an increased risk for retinopathy and albuminuria in both T1D and T2D.

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Contributors JD and TB conceived and initiated the study. ATE and JD performed data acquisition and analyses. MP supervised all statistical analyses. JD, ATE, TB, MP, KEO and CT contributed to interpretation of results. ATE and JD wrote the manuscript, which was critically reviewed and edited by TB, MP, KEO and CT. All authors had access to the original data and approved the final version of the manuscript. JD is responsible for the integrity of the work and the decision to submit, and acts as guarantor. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

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Competing interests All authors have completed the ICMJE uniform disclosure form at http://www.icmje.org/disclosure-of-interest/ and declare: ATE, CT, TB and JD had financial support from the Eklund Foundation (grant 2018-132) and TUA Research Funding (grants TUAGBG-919531 & TUAGBG-979382) for the submitted work; CT serves as a consultant for PreBiomics S.r.l (outside the present work); TB serves as an advisor for the Swedish Quality Registry for Caries and Periodontal Diseases (SKaPa); KEO serves as the director of the Swedish National Diabetes Register (NDR) and has received fees for lecturing and/or honoraria for consulting from Sanofi, Novo Nordisk, Eli Lilly and Abbot Diabetes Care (all outside the present work); no other relationships or activities that could appear to have influenced the submitted work.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by the Swedish Ethical Review Authority (Dnr: 2019-04140). The ethical approval covers use of register data without seeking specific informed consent from the participants. Swedish quality registers, such as SKaPa and NDR, are voluntary and regulated by the Swedish law (The Patient Data Act, Patientdatalag (2008:355)), which does not require specific consent from each individual for their data to be included in research projects.

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Data availability statement Data are available upon reasonable request. The de-identified participant data that underlie the results reported in this article, as well as the statistical code are available from the corresponding author upon reasonable request and upon a signed data access agreement.

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Periodontitis in patients with diabetes and its association with diabetes-related complications. A register-based cohort study.

Appendix

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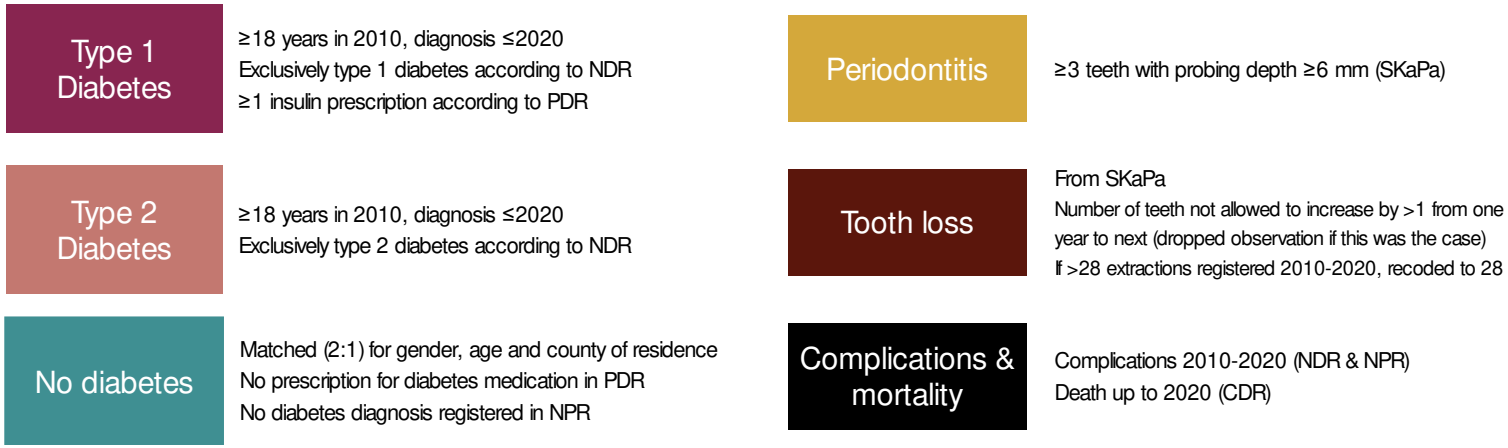
Data retrieval from national registries

Swedish Total Population Register[1]	National Prescribed Drug Register[2] (PDR)	Longitudinal Integrated Database for Health Insurance and Labour Market Studies[1]	National Patient Register[2] (NPR)	National Diabetes Register[3] (NDR)	Swedish Quality Registry for Caries and Periodontal Disease[4] (SKaPa)	Cause of Death Register[2] (CDR)
Demographic data	Data on anti-diabetic medication & antibiotics	Socioeconomic data	Data on systemic diseases	Diabetes-related parameters	Data on dental status & extractions	Cause of death
2005-2020	2005-2020	2005-2019	2005-2020	2005-2020	2010-2020	2010-2020



[1]Statistics Sweden; [2]Swedish National Board of Health and Welfare (authority responsible for matching the registries through the national personal identity number); [3]Region Västra Götaland; [4]Region Värmland

Additional variable description

In the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions, a **periodontitis case** was defined by interdental clinical attachment loss at ≥2 non-adjacent teeth. The case definition for periodontitis in this study was based on periodontal probing depth (PPD) only, due to the low degree of completeness for data on clinical attachment levels in SKaPa. We chose a threshold of ≥3 teeth with PPD ≥6 mm in an attempt to approximate the definition from the World Workshop.

> *Papapanou PN, Sanz M, et al. Periodontitis: Consensus report of Workgroup 2 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. J Periodontol. 2018; 89(Suppl 1): S173–S182.*

Many epidemiological studies have utilized case definitions based on "deep" PPD (≥6 mm). For instance, 50 of 72 studies included in the widely cited systematic review by Kassebaum et al. (2014) on the global burden of severe periodontitis based their case definitions exclusively on PPD (CPI 4 or PPD ≥6 mm).

> *Kassebaum NJ, Bernabé E, Dahiya M, Bhandari B, Murray CJL, Marcenes W. Global Burden of Severe Periodontitis in 1990-2010: A Systematic Review and Meta-regression. Journal of Dental Research. 2014;93(11):1045-1053.*

In this Appendix we provide sensitivity analysis based on an alternative case definition for periodontitis (≥1 tooth with PPD ≥6 mm), as well as a continuous measure of the extent of periodontitis (number of teeth with PPD ≥6 mm).

Age (in 2010) was categorized as follows: 18-29 years (born 1981-1992), 30-39 years (born 1971-1980), 40-49 years (born 1961-1970), 50-59 years (born 1951-1960), 60-69 years (born 1941-1950), and ≥70 years (born before 1940).

Information on the **level of education** was obtained from the Longitudinal Integrated Database for Health Insurance and Labour Market Studies (LISA). Individuals were then classified according to the maximum level of education obtained by year 2019:

1. Up to Lower secondary education.
2. Upper secondary to Post-secondary education <2 years.
3. Post-secondary ≥2 years to Tertiary education.

Annual income included salary, pension and capital gain (obtained from LISA). For categorization purposes, we used a ratio calculated relative to a yearly national reference amount*. Ranking was then performed by age for each year (2005-2019). The lowest income subgroup consisted of individuals who ranked within the lowest 5 percentile. Number of years within this lowest income subgroup was used as a measure of deprivation ("**income**").

* Information obtained from: Statistics Sweden (SCB) 2023, Prisbasbelopp, last accessed 17th august 2023 (https://www.scb.se/hitta-statistik/statistik-efter-amne/priser-och-konsumtion/konsumentprisindex/konsumentprisindex-kpi/pong/tabell-och-diagram/prisbasbelopp/prisbasbelopp/)

Data on **systemic conditions** originate from the National Patient Register, including in-patient care and specialist care in Sweden. The register does not cover primary care.

Certain infectious and parasitic diseases (A00-B99)
Neoplasms (C00-D48)
    Cancer (C00-C97)
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (D50-D89)
Endocrine, nutritional and metabolic diseases (E00-E90)
    Obesity (E66)
Mental and behavioral disorders (F00-F99)
Diseases of the nervous system (G00-G99)
Diseases of the eye and adnexa (H00-H59)
Diseases of the ear and mastoid process (H60-H95)
Diseases of the circulatory system (I00-I99)

Ischemic heart diseases (I20-I25)
Stroke (I60, I61, I63, I64, G45)
Diseases of the respiratory system (J00-J99)
Diseases of the digestive system (K00-K93)
Diseases of the skin and subcutaneous tissue (L00-L99)
Diseases of the musculoskeletal system and connective tissue (M00-M99)
Diseases of the genitourinary system (N00-N99)
Nephritis, nephrotic syndrome and nephrosis (N00-N07, N17-N19, N25-N27)

For individuals with **diabetes**, year of **onset** was retrieved from NDR. When missing, the first registration in NDR was used instead.

For both T1D and T2D, the yearly maximum **HbA1c** score was noted for the time period 2010-2020 (obtained from NDR). The median yearly HbA1c over the observation period was chosen to represent the individual. Within those individuals with HbA1c data for ≥5 years, subgroups by glycemic control were defined as follows:

- **Good glycemic control**: maximum yearly HbA1c <52 mmol/mol for ≥75% of their observation period.
- **Poor glycemic control**: maximum yearly HbA1c >62 mmol/mol for ≥75% of their observation period.

For these subgroups, information on **smoking** habits, **BMI** and **physical exercise** were obtained from NDR. An individual was classified as smoker if they had reported smoking daily at least once between 2005 and 2020. Non-smoking, non-daily smoking and previous smoking were classified as non-smoking. Maximum BMI and median physical exercise (dichotomized to < or ≥3 times/week; each occasion being the equivalent to a 30-minute walk) between 2005 and 2020 was chosen to represent the individual.

Tooth loss (extractions) was considered as both a continuous variable and categorized into 0, 1-4 or ≥5 extractions over the observation period (data obtained from SKaPa).

Follow-up represents number of years from the first to the last registration in SKaPa between 2010 and 2020. For the purpose of the Poisson regression analyses for tooth loss, individuals with data from one year only were given a follow-up period value of 0.1 years.

Table A1. Included individuals with T1D and matched controls without diabetes.

	Group			
	No Diabetes		Type 1 Diabetes	
Gender				
Female	26 271	45.4%	13 022	45.2%
Male	31 568	54.6%	15 779	54.8%
Age in 2010	42.9	(16.9)	42.4	(16.5)
Year of birth				
1981-1992	15 984	27.6%	8 071	28.0%
1971-1980	10 066	17.4%	5 134	17.8%
1961-1970	11 227	19.4%	5 757	20.0%
1951-1960	9 253	16.0%	4 635	16.1%
1941-1950	7 545	13.0%	3 571	12.4%
≤1940	3 764	6.5%	1 633	5.7%
Birthplace				
Sweden	51 397	88.9%	26 689	92.7%
Scandinavia (excl. Sweden)	1 405	2.4%	597	2.1%
Europe (excl. Scandinavia)	2 100	3.6%	589	2.0%
Other	2 937	5.1%	922	3.2%
Unknown	0	0.0%	1	0.0%
National area according to NUTS 2				
SE11 Stockholm	8 774	15.2%	4 495	15.6%
SE12 East Middle Sweden	10 718	18.5%	5 318	18.5%
SE21 Småland and the islands	5 989	10.4%	2 992	10.4%
SE22 South Sweden	7 832	13.5%	3 989	13.9%
SE23 West Sweden	11 901	20.6%	5 804	20.2%
SE31 North Middle Sweden	6 794	11.7%	3 254	11.3%
SE32 Middle Norrland	2 407	4.2%	1 242	4.3%
SE33 Upper Norrland	3 424	5.9%	1 707	5.9%
Education (latest available)				
Up to Lower secondary education	7 818	13.6%	4 083	14.2%
Upper secondary to Post-secondary education <2 years	29 831	51.8%	15 214	53.1%
Post-secondary ≥2 years to Tertiary education	19 965	34.7%	9 362	32.7%
Annual Income (SEK; latest available)	300 900	[275 600]	266 700	[271 600]
Years in lowest 5th percentile of income (2005-2019)	0.7	(1.9)	0.8	(2.0)
0	45 123	78.0%	22 128	76.8%
1-4 years	9 923	17.2%	5 081	17.6%
≥5 years	2 793	4.8%	1 589	5.5%
Systemic conditions (2005-2020)*				
Certain infectious and parasitic diseases (A00-B99)	1 702	2.9%	10 768	37.4%
Neoplasms (C00-D48)	15 418	26.7%	10 423	36.2%
Cancer (C00-C97)	6 079	10.5%	2 684	9.3%
Diseases of the blood and blood-forming organs [...] (D50-D89)	0	0.0%	1	0.0%
Endocrine, nutritional and metabolic diseases (E00-E90)	7 910	13.7%	28 664	99.5%
Obesity (E66)	1 761	3.0%	2 205	7.7%
Mental and behavioral disorders (F00-F99)	25	0.0%	300	1.0%
Diseases of the nervous system (G00-G99)	0	0.0%	3	0.0%
Diseases of the eye and adnexa (H00-H59)	0	0.0%	6	0.0%
Diseases of the ear and mastoid process (H60-H95)	0	0.0%	0	0.0%
Diseases of the circulatory system (I00-I99)	14 314	24.7%	14 465	50.2%
Ischemic heart diseases (I20-I25)	2 648	4.6%	3 000	10.4%
Stroke (I60, I61, I63, I64, G45)	1 298	2.2%	1 186	4.1%
Diseases of the respiratory system (J00-J99)	8	0.0%	11	0.0%
Diseases of the digestive system (K00-K93)	1	0.0%	10	0.0%
Diseases of the skin and subcutaneous tissue (L00-L99)	1	0.0%	5	0.0%
Diseases of the musculoskeletal system and connective tissue (M00-M99)	5	0.0%	5	0.0%
Diseases of the genitourinary system (N00-N99)	1	0.0%	9	0.0%
Nephritis, nephrotic syndrome and nephrosis (N00-N07, N17-N19, N25-N27)	1	0.0%	8	0.0%
Glycemic control**				
Good glycemic control	-	-	1 761	-
Poor glycemic control	-	-	6 986	-
Smoking***	-	-	3 703	13.0%

* Systemic conditions exclude diagnoses only registered in primary care. ICD10 codes provided in parentheses.
Categorical data is presented as frequencies and percentages. The continuous variables age and number of years in the lowest 5th percentile of income are presented as mean (standard deviation); income is presented as median [interquartile range].
**T1D with ≥5 years HbA1c data, only
*** Smoking data extracted from NDR; information missing for 293 individuals in T1D

Table A2. Subgroups of included individuals with T1D according to glycemic control and their matched controls without diabetes.

	No Diabetes		Type 1 Diabetes Group: Good glycemic control		Type 1 Diabetes Group: Poor glycemic control	
	No Diabetes		Type 1 Diabetes			
Gender						
Female			25 477	42.1%	13 088	42.2%
Male			35 068	57.9%	17 921	57.8%
Age in 2010 (mean (SD))	41.9	(19.8)	51.3	(18.0)	52.0	(18.1)
Year of birth						
1981-1995	4 680	27.5%	545	30.9%	1 816	26.0%
1971-1980	3 145	18.5%	24 447	20.7%	12 237	20.5%
1961-1970	3 730	21.9%	19 341	21.1%	11 211	21.3%
1951-1960	2 748	16.1%	22 070	16.3%	9 684	16.2%
1941-1950	1 992	11.7%	19 753	18.6%	11 080	18.5%
≤1940	751	4.4%	18 851	15.0%	9 976	16.7%
			13 922	12.9%	9 582	16.0%
				2.7%	7 251	12.1%
Birthplace						
Sweden			49 309	81.5%	27 012	87.4%
Scandinavia (excl. Sweden)			2 398	4.0%	1 124	3.6%
Europe (excl. Scandinavia)			4 297	7.1%	1 297	4.2%
Unknown	0	0.0%	0	0.0%	0	0.0%
National area according to NUTS 2						
SE11 Stockholm	2 266	13.3%	302	17.1%	953	13.6%
SE12 East Middle Sweden	3 275	19.2%	246	14.0%	1 388	19.9%
SE21 Småland and the islands	1 889	11.1%	154	8.7%	824	11.8%
SE22 South Sweden	2 464	14.5%	277	15.7%	998	14.3%
SE23 West Sweden	3 394	19.9%	427	24.2%	1 247	17.8%
SE31 North Middle Sweden	1 997	11.7%	149	8.5%	856	12.3%
SE32 Middle Norrland	737	4.3%	97	5.5%	273	3.9%
SE33 Upper Norrland	1 024	6.0%	109	6.2%	447	6.4%
Education (latest available)						
Up to Lower secondary education	2 159	12.7%	147	8.4%	1 256	18.1%
Upper secondary to Post-secondary education <2 years	8 986	52.9%	769	43.8%	4 130	59.5%
Post-secondary ≥2 years to Tertiary education	5 835	34.4%	840	47.8%	1 561	22.5%
Annual Income (SEK; latest available)	311 900	[275 300]	342 200	[304 100]	219 550	[257 800]
Years in lowest 5th percentile of income (2005-2019)	0.7	(1.9)	0.5	(1.4)	1.0	(2.4)
0	13 217	77.5%	1 453	82.5%	5 009	71.7%
1-4 years	2 978	17.5%	260	14.8%	1 396	20.0%
≥5 years	851	5.0%	48	2.7%	581	8.3%
Systemic conditions (2005-2020)						
Certain infectious and parasitic diseases (A00-B99)	442	2.6%	416	23.6%	3 308	47.4%
Neoplasms (C00-D48)	4 388	25.7%	569	32.3%	2 848	40.8%
Cancer (C00-C97)	1 586	9.3%	139	7.9%	614	8.8%
Diseases of the blood and blood-forming organs [...] (D50-D89)	0	0.0%	0	0.0%	0	0.0%
Endocrine, nutritional and metabolic diseases (E00-E90)	2 196	12.9%	1 750	99.4%	6 981	99.9%
Obesity (E66)	539	3.2%	44	2.5%	810	11.6%
Mental and behavioral disorders (F00-F99)	6	0.0%	12	0.7%	108	1.5%
Diseases of the nervous system (G00-G99)	0	0.0%	0	0.0%	2	0.0%
Diseases of the eye and adnexa (H00-H59)	0	0.0%	0	0.0%	4	0.1%
Diseases of the ear and mastoid process (H60-H95)	0	0.0%	0	0.0%	0	0.0%
Diseases of the circulatory system (I00-I99)	3 828	22.5%	686	39.0%	4 042	57.9%
Ischemic heart diseases (I20-I25)	647	3.8%	78	4.4%	961	13.8%
Stroke (I60, I61, I63, I64, G45)	331	1.9%	27	1.5%	380	5.4%
Diseases of the respiratory system (J00-J99)	1	0.0%	1	0.1%	5	0.1%
Diseases of the digestive system (K00-K93)	0	0.0%	0	0.0%	2	0.0%
Diseases of the skin and subcutaneous tissue (L00-L99)	0	0.0%	0	0.0%	0	0.0%
Diseases of the musculoskeletal system and connective tissue (M00-M99)	0	0.0%	0	0.0%	0	0.0%
Diseases of the genitourinary system (N00-N99)	0	0.0%	1	0.1%	3	0.0%
Nephritis, nephrotic syndrome and nephrosis (N00-N07, N17-N19, N25-N27)	0	0.0%	1	0.1%	2	0.0%
Behavior						
Smoking	-	-	103	5.9%	1 472	21.1%
Physical exercise						
≤2 times/week	-	-	538	30.6%	3 702	53.2%
≥3 times/week	-	-	1 218	69.4%	3 259	46.8%
Overweight/obesity						
BMI <25	-	-	781	44.3%	1 492	21.4%
BMI 25-29.9 (Overweight)	-	-	712	40.4%	2 719	38.9%
BMI ≥30 (Obesity)	-	-	268	15.2%	2 775	39.7%

Table A3. Excluded individuals with T1D and matched controls without diabetes, lacking entry in SKaPa (period: 2010-2020).

Other	4 509	7.5%	1 479	4.8%
Unknown	5	0.0%	3	0.0%
National area according to NUTS 2				
SE11 Stockholm	23 277	19.7%	11 763	19.7%
SE12 East Middle Sweden	20 622	17.4%	10 408	17.4%
SE21 Småland and the islands	11 107	9.4%	5 614	9.4%
SE22 South Sweden	17 285	14.6%	8 763	14.7%
SE23 West Sweden	24 206	20.4%	12 204	20.4%
SE31 North Middle Sweden	11 756	9.9%	5 935	9.9%
SE32 Middle Norrland	4 524	3.8%	2 285	3.8%
SE33 Upper Norrland	5 607	4.7%	2 838	4.7%
Education				
Up to Lower secondary education	13 042	22.4%	7 029	23.6%
Upper secondary to Post-secondary education <2 years	28 477	48.9%	15 061	50.5%
Post-secondary ≥2 years to Tertiary education	16 736	28.7%	7 717	25.9%
Annual Income (SEK; median [IQR])	212 400	[267 400]	180 700	[243 900]
Years in lowest 5th percentile of income (2005-2019)	0.8	(2.1)	0.8	(2.0)
0	47 100	78.1%	24 131	78.1%
1-4 years	9 762	16.2%	4 997	16.2%
≥5 years	3 465	5.7%	1 782	5.8%
Systemic conditions (2005-2020)				
Certain infectious and parasitic diseases (A00-B99)	3 260	5.4%	11 841	38.2%
Neoplasms (C00-D48)	18 192	30.0%	12 477	40.2%
Cancer (C00-C97)	9 873	16.3%	4 772	15.4%
Diseases of the blood and blood-forming organs [...] (D50-D89)	0	0.0%	0	0.0%
Endocrine, nutritional and metabolic diseases (E00-E90)	9 858	16.3%	30 653	98.9%
Obesity (E66)	1 577	2.6%	1 991	6.4%
Mental and behavioral disorders (F00-F99)	61	0.1%	328	1.1%
Diseases of the nervous system (G00-G99)	1	0.0%	5	0.0%
Diseases of the eye and adnexa (H00-H59)	0	0.0%	2	0.0%
Diseases of the ear and mastoid process (H60-H95)	0	0.0%	0	0.0%
Diseases of the circulatory system (I00-I99)	20 609	34.0%	19 771	63.8%
Ischemic heart diseases (I20-I25)	4 694	7.8%	6 073	19.6%
Stroke (I60, I61, I63, I64, G45)	2 798	4.6%	2 684	8.7%
Diseases of the respiratory system (J00-J99)	24	0.0%	13	0.0%
Diseases of the digestive system (K00-K93)	0	0.0%	9	0.0%
Diseases of the skin and subcutaneous tissue (L00-L99)	15	0.0%	15	0.0%
Diseases of the musculoskeletal system and connective tissue (M00-M99)	9	0.0%	11	0.0%
Diseases of the genitourinary system (N00-N99)	1	0.0%	3	0.0%
Nephritis, nephrotic syndrome and nephrosis (N00-N07, N17-N19, N25-N27)	1	0.0%	3	0.0%
Glycemic control (T1D with ≥5 years HbA1c data, only)				
Good glycemic control	-	-	1 324	-
Poor glycemic control	-	-	6 849	-

Table A4. Included individuals with T2D and matched controls without diabetes.

	Group			
	No Diabetes		Type 2 Diabetes	
Gender				
Female	235 533	43.6%	110 627	44.0%
Male	304 272	56.4%	141 018	56.0%
Age in 2010	60.1	(13.3)	60.7	(13.1)
Year of birth				
1981-1992	10 348	1.9%	4 217	1.7%
1971-1980	28 120	5.2%	11 576	4.6%
1961-1970	75 431	14.0%	33 536	13.3%
1951-1960	124 714	23.1%	58 104	23.1%
1941-1950	168 295	31.2%	80 540	32.0%
≤1940	132 897	24.6%	63 672	25.3%
Birthplace				
Sweden	478 632	88.7%	203 514	80.9%
Scandinavia (excl. Sweden)	21 928	4.1%	11 253	4.5%
Europe (excl. Scandinavia)	19 890	3.7%	13 279	5.3%
Other	19 334	3.6%	23 527	9.4%
Unknown	6	0.0%	12	0.0%
National area according to NUTS 2				
SE11 Stockholm	76 258	14.1%	35 020	13.9%
SE12 East Middle Sweden	100 629	18.6%	47 765	19.0%
SE21 Småland and the islands	55 450	10.3%	25 763	10.2%
SE22 South Sweden	66 992	12.4%	31 651	12.6%
SE23 West Sweden	104 103	19.3%	47 772	19.0%
SE31 North Middle Sweden	74 247	13.8%	34 396	13.7%
SE32 Middle Norrland	27 280	5.1%	12 669	5.0%
SE33 Upper Norrland	34 846	6.5%	16 609	6.6%
Education (latest available)				
Up to Lower secondary education	134 919	25.1%	80 780	32.4%
Upper secondary to Post-secondary education <2 years	262 874	48.9%	124 894	50.2%
Post-secondary ≥2 years to Tertiary education	139 526	26.0%	43 312	17.4%
Annual Income (SEK; latest available)	197 400	[202 400]	168 500	[133 200]
Years in lowest 5th percentile of income (2005-2019)	0.5	(1.9)	0.8	(2.3)
0	464 008	86.0%	203 105	80.7%
1-4 years	53 916	10.0%	32 265	12.8%
≥5 years	21 880	4.1%	16 267	6.5%
Systemic conditions (2005-2020)*				
Certain infectious and parasitic diseases (A00-B99)	37 332	6.9%	35 971	14.3%
Neoplasms (C00-D48)	208 763	38.7%	104 478	41.5%
Cancer (C00-C97)	121 118	22.4%	57 907	23.0%
Diseases of the blood and blood-forming organs [...] (D50-D89)	5	0.0%	5	0.0%
Endocrine, nutritional and metabolic diseases (E00-E90)	110 280	20.4%	186 300	74.0%
Obesity (E66)	11 641	2.2%	30 423	12.1%
Mental and behavioral disorders (F00-F99)	722	0.1%	853	0.3%
Diseases of the nervous system (G00-G99)	6	0.0%	14	0.0%
Diseases of the eye and adnexa (H00-H59)	11	0.0%	19	0.0%
Diseases of the ear and mastoid process (H60-H95)	0	0.0%	0	0.0%
Diseases of the circulatory system (I00-I99)	253 533	47.0%	170 748	67.9%
Ischemic heart diseases (I20-I25)	64 083	11.9%	56 417	22.4%
Stroke (I60, I61, I63, I64, G45)	31 514	5.8%	23 098	9.2%
Diseases of the respiratory system (J00-J99)	158	0.0%	108	0.0%
Diseases of the digestive system (K00-K93)	18	0.0%	11	0.0%
Diseases of the skin and subcutaneous tissue (L00-L99)	50	0.0%	34	0.0%
Diseases of the musculoskeletal system and connective tissue (M00-M99)	90	0.0%	48	0.0%
Diseases of the genitourinary system (N00-N99)	18	0.0%	34	0.0%
Nephritis, nephrotic syndrome and nephrosis (N00-N07, N17-N19, N25-N27)	12	0.0%	24	0.0%
Glycemic control**				
Good glycemic control	-	-	43 863	-
Poor glycemic control	-	-	13 559	-
Smoking***	-	-	34 708	14.3%

* Systemic conditions exclude diagnoses only registered in primary care. ICD10 codes provided in parentheses.
Categorical data is presented as frequencies and percentages. The continuous variables age and number of years in the lowest 5th percentile of income are presented as mean (standard deviation); income is presented as median [interquartile range].
**T2D with ≥5 years HbA1c data, only
*** Smoking data extracted from NDR; information missing for 9 568 individuals in T2D

Table A5. Subgroups of included individuals with T2D according to glycemic control and their matched controls without diabetes.

	No Diabetes		Type 2 Diabetes: Good glycemic control		Type 2 Diabetes: Poor glycemic control	
Gender						
Female	51 018	46.0%	20 906	47.7%	5 640	41.6%
Male	59 979	54.0%	22 957	52.3%	7 919	58.4%
Age in 2010	60.8	(11.7)	62.5	(11.2)	59.4	(13.0)
Year of birth						
1981-1992	1 114	1.0%	304	0.7%	217	1.6%
1971-1980	4 161	3.7%	1 191	2.7%	628	4.6%
1961-1970	13 590	12.2%	4 147	9.5%	2 264	16.7%
1951-1960	26 173	23.6%	9 254	21.1%	3 526	26.0%
1941-1950	40 511	36.5%	17 324	39.5%	3 833	28.3%
≤1940	25 448	22.9%	11 643	26.5%	3 091	22.8%
Birthplace						
Sweden	98 283	88.5%	36 478	83.2%	10 013	73.8%
Scandinavia (excl. Sweden)	4 809	4.3%	2 119	4.8%	654	4.8%
Europe (excl. Scandinavia)	4 164	3.8%	2 034	4.6%	964	7.1%
Other	3 740	3.4%	3 232	7.4%	1 928	14.2%
Unknown	1	0.0%	0	0.0%	0	0.0%
National area according to NUTS 2						
SE11 Stockholm	16 267	14.7%	6 317	14.4%	2 030	15.0%
SE12 East Middle Sweden	19 221	17.3%	7 946	18.1%	2 290	16.9%
SE21 Småland and the islands	11 140	10.0%	4 250	9.7%	1 379	10.2%
SE22 South Sweden	14 801	13.3%	5 911	13.5%	1 750	12.9%
SE23 West Sweden	23 199	20.9%	9 105	20.8%	2 632	19.4%
SE31 North Middle Sweden	15 800	14.2%	6 037	13.8%	2 130	15.7%
SE32 Middle Norrland	5 175	4.7%	2 117	4.8%	613	4.5%
SE33 Upper Norrland	5 394	4.9%	2 180	5.0%	735	5.4%
Education (latest available)						
Up to Lower secondary education	27 587	25.0%	13 889	31.9%	4 804	36.1%
Upper secondary to Post-secondary education <2 years	53 962	48.8%	21 450	49.3%	6 768	50.8%
Post-secondary ≥2 years to Tertiary education	28 948	26.2%	8 205	18.8%	1 749	13.1%
Annual Income (SEK; latest available)	193 000	[182 500]	170 600	[109 300]	149 800	[129 800]
Years in lowest 5th percentile of income (2005-2019)	0.5	(1.9)	0.7	(2.2)	1.1	(2.6)
0	95 344	85.9%	36 327	82.8%	10 180	75.1%
1-4 years	11 139	10.0%	5 022	11.4%	2 151	15.9%
≥5 years	4 514	4.1%	2 514	5.7%	1 228	9.1%
Systemic conditions (2005-2020)						
Certain infectious and parasitic diseases (A00-B99)	7 744	7.0%	4 908	11.2%	3 743	27.6%
Neoplasms (C00-D48)	44 217	39.8%	19 090	43.5%	5 671	41.8%
Cancer (C00-C97)	25 907	23.3%	10 667	24.3%	2 782	20.5%
Diseases of the blood and blood-forming organs [...] (D50-D89)	0	0.0%	0	0.0%	1	0.0%
Endocrine, nutritional and metabolic diseases (E00-E90)	23 224	20.9%	32 232	73.5%	12 486	92.1%
Obesity (E66)	2 467	2.2%	4 306	9.8%	2 872	21.2%
Mental and behavioral disorders (F00-F99)	153	0.1%	112	0.3%	119	0.9%
Diseases of the nervous system (G00-G99)	153	0.1%	112	0.3%	119	0.9%
Diseases of the eye and adnexa (H00-H59)	2	0.0%	2	0.0%	4	0.0%
Diseases of the ear and mastoid process (H60-H95)	0	0.0%	0	0.0%	0	0.0%
Diseases of the circulatory system (I00-I99)	53 013	47.8%	30 112	68.7%	10 347	76.3%
Ischemic heart diseases (I20-I25)	12 887	11.6%	8 857	20.2%	4 182	30.8%
Stroke (I60, I61, I63, I64, G45)	6 373	5.7%	3 565	8.1%	1 670	12.3%
Diseases of the respiratory system (J00-J99)	24	0.0%	24	0.1%	7	0.1%
Diseases of the digestive system (K00-K93)	3	0.0%	4	0.0%	0	0.0%
Diseases of the skin and subcutaneous tissue (L00-L99)	10	0.0%	3	0.0%	7	0.1%
Diseases of the musculoskeletal system and connective tissue (M00-M99)	16	0.0%	7	0.0%	2	0.0%
Diseases of the genitourinary system (N00-N99)	5	0.0%	2	0.0%	6	0.0%
Nephritis, nephrotic syndrome and nephrosis (N00-N07, N17-N19, N25-N27)	4	0.0%	2	0.0%	6	0.0%
Behavior						
Smoking	-	-	6 336	14.5%	2 542	18.8%
Physical exercise						
≤2 times/week	-	-	16 977	39.1%	8 364	62.4%
≥3 times/week	-	-	26 396	60.9%	5 050	37.6%
Overweight/obesity						
BMI <25	-	-	3 898	8.9%	547	4.0%
BMI 25-29.9 (Overweight)	-	-	15 924	36.3%	3 289	24.3%
BMI ≥30 (Obesity)	-	-	24 041	54.8%	9 723	71.7%

Table A6. Excluded individuals with T2D and matched controls without diabetes, lacking entry in SKaPa (period: 2010-2020)

	Group			
	No Diabetes		Type 2 Diabetes	
Gender				
Female	356 182	42.6%	190 662	42.4%
Male	479 575	57.4%	259 105	57.6%
Age in 2010 (mean (SD))	65.7	(14.0)	65.4	(14.2)
Year of birth				
1981-1992	18 047	1.3%	9 034	1.3%
1971-1980	55 295	4.0%	27 691	3.9%
1961-1970	151 557	11.0%	76 064	10.8%
1951-1960	269 090	19.6%	135 621	19.3%
1941-1950	409 963	29.8%	208 220	29.7%
≤1940	471 610	34.3%	244 782	34.9%
Birthplace				
Sweden	702 041	84.0%	345 345	76.9%
Scandinavia (excl. Sweden)	43 694	5.2%	24 436	5.4%
Europe (excl. Scandinavia)	51 977	6.2%	36 055	8.0%
Other	37 585	4.5%	42 976	9.6%
Unknown	82	0.0%	39	0.0%
National area according to NUTS 2				
SE11 Stockholm	258 179	18.8%	131 385	18.7%
SE12 East Middle Sweden	242 751	17.6%	123 691	17.6%
SE21 Småland and the islands	127 638	9.3%	65 289	9.3%
SE22 South Sweden	193 129	14.0%	99 007	14.1%
SE23 West Sweden	267 339	19.4%	135 620	19.3%
SE31 North Middle Sweden	151 878	11.0%	77 300	11.0%
SE32 Middle Norrland	61 215	4.5%	31 308	4.5%
SE33 Upper Norrland	73 433	5.3%	37 812	5.4%
Education				
Up to Lower secondary education	271 317	33.8%	176 121	41.0%
Upper secondary to Post-secondary education <2 years	351 243	43.7%	188 488	43.9%
Post-secondary ≥2 years to Tertiary education	180 578	22.5%	64 994	15.1%
Annual Income (SEK; median [IQR])	169 900	[132 600]	149 000	[113 200]
Years in lowest 5th percentile of income (2005-2019)	0.7	(2.1)	0.9	(2.4)
0	700 259	84.1%	358 206	79.9%
1-4 years	88 342	10.6%	57 384	12.8%
≥5 years	44 418	5.3%	32 938	7.3%
Glycemic control (T2D with ≥5 years HbA1c data)				
Good glycemic control	-	-	59 701	-
Poor glycemic control	-	-	23 648	-
Systemic conditions (2005-2020)				
Certain infectious and parasitic diseases (A00-B99)	80 605	9.6%	83 346	18.5%
Neoplasms (C00-D48)	333 452	39.9%	189 060	42.0%
Cancer (C00-C97)	220 372	26.4%	117 584	26.1%
Diseases of the blood and blood-forming organs [...] (D50-D89)	21	0.0%	26	0.0%
Endocrine, nutritional and metabolic diseases (E00-E90)	191 508	22.9%	352 924	78.5%
Obesity (E66)	15 883	1.9%	46 292	10.3%
Mental and behavioral disorders (F00-F99)	1 437	0.2%	1 721	0.4%
Diseases of the nervous system (G00-G99)	14	0.0%	35	0.0%
Diseases of the eye and adnexa (H00-H59)	25	0.0%	27	0.0%
Diseases of the ear and mastoid process (H60-H95)	0	0.0%	0	0.0%
Diseases of the circulatory system (I00-I99)	454 661	54.4%	331 195	73.6%
Ischemic heart diseases (I20-I25)	127 680	15.3%	122 541	27.2%
Stroke (I60, I61, I63, I64, G45)	73 365	8.8%	56 533	12.6%
Diseases of the respiratory system (J00-J99)	327	0.0%	195	0.0%
Diseases of the digestive system (K00-K93)	35	0.0%	17	0.0%
Diseases of the skin and subcutaneous tissue (L00-L99)	237	0.0%	145	0.0%
Diseases of the musculoskeletal system and connective tissue (M00-M99)	151	0.0%	106	0.0%
Diseases of the genitourinary system (N00-N99)	39	0.0%	67	0.0%
Nephritis, nephrotic syndrome and nephrosis (N00-N07, N17-N19, N25-N27)	31	0.0%	54	0.0%

Sensitivity analyses: Periodontitis

Table A7. Summary of sensitivity analyses (outcome: periodontitis)

		T1D versus non-T1D	T2D versus non-T2D
Prevalent periodontitis (risk ratio (95% CI))	≥3 teeth with PPD ≥6 mm	1.13 (1.09, 1.18)	1.26 (1.24, 1.27)
	≥1 tooth with PPD ≥6 mm	1.07 (1.05, 1.09)	1.12 (1.11, 1.12)
Maximum extent of periodontitis (mean difference (95% CI))	Number of teeth with PPD ≥6 mm	0.12 (0.08, 0.15)	0.36 (0.35, 0.38)

Alternative case definition for periodontitis: ≥1 tooth with PPD ≥6 mm

Logistic regression model T1D versus matched controls without diabetes (outcome: periodontitis)

```
Logistic regression                             Number of obs =  85,042
                                                LR chi2(15)   = 4896.42
                                                Prob > chi2   =  0.0000
Log likelihood = -48328.034                     Pseudo R2     =  0.0482

------------------------------------------------------------------------------
                  everParod1 | Odds ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
                      cohort |
                       18-29 |          1  (base)
                       30-39 |   1.499471   .0492636    12.33   0.000     1.405959    1.599202
                       40-49 |   1.976131   .0608892    22.11   0.000     1.860322    2.099149
                       50-59 |   3.016299   .0942308    35.34   0.000      2.83715    3.206759
                       60-69 |   3.902143   .1275685    41.65   0.000     3.659955    4.160357
                         ≥70 |   3.587603   .1476423    31.04   0.000     3.309592    3.888967
                             |
                       Group |
                  No Diabetes |          1  (base)
              Type 1 Diabetes |    1.13237   .0416591     3.38   0.001     1.053593    1.217036
                             |
                 cohort#Group |
  30-39#Type 1 Diabetes      |   1.043754   .0572982     0.78   0.435     .9372825    1.162321
  40-49#Type 1 Diabetes      |   1.038522   .0534301     0.73   0.463     .9389073    1.148704
  50-59#Type 1 Diabetes      |   .9697944    .050968    -0.58   0.559     .8748716    1.075016
  60-69#Type 1 Diabetes      |   .9352488   .0518582    -1.21   0.227     .8389368    1.042618
    ≥70#Type 1 Diabetes      |   .7379291   .0530133    -4.23   0.000     .6410084    .8495043
                             |
                         Kon |
                        Male |          1  (base)
                      Female |   .7544315   .0120626   -17.62   0.000     .7311557    .7784482
                             |
                   Education |
  Up to Lower secondary education |   1.170412    .027066     6.80   0.000     1.118548    1.224681
Upper secondary to Post-secondary education <2 years |          1  (base)
 Post-secondary ≥2 years to Tertiary education |   .8215446   .0148662   -10.86   0.000      .792918    .8512047
                             |
                    No_5p_rank |   1.006189   .0042374     1.47   0.143     .9979181    1.014529
                         _cons |   .2256258   .0055071   -61.00   0.000     .2150862    .2366819
------------------------------------------------------------------------------
Note: _cons estimates baseline odds.
```

Logistic regression model T2D versus matched controls without diabetes (outcome: periodontitis)

```
Logistic regression                             Number of obs =  770,672
                                                LR chi2(15)   = 17420.11
                                                Prob > chi2   =   0.0000
Log likelihood = -507022.14                     Pseudo R2     =   0.0169

------------------------------------------------------------------------------
                  everParod1 | Odds ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
                      cohort |
                       18-29 |          1  (base)
                       30-39 |   1.445942   .0430251    12.39   0.000     1.364026    1.532777
                       40-49 |   1.827252   .0500713    22.00   0.000     1.731703    1.928073
                       50-59 |   2.665167   .0715235    36.53   0.000     2.528607    2.809103
                       60-69 |   3.457682   .0921707    46.54   0.000     3.281669    3.643136
                         ≥70 |   2.941754   .0790108    40.17   0.000     2.790901     3.10076
                             |
                       Group |
                  No Diabetes |          1  (base)
              Type 2 Diabetes |   1.351781   .0621216     6.56   0.000     1.235348    1.479189
                             |
                 cohort#Group |
  30-39#Type 2 Diabetes      |   1.129387   .0589159     2.33   0.020     1.019621     1.25097
  40-49#Type 2 Diabetes      |   1.137365   .0546202     2.68   0.007     1.035195    1.249619
  50-59#Type 2 Diabetes      |   .9899537   .0466182    -0.21   0.830     .9026735    1.085673
  60-69#Type 2 Diabetes      |   .8420575   .0393789    -3.68   0.000     .7683079    .9228864
```

```
                ≥70#Type 2 Diabetes |   .7349303   .0345607    -6.55   0.000     .6702205    .8058878
                                    |
                                Kon |
                               Male |          1  (base)
                             Female |   .7826459   .0037675   -50.91   0.000     .7752963    .7900651
                                    |
                          Education |
        Up to Lower secondary education |   1.046709   .0060137     7.95   0.000     1.034989    1.058563
Upper secondary to Post-secondary education <2 years |          1  (base)
Post-secondary ≥2 years to Tertiary education |   .8490589   .0051623   -26.91   0.000      .839001    .8592373
                                    |
                             No_5p_rank |   1.002782   .0012313     2.26   0.024     1.000372    1.005199
                                  _cons |   .2538528   .0066969   -51.97   0.000     .2410607    .2673238
------------------------------------------------------------------------------------------------------------------------
Note: _cons estimates baseline odds.
```

Number of teeth with PPD ≥6 mm

Regression model T1D versus matched controls without diabetes (outcome: periodontitis extent)

```
      Source |       SS           df       MS      Number of obs   =    85,042
-------------+----------------------------------   F(15, 85026)    =    232.30
       Model |  19049.8111        15  1269.98741   Prob > F        =    0.0000
    Residual |  464843.119    85,026  5.46707029   R-squared       =    0.0394
-------------+----------------------------------   Adj R-squared   =    0.0392
       Total |   483892.93    85,041  5.69011336   Root MSE        =    2.3382

------------------------------------------------------------------------------------------------------------------------
                          perio_numberTeeth | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
----------------------------------------------+-------------------------------------------------------------------------
                                     cohort |
                                      18-29 |          0  (base)
                                      30-39 |   .2931772   .0300766     9.75   0.000     .2342273    .3521271
                                      40-49 |   .5419772   .0292682    18.52   0.000     .4846118    .5993426
                                      50-59 |   .9655693   .0311702    30.98   0.000      .904476    1.026663
                                      60-69 |   1.042657   .0335753    31.05   0.000       .97685    1.108465
                                        ≥70 |    .732808   .0440258    16.64   0.000     .6465179    .8190981
                                            |
                                      Group |
                                   No Diabetes |          0  (base)
                                 Type 1 Diabetes |   .1154013   .0322195     3.58   0.000     .0522514    .1785512
                                            |
                                cohort#Group |
                          30-39#Type 1 Diabetes |   .0304001   .0517101     0.59   0.557    -.0709512    .1317515
                          40-49#Type 1 Diabetes |    .086738   .0500423     1.73   0.083    -.0113446    .1848206
                          50-59#Type 1 Diabetes |  -.0128664   .0533327    -0.24   0.809     -.117398    .0916652
                          60-69#Type 1 Diabetes |  -.0508365   .0578026    -0.88   0.379    -.1641291    .0624562
                            ≥70#Type 1 Diabetes |   -.226206   .0771316    -2.93   0.003    -.3773834   -.0750286
                                            |
                                         Kon |
                                        Male |          0  (base)
                                      Female |  -.2111529   .0162748   -12.97   0.000    -.2430515   -.1792544
                                            |
                                   Education |
                        Up to Lower secondary education |   .2981926   .0253997    11.74   0.000     .2484094    .3479757
Upper secondary to Post-secondary education <2 years |          0  (base)
       Post-secondary ≥2 years to Tertiary education |  -.2339976   .0180107   -12.99   0.000    -.2692984   -.1986969
                                            |
                                    No_5p_rank |   .0184246   .0043752     4.21   0.000     .0098492        .027
                                         _cons |   .5320711   .0220034    24.18   0.000     .4889447    .5751975
------------------------------------------------------------------------------------------------------------------------
```

Regression model T2D versus matched controls without diabetes (outcome: periodontitis extent)

```
      Source |       SS           df       MS      Number of obs   =   770,672
-------------+----------------------------------   F(15, 770656)   =   1004.30
       Model |  114074.761        15  7604.98406   Prob > F        =    0.0000
    Residual |   5835739.3   770,656  7.57243089   R-squared       =    0.0192
-------------+----------------------------------   Adj R-squared   =    0.0192
       Total |  5949814.06   770,671  7.72030355   Root MSE        =    2.7518

------------------------------------------------------------------------------------------------------------------------
                          perio_numberTeeth | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
----------------------------------------------+-------------------------------------------------------------------------
                                     cohort |
                                      18-29 |          0  (base)
                                      30-39 |   .2615618   .0319508     8.19   0.000     .1989393    .3241844
                                      40-49 |   .4963294   .0291544    17.02   0.000     .4391878     .553471
                                      50-59 |   .8244596   .0284651    28.96   0.000     .7686689    .8802504
                                      60-69 |   .9596533   .0282087    34.02   0.000     .9043653    1.014941
                                        ≥70 |   .6401186   .0285268    22.44   0.000     .5842069    .6960302
                                            |
                                      Group |
                                   No Diabetes |          0  (base)
                                 Type 2 Diabetes |   .3255561   .0515371     6.32   0.000     .2245452    .4265671
                                            |
                                cohort#Group |
                          30-39#Type 2 Diabetes |   .3827225   .0600723     6.37   0.000     .2649827    .5004623
                          40-49#Type 2 Diabetes |   .3785032   .0546583     6.92   0.000     .2713748    .4856316
```

```
                        50-59#Type 2 Diabetes  |    .210149   .0533788     3.94   0.000     .1055282    .3147698
                        60-69#Type 2 Diabetes  |   -.0557004   .0528814    -1.05   0.292    -.1593462    .0479454
                          ≥70#Type 2 Diabetes  |   -.2575913   .0532505    -4.84   0.000    -.3619604   -.1532221
                                               |
                                           Kon |
                                          Male |          0  (base)
                                        Female |   -.3675553   .0063701   -57.70   0.000    -.3800404   -.3550701
                                               |
                                     Education |
                           Up to Lower secondary education  |    .1187198   .0077342    15.35   0.000     .1035612    .1338785
Upper secondary to Post-secondary education <2 years  |          0  (base)
       Post-secondary ≥2 years to Tertiary education  |   -.2338523   .0079466   -29.43   0.000    -.2494274   -.2182772
                                               |
                                    No_5p_rank |    .015198   .0016358     9.29   0.000     .0119919    .0184041
                                         _cons |    .7215133   .0277463    26.00   0.000     .6671315    .7758951
------------------------------------------------------------------------------------------------------------------------
```

Sensitivity analyses: Complications

Table A8. Summary of sensitivity analyses (outcome: diabetes-related complications)

	Case definition for periodontitis		Number of teeth with PPD ≥6 mm (continuous)	Number of teeth at start of observation period (continuous)
	≥3 teeth with PPD ≥6 mm (categorical, as presented in main text)	**≥1 tooth with PPD ≥6 mm** (categorical)		
Complications in T1D Periodontitis versus no periodontitis; hazard ratio (95% CI)				
Retinopathy	1.08 (1.02, 1.14)	1.08 (1.04, 1.13)	1.01 (1.01, 1.02)	1.00 (1.00, 1.00)
Albuminuria	1.14 (1.06, 1.23)	1.10 (1.04, 1.17)	1.02 (1.01, 1.03)	0.99 (0.98, 0.99)
Ischemic heart disease	0.96 (0.86, 1.08)	0.95 (0.87, 1.04)	0.99 (0.98, 1.01)	0.98 (0.97, 0.99)
Stroke	1.05 (0.89, 1.25)	1.04 (0.91, 1.19)	1.02 (0.99, 1.04)	0.98 (0.97, 0.99)
Mortality	0.91 (0.81, 1.02)	0.77 (0.70, 0.85)	0.98 (0.97, 1.00)	0.97 (0.96, 0.97)
Complications in T2D Periodontitis versus no periodontitis; hazard ratio (95% CI)				
Retinopathy	1.08 (1.06, 1.10)	1.08 (1.06, 1.09)	1.01 (1.01, 1.01)	1.00 (1.00, 1.00)
Albuminuria	1.09 (1.07, 1.11)	1.06 (1.05, 1.08)	1.01 (1.01, 1.02)	0.99 (0.99, 0.99)
Ischemic heart disease	0.96 (0.94, 0.99)	0.93 (0.91, 0.95)	1.00 (0.99, 1.00)	0.98 (0.98, 0.98)
Stroke	0.99 (0.95, 1.03)	0.95 (0.91, 0.98)	1.00 (1.00, 1.01)	0.98 (0.98, 0.99)
Mortality	0.81 (0.79, 0.83)	0.77 (0.75, 0.79)	0.97 (0.97, 0.97)	0.97 (0.97, 0.97)

Alternative case definition for periodontitis: ≥1 tooth with PPD ≥6 mm

Cox regression model T1D with and without periodontitis (outcome: retinopathy)

```
Cox regression with Breslow method for ties

No. of subjects = 17,788                              Number of obs = 17,788
No. of failures = 12,239
Time at risk    = 88,930
                                                      LR chi2(10)   =  97.35
Log likelihood = -113558.59                           Prob > chi2   = 0.0000

------------------------------------------------------------------------------------------------------------------------
                                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
---------------------------------------------+--------------------------------------------------------------------------
                               1.everParod1 |    1.08084   .0222172     3.78   0.000     1.038161    1.125274
                                            |
                                     cohort |
                                      30-39 |   1.117403   .0295336     4.20   0.000     1.060992    1.176813
                                      40-49 |   1.133445   .0298741     4.75   0.000      1.07638    1.193536
                                      50-59 |   1.139527   .0335238     4.44   0.000      1.07568    1.207164
                                      60-69 |     1.1706   .0388417     4.75   0.000     1.096895    1.249259
                                        ≥70 |   1.188631   .0564402     3.64   0.000     1.083002    1.304563
                                            |
                                        Kon |
                                     Female |   .9912268   .0182015    -0.48   0.631     .9561868    1.027551
                                            |
                                  Education |
                        Up to Lower secondary education  |   .9815376   .0286141    -0.64   0.523     .9270271    1.039253
Post-secondary ≥2 years to Tertiary education  |   .9404062   .0189643    -3.05   0.002     .9039617    .9783199
                                            |
                                  No_5p_rank |   1.012804   .0047089     2.74   0.006     1.003617    1.022076
------------------------------------------------------------------------------------------------------------------------
```

Cox regression model T1D with and without periodontitis (outcome: albuminuria)

```
Cox regression with Breslow method for ties

No. of subjects =  24,817                           Number of obs =  24,817
No. of failures =   5,083
Time at risk    = 204,357
                                                    LR chi2(10)   = 1170.28
Log likelihood = -50054.026                         Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------------
                                         _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------------------+---------------------------------------------------------------
                               1.everParod1 |   1.099848   .0331982     3.15   0.002     1.036668    1.166878
                                            |
                                     cohort |
                                      30-39 |   1.200659   .0597628     3.67   0.000     1.089058    1.323696
                                      40-49 |   1.528273   .0697781     9.29   0.000     1.397451    1.671341
                                      50-59 |   1.908756   .0887975    13.90   0.000     1.742415    2.090977
                                      60-69 |   2.595247   .1232806    20.08   0.000     2.364528    2.848478
                                        ≥70 |    3.62339   .2081824    22.41   0.000     3.237496    4.055282
                                            |
                                        Kon |
                                     Female |   .9513001   .0271543    -1.75   0.080     .8995401    1.006038
                                            |
                                  Education |
                  Up to Lower secondary education |   1.195327   .0459783     4.64   0.000     1.108524    1.288926
Post-secondary ≥2 years to Tertiary education |   .7496298   .0257259    -8.40   0.000     .7008663    .8017861
                                            |
                                No_5p_rank |   1.045097   .0065456     7.04   0.000     1.032346    1.058005
------------------------------------------------------------------------------------------------------------
```

Cox regression model T1D with and without periodontitis (outcome: ischemic heart disease)

```
Cox regression with Breslow method for ties

No. of subjects =  27,290                           Number of obs =  27,290
No. of failures =   1,982
Time at risk    = 243,289
                                                    LR chi2(10)   = 2573.82
Log likelihood = -18755.837                         Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------------
                                         _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------------------+---------------------------------------------------------------
                               1.everParod1 |   .9508762   .0442041    -1.08   0.279     .8680676    1.041584
                                            |
                                     cohort |
                                      30-39 |   5.800826   1.393203     7.32   0.000      3.62288    9.288075
                                      40-49 |      20.84   4.591744    13.78   0.000     13.53162    32.09561
                                      50-59 |   46.31931   10.08966    17.61   0.000      30.2236    70.98685
                                      60-69 |   69.34966   15.11117    19.45   0.000     45.24484    106.2967
                                        ≥70 |   114.8771   25.37307    21.48   0.000     74.51219    177.1086
                                            |
                                        Kon |
                                     Female |   .8264167   .0380096    -4.15   0.000     .7551784    .9043751
                                            |
                                  Education |
                  Up to Lower secondary education |    1.18656   .0654212     3.10   0.002     1.065022    1.321968
Post-secondary ≥2 years to Tertiary education |   .7920238   .0468965    -3.94   0.000     .7052413    .8894852
                                            |
                                No_5p_rank |    1.02836   .0109159     2.63   0.008     1.007187    1.049979
------------------------------------------------------------------------------------------------------------
```

Cox regression model T1D with and without periodontitis (outcome: stroke)

```
Cox regression with Breslow method for ties

No. of subjects =  27,938                           Number of obs = 27,938
No. of failures =     873
Time at risk    = 253,965
                                                    LR chi2(10)   = 968.80
Log likelihood = -8365.8013                         Prob > chi2   = 0.0000

------------------------------------------------------------------------------------------------------------
                                         _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------------------+---------------------------------------------------------------
                               1.everParod1 |   1.039454   .0726304     0.55   0.580     .9064182    1.192015
                                            |
                                     cohort |
                                      30-39 |   4.369814   1.110932     5.80   0.000     2.654991    7.192216
                                      40-49 |   9.547933   2.226244     9.68   0.000     6.045594    15.07925
                                      50-59 |   15.50635    3.57449    11.89   0.000      9.86944    24.36277
                                      60-69 |   24.93709   5.724279    14.01   0.000     15.90207    39.10552
                                        ≥70 |   57.74206   13.39809    17.48   0.000      36.6425    90.99121
                                            |
                                        Kon |
                                     Female |   .7736698   .0540637    -3.67   0.000     .6746431     .887232
                                            |
                                  Education |
                  Up to Lower secondary education |   1.070732   .0894788     0.82   0.413     .9089665    1.261287
Post-secondary ≥2 years to Tertiary education |   .7191097   .0654345    -3.62   0.000     .6016461    .8595065
                                            |
                                No_5p_rank |   1.060272   .0144739     4.29   0.000     1.032279    1.089023
```

Cox regression model T1D with and without periodontitis (outcome: death)

```
Cox regression with Breslow method for ties

No. of subjects =  28,041                           Number of obs =  28,041
No. of failures =   1,942
Time at risk    = 257,631
                                                    LR chi2(10)   = 3478.28
Log likelihood = -17952.2                           Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------------
                                         _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------------------+---------------------------------------------------------------
                           1.everParodl1 |   .7744165   .0372397    -5.32   0.000      .704762    .8509552
                                         |
                                cohort |
                                30-39  |   1.624549    .281958     2.80   0.005     1.156106    2.282801
                                40-49  |   3.653772   .5284121     8.96   0.000     2.751946    4.851132
                                50-59  |   7.916757   1.082656    15.13   0.000     6.055378    10.35031
                                60-69  |   18.63869   2.466815    22.10   0.000     14.38003    24.15857
                                  ≥70  |   59.69864   7.872017    31.01   0.000     46.10232    77.30473
                                       |
                                   Kon |
                                Female  |   .7937009   .0370559    -4.95   0.000     .7242965    .8697558
                                       |
                             Education |
                Up to Lower secondary education  |   1.289715   .0670992     4.89   0.000     1.164686    1.428166
Post-secondary ≥2 years to Tertiary education  |   .5791211   .0396644    -7.98   0.000     .5063723    .6623214
                                       |
                           No_5p_rank |   1.023645   .0105113     2.28   0.023     1.003249    1.044455
------------------------------------------------------------------------------------------------------------
```

Cox regression model T2D with and without periodontitis (outcome: retinopathy)

```
Cox regression with Breslow method for ties

No. of subjects =   187,388                         Number of obs = 187,388
No. of failures =    63,032
Time at risk    = 1,100,711
                                                    LR chi2(10)   =  454.63
Log likelihood = -739350.52                         Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------------
                                         _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------------------+---------------------------------------------------------------
                           1.everParodl1 |   1.077622   .0086716     9.29   0.000     1.060759    1.094752
                                         |
                                cohort |
                                30-39  |   1.118431   .0505392     2.48   0.013     1.023636    1.222005
                                40-49  |   1.119879   .0466907     2.72   0.007     1.032006    1.215234
                                50-59  |   1.102734   .0451976     2.39   0.017     1.017613    1.194975
                                60-69  |   1.130943   .0460797     3.02   0.003     1.044141    1.224962
                                  ≥70  |   1.123552   .0460985     2.84   0.005     1.036738    1.217636
                                       |
                                   Kon |
                                Female  |    .881117   .0071929   -15.50   0.000     .8671313    .8953283
                                       |
                             Education |
                Up to Lower secondary education  |   1.071312   .0097544     7.57   0.000     1.052363    1.090602
Post-secondary ≥2 years to Tertiary education  |    .987202   .0111481    -1.14   0.254     .9655921    1.009296
                                       |
                           No_5p_rank |   1.005197   .0017968     2.90   0.004     1.001681    1.008725
------------------------------------------------------------------------------------------------------------
```

Cox regression model T2D with and without periodontitis (outcome: albuminuria)

```
Cox regression with Breslow method for ties

No. of subjects =   190,677                         Number of obs = 190,677
No. of failures =    62,289
Time at risk    = 1,133,619
                                                    LR chi2(10)   = 2866.23
Log likelihood = -730149.66                         Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------------
                                         _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------------------+---------------------------------------------------------------
                           1.everParodl1 |   1.063475    .008608     7.60   0.000     1.046737    1.080481
                                         |
                                cohort |
                                30-39  |   .9473513   .0447314    -1.15   0.252     .8636138    1.039208
                                40-49  |    .956334   .0411102    -1.04   0.299     .8790606      1.0404
                                50-59  |   1.015592   .0427257     0.37   0.713     .9352101    1.102882
                                60-69  |   1.176229   .0490838     3.89   0.000     1.083855    1.276475
                                  ≥70  |   1.502256    .062882     9.72   0.000     1.383929    1.630699
                                       |
                                   Kon |
                                Female  |   .7728591   .0063967   -31.13   0.000     .7604229    .7854986
                                       |
```

```
                                  Education |
              Up to Lower secondary education |    1.05802   .0095958     6.22   0.000     1.039379    1.076995
Post-secondary ≥2 years to Tertiary education |   .9247508   .0107353    -6.74   0.000     .9039475    .9460327
                                            |
                                No_5p_rank |   1.012124   .0017725     6.88   0.000     1.008655    1.015604
------------------------------------------------------------------------------------------------------------------
```

Cox regression model T2D with and without periodontitis (outcome: ischemic heart disease)

```
Cox regression with Breslow method for ties

No. of subjects =   214,426                         Number of obs =  214,426
No. of failures =    29,867
Time at risk    = 1,430,544
                                                    LR chi2(10)   = 11346.77
Log likelihood = -351074.26                         Prob > chi2   =   0.0000

------------------------------------------------------------------------------------------------------------------
                                         _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------------------+---------------------------------------------------------------------
                               1.everParod1 |    .933064   .0109432    -5.91   0.000     .9118604    .9547607
                                            |
                                     cohort |
                                      30-39 |   2.819661   .6654262     4.39   0.000     1.775487     4.47792
                                      40-49 |   6.579414   1.482194     8.36   0.000      4.23088     10.2316
                                      50-59 |   12.21048   2.736781    11.16   0.000     7.869551    18.94593
                                      60-69 |   19.12648   4.282106    13.18   0.000     12.33289    29.66232
                                        ≥70 |   34.99851   7.834611    15.88   0.000     22.56854    54.27449
                                            |
                                        Kon |
                                     Female |   .5652654   .0069854   -46.16   0.000     .5517388    .5791236
                                            |
                                  Education |
              Up to Lower secondary education |   1.110296   .0141886     8.19   0.000     1.082832    1.138456
Post-secondary ≥2 years to Tertiary education |    .896951   .0158898    -6.14   0.000     .8663421    .9286413
                                            |
                                No_5p_rank |   1.023575   .0025446     9.37   0.000       1.0186    1.028575
------------------------------------------------------------------------------------------------------------------
```

Cox regression model T2D with and without periodontitis (outcome: stroke)

```
Cox regression with Breslow method for ties

No. of subjects =   228,866                         Number of obs = 228,866
No. of failures =    13,561
Time at risk    = 1,597,660
                                                    LR chi2(10)   = 5853.82
Log likelihood = -159635.7                          Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------------------
                                         _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------------------+---------------------------------------------------------------------
                               1.everParod1 |   .9466764   .0165093    -3.14   0.002     .9148654    .9795935
                                            |
                                     cohort |
                                      30-39 |   1.614247    .488706     1.58   0.114     .8918109    2.921914
                                      40-49 |    3.41469   .9597446     4.37   0.000     1.968383    5.923698
                                      50-59 |   5.524441    1.53915     6.13   0.000     3.199907    9.537605
                                      60-69 |   10.33701   2.872412     8.41   0.000     5.996065    17.82066
                                        ≥70 |   22.64222   6.288785    11.23   0.000     13.13715    39.02445
                                            |
                                        Kon |
                                     Female |   .7823883   .0138862   -13.83   0.000     .7556397    .8100837
                                            |
                                  Education |
              Up to Lower secondary education |   1.069446   .0202128     3.55   0.000     1.030555    1.109806
Post-secondary ≥2 years to Tertiary education |   .9180313   .0242636    -3.24   0.001     .8716863    .9668404
                                            |
                                No_5p_rank |   1.014328   .0037698     3.83   0.000     1.006966    1.021743
------------------------------------------------------------------------------------------------------------------
```

Cox regression model T2D with and without periodontitis (outcome: death)

```
Cox regression with Breslow method for ties

No. of subjects =   233,478                         Number of obs =  233,478
No. of failures =    34,743
Time at risk    = 1,661,307
                                                    LR chi2(10)   = 29255.86
Log likelihood = -400399.56                         Prob > chi2   =   0.0000

------------------------------------------------------------------------------------------------------------------
                                         _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------------------+---------------------------------------------------------------------
                               1.everParod1 |   .7711431   .0085884   -23.33   0.000     .7544926    .7881611
                                            |
                                     cohort |
                                      30-39 |   1.251517   .2540876     1.11   0.269     .8406647    1.863163
                                      40-49 |   1.733877   .3242397     2.94   0.003     1.201825     2.50147
```

```
                                    50-59  |   3.529571   .6484719     6.86   0.000     2.462264    5.059519
                                    60-69  |   7.158449   1.309903    10.76   0.000     5.001037    10.24655
                                      ≥70  |   26.50508   4.844722    17.93   0.000     18.52433    37.92414
                                           |
                                       Kon |
                                    Female  |   .8044119   .0088723   -19.73   0.000     .7872091    .8219907
                                           |
                                 Education |
                  Up to Lower secondary education  |   1.216247   .0141676    16.81   0.000     1.188793    1.244334
Post-secondary ≥2 years to Tertiary education  |   .8250379   .0148608   -10.68   0.000     .7964195    .8546846
                                           |
                                No_5p_rank |   .9938541   .0024718    -2.48   0.013     .9890212    .9987106
-------------------------------------------------------------------------------------------------------------------
```

Number of teeth with PPD ≥6 mm

Cox regression model T1D with and without periodontitis (outcome: retinopathy)

```
Cox regression with Breslow method for ties

No. of subjects = 17,788                                 Number of obs = 17,788
No. of failures = 12,239
Time at risk    = 88,930
                                                         LR chi2(10)   =  96.23
Log likelihood = -113559.15                              Prob > chi2   = 0.0000

-------------------------------------------------------------------------------------------------------------------
                                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
---------------------------------------------+---------------------------------------------------------------------
                            perio_numberTeeth |   1.013054   .0035551     3.70   0.000      1.00611    1.020046
                                           |
                                     cohort |
                                    30-39  |   1.117955   .0295451     4.22   0.000     1.061522    1.177388
                                    40-49  |   1.134646   .0298877     4.80   0.000     1.077553    1.194763
                                    50-59  |    1.14478   .0335197     4.62   0.000     1.080932    1.212399
                                    60-69  |   1.179904   .0387936     5.03   0.000     1.106268    1.258441
                                      ≥70  |   1.198902   .0567402     3.83   0.000     1.092695    1.315432
                                           |
                                       Kon |
                                    Female  |   .9903381   .0181772    -0.53   0.597     .9553446    1.026613
                                           |
                                 Education |
                  Up to Lower secondary education  |   .9802985   .0285926    -0.68   0.495     .9258298    1.037972
Post-secondary ≥2 years to Tertiary education  |   .9411897   .0189899    -3.00   0.003     .9046965    .9791549
                                           |
                                No_5p_rank |   1.012635   .0047094     2.70   0.007     1.003446    1.021907
-------------------------------------------------------------------------------------------------------------------
```

Cox regression model T1D with and without periodontitis (outcome: albuminuria)

```
Cox regression with Breslow method for ties

No. of subjects =  24,817                                Number of obs =  24,817
No. of failures =   5,083
Time at risk    = 204,357
                                                         LR chi2(10)   = 1179.02
Log likelihood = -50049.654                              Prob > chi2   =  0.0000

-------------------------------------------------------------------------------------------------------------------
                                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
---------------------------------------------+---------------------------------------------------------------------
                            perio_numberTeeth |   1.022029   .0049772     4.47   0.000     1.012321    1.031831
                                           |
                                     cohort |
                                    30-39  |   1.200549   .0597363     3.67   0.000     1.088996    1.323529
                                    40-49  |    1.52581   .0695885     9.26   0.000     1.395337    1.668482
                                    50-59  |   1.905609   .0883109    13.91   0.000      1.74015    2.086799
                                    60-69  |   2.606415   .1224479    20.39   0.000     2.377139    2.857805
                                      ≥70  |   3.650006   .2086192    22.65   0.000      3.26319    4.082674
                                           |
                                       Kon |
                                    Female  |   .9523241   .0271806    -1.71   0.087     .9005138    1.007115
                                           |
                                 Education |
                  Up to Lower secondary education  |   1.191329   .0458366     4.55   0.000     1.104794    1.284641
Post-secondary ≥2 years to Tertiary education  |   .7519518   .0258213    -8.30   0.000     .7030085    .8043025
                                           |
                                No_5p_rank |   1.044719   .0065488     6.98   0.000     1.031962    1.057634
-------------------------------------------------------------------------------------------------------------------
```

Cox regression model T1D with and without periodontitis (outcome: ischemic heart disease)

```
Cox regression with Breslow method for ties

No. of subjects =  27,290                                Number of obs =  27,290
No. of failures =   1,982
Time at risk    = 243,289
                                                         LR chi2(10)   = 2573.28
```

```
Log likelihood = -18756.105                           Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------------
                                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
---------------------------------------------+--------------------------------------------------------------
                            perio_numberTeeth |   .9935326   .0081208    -0.79   0.427     .9777429    1.009577
                                              |
                                      cohort |
                                      30-39  |   5.790759   1.390718     7.31   0.000     3.616675    9.271745
                                      40-49  |   20.78236   4.578399    13.77   0.000     13.49501     32.0049
                                      50-59  |   46.10706   10.03943    17.59   0.000     30.09023    70.64957
                                      60-69  |   68.86806   14.99245    19.44   0.000     44.94825    105.5171
                                        ≥70  |   114.1397    25.1928    21.46   0.000     74.05598    175.9191
                                              |
                                         Kon |
                                      Female  |   .8262206   .0380355    -4.15   0.000     .7549367    .9042355
                                              |
                                   Education |
                Up to Lower secondary education  |    1.18659   .0654257     3.10   0.002     1.065044    1.322007
Post-secondary ≥2 years to Tertiary education  |   .7921507    .046918    -3.93   0.000     .7053299    .8896585
                                              |
                                 No_5p_rank |   1.028457   .0109153     2.64   0.008     1.007284    1.050075
------------------------------------------------------------------------------------------------------------
```

Cox regression model T1D with and without periodontitis (outcome: stroke)

```
Cox regression with Breslow method for ties

No. of subjects =  27,938                             Number of obs = 27,938
No. of failures =     873
Time at risk    = 253,965
                                                      LR chi2(10)   = 970.36
Log likelihood = -8365.0197                           Prob > chi2   = 0.0000

------------------------------------------------------------------------------------------------------------
                                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
---------------------------------------------+--------------------------------------------------------------
                            perio_numberTeeth |   1.016182    .011643     1.40   0.161     .9936166     1.03926
                                              |
                                      cohort |
                                      30-39  |   4.359409   1.108178     5.79   0.000     2.648799    7.174742
                                      40-49  |   9.494074   2.213135     9.66   0.000     6.012175    14.99248
                                      50-59  |   15.38392   3.543405    11.87   0.000      9.79509    24.16161
                                      60-69  |   24.76856   5.673947    14.01   0.000     15.80916    38.80546
                                        ≥70  |   57.61747   13.34707    17.50   0.000     36.59094    90.72663
                                              |
                                         Kon |
                                      Female  |   .7767747   .0543381    -3.61   0.000     .6772524    .8909218
                                              |
                                   Education |
                Up to Lower secondary education  |   1.069294   .0893387     0.80   0.423     .9077785    1.259547
Post-secondary ≥2 years to Tertiary education  |   .7216985   .0657007    -3.58   0.000     .6037618    .8626726
                                              |
                                 No_5p_rank |   1.060114   .0144753     4.28   0.000     1.032119    1.088868
------------------------------------------------------------------------------------------------------------
```

Cox regression model T1D with and without periodontitis (outcome: death)

```
Cox regression with Breslow method for ties

No. of subjects =  28,041                             Number of obs =  28,041
No. of failures =   1,942
Time at risk    = 257,631
                                                      LR chi2(10)   = 3452.82
Log likelihood = -17964.927                           Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------------
                                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
---------------------------------------------+--------------------------------------------------------------
                            perio_numberTeeth |   .9836942   .0088997    -1.82   0.069     .9664049    1.001293
                                              |
                                      cohort |
                                      30-39  |   1.602791   .2781665     2.72   0.007     1.140643    2.252185
                                      40-49  |   3.567883   .5159224     8.80   0.000     2.687357    4.736919
                                      50-59  |   7.620365   1.041572    14.86   0.000     5.829498    9.961399
                                      60-69  |   17.70468   2.338839    21.75   0.000     13.66602    22.93688
                                        ≥70  |   57.21464   7.531548    30.74   0.000     44.20362    74.05537
                                              |
                                         Kon |
                                      Female  |   .7941407    .037119    -4.93   0.000     .7246218    .8703291
                                              |
                                   Education |
                Up to Lower secondary education  |   1.290631   .0670965     4.91   0.000     1.165602    1.429071
Post-secondary ≥2 years to Tertiary education  |   .5812027   .0398194    -7.92   0.000     .5081712    .6647299
                                              |
                                 No_5p_rank |   1.024305   .0105135     2.34   0.019     1.003905     1.04512
------------------------------------------------------------------------------------------------------------
```

Cox regression model T2D with and without periodontitis (outcome: retinopathy)

```
Cox regression with Breslow method for ties
```

```
No. of subjects =   187,388                         Number of obs = 187,388
No. of failures =    63,032
Time at risk    = 1,100,711
                                                    LR chi2(10)   =  445.34
Log likelihood = -739355.17                         Prob > chi2   =  0.0000

------------------------------------------------------------------------------
                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
perio_numberTeeth |   1.010753   .0012132     8.91   0.000     1.008378    1.013133
                  |
           cohort |
           30-39  |   1.118563   .0505462     2.48   0.013     1.023755    1.222151
           40-49  |   1.121759   .0467656     2.76   0.006     1.033745    1.217267
           50-59  |   1.108062   .0453983     2.50   0.012     1.022562    1.200711
           60-69  |   1.140419   .0464305     3.23   0.001     1.052953     1.23515
             ≥70  |   1.133936   .0464989     3.07   0.002     1.046366    1.228835
                  |
              Kon |
           Female |   .8818343   .0072081   -15.38   0.000     .8678192    .8960758
                  |
        Education |
Up to Lower secondary education |   1.070588   .0097495     7.49   0.000     1.051649    1.089868
Post-secondary ≥2 years to Tertiary education |   .9870097   .0111459    -1.16   0.247     .9654042    1.009099
                  |
      No_5p_rank |   1.005033   .0017969     2.81   0.005     1.001517    1.008561
------------------------------------------------------------------------------
```

Cox regression model T2D with and without periodontitis (outcome: albuminuria)

```
Cox regression with Breslow method for ties

No. of subjects =   190,677                         Number of obs = 190,677
No. of failures =    62,289
Time at risk    = 1,133,619
                                                    LR chi2(10)   = 2929.32
Log likelihood = -730118.12                         Prob > chi2   =  0.0000

------------------------------------------------------------------------------
                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
perio_numberTeeth |   1.013774   .0012358    11.22   0.000     1.011355    1.016199
                  |
           cohort |
           30-39  |   .9438327   .0445672    -1.22   0.221     .8604028    1.035352
           40-49  |   .9537114   .0409939    -1.10   0.270     .8766562    1.037539
           50-59  |    1.01491   .0426801     0.35   0.725     .9346134    1.102106
           60-69  |   1.179912   .0491987     3.97   0.000     1.087319    1.280389
             ≥70  |   1.511186   .0632176     9.87   0.000     1.392225    1.640311
                  |
              Kon |
           Female |    .775244   .0064238   -30.72   0.000     .7627553    .7879372
                  |
        Education |
Up to Lower secondary education |   1.056859    .009585     6.10   0.000     1.038239    1.075814
Post-secondary ≥2 years to Tertiary education |   .9251649   .0107399    -6.70   0.000     .9043527    .9464561
                  |
      No_5p_rank |   1.011912   .0017727     6.76   0.000     1.008444    1.015393
------------------------------------------------------------------------------
```

Cox regression model T2D with and without periodontitis (outcome: ischemic heart disease)

```
Cox regression with Breslow method for ties

No. of subjects =   214,426                         Number of obs =  214,426
No. of failures =    29,867
Time at risk    = 1,430,544
                                                    LR chi2(10)   = 11313.80
Log likelihood = -351090.75                         Prob > chi2   =   0.0000

------------------------------------------------------------------------------
                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
perio_numberTeeth |   .9972616   .0019334    -1.41   0.157     .9934793    1.001058
                  |
           cohort |
           30-39  |   2.804704   .6618986     4.37   0.000     1.766066    4.454174
           40-49  |   6.523594   1.469616     8.32   0.000     4.194987    10.14479
           50-59  |   12.06568   2.704273    11.11   0.000     7.776293    18.72109
           60-69  |   18.85524   4.221187    13.12   0.000     12.15823    29.24108
             ≥70  |   34.58766   7.742333    15.83   0.000     22.30399    53.63643
                  |
              Kon |
           Female |   .5671999   .0070172   -45.83   0.000     .5536119    .5811214
                  |
        Education |
Up to Lower secondary education |    1.11077   .0141924     8.22   0.000     1.083299    1.138938
Post-secondary ≥2 years to Tertiary education |   .8976175   .0159019    -6.10   0.000     .8669852    .9293322
                  |
      No_5p_rank |   1.023651   .0025445     9.40   0.000     1.018676     1.02865
```

Cox regression model T2D with and without periodontitis (outcome: stroke)

```
Cox regression with Breslow method for ties

No. of subjects =   228,866                         Number of obs = 228,866
No. of failures =    13,561
Time at risk    = 1,597,660
                                                    LR chi2(10)   = 5845.19
Log likelihood = -159640.01                         Prob > chi2   =  0.0000

------------------------------------------------------------------------------
                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
          perio_numberTeeth |     1.0033   .0029277     1.13   0.259     .9975784    1.009055
                            |
                     cohort |
                      30-39 |   1.601217   .4847648     1.55   0.120     .8846081    2.898342
                      40-49 |   3.374163   .9483577     4.33   0.000     1.945017    5.853406
                      50-59 |   5.441543   1.516019     6.08   0.000      3.15193    9.394369
                      60-69 |   10.17227   2.826458     8.35   0.000     5.900699    17.53606
                        ≥70 |   22.38004   6.215626    11.19   0.000     12.98542    38.57142
                            |
                        Kon |
                     Female |   .7868412   .0139859   -13.49   0.000     .7599013    .8147361
                            |
                  Education |
  Up to Lower secondary education |    1.06998   .0202184     3.58   0.000     1.031077     1.11035
Post-secondary ≥2 years to Tertiary education |    .919094   .0242919    -3.19   0.001     .8726948    .9679601
                            |
                No_5p_rank |   1.014322   .0037696     3.83   0.000     1.006961    1.021738
------------------------------------------------------------------------------
```

Cox regression model T2D with and without periodontitis (outcome: death)

```
Cox regression with Breslow method for ties

No. of subjects =   233,478                         Number of obs =  233,478
No. of failures =    34,743
Time at risk    = 1,661,307
                                                    LR chi2(10)   = 28917.92
Log likelihood = -400568.53                         Prob > chi2   =   0.0000

------------------------------------------------------------------------------
                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
          perio_numberTeeth |    .969708   .0021067   -14.16   0.000     .9655878    .9738458
                            |
                     cohort |
                      30-39 |   1.243774   .2525168     1.07   0.283     .8354619    1.851639
                      40-49 |   1.710792    .319924     2.87   0.004     1.185822    2.468168
                      50-59 |   3.448823    .633629     6.74   0.000     2.405943    4.943749
                      60-69 |   6.929528   1.267967    10.58   0.000     4.841173    9.918744
                        ≥70 |   25.68848   4.695292    17.76   0.000     17.95384    36.75525
                            |
                        Kon |
                     Female |   .8076779   .0089182   -19.34   0.000     .7903863    .8253478
                            |
                  Education |
  Up to Lower secondary education |   1.219443   .0142017    17.04   0.000     1.191923    1.247598
Post-secondary ≥2 years to Tertiary education |   .8255735   .0148705   -10.64   0.000     .7969362    .8552398
                            |
                No_5p_rank |   .9942871   .0024717    -2.30   0.021     .9894546    .9991433
------------------------------------------------------------------------------
```

Number of teeth

Cox regression model T1D with and without periodontitis (outcome: retinopathy)

```
Cox regression with Breslow method for ties

No. of subjects = 18,035                            Number of obs = 18,035
No. of failures = 12,414
Time at risk    = 90,129
                                                    LR chi2(10)   =  85.33
Log likelihood = -115359.55                         Prob > chi2   = 0.0000

------------------------------------------------------------------------------
                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
                maximum_AT |   1.000448   .0016928     0.26   0.791     .9971355    1.003771
                            |
                     cohort |
                      30-39 |   1.123103   .0294676     4.42   0.000     1.066807    1.182369
                      40-49 |   1.142784   .0298067     5.12   0.000     1.085832    1.202723
                      50-59 |   1.156058   .0336376     4.98   0.000     1.091974    1.223902
                      60-69 |   1.203416   .0396272     5.62   0.000     1.128202    1.283645
                        ≥70 |   1.212586   .0583872     4.00   0.000     1.103383    1.332596
```

```
                                    |
                                Kon |
                             Female |   .9874234   .0179921    -0.69   0.487     .9527818    1.023324
                                    |
                          Education |
          Up to Lower secondary education |   .9815353   .0285025    -0.64   0.521     .9272315    1.039019
Post-secondary ≥2 years to Tertiary education |   .9349322   .0187431    -3.36   0.001     .8989088    .9723992
                                    |
                        No_5p_rank |   1.012638    .004662     2.73   0.006     1.003542    1.021817
------------------------------------------------------------------------------------------------------------
```

Cox regression model T1D with and without periodontitis (outcome: albuminuria)

```
Cox regression with Breslow method for ties

No. of subjects =  25,190                         Number of obs =  25,190
No. of failures =   5,168
Time at risk    = 207,422
                                                  LR chi2(10)   = 1206.81
Log likelihood = -50959.636                       Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------------
                                        _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------------------------------------+----------------------------------------------------------------
                               maximum_AT |   .9860528   .0021266    -6.51   0.000     .9818935    .9902297
                                          |
                                   cohort |
                                   30-39  |   1.204934   .0594879     3.78   0.000     1.093803    1.327356
                                   40-49  |   1.522843   .0688805     9.30   0.000     1.393651    1.664011
                                   50-59  |   1.889293     .08682    13.84   0.000     1.726567    2.067356
                                   60-69  |   2.509461   .1186498    19.46   0.000     2.287362    2.753126
                                     ≥70  |   3.354264   .1975277    20.55   0.000     2.988624    3.764638
                                          |
                                      Kon |
                                   Female |    .934621   .0264624    -2.39   0.017     .8841685    .9879524
                                          |
                                Education |
                    Up to Lower secondary education |    1.17494   .0449728     4.21   0.000      1.09002    1.266476
Post-secondary ≥2 years to Tertiary education |    .753338   .0256921    -8.31   0.000     .7046285    .8054146
                                          |
                               No_5p_rank |   1.042107   .0064912     6.62   0.000     1.029462    1.054907
------------------------------------------------------------------------------------------------------------
```

Cox regression model T1D with and without periodontitis (outcome: ischemic heart disease)

```
Cox regression with Breslow method for ties

No. of subjects =  27,697                         Number of obs =  27,697
No. of failures =   2,024
Time at risk    = 246,890
                                                  LR chi2(10)   = 2647.02
Log likelihood = -19173.856                       Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------------
                                        _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------------------------------------+----------------------------------------------------------------
                               maximum_AT |   .9808004    .002974    -6.39   0.000     .9749888    .9866467
                                          |
                                   cohort |
                                   30-39  |   5.796203   1.388515     7.34   0.000     3.624375    9.269451
                                   40-49  |   20.40805   4.492557    13.70   0.000     13.25626    31.41825
                                   50-59  |   44.57033   9.699038    17.45   0.000     29.09472    68.27749
                                   60-69  |   63.85931     13.911    19.08   0.000     41.66774    97.86974
                                     ≥70  |   99.92518   22.15475    20.77   0.000     64.70713    154.3113
                                          |
                                      Kon |
                                   Female |   .8295041    .037724    -4.11   0.000     .7587659    .9068372
                                          |
                                Education |
                    Up to Lower secondary education |   1.143256   .0627595     2.44   0.015     1.026636    1.273124
Post-secondary ≥2 years to Tertiary education |   .8076512   .0473533    -3.64   0.000     .7199746    .9060049
                                          |
                               No_5p_rank |   1.025776   .0108083     2.42   0.016      1.00481     1.04718
------------------------------------------------------------------------------------------------------------
```

Cox regression model T1D with and without periodontitis (outcome: stroke)

```
Cox regression with Breslow method for ties

No. of subjects =  28,354                         Number of obs =  28,354
No. of failures =     887
Time at risk    = 257,784
                                                  LR chi2(10)   = 1000.82
Log likelihood = -8505.135                        Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------------
                                        _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------------------------------------+----------------------------------------------------------------
                               maximum_AT |   .9802701   .0044536    -4.39   0.000     .9715799     .989038
                                          |
                                   cohort |
```

30-39	4.289747	1.090463	5.73	0.000	2.60648	7.060071
40-49	9.396143	2.187399	9.62	0.000	5.953768	14.82884
50-59	15.06378	3.465448	11.79	0.000	9.596517	23.64582
60-69	23.18563	5.320482	13.70	0.000	14.78737	36.35356
≥70	50.58813	11.8318	16.78	0.000	31.9864	80.0077
Kon						
Female	.765518	.0530869	-3.85	0.000	.6682308	.8769691
Education						
Up to Lower secondary education	1.047542	.0871855	0.56	0.577	.8898709	1.233149
Post-secondary ≥2 years to Tertiary education	.7251791	.0657847	-3.54	0.000	.6070556	.8662875
No_5p_rank	1.055459	.0144349	3.95	0.000	1.027543	1.084133

Cox regression model T1D with and without periodontitis (outcome: death)

Cox regression with Breslow method for ties

No. of subjects = 28,459 — Number of obs = 28,459
No. of failures = 1,958
Time at risk = 261,529
LR chi2(10) = 3582.47
Log likelihood = -18091.619 — Prob > chi2 = 0.0000

_t	Haz. ratio	Std. err.	z	P>|z|	[95% conf.	interval]
maximum_AT	.9692833	.0027148	-11.14	0.000	.9639769	.9746188
cohort						
30-39	1.589974	.2740163	2.69	0.007	1.134211	2.228877
40-49	3.345542	.4834353	8.36	0.000	2.520385	4.440852
50-59	6.972799	.9520126	14.22	0.000	5.33569	9.112209
60-69	15.1103	2.00172	20.50	0.000	11.65497	19.59003
≥70	45.21701	6.02971	28.58	0.000	34.81719	58.72323
Kon						
Female	.7856174	.0365653	-5.18	0.000	.7171224	.8606546
Education						
Up to Lower secondary education	1.208235	.0630475	3.63	0.000	1.090774	1.338346
Post-secondary ≥2 years to Tertiary education	.6015012	.0411528	-7.43	0.000	.5260172	.6878172
No_5p_rank	1.022077	.0103816	2.15	0.032	1.001931	1.042628

Cox regression model T2D with and without periodontitis (outcome: retinopathy)

Cox regression with Breslow method for ties

No. of subjects = 191,425 — Number of obs = 191,425
No. of failures = 64,261
Time at risk = 1,125,121
LR chi2(10) = 397.45
Log likelihood = -755175.07 — Prob > chi2 = 0.0000

_t	Haz. ratio	Std. err.	z	P>|z|	[95% conf.	interval]
maximum_AT	.9972122	.0005452	-5.11	0.000	.9961442	.9982813
cohort						
30-39	1.125653	.0504856	2.64	0.008	1.030927	1.229082
40-49	1.127315	.0466921	2.89	0.004	1.039416	1.222647
50-59	1.114094	.0453643	2.65	0.008	1.028637	1.206651
60-69	1.141098	.0462346	3.26	0.001	1.053985	1.235412
≥70	1.119742	.0458535	2.76	0.006	1.033383	1.213318
Kon						
Female	.8765366	.0070724	-16.33	0.000	.862784	.8905085
Education						
Up to Lower secondary education	1.06704	.0096693	7.16	0.000	1.048256	1.086161
Post-secondary ≥2 years to Tertiary education	.9895169	.0110861	-0.94	0.347	.9680254	1.011486
No_5p_rank	1.004595	.001782	2.58	0.010	1.001108	1.008094

Cox regression model T2D with and without periodontitis (outcome: albuminuria)

Cox regression with Breslow method for ties

No. of subjects = 194,636 — Number of obs = 194,636
No. of failures = 63,478
Time at risk = 1,158,230
LR chi2(10) = 3114.40
Log likelihood = -745345.88 — Prob > chi2 = 0.0000

_t	Haz. ratio	Std. err.	z	P>|z|	[95% conf.	interval]
maximum_AT	.9911666	.0005274	-16.67	0.000	.9901335	.9922009
cohort						
30-39	.9420343	.0441261	-1.27	0.202	.8594	1.032614
40-49	.9504828	.0405735	-1.19	0.234	.874196	1.033427
50-59	1.004797	.0419791	0.11	0.909	.9257982	1.090537
60-69	1.143982	.0474565	3.24	0.001	1.05465	1.240881
≥70	1.4212	.0593456	8.42	0.000	1.309518	1.542408
Kon						
Female	.7673043	.0062771	-32.38	0.000	.7550994	.7797065
Education						
Up to Lower secondary education	1.046385	.0094474	5.02	0.000	1.028031	1.065066
Post-secondary ≥2 years to Tertiary education	.9372047	.0107971	-5.63	0.000	.91628	.9586072
No_5p_rank	1.010607	.0017592	6.06	0.000	1.007165	1.014061

Cox regression model T2D with and without periodontitis (outcome: ischemic heart disease)

```
Cox regression with Breslow method for ties

No. of subjects =   218,894                         Number of obs =  218,894
No. of failures =    30,500
Time at risk    = 1,460,702
                                                    LR chi2(10)   = 12051.17
Log likelihood = -358918.02                         Prob > chi2   =   0.0000
```

_t	Haz. ratio	Std. err.	z	P>|z|	[95% conf.	interval]
maximum_AT	.9830805	.0007098	-23.63	0.000	.9816903	.9844727
cohort						
30-39	2.7891	.6572857	4.35	0.000	1.757389	4.426497
40-49	6.453572	1.453535	8.28	0.000	4.150348	10.03496
50-59	11.65989	2.613203	10.96	0.000	7.51491	18.09109
60-69	17.68353	3.959134	12.83	0.000	11.40237	27.42477
≥70	30.8158	6.900156	15.31	0.000	19.86898	47.79376
Kon						
Female	.5621629	.0068627	-47.18	0.000	.5488719	.5757757
Education						
Up to Lower secondary education	1.076098	.013682	5.77	0.000	1.049613	1.103251
Post-secondary ≥2 years to Tertiary education	.9254976	.0162466	-4.41	0.000	.8941964	.9578945
No_5p_rank	1.020962	.0025255	8.39	0.000	1.016024	1.025924

Cox regression model T2D with and without periodontitis (outcome: stroke)

```
Cox regression with Breslow method for ties

No. of subjects =   233,625                         Number of obs = 233,625
No. of failures =    13,821
Time at risk    = 1,631,469
                                                    LR chi2(10)   = 6123.16
Log likelihood = -162907.98                         Prob > chi2   =  0.0000
```

_t	Haz. ratio	Std. err.	z	P>|z|	[95% conf.	interval]
maximum_AT	.9846575	.0010494	-14.51	0.000	.9826029	.9867165
cohort						
30-39	1.389533	.395415	1.16	0.248	.7955087	2.427127
40-49	2.920228	.765288	4.09	0.000	1.747218	4.880749
50-59	4.594836	1.192433	5.88	0.000	2.762929	7.641353
60-69	8.328333	2.15519	8.19	0.000	5.015172	13.83026
≥70	17.49221	4.525999	11.06	0.000	10.5342	29.04609
Kon						
Female	.7815262	.0137054	-14.06	0.000	.7551205	.8088553
Education						
Up to Lower secondary education	1.042235	.0196104	2.20	0.028	1.004499	1.081388
Post-secondary ≥2 years to Tertiary education	.944835	.0248071	-2.16	0.031	.8974437	.9947288
No_5p_rank	1.012082	.003742	3.25	0.001	1.004775	1.019443

Cox regression model T2D with and without periodontitis (outcome: death)

```
Cox regression with Breslow method for ties

No. of subjects =   238,326                         Number of obs =  238,326
No. of failures =    35,217
```

```
Time at risk     = 1,696,385
                                                LR chi2(10)    = 30879.76
Log likelihood = -405980.73                     Prob > chi2    =   0.0000

------------------------------------------------------------------------------------------------------------------
                                          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
---------------------------------------------+--------------------------------------------------------------------
                                maximum_AT |   .9733441   .0006178   -42.57   0.000      .972134    .9745557
                                           |
                                    cohort |
                                     30-39 |    1.09742   .2169289     0.47   0.638     .7449281    1.616707
                                     40-49 |   1.509957   .2736432     2.27   0.023     1.058534    2.153894
                                     50-59 |   2.905974   .5171075     5.99   0.000     2.050329    4.118698
                                     60-69 |    5.56341    .985909     9.68   0.000     3.930945    7.873813
                                       ≥70 |   19.38888   3.433034    16.74   0.000     13.70368    27.43267
                                           |
                                       Kon |
                                    Female |   .8084089   .0088358   -19.46   0.000     .7912752    .8259135
                                           |
                                 Education |
                  Up to Lower secondary education |   1.166461   .0135591    13.25   0.000     1.140186    1.193342
Post-secondary ≥2 years to Tertiary education |   .8767266    .015739    -7.33   0.000     .8464151    .9081237
                                           |
                                No_5p_rank |   .9915055   .0024545    -3.45   0.001     .9867064     .996328
------------------------------------------------------------------------------------------------------------------
```

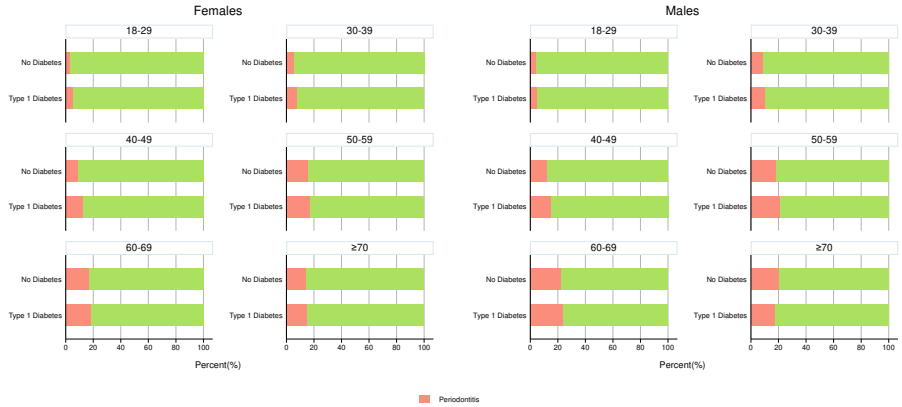
Diabetes and periodontitis

Table A9. Prevalence of periodontitis by age category and gender (comparing T1D to no diabetes)

		No Diabetes	Type 1 Diabetes	Crude RR (95%CI)	Adjusted RRs* (95%CI)
18-29 years	Female	236 / 7 097 (3.3%)	183 / 3 585 (5.1%)	1.54 (1.27, 1.85)	**1.48 (1.22, 1.79)**
	Male	422 / 8 755 (4.8%)	232 / 4 424 (5.2%)	1.09 (0.93, 1.27)	1.08 (0.92, 1.26)
	Total	658 / 15 852 (4.2%)	415 / 8 009 (5.2%)	1.25 (1.11, 1.41)	**1.23 (1.09, 1.38)**
30-39 years	Female	245 / 4 426 (5.5%)	181 / 2 281 (7.9%)	1.43 (1.19, 1.73)	**1.41 (1.17, 1.69)**
	Male	505 / 5 518 (9.2%)	284 / 2 779 (10.2%)	1.12 (0.97, 1.28)	1.11 (0.97, 1.28)
	Total	750 / 9 944 (7.5%)	465 / 5 060 (9.2%)	1.22 (1.09, 1.36)	**1.21 (1.08, 1.35)**
40-49 years	Female	451 / 4 896 (9.2%)	314 / 2 478 (12.7%)	1.38 (1.20, 1.58)	**1.35 (1.18, 1.55)**
	Male	761 / 6 141 (12.4%)	476 / 3 167 (15.0%)	1.21 (1.09, 1.35)	**1.20 (1.08, 1.34)**
	Total	1 212 / 11 037 (11.0%)	790 / 5 645 (14.0%)	1.27 (1.17, 1.39)	**1.26 (1.16, 1.37)**
50-59 years	Female	660 / 4 177 (15.8%)	357 / 2 050 (17.4%)	1.10 (0.98, 1.24)	1.08 (0.96, 1.22)
	Male	906 / 4 892 (18.5%)	523 / 2 503 (20.9%)	1.13 (1.02, 1.24)	**1.12 (1.02, 1.24)**
	Total	1 566 / 9 069 (17.3%)	880 / 4 553 (19.3%)	1.12 (1.04, 1.21)	**1.10 (1.02, 1.19)**
60-69 years	Female	583 / 3 383 (17.2%)	289 / 1 581 (18.3%)	1.06 (0.93, 1.21)	1.05 (0.92, 1.20)
	Male	914 / 4 023 (22.7%)	468 / 1 924 (24.3%)	1.07 (0.97, 1.18)	1.07 (0.97, 1.18)
	Total	1 497 / 7 406 (20.2%)	757 / 3 505 (21.6%)	1.07 (0.99, 1.15)	1.06 (0.98, 1.15)
≥70 years	Female	277 / 1 919 (14.4%)	131 / 846 (15.5%)	1.07 (0.89, 1.30)	1.03 (0.85, 1.26)
	Male	373 / 1 795 (20.8%)	137 / 764 (17.9%)	0.86 (0.72, 1.03)	0.86 (0.72, 1.03)
	Total	650 / 3 714 (17.5%)	268 / 1 610 (16.6%)	0.95 (0.84, 1.08)	0.94 (0.82, 1.07)
Overall	Female	2 452 / 25 898 (9.5%)	1 455 / 12 821 (11.3%)	1.20 (1.13, 1.27)	**1.19 (1.12, 1.27)**
	Male	3 881 / 31 124 (12.5%)	2 120 / 15 561 (13.6%)	1.09 (1.04, 1.15)	**1.10 (1.04, 1.15)**
	Total	6 333 / 57 022 (11.1%)	3 575 / 28 382 (12.6%)	1.13 (1.09, 1.18)	**1.13 (1.09, 1.18)**

Prevalence is presented as frequency / n (%)
*Adjusted RRs originate from logistic regression models, which included diabetes, age category (and its interaction with diabetes), gender, level of education and number of years in the 5th lowest level of income.
Statistically significant adjusted RRs are highlighted in **bold**

Figure A1. Prevalence of periodontitis (2010-2020) in subjects with T1D and matched controls without diabetes, females and males by age category.



Logistic regression model T1D versus matched controls without diabetes (outcome: periodontitis)

```
Logistic regression                                     Number of obs =  85,042
                                                        LR chi2(15)   = 3660.30
                                                        Prob > chi2   =  0.0000
Log likelihood = -28693.942                             Pseudo R2     =  0.0600

------------------------------------------------------------------------------
                  everParod2 | Odds ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
                      cohort |
                       18-29 |          1  (base)
                       30-39 |   1.906142   .1057874    11.62   0.000     1.709681    2.125178
                       40-49 |   2.751468   .1393275    19.99   0.000     2.491505    3.038556
                       50-59 |   4.556775   .2242699    30.81   0.000      4.13775    5.018235
                       60-69 |   5.342634   .2683126    33.37   0.000     4.841804    5.895269
                         ≥70 |   4.247262   .2572959    23.87   0.000     3.771758    4.782711
                             |
                       Group |
                  No Diabetes |          1  (base)
                 Type 1 Diabetes |   1.239947   .0804209     3.32   0.001     1.091932    1.408026
                             |
                 cohort#Group |
          30-39#Type 1 Diabetes |    .995091   .0893285    -0.05   0.956      .8345477    1.186518
          40-49#Type 1 Diabetes |    1.05057   .0855291     0.61   0.545      .8956262    1.232318
          50-59#Type 1 Diabetes |   .9109861   .0729593    -1.16   0.244      .7786468    1.065818
          60-69#Type 1 Diabetes |   .8698582    .071534    -1.70   0.090      .7403698    1.021994
            ≥70#Type 1 Diabetes |   .7469267    .077117    -2.83   0.005      .6100916    .9144521
                             |
                         Kon |
                        Male |          1  (base)
                      Female |   .7728429   .0173834   -11.46   0.000      .7395121     .807676
                             |
                   Education |
      Up to Lower secondary education |   1.301469   .0382068     8.98   0.000     1.228699    1.378549
Upper secondary to Post-secondary ed.. |          1  (base)
Post-secondary ≥2 years to Tertiary .. |   .6977537   .0189023   -13.28   0.000      .6616722    .7358027
                             |
                    No_5p_rank |   1.017834   .0057163     3.15   0.002     1.006691    1.029099
                         _cons |   .0529482     .00226   -68.84   0.000      .048699    .0575682
------------------------------------------------------------------------------
Note: _cons estimates baseline odds.


Goodness-of-fit test after logistic model
Variable: everParod2

  Table collapsed on quantiles of estimated probabilities
  +-------------------------------------------------------------+
  | Group |    Prob | Obs_1 |  Exp_1 | Obs_0 |  Exp_0 | Total |
  |-------+---------+-------+--------+-------+--------+-------|
  |     1 | 0.0388 |   262 |  274.8 |  8270 | 8257.2 |  8532 |
  |     2 | 0.0503 |   389 |  400.3 |  8402 | 8390.7 |  8791 |
  |     3 | 0.0645 |   421 |  469.8 |  7877 | 7828.2 |  8298 |
  |     4 | 0.0878 |   629 |  640.1 |  8129 | 8117.9 |  8758 |
  |     5 | 0.1012 |   837 |  799.0 |  7583 | 7621.0 |  8420 |
  |-------+---------+-------+--------+-------+--------+-------|
  |     6 | 0.1272 |  1041 | 1030.1 |  7628 | 7638.9 |  8669 |
  |     7 | 0.1572 |  1335 | 1253.5 |  7561 | 7642.5 |  8896 |
  |     8 | 0.1794 |  1444 | 1352.6 |  6612 | 6703.4 |  8056 |
  |     9 | 0.2172 |  1574 | 1608.3 |  6581 | 6546.7 |  8155 |
  |    10 | 0.3215 |  1935 | 2038.4 |  6532 | 6428.6 |  8467 |
  +-------------------------------------------------------------+
```

```
 Number of observations = 85,042
       Number of groups =     10
Hosmer-Lemeshow chi2(8) =  30.06
           Prob > chi2 = 0.0002
```

Figure A2. Probability estimates for periodontitis and their contrasts (based on logistic regression, stratified by gender), females and males by age category.

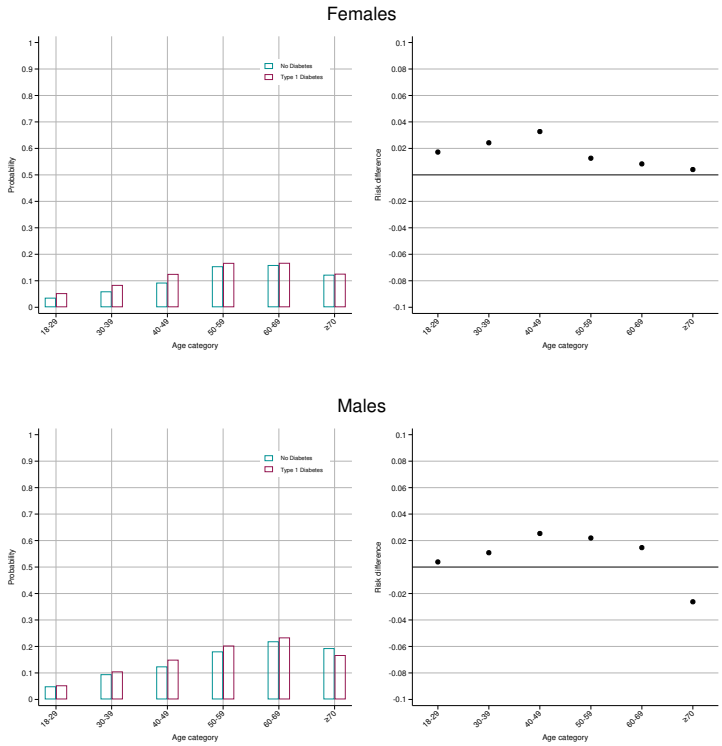
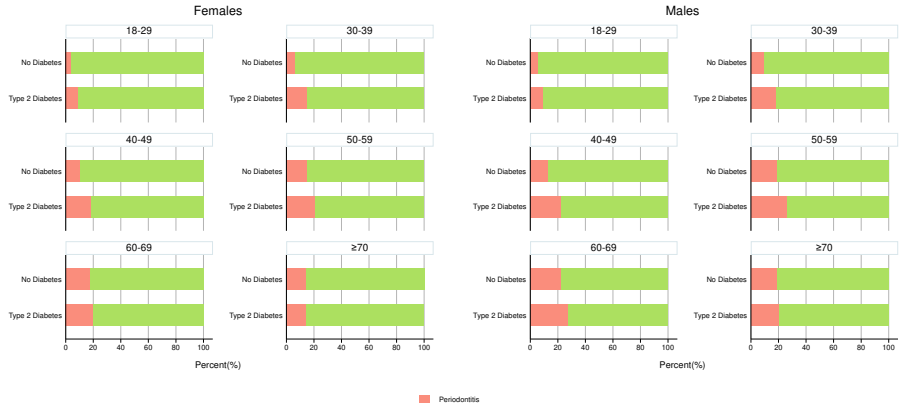


Table A10. Prevalence of periodontitis by age category and gender (comparing T2D to no diabetes)

		No Diabetes	Type 2 Diabetes	Crude RR (95%CI)	Adjusted RRs* (95%CI)
18-29 years	Female	201 / 5 056 (4.0%)	185 / 2 077 (8.9%)	2.24 (1.85, 2.72)	**2.00 (1.65, 2.44)**
	Male	321 / 5 190 (6.2%)	205 / 2 070 (9.9%)	1.60 (1.35, 1.89)	**1.49 (1.25, 1.77)**
	Total	522 / 10 246 (5.1%)	390 / 4 147 (9.4%)	1.85 (1.63, 2.09)	**1.71 (1.50, 1.94)**
30-39 years	Female	818 / 12 162 (6.7%)	790 / 5 131 (15.4%)	2.29 (2.09, 2.51)	**2.06 (1.88, 2.26)**
	Male	1 523 / 15 527 (9.8%)	1 140 / 6 162 (18.5%)	1.89 (1.76, 2.02)	**1.82 (1.70, 1.96)**
	Total	2 341 / 27 689 (8.5%)	1 930 / 11 293 (17.1%)	2.02 (1.91, 2.14)	**1.92 (1.81, 2.03)**
40-49 years	Female	3 138 / 29 796 (10.5%)	2 506 / 13 513 (18.5%)	1.76 (1.68, 1.85)	**1.66 (1.58, 1.74)**
	Male	5 945 / 44 305 (13.4%)	4 378 / 19 338 (22.6%)	1.69 (1.63, 1.75)	**1.65 (1.60, 1.71)**
	Total	9 083 / 74 101 (12.3%)	6 884 / 32 851 (21.0%)	1.71 (1.66, 1.76)	**1.66 (1.61, 1.71)**
50-59 years	Female	7 351 / 48 542 (15.1%)	4 859 / 22 844 (21.3%)	1.40 (1.36, 1.45)	**1.34 (1.30, 1.38)**
	Male	13 903 / 73 468 (18.9%)	8 992 / 33 939 (26.5%)	1.40 (1.37, 1.43)	**1.38 (1.35, 1.41)**
	Total	21 254 / 122 010 (17.4%)	13 851 / 56 783 (24.4%)	1.40 (1.37, 1.43)	**1.37 (1.34, 1.40)**
60-69 years	Female	12 024 / 68 957 (17.4%)	6 569 / 32 969 (19.9%)	1.14 (1.11, 1.17)	**1.11 (1.08, 1.14)**
	Male	21 904 / 95 645 (22.9%)	12 613 / 45 847 (27.5%)	1.20 (1.18, 1.22)	**1.18 (1.16, 1.21)**
	Total	33 928 / 164 602 (20.6%)	19 182 / 78 816 (24.3%)	1.18 (1.16, 1.20)	**1.16 (1.14, 1.18)**
≥70 years	Female	9 420 / 66 445 (14.2%)	4 718 / 31 786 (14.8%)	1.05 (1.01, 1.08)	1.03 (0.99, 1.06)
	Male	12 343 / 64 112 (19.3%)	6 362 / 30 813 (20.6%)	1.07 (1.04, 1.10)	**1.07 (1.04, 1.10)**
	Total	21 763 / 130 557 (16.7%)	11 080 / 62 599 (17.7%)	1.06 (1.04, 1.08)	**1.05 (1.03, 1.07)**
Overall	Female	32 952 / 230 958 (14.3%)	19 627 / 108 320 (18.1%)	1.27 (1.25, 1.29)	**1.22 (1.20, 1.24)**
	Male	55 939 / 298 247 (18.8%)	33 690 / 138 169 (24.4%)	1.30 (1.28, 1.32)	**1.27 (1.26, 1.29)**
	Total	88 891 / 529 205 (16.8%)	53 317 / 246 489 (21.6%)	1.29 (1.28, 1.30)	**1.26 (1.24 ,1.27)**

Prevalence is presented as frequency / n (%)
*Adjusted RRs originate from logistic regression models, which included diabetes, age category (and its interaction with diabetes), gender, level of education and number of years in the 5th lowest level of income. Statistically significant adjusted RRs are highlighted in **bold**

Figure A3. Prevalence of periodontitis (2010-2020) in T2D and matched controls without diabetes, females and males by age category.



Logistic regression model T2D versus matched controls without diabetes (outcome: periodontitis)

```
Logistic regression                               Number of obs =  770,672
                                                  LR chi2(15)   = 14615.94
                                                  Prob > chi2   =   0.0000
Log likelihood = -359642.23                       Pseudo R2     =   0.0199

------------------------------------------------------------------------------
                  everParod2 | Odds ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
                      cohort |
                       18-29 |          1  (base)
                       30-39 |   1.694295   .0849703    10.51   0.000     1.535679    1.869293
                       40-49 |    2.46151   .1146873    19.33   0.000     2.246685    2.696876
                       50-59 |   3.689637   .1691672    28.47   0.000     3.372536    4.036553
                       60-69 |   4.523635   .2064842    33.07   0.000     4.136508    4.946992
                         ≥70 |    3.47321    .159431    27.12   0.000     3.174375    3.800177
                             |
                       Group |
                  No Diabetes |          1  (base)
                Type 2 Diabetes |   1.780343   .1265509     8.11   0.000     1.548811    2.046487
                             |
                 cohort#Group |
          30-39#Type 2 Diabetes |   1.187102    .093213     2.18   0.029     1.017772    1.384604
          40-49#Type 2 Diabetes |   1.032759   .0756357     0.44   0.660     .8946641     1.19217
          50-59#Type 2 Diabetes |   .8374202   .0604124    -2.46   0.014     .7270041    .9646061
          60-69#Type 2 Diabetes |   .6795849   .0488068    -5.38   0.000     .5903529    .7823043
            ≥70#Type 2 Diabetes |    .59578   .0430404    -7.17   0.000     .5171224     .686402
                             |
                          Kon |
                         Male |          1  (base)
                       Female |   .7201552   .0044327   -53.34   0.000     .7115196    .7288957
                             |
                    Education |
      Up to Lower secondary education |   1.083912   .0076531    11.41   0.000     1.069015    1.099016
Upper secondary to Post-secondary ed.. |          1  (base)
Post-secondary ≥2 years to Tertiary .. |    .79023   .0063003   -29.53   0.000     .7779775    .8026754
                             |
                    No_5p_rank |   1.011269    .001527     7.42   0.000     1.008281    1.014267
                         _cons |    .06719   .0030501   -59.48   0.000     .0614701    .0734421
------------------------------------------------------------------------------
Note: _cons estimates baseline odds.


Goodness-of-fit test after logistic model
Variable: everParod2

  Table collapsed on quantiles of estimated probabilities
  +--------------------------------------------------------------------+
  | Group |   Prob | Obs_1 |   Exp_1 | Obs_0 |   Exp_0 |  Total |
  |-------+--------+-------+---------+-------+---------+--------|
  |     1 | 0.1156 |  7124 |  7164.3 | 72857 | 72816.7 |  79981 |
  |     2 | 0.1439 | 10929 | 11079.6 | 71920 | 71769.4 |  82849 |
  |     3 | 0.1541 | 13509 | 13648.4 | 76859 | 76719.6 |  90368 |
  |     4 | 0.1638 | 10172 |  9607.8 | 49601 | 50165.2 |  59773 |
  |     5 | 0.1892 | 15294 | 15110.6 | 68288 | 68471.4 |  83582 |
  |-------+--------+-------+---------+-------+---------+--------|
  |     6 | 0.1987 | 18657 | 18423.2 | 75394 | 75627.8 |  94051 |
  |     7 | 0.2096 |  9476 | 10024.6 | 39642 | 39093.4 |  49118 |
  |     8 | 0.2331 | 25220 | 24971.6 | 86971 | 87219.4 | 112191 |
  |     9 | 0.2478 | 10411 | 10768.8 | 34082 | 33724.2 |  44493 |
  |    10 | 0.3216 | 20360 | 20353.0 | 53906 | 53913.0 |  74266 |
  +--------------------------------------------------------------------+
```

```
 Number of observations = 770,672
       Number of groups =      10
Hosmer-Lemeshow chi2(8) =  106.76
           Prob > chi2 =  0.0000
```

Figure A4. Probability estimates for periodontitis and their contrasts (based on logistic regression, stratified by gender), females and males by age category.

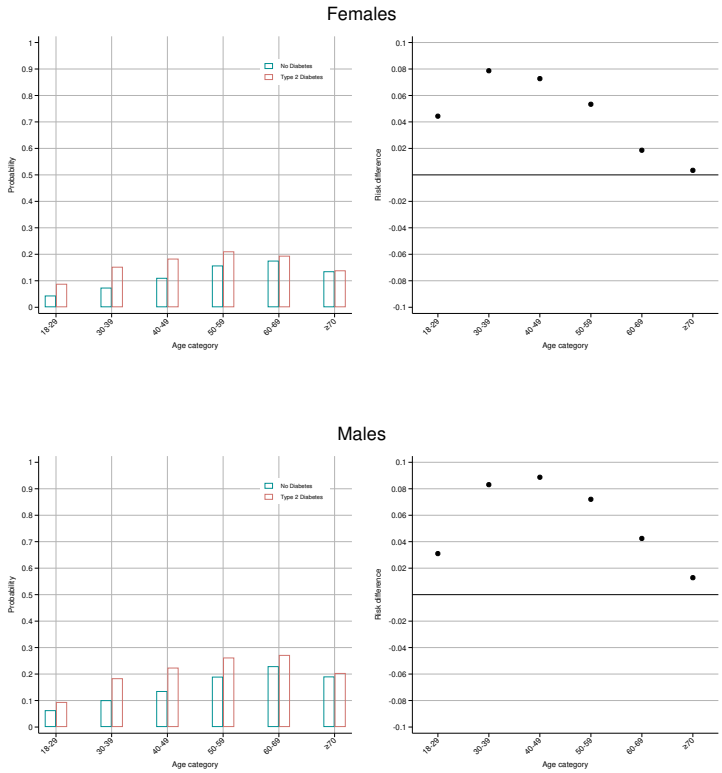
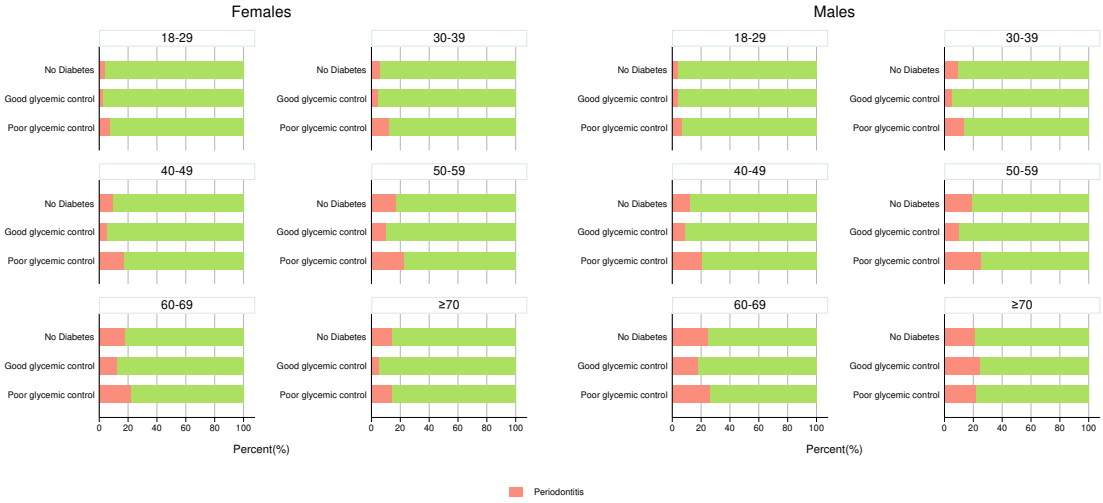


Figure A5. Prevalence of periodontitis (2010-2020) in subjects with T1D with good/poor glycemic control and matched controls without diabetes, females and males by age category.



Logistic regression model T1D with good/poor glycemic control versus matched controls without diabetes (outcome: periodontitis)

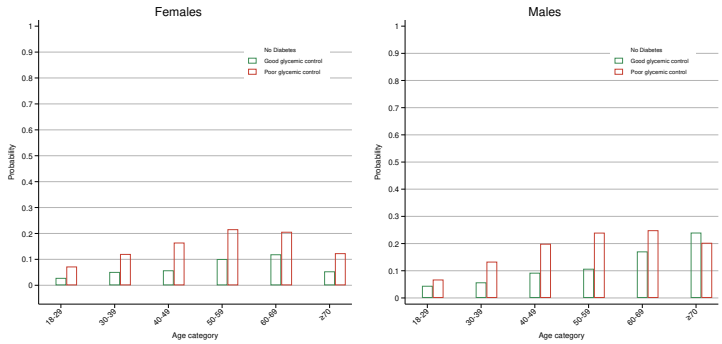
```
Logistic regression                                     Number of obs =  25,302
                                                        LR chi2(21)   = 1220.09
                                                        Prob > chi2   =  0.0000
Log likelihood = -8804.1101                             Pseudo R2     =  0.0648

------------------------------------------------------------------------------------------------------
                     everParod2 | Odds ratio   Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------+---------------------------------------------------------------------
                         cohort |
                          18-29 |          1  (base)
                          30-39 |   2.077607   .2086139     7.28   0.000     1.706451    2.529491
                          40-49 |   2.803505   .2583964    11.18   0.000     2.340168    3.358581
                          50-59 |   4.977558   .4519379    17.68   0.000     4.166117    5.947046
                          60-69 |   5.991909   .5632574    19.05   0.000     4.983675    7.204117
                            ≥70 |   4.381787   .5487186    11.80   0.000     3.428133    5.600732
                                |
               Diabetes_Control |
                   No Diabetes  |          1  (base)
          Good glycemic control |   .8910273   .2241488    -0.46   0.646      .544203    1.458885
          Poor glycemic control |    1.68618   .2003936     4.40   0.000     1.335805    2.128456
                                |
        cohort#Diabetes_Control |
    30-39#Good glycemic control |   .6976811   .2478233    -1.01   0.311     .3477777    1.399627
    30-39#Poor glycemic control |   .9515281   .1535588    -0.31   0.758     .6935115    1.305538
    40-49#Good glycemic control |   .7706925   .2594015    -0.77   0.439     .3984573    1.490667
    40-49#Poor glycemic control |   1.085081   .1581132     0.56   0.575     .8155095    1.443762
    50-59#Good glycemic control |   .5968739   .1955601    -1.58   0.115     .3140469    1.134412
    50-59#Poor glycemic control |   .8155658   .1189835    -1.40   0.162     .6127404    1.085529
    60-69#Good glycemic control |   .7439913   .2367735    -0.93   0.353     .3987263    1.388228
    60-69#Poor glycemic control |   .6779316   .1052371    -2.50   0.012      .500094    .9190097
      ≥70#Good glycemic control |   1.148765   .5454753     0.29   0.770     .4529495    2.913484
      ≥70#Poor glycemic control |    .581413   .1208858    -2.61   0.009     .3868167     .873905
                                |
                            Kon |
                           Male |          1  (base)
                         Female |   .8120334   .0325718    -5.19   0.000     .7506387    .8784495
                                |
                      Education |
  Up to Lower secondary education |   1.29912   .0681355     4.99   0.000     1.172211    1.439768
Upper secondary to Post-secondary ed.. |          1  (base)
Post-secondary ≥2 years to Tertiary .. |   .7045188   .0350536    -7.04   0.000     .6390587    .7766841
                                |
                     No_5p_rank |   1.018275   .0095895     1.92   0.054     .9996521    1.037244
                          _cons |   .0503224   .0039796   -37.80   0.000      .043097    .0587593
------------------------------------------------------------------------------------------------------
Note: _cons estimates baseline odds.


Goodness-of-fit test after logistic model
Variable: everParod2

  Table collapsed on quantiles of estimated probabilities
  +--------------------------------------------------------+
  | Group |    Prob | Obs_1 | Exp_1 | Obs_0 |  Exp_0 | Total |
```

```
|-------+--------+-------+-------+-------+--------+-------|
|     1 | 0.0393 |    99 |  91.9 |  2743 | 2750.1 |  2842 |
|     2 | 0.0505 |   101 | 105.5 |  2176 | 2171.5 |  2277 |
|     3 | 0.0686 |   133 | 151.4 |  2339 | 2320.6 |  2472 |
|     4 | 0.0893 |   178 | 199.3 |  2354 | 2332.7 |  2532 |
|     5 | 0.1028 |   263 | 250.1 |  2312 | 2324.9 |  2575 |
|-------+--------+-------+-------+-------+--------+-------|
|     6 | 0.1253 |   330 | 306.9 |  2226 | 2249.1 |  2556 |
|     7 | 0.1647 |   368 | 362.6 |  2121 | 2126.4 |  2489 |
|     8 | 0.1967 |   479 | 467.1 |  2121 | 2132.9 |  2600 |
|     9 | 0.2298 |   502 | 509.1 |  1928 | 1920.9 |  2430 |
|    10 | 0.3574 |   649 | 658.2 |  1880 | 1870.8 |  2529 |
+-------------------------------------------------------------+

 Number of observations = 25,302
       Number of groups =     10
Hosmer-Lemeshow chi2(8) =   9.10
           Prob > chi2 = 0.3341
```

Table A11. Risk ratios (T1D with good/poor glycemic control versus matched controls without diabetes)

	Poor glycemic control versus no diabetes	**Good glycemic control versus no diabetes**
Age 18-29 years	1.64 (1.31, 2.04)	0.90 (0.56, 1.44)
Age 30-39 years	1.52 (1.26, 1.84)	0.64 (0.40, 1.02)
Age 40-49 years	1.67 (1.45, 1.92)	0.71 (0.48, 1.06)
Age 50-59 years	1.29 (1.13, 1.46)	0.58 (0.40, 0.84)
Age 60-69 years	1.11 (0.95, 1.29)	0.71 (0.52, 0.99)
Age ≥70 years	0.98 (0.74, 1.30)	1.02 (0.53, 1.96)
Overall	1.37 (1.28, 1.47)	0.71 (0.60, 0.84)

Figure A6. Probability estimates for periodontitis (based on logistic regression, stratified by gender), females and males by age category.



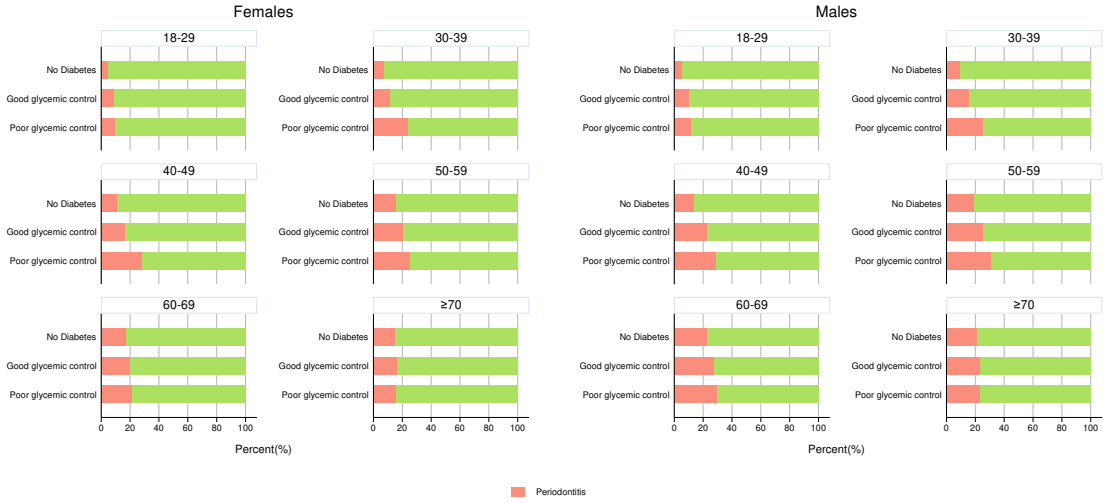
Logistic regression model T1D according to median yearly HbA1c (outcome: periodontitis)

```
Logistic regression                             Number of obs =  28,130
                                                LR chi2(39)   = 1300.37
                                                Prob > chi2   =  0.0000
Log likelihood = -10004.17                      Pseudo R2     =  0.0610

------------------------------------------------------------------------------
                  everParod2 | Odds ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
                      cohort |
                       18-29 |          1  (base)
                       30-39 |   1.347304   .3515783     1.14   0.253     .8078765    2.246913
                       40-49 |   2.238241   .5546257     3.25   0.001     1.377156    3.637732
                       50-59 |   3.025721   .7403349     4.52   0.000      1.87308    4.887663
                       60-69 |   4.237412   1.023362     5.98   0.000     2.639552    6.802542
                         ≥70 |   2.101838     .86216     1.81   0.070     .9406804    4.696307
```

hba1c_cat						
1	1	(base)				
2	.6268012	.2004069	-1.46	0.144	.3349465	1.172963
3	.8992921	.2107056	-0.45	0.651	.5681499	1.423438
4	1.237589	.2463357	1.07	0.284	.8378169	1.828116
5	1.312637	.2780011	1.28	0.199	.8667025	1.988012
6	1.790957	.3417398	3.05	0.002	1.232151	2.603194
cohort#hba1c_cat						
30-39#2	1.97987	.8740026	1.55	0.122	.8334482	4.703215
30-39#3	1.304794	.4467174	0.78	0.437	.6669898	2.552493
30-39#4	1.289706	.3834317	0.86	0.392	.7201565	2.309693
30-39#5	1.417811	.441117	1.12	0.262	.7705267	2.608848
30-39#6	1.561617	.4479442	1.55	0.120	.8900414	2.739924
40-49#2	2.033833	.8381166	1.72	0.085	.9068716	4.561257
40-49#3	1.303966	.4180345	0.83	0.408	.6956362	2.444277
40-49#4	1.121462	.3128591	0.41	0.681	.6491147	1.937528
40-49#5	1.408848	.4089475	1.18	0.238	.7976003	2.488531
40-49#6	1.299398	.3508807	0.97	0.332	.765402	2.205946
50-59#2	1.83508	.7502632	1.48	0.138	.8234656	4.089446
50-59#3	1.625424	.5102988	1.55	0.122	.8784835	3.007459
50-59#4	1.424631	.3906296	1.29	0.197	.8323487	2.438368
50-59#5	1.440485	.4141522	1.27	0.204	.8199372	2.530677
50-59#6	1.234967	.330794	0.79	0.431	.7305592	2.087638
60-69#2	2.002088	.812141	1.71	0.087	.9040573	4.433743
60-69#3	1.471687	.456859	1.24	0.213	.8008943	2.704306
60-69#4	1.241339	.3379624	0.79	0.427	.7280232	2.116583
60-69#5	1.044195	.3004958	0.15	0.881	.5940525	1.835432
60-69#6	.8694577	.2346676	-0.52	0.604	.5122809	1.475668
≥70#2	4.337202	2.476687	2.57	0.010	1.416267	13.28233
≥70#3	2.05831	.9889806	1.50	0.133	.8026454	5.278344
≥70#4	1.73783	.7662025	1.25	0.210	.7323455	4.123811
≥70#5	1.526618	.6913648	0.93	0.350	.6284111	3.70866
≥70#6	1.132499	.4943542	0.29	0.776	.4813649	2.66441
Kon						
Male	1	(base)				
Female	.8095731	.0305403	-5.60	0.000	.7518745	.8716994
Education						
Up to Lower secondary education	1.272783	.0629612	4.88	0.000	1.155175	1.402365
Upper secondary to Post-secondary education <2 years	1	(base)				
Post-secondary ≥2 years to Tertiary education	.7786017	.0358293	-5.44	0.000	.7114514	.85209
No_5p_rank	1.00337	.0093442	0.36	0.718	.985222	1.021853
_cons	.0496615	.0085614	-17.42	0.000	.0354223	.0696247

Note: _cons estimates baseline odds.

Figure A7. Prevalence of periodontitis (2010-2020) in T2D with good/poor glycemic control and matched controls without diabetes, females and males by age category.



Logistic regression model T2D with good/poor glycemic control versus matched controls without diabetes (outcome: periodontitis)

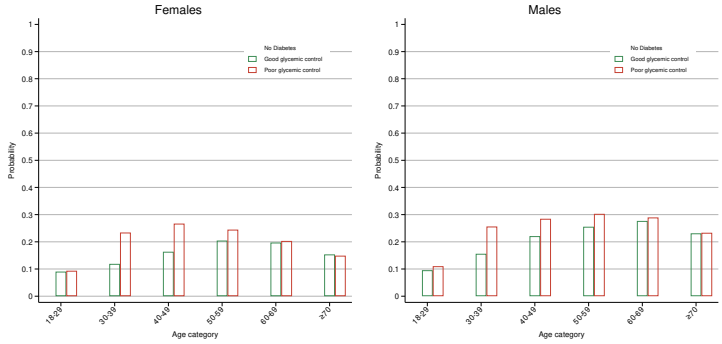
```
Logistic regression                                     Number of obs = 163,981
                                                        LR chi2(21)   = 3014.26
                                                        Prob > chi2   =  0.0000
Log likelihood = -78940.853                             Pseudo R2     =  0.0187

------------------------------------------------------------------------------------------------------
                     everParod2 | Odds ratio   Std. err.      z    P>|z|     [95% conf. interval]
--------------------------------+---------------------------------------------------------------------
                         cohort |
                          18-29 |          1  (base)
                          30-39 |   1.702383   .2547548     3.56   0.000     1.269633    2.282633
                          40-49 |   2.502785   .3530183     6.50   0.000     1.898285    3.299785
                          50-59 |   3.742596    .522319     9.46   0.000     2.846943    4.920023
                          60-69 |    4.41784   .6148524    10.67   0.000     3.363134    5.803311
                            ≥70 |   3.759718   .5251601     9.48   0.000     2.859294    4.943695
                                |
                Diabetes_Control |
                    No Diabetes |          1  (base)
           Good glycemic control |   1.818708   .4517575     2.41   0.016      1.11771    2.959355
           Poor glycemic control |   1.969524   .5222958     2.56   0.011     1.171203    3.312001
                                |
        cohort#Diabetes_Control |
  30-39#Good glycemic control   |   .9029824   .2431458    -0.38   0.705     .5326924    1.530672
  30-39#Poor glycemic control   |   1.677247   .4816164     1.80   0.072     .9553819    2.944537
  40-49#Good glycemic control   |   .9188281   .2324033    -0.33   0.738     .5596753    1.508455
  40-49#Poor glycemic control   |   1.323811   .3583087     1.04   0.300      .778818    2.250174
  50-59#Good glycemic control   |   .7706369    .192798    -1.04   0.298     .4719502    1.258356
  50-59#Poor glycemic control   |   .8994431    .241372    -0.39   0.693     .5315544    1.521948
  60-69#Good glycemic control   |    .684664   .1707218    -1.52   0.129     .4199808    1.116158
  60-69#Poor glycemic control   |   .6711535   .1799221    -1.49   0.137     .3968557     1.13504
    ≥70#Good glycemic control   |   .6113378     .15288    -1.97   0.049     .3744703    .9980334
    ≥70#Poor glycemic control   |   .5596064   .1509048    -2.15   0.031     .3298721    .9493353
                                |
                            Kon |
                           Male |          1  (base)
                         Female |   .7093146   .0091818   -26.53   0.000      .691545    .7275407
                                |
                      Education |
      Up to Lower secondary education |    1.08593   .0161646     5.54   0.000     1.054706    1.118079
Upper secondary to Post-secondary ed.. |          1  (base)
Post-secondary ≥2 years to Tertiary .. |   .7836844    .013284   -14.38   0.000     .7580759     .810158
                                |
                     No_5p_rank |   1.005197   .0032256     1.62   0.106     .9988949    1.011539
                          _cons |   .0686563   .0095335   -19.29   0.000     .0522979    .0901314
------------------------------------------------------------------------------------------------------
Note: _cons estimates baseline odds.


Goodness-of-fit test after logistic model
Variable: everParod2

  Table collapsed on quantiles of estimated probabilities
  +--------------------------------------------------------+
  | Group |   Prob | Obs_1 |  Exp_1 | Obs_0 |   Exp_0 | Total |
```

```
|-------+--------+-------+--------+-------+---------+-------|
|     1 | 0.1250 |  1677 | 1731.1 | 15469 | 15414.9 | 17146 |
|     2 | 0.1542 |  2819 | 2791.9 | 16542 | 16569.1 | 19361 |
|     3 | 0.1659 |  2110 | 2046.2 | 10645 | 10708.8 | 12755 |
|     4 | 0.1771 |  3325 | 3465.2 | 16829 | 16688.8 | 20154 |
|     5 | 0.1921 |  2967 | 2868.7 | 12406 | 12504.3 | 15373 |
|-------+--------+-------+--------+-------+---------+-------|
|     6 | 0.2052 |  3106 | 3065.0 | 11944 | 11985.0 | 15050 |
|     7 | 0.2214 |  3229 | 3294.5 | 12030 | 11964.5 | 15259 |
|     8 | 0.2327 |  4020 | 3983.1 | 13379 | 13415.9 | 17399 |
|     9 | 0.2648 |  4158 | 4149.4 | 12659 | 12667.6 | 16817 |
|    10 | 0.3470 |  4243 | 4258.8 | 10424 | 10408.2 | 14667 |
+-------------------------------------------------------------+

 Number of observations = 163,981
       Number of groups =      10
Hosmer-Lemeshow chi2(8) =   18.44
           Prob > chi2 =  0.0181
```

Table A12. Risk ratios (T2D with good/poor glycemic control versus matched controls without diabetes)

	Poor glycemic control versus no diabetes	**Good glycemic control versus no diabetes**
Age 18-29 years	1.87 (1.16, 2.99)	1.74 (1.11, 2.71)
Age 30-39 years	2.72 (2.29, 3.23)	1.55 (1.30, 1.85)
Age 40-49 years	2.16 (1.99, 2.34)	1.54 (1.42, 1.66)
Age 50-59 years	1.55 (1.46, 1.65)	1.31 (1.25, 1.37)
Age 60-69 years	1.24 (1.17, 1.31)	1.18 (1.15, 1.22)
Age ≥70 years	1.08 (1.00, 1.17)	1.09 (1.04, 1.14)
Overall	1.38 (1.33, 1.43)	1.23 (1.20, 1.26)

Figure A8. Probability estimates for periodontitis (based on logistic regression, stratified by gender), females and males by age category.



Logistic regression model T2D according to median yearly HbA1c (outcome: periodontitis)

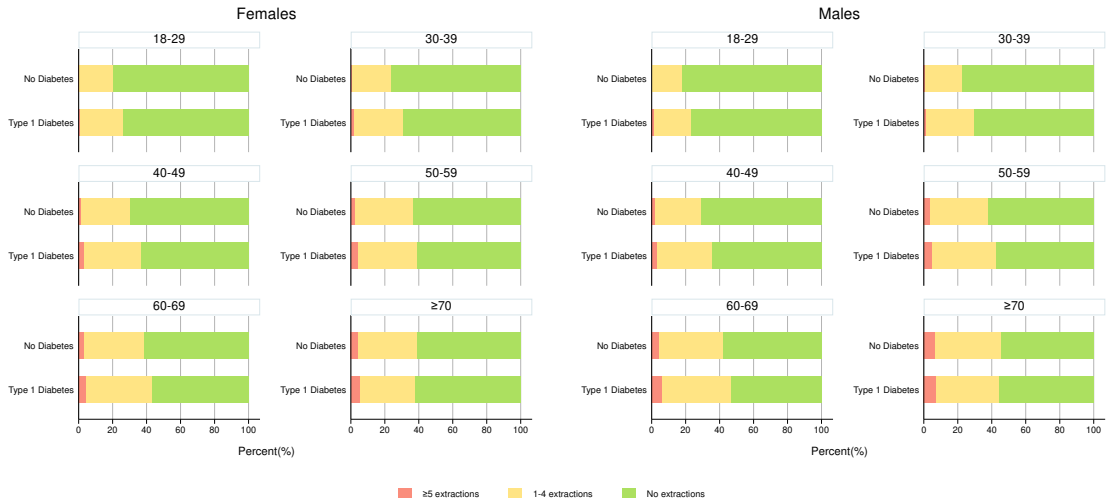
```
Logistic regression                               Number of obs = 240,307
                                                  LR chi2(39)   = 3300.89
                                                  Prob > chi2   =   0.0000
Log likelihood = -124115.08                       Pseudo R2     =   0.0131

------------------------------------------------------------------------------
                  everParod2 | Odds ratio   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------+------------------------------------------------
              cohort         |
                18-29        |          1  (base)
                30-39        |   2.191313   .2366705     7.26   0.000     1.773255    2.707931
                40-49        |    3.12743   .3180317    11.21   0.000     2.562288     3.81722
                50-59        |   3.797523   .3810246    13.30   0.000     3.119572    4.622807
                60-69        |   4.112625   .4107689    14.16   0.000     3.381436    5.001924
                  ≥70        |   2.878174   .2897382    10.50   0.000      2.36281    3.505947
                             |
           hba1c_cat         |
                   1         |          1  (base)
                   2         |   1.361426   .2833762     1.48   0.138     .9053563    2.047241
                   3         |   1.277057   .2466087     1.27   0.205     .8746564     1.86459
                   4         |   1.664921   .2939852     2.89   0.004     1.177855    2.353398
                   5         |   1.389114     .31373     1.46   0.146     .8922673    2.162624
------------------------------------------------------------------------------
```

6	1.931245	.2802244	4.54	0.000	1.453208	2.566534
cohort#hba1c_cat						
30-39#2	.9111096	.2071896	-0.41	0.682	.5834509	1.422777
30-39#3	1.026223	.2147926	0.12	0.902	.6808974	1.546684
30-39#4	.7509925	.1459219	-1.47	0.141	.5131479	1.099079
30-39#5	1.021556	.2525195	0.09	0.931	.6292928	1.658332
30-39#6	.8148126	.1323178	-1.26	0.207	.5926942	1.120172
40-49#2	.7894536	.1684166	-1.11	0.268	.5196814	1.199268
40-49#3	.8076952	.1597715	-1.08	0.280	.5481129	1.190214
40-49#4	.6563455	.1191153	-2.32	0.020	.4598902	.9367222
40-49#5	.8847942	.2054342	-0.53	0.598	.5613165	1.394687
40-49#6	.6598311	.09962	-2.75	0.006	.4908175	.8870447
50-59#2	.7628093	.1606973	-1.29	0.199	.5047746	1.152748
50-59#3	.8344131	.1629973	-0.93	0.354	.5689895	1.223652
50-59#4	.682295	.122144	-2.14	0.033	.4803864	.9690668
50-59#5	.8966097	.2056626	-0.48	0.634	.5719478	1.405563
50-59#6	.6497179	.0967614	-2.90	0.004	.4852402	.8699472
60-69#2	.7045081	.1478398	-1.67	0.095	.4669418	1.062941
60-69#3	.7557112	.1470993	-1.44	0.150	.5160233	1.106732
60-69#4	.5895348	.1051306	-2.96	0.003	.4156391	.8361852
60-69#5	.7738327	.1769478	-1.12	0.262	.4943196	1.211397
60-69#6	.5301904	.0789174	-4.26	0.000	.3960343	.7097918
≥70#2	.7108733	.1499902	-1.62	0.106	.4701036	1.074956
≥70#3	.7534346	.1473708	-1.45	0.148	.5135133	1.105451
≥70#4	.5665932	.1015507	-3.17	0.002	.3987587	.8050678
≥70#5	.6535014	.1502837	-1.85	0.064	.4163882	1.025639
≥70#6	.4900729	.0738813	-4.73	0.000	.3647011	.6585433
Kon						
Male	1	(base)				
Female	.7079629	.0072989	-33.50	0.000	.6938009	.722414
Education						
Up to Lower secondary education	1.099737	.0125347	8.34	0.000	1.075441	1.124581
Upper secondary to Post-secondary education <2 years	1	(base)				
Post-secondary ≥2 years to Tertiary education	.8818745	.0126065	-8.79	0.000	.8575092	.9069322
No_5p_rank	1.005333	.0023074	2.32	0.020	1.00082	1.009865
_cons	.0892719	.008861	-24.34	0.000	.0734895	.1084437

Note: _cons estimates baseline odds.

Diabetes and tooth loss

Figure A9. Prevalence of tooth loss (2010-2020) in T1D and matched controls without diabetes, females and males by age category.



Poisson regression model T1D versus matched controls without diabetes (outcome: tooth loss)

```
Poisson regression                              Number of obs =    86,273
                                                LR chi2(16)   = 22796.97
                                                Prob > chi2   =   0.0000
Log likelihood = -108311.34                     Pseudo R2     =   0.0952

------------------------------------------------------------------------------------------------------------------
                                    total_ex_any |        IRR   Std. err.       z    P>|z|     [95% conf. interval]
-------------------------------------------------+----------------------------------------------------------------
                                          cohort |
                                           18-29 |          1  (base)
                                           30-39 |    1.26139   .0270857    10.81   0.000     1.209404     1.31561
                                           40-49 |   1.602032   .0306066    24.67   0.000     1.543153     1.663157
                                           50-59 |   2.240376   .0414724    43.58   0.000     2.160549     2.323153
                                           60-69 |   2.379442   .0455687    45.26   0.000     2.291784     2.470452
                                             ≥70 |   2.266803   .0511388    36.28   0.000     2.168756     2.369282
                                                 |
                                           Group |
                                      No Diabetes |          1  (base)
                                  Type 1 Diabetes |   1.516422   .0325377    19.40   0.000     1.453972     1.581555
                                                 |
                                     cohort#Group |
                          30-39#Type 1 Diabetes  |   .9399376   .0305802    -1.90   0.057     .8818725     1.001826
                          40-49#Type 1 Diabetes  |   .9119992   .0263441    -3.19   0.001     .8618002     .9651222
                          50-59#Type 1 Diabetes  |   .7462661   .0213745   -10.22   0.000      .705527     .7893577
                          60-69#Type 1 Diabetes  |   .7936694   .0232492    -7.89   0.000     .7493852     .8405706
                            ≥70#Type 1 Diabetes  |   .7563702   .0271983    -7.77   0.000     .7048976     .8116015
                                                 |
                                            Kon  |
                                           Male  |          1  (base)
                                         Female  |     .96253    .008354    -4.40   0.000      .946295     .9790435
                                                 |
                                      Education  |
                        Up to Lower secondary education  |   1.28227   .0142967    22.30   0.000     1.254553      1.3106
Upper secondary to Post-secondary education <2 years  |          1  (base)
       Post-secondary ≥2 years to Tertiary education  |    .673014   .0075058   -35.51   0.000     .6584625     .6878871
                                                 |
                                     maximum_AT  |   .9495241   .0005248   -93.71   0.000      .948496     .9505533
                                      No_5p_rank |   1.048622   .0019705    25.27   0.000     1.044767     1.052491
                                           _cons |   .2125596    .004399   -74.83   0.000     .2041103     .2213586
                                ln(years_followup) |          1  (exposure)
------------------------------------------------------------------------------------------------------------------
Note: _cons estimates baseline incidence rate.
```

Multinomial logistic regression model T1D versus matched controls without diabetes (outcome: tooth loss, categorical - no extraction, 1-4 extractions, ≥5 extractions)

```
Multinomial logistic regression                 Number of obs =   86,273
                                                LR chi2(34)   = 10382.74
                                                Prob > chi2   =   0.0000
Log likelihood = -55087.187                     Pseudo R2     =   0.0861
```

ex	RRR	Std. err.	z	P>|z|	[95% conf. interval]	
0	(base outcome)					
1						
cohort						
18-29	1	(base)				
30-39	1.301534	.0422248	8.12	0.000	1.221351	1.386981
40-49	1.671736	.050689	16.95	0.000	1.575282	1.774096
50-59	2.266928	.0711586	26.07	0.000	2.131664	2.410776
60-69	2.649696	.0890743	28.99	0.000	2.480741	2.830159
≥70	2.500326	.1094496	20.94	0.000	2.294753	2.724314
Group						
No Diabetes	1	(base)				
Type 1 Diabetes	1.3219	.0453647	8.13	0.000	1.235911	1.413872
cohort#Group						
30-39#Type 1 Diabetes	1.05507	.0560363	1.01	0.313	.9507645	1.17082
40-49#Type 1 Diabetes	.9453756	.0473404	-1.12	0.262	.856998	1.042867
50-59#Type 1 Diabetes	.8588963	.0449838	-2.90	0.004	.775104	.9517471
60-69#Type 1 Diabetes	.884129	.0495536	-2.20	0.028	.7921502	.9867876
≥70#Type 1 Diabetes	.7268355	.053996	-4.29	0.000	.6283492	.8407583
Kon						
Male	1	(base)				
Female	1.03078	.0166276	1.88	0.060	.9987001	1.06389
Education						
Up to Lower secondary education	1.209385	.0289868	7.93	0.000	1.153886	1.267554
Upper secondary to Post-secondary education <2 years	1	(base)				
Post-secondary ≥2 years to Tertiary education	.6775641	.0124952	-21.11	0.000	.6535112	.7025022
maximum_AT	.9705566	.0013878	-20.90	0.000	.9678404	.9732804
No_5p_rank	1.051587	.004375	12.09	0.000	1.043047	1.060197
years_followup	1.160388	.0027748	62.21	0.000	1.154962	1.16584
_cons	.1990989	.0092145	-34.87	0.000	.1818337	.2180034
2						
cohort						
18-29	1	(base)				
30-39	2.547523	.4383782	5.43	0.000	1.818207	3.569382
40-49	4.469039	.6815012	9.82	0.000	3.314447	6.025834
50-59	9.077092	1.326862	15.09	0.000	6.81586	12.08851
60-69	9.303989	1.377228	15.07	0.000	6.960968	12.43566
≥70	9.197442	1.434235	14.23	0.000	6.775354	12.48539
Group						
No Diabetes	1	(base)				
Type 1 Diabetes	3.482451	.5878178	7.39	0.000	2.501538	4.848004
cohort#Group						
30-39#Type 1 Diabetes	.6289339	.1438846	-2.03	0.043	.4016715	.9847794
40-49#Type 1 Diabetes	.6201846	.1237597	-2.39	0.017	.4194316	.9170243
50-59#Type 1 Diabetes	.4203357	.0813704	-4.48	0.000	.2876186	.6142931
60-69#Type 1 Diabetes	.4214018	.0827304	-4.40	0.000	.286805	.6191644
≥70#Type 1 Diabetes	.3115711	.0666433	-5.45	0.000	.2048754	.4738322
Kon						
Male	1	(base)				
Female	.8638233	.0413851	-3.06	0.002	.7864018	.948867
Education						
Up to Lower secondary education	1.670877	.0937169	9.15	0.000	1.496931	1.865035
Upper secondary to Post-secondary education <2 years	1	(base)				
Post-secondary ≥2 years to Tertiary education	.4326162	.030539	-11.87	0.000	.376717	.4968101
maximum_AT	.9040575	.0024005	-37.99	0.000	.8993648	.9087747
No_5p_rank	1.086892	.0106627	8.49	0.000	1.066193	1.107993
years_followup	1.169838	.0084214	21.79	0.000	1.153448	1.186461
_cons	.0236564	.003619	-24.47	0.000	.0175278	.0319277

Note: _cons estimates baseline relative risk for each outcome.

Figure A10. Estimated annual incidence rate of tooth loss (based on Poisson regression, stratified by gender) and probability estimates for tooth loss (based on multinomial logistic regression, stratified by gender) in T1D and controls without diabetes, females and males by age category.

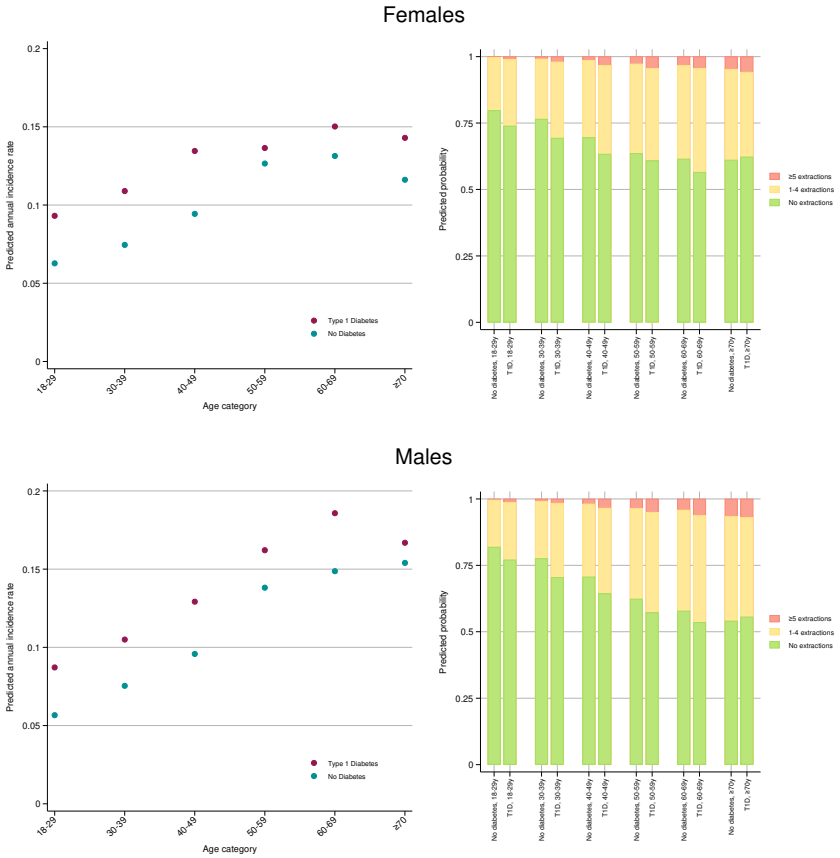
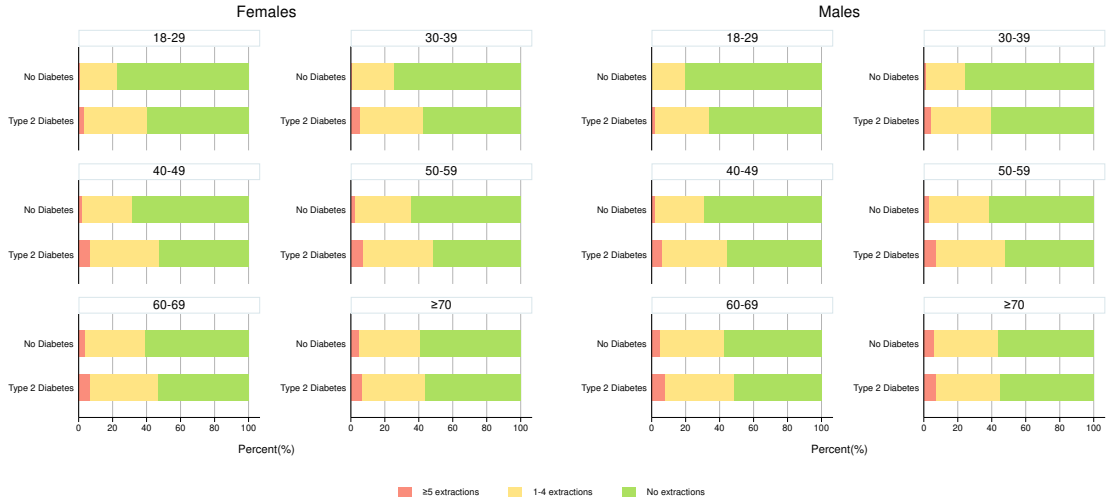


Figure A11. Prevalence of tooth loss (2010-2020) in T2D and matched controls without diabetes, females and males by age category.



Poisson regression model T2D versus matched controls without diabetes (outcome: tooth loss)

```
Poisson regression                              Number of obs =   786,305
                                                LR chi2(16)   = 195753.70
                                                Prob > chi2   =    0.0000
Log likelihood = -1321387.9                     Pseudo R2     =    0.0690

------------------------------------------------------------------------------
                     total_ex_any |        IRR   Std. err.      z    P>|z|     [95% conf. interval]
----------------------------------+-------------------------------------------------------------------
                           cohort |
                            18-29 |          1  (base)
                            30-39 |   1.167662   .0221978     8.15   0.000     1.124955    1.211989
                            40-49 |   1.485801   .0257138    22.88   0.000     1.436248    1.537063
                            50-59 |   1.969596   .0333798    40.00   0.000     1.905248    2.036118
                            60-69 |   2.262443   .0381273    48.45   0.000     2.188935    2.338419
                              ≥70 |   2.221351    .037609    47.14   0.000     2.148848      2.2963
                                  |
                            Group |
                        No Diabetes |          1  (base)
                    Type 2 Diabetes |   2.268554   .0545928    34.04   0.000     2.164038    2.378117
                                  |
                     cohort#Group |
          30-39#Type 2 Diabetes |   1.079502   .0295356     2.80   0.005     1.023138    1.138971
          40-49#Type 2 Diabetes |   .8986358   .0224803    -4.27   0.000     .8556379    .9437944
          50-59#Type 2 Diabetes |   .6866333   .0168448   -15.32   0.000     .6543992    .7204551
          60-69#Type 2 Diabetes |   .5554402   .0135447   -24.11   0.000     .5295175     .582632
            ≥70#Type 2 Diabetes |   .4888739   .0119711   -29.23   0.000     .4659651    .5129091
                                  |
                             Kon |
                            Male |          1  (base)
                          Female |     .89955   .0021068   -45.20   0.000     .8954303    .9036887
                                  |
                       Education |
          Up to Lower secondary education |   1.091425   .0028975    32.95   0.000     1.085761    1.097119
Upper secondary to Post-secondary education <2 years |          1  (base)
 Post-secondary ≥2 years to Tertiary education |   .8248373   .0027077   -58.66   0.000     .8195474    .8301613
                                  |
                       maximum_AT |   .9534952   .0001343  -338.10   0.000      .953232    .9537585
                        No_5p_rank |   1.031566    .000526    60.95   0.000     1.030535    1.032597
                             _cons |   .2218592   .0037908   -88.12   0.000     .2145523    .2294149
                  ln(years_followup) |          1  (exposure)
------------------------------------------------------------------------------
Note: _cons estimates baseline incidence rate.
```

Multinomial logistic regression model T2D versus matched controls without diabetes (outcome: tooth loss, categorical - no extraction, 1-4 extractions, ≥5 extractions)

```
Multinomial logistic regression                 Number of obs =   786,305
                                                LR chi2(34)   = 103807.63
                                                Prob > chi2   =    0.0000
Log likelihood = -594097.74                     Pseudo R2     =    0.0803
```

ex	RRR	Std. err.	z	P>|z|	[95% conf.	interval]
0	(base outcome)					
1						
cohort						
18-29	1	(base)				
30-39	1.245118	.036196	7.54	0.000	1.176158	1.318121
40-49	1.56397	.0415777	16.82	0.000	1.484566	1.647622
50-59	2.040037	.0531182	27.38	0.000	1.938539	2.146849
60-69	2.482914	.0642487	35.15	0.000	2.360129	2.612087
≥70	2.518754	.0659597	35.28	0.000	2.392737	2.651408
Group						
No Diabetes	1	(base)				
Type 2 Diabetes	2.242427	.0965605	18.75	0.000	2.060938	2.439898
cohort#Group						
30-39#Type 2 Diabetes	.9435305	.0470504	-1.17	0.244	.8556767	1.040404
40-49#Type 2 Diabetes	.8059612	.0366247	-4.75	0.000	.737282	.881038
50-59#Type 2 Diabetes	.6569772	.0291958	-9.45	0.000	.6021757	.7167659
60-69#Type 2 Diabetes	.54013	.0238036	-13.98	0.000	.495434	.5888584
≥70#Type 2 Diabetes	.4657739	.0206617	-17.22	0.000	.4269881	.5080828
Kon						
Male	1	(base)				
Female	.9333044	.0047563	-13.54	0.000	.9240286	.9426733
Education						
Up to Lower secondary education	1.055868	.0065147	8.81	0.000	1.043176	1.068714
Upper secondary to Post-secondary education <2 years	1	(base)				
Post-secondary ≥2 years to Tertiary education	.8275829	.0053284	-29.39	0.000	.8172051	.8380925
maximum_AT	.9771219	.0003803	-59.46	0.000	.9763768	.9778676
No_5p_rank	1.023342	.0013389	17.64	0.000	1.020722	1.02597
years_followup	1.186804	.000855	237.72	0.000	1.18513	1.188481
_cons	.1658509	.0046024	-64.74	0.000	.1570713	.1751212
2						
cohort						
18-29	1	(base)				
30-39	1.443491	.2028295	2.61	0.009	1.095996	1.901162
40-49	2.805293	.3595741	8.05	0.000	2.182096	3.606473
50-59	5.101211	.6441001	12.91	0.000	3.982878	6.533555
60-69	6.765135	.8512576	15.19	0.000	5.286518	8.657316
≥70	6.384472	.8044898	14.71	0.000	4.987322	8.17302
Group						
No Diabetes	1	(base)				
Type 2 Diabetes	5.224025	.8305096	10.40	0.000	3.825447	7.133921
cohort#Group						
30-39#Type 2 Diabetes	1.269003	.225058	1.34	0.179	.8964004	1.796485
40-49#Type 2 Diabetes	.8353278	.1361947	-1.10	0.270	.6068398	1.149846
50-59#Type 2 Diabetes	.4850014	.0779466	-4.50	0.000	.3539507	.6645737
60-69#Type 2 Diabetes	.3214676	.0514615	-7.09	0.000	.2348953	.4399468
≥70#Type 2 Diabetes	.2349253	.0376644	-9.03	0.000	.1715776	.3216613
Kon						
Male	1	(base)				
Female	.8122571	.0092595	-18.24	0.000	.7943101	.8306096
Education						
Up to Lower secondary education	1.199257	.0150163	14.51	0.000	1.170183	1.229052
Upper secondary to Post-secondary education <2 years	1	(base)				
Post-secondary ≥2 years to Tertiary education	.6166008	.0106884	-27.89	0.000	.5960038	.6379095
maximum_AT	.9130944	.0005956	-139.38	0.000	.9119279	.9142625
No_5p_rank	1.060133	.0025078	24.69	0.000	1.055229	1.06506
years_followup	1.216426	.0020701	115.12	0.000	1.212375	1.22049
_cons	.0259885	.0032903	-28.83	0.000	.0202775	.0333079

Note: _cons estimates baseline relative risk for each outcome.

Figure A12. Estimated annual incidence rate of tooth loss (based on Poisson regression, stratified by gender) and probability estimates for tooth loss (based on multinomial logistic regression, stratified by gender) in T2D and controls without diabetes, females and males by age category.

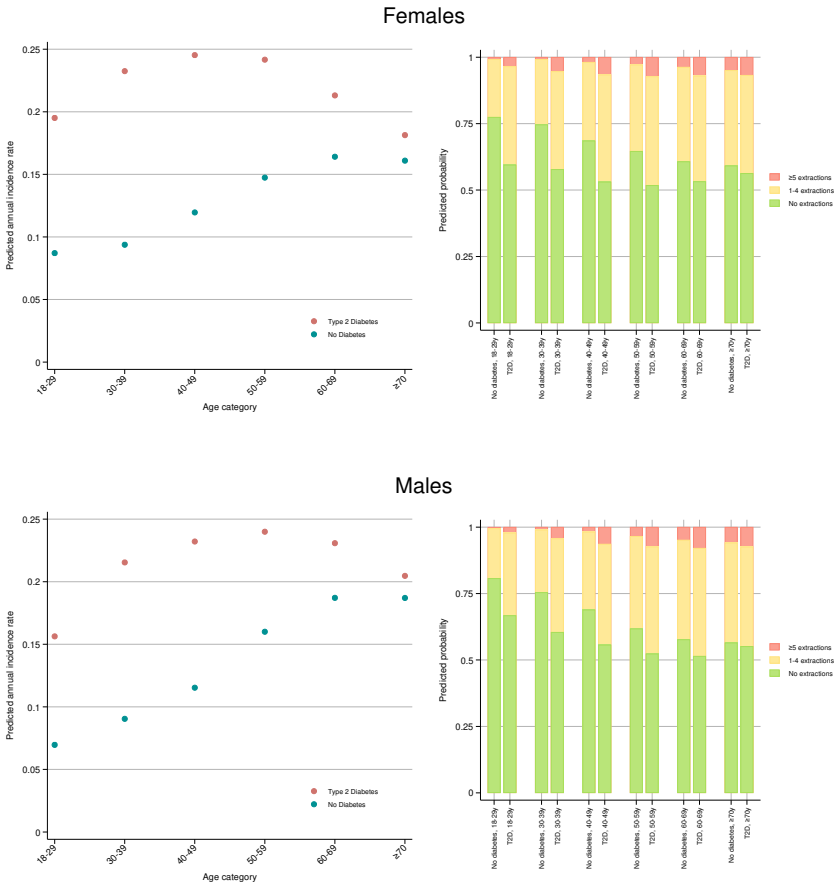
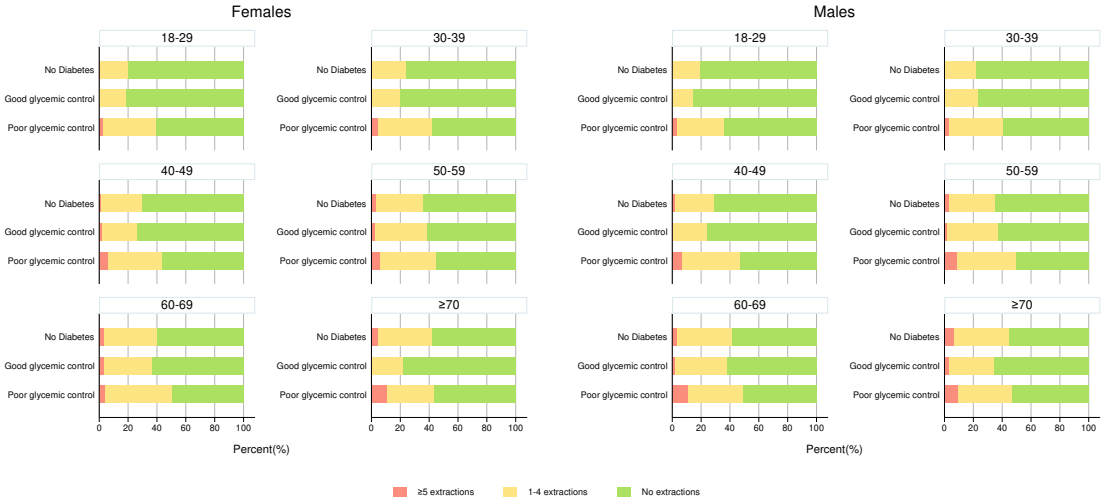


Figure A13. Prevalence of tooth loss (2010-2020) in T1D with good/poor glycemic control and matched controls without diabetes, females and males by age category.



Poisson regression model T1D with good/poor glycemic control versus matched controls without diabetes (outcome: tooth loss)

```
Poisson regression                              Number of obs =  25,683
                                                LR chi2(22)   = 8178.69
                                                Prob > chi2   =  0.0000
Log likelihood = -34021.236                     Pseudo R2     =  0.1073

------------------------------------------------------------------------------------------------------------------
                                   total_ex_any |        IRR   Std. err.      z    P>|z|     [95% conf. interval]
------------------------------------------------+-----------------------------------------------------------------
                                         cohort |
                                          18-29 |          1  (base)
                                          30-39 |   1.214734   .0474491     4.98   0.000     1.125206    1.311385
                                          40-49 |   1.597012   .0548706    13.63   0.000     1.493009     1.70826
                                          50-59 |    2.14045   .0733573    22.21   0.000     2.001395    2.289166
                                          60-69 |   2.453886   .0878675    25.07   0.000     2.287573     2.63229
                                            ≥70 |   2.223956   .1035115    17.17   0.000     2.030056    2.436376
                                                |
                                Diabetes_Control |
                                    No Diabetes |          1  (base)
                           Good glycemic control |   .8175985   .0748869    -2.20   0.028     .6832434    .9783737
                           Poor glycemic control |   2.510705   .0917036    25.20   0.000     2.337252    2.697031
                                                |
                         cohort#Diabetes_Control |
                30-39#Good glycemic control    |   1.053379   .1406832     0.39   0.697     .8107801    1.368567
                30-39#Poor glycemic control    |   .9130371   .0501537    -1.66   0.098     .8198443    1.016823
                40-49#Good glycemic control    |   .8761499   .1151447    -1.01   0.314      .677193     1.13356
                40-49#Poor glycemic control    |   .7828119   .0377901    -5.07   0.000     .7121408    .8604962
                50-59#Good glycemic control    |   1.123144   .1337226     0.98   0.329     .8893867     1.41834
                50-59#Poor glycemic control    |   .5775416   .0285144   -11.12   0.000     .5242733    .6362223
                60-69#Good glycemic control    |    1.07822   .1308024     0.62   0.535     .8500518    1.367633
                60-69#Poor glycemic control    |   .5355006   .0282457   -11.84   0.000     .4829056     .593824
                  ≥70#Good glycemic control    |   1.212922   .2485858     0.94   0.346     .8116723    1.812528
                  ≥70#Poor glycemic control    |   .4888312   .0331556   -10.55   0.000     .4279815    .5583323
                                                |
                                            Kon |
                                           Male |          1  (base)
                                         Female |   .9758769   .0147643    -1.61   0.107     .9473642    1.005248
                                                |
                                      Education |
                        Up to Lower secondary education |   1.259997    .024233    12.02   0.000     1.213385    1.308399
Upper secondary to Post-secondary education <2 years |          1  (base)
       Post-secondary ≥2 years to Tertiary education |    .672721   .0136437   -19.55   0.000     .6465043    .7000007
                                                |
                                     maximum_AT |   .9521084   .0009116   -51.26   0.000     .9503234    .9538968
                                     No_5p_rank |   1.040695   .0032134    12.92   0.000     1.034416    1.047012
                                          _cons |   .1984573   .0073211   -43.84   0.000     .1846146    .2133379
                                ln(years_followup) |          1  (exposure)
------------------------------------------------------------------------------------------------------------------
Note: _cons estimates baseline incidence rate.
```

Multinomial logistic regression model T1D with good/poor glycemic control versus matched controls without diabetes (outcome: tooth loss, categorical - no extraction, 1-4 extractions, ≥5 extractions)

```
Multinomial logistic regression                 Number of obs =  25,683
                                                LR chi2(46)   = 3479.58
                                                Prob > chi2   =  0.0000
Log likelihood = -16840.474                     Pseudo R2     =  0.0936
```

ex	RRR	Std. err.	z	P>|z|	[95% conf.	interval]
0	(base outcome)					
1						
cohort						
18-29	1	(base)				
30-39	1.266244	.0738468	4.05	0.000	1.129472	1.419577
40-49	1.575817	.0853031	8.40	0.000	1.417189	1.752199
50-59	2.006312	.1161044	12.03	0.000	1.791182	2.24728
60-69	2.609146	.1655708	15.11	0.000	2.304003	2.954703
≥70	2.557975	.2350858	10.22	0.000	2.136329	3.06284
Diabetes_Control						
No Diabetes	1	(base)				
Good glycemic control	.8492123	.10621	-1.31	0.191	.6645956	1.085113
Poor glycemic control	2.172536	.1407825	11.97	0.000	1.913411	2.466753
cohort#Diabetes_Control						
30-39#Good glycemic control	1.166842	.2159403	0.83	0.404	.8118675	1.677021
30-39#Poor glycemic control	.9815739	.0980355	-0.19	0.852	.807065	1.193816
40-49#Good glycemic control	.9688348	.183778	-0.17	0.867	.668014	1.405122
40-49#Poor glycemic control	.8090039	.0751418	-2.28	0.022	.6743562	.9705365
50-59#Good glycemic control	1.380647	.2604817	1.71	0.087	.9538707	1.998369
50-59#Poor glycemic control	.6673799	.0664819	-4.06	0.000	.5490092	.8112722
60-69#Good glycemic control	1.04791	.2072231	0.24	0.813	.7112131	1.544003
60-69#Poor glycemic control	.5954403	.0664688	-4.64	0.000	.4784305	.7410671
≥70#Good glycemic control	.8768436	.3240015	-0.36	0.722	.4250065	1.809042
≥70#Poor glycemic control	.3998611	.0622367	-5.89	0.000	.2947292	.5424942
Kon						
Male	1	(base)				
Female	1.044006	.0306951	1.46	0.143	.9855457	1.105935
Education						
Up to Lower secondary education	1.187827	.0513745	3.98	0.000	1.091284	1.29291
Upper secondary to Post-secondary education <2 years	1	(base)				
Post-secondary ≥2 years to Tertiary education	.6807665	.0233056	-11.23	0.000	.6365872	.728012
maximum_AT	.9714477	.0025184	-11.17	0.000	.9665243	.9763962
No_5p_rank	1.046308	.0075347	6.29	0.000	1.031644	1.06118
years_followup	1.160549	.0050675	34.10	0.000	1.150659	1.170524
_cons	.200077	.0168114	-19.15	0.000	.1696974	.2358952
2						
cohort						
18-29	1	(base)				
30-39	2.346646	.7920318	2.53	0.011	1.211024	4.54718
40-49	5.200822	1.509589	5.68	0.000	2.944438	9.186319
50-59	10.25389	2.901789	8.23	0.000	5.888489	17.85557
60-69	10.35553	3.008838	8.05	0.000	5.859391	18.30173
≥70	10.51542	3.338251	7.41	0.000	5.644197	19.59076
Diabetes_Control						
No Diabetes	1	(base)				
Good glycemic control	1.17e-06	.0009043	-0.02	0.986	0	.
Poor glycemic control	10.97976	3.235812	8.13	0.000	6.162233	19.56356
cohort#Diabetes_Control						
30-39#Good glycemic control	769379.4	5.96e+08	0.02	0.986	0	.
30-39#Poor glycemic control	.6057881	.2388404	-1.27	0.204	.2797195	1.311954
40-49#Good glycemic control	506603.7	3.92e+08	0.02	0.986	0	.
40-49#Poor glycemic control	.3792475	.1288195	-2.85	0.004	.1948919	.7379917
50-59#Good glycemic control	625201.2	4.84e+08	0.02	0.986	0	.
50-59#Poor glycemic control	.202724	.0681051	-4.75	0.000	.1049408	.3916211
60-69#Good glycemic control	646829.2	5.01e+08	0.02	0.986	0	.
60-69#Poor glycemic control	.1821069	.0640142	-4.85	0.000	.0914349	.3626942
≥70#Good glycemic control	480722.2	3.72e+08	0.02	0.987	0	.
≥70#Poor glycemic control	.1564079	.060838	-4.77	0.000	.0729738	.3352361
Kon						
Male	1	(base)				
Female	.8564325	.0695117	-1.91	0.056	.7304762	1.004108
Education						
Up to Lower secondary education	1.634085	.1547012	5.19	0.000	1.357345	1.967248
Upper secondary to Post-secondary education <2 years	1	(base)				
Post-secondary ≥2 years to Tertiary education	.3979255	.0511511	-7.17	0.000	.3093033	.5119398
maximum_AT	.9108848	.0042162	-20.17	0.000	.9026585	.9191861
No_5p_rank	1.072559	.0169635	4.43	0.000	1.039821	1.106327
years_followup	1.171413	.0144879	12.79	0.000	1.143358	1.200155
_cons	.017953	.0052453	-13.76	0.000	.0101261	.0318297

```
------------------------------------------------------------------------------------------------------------------------
Note: _cons estimates baseline relative risk for each outcome.
```

Figure A14. Probability estimates for tooth loss (based on multinomial logistic regression) in T1D with good/poor glycemic control and matched controls without diabetes, by age category.

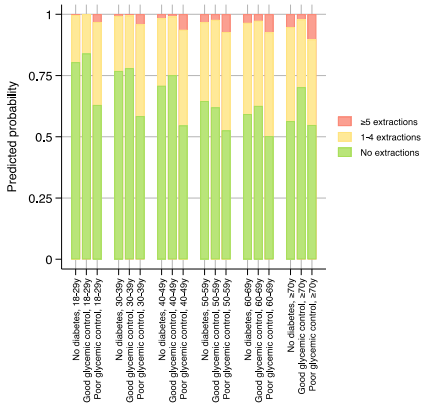


Figure A15. Estimated annual incidence rate of tooth loss (based on Poisson regression, stratified by gender) in T1D with good/poor glycemic control and matched controls without diabetes, females and males by age category.

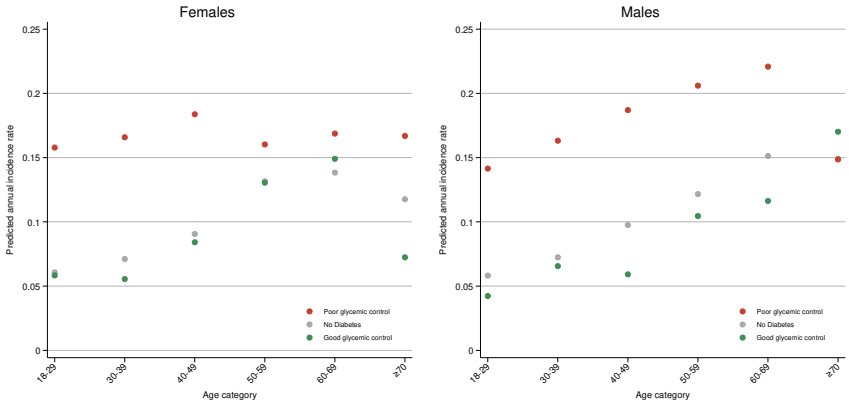
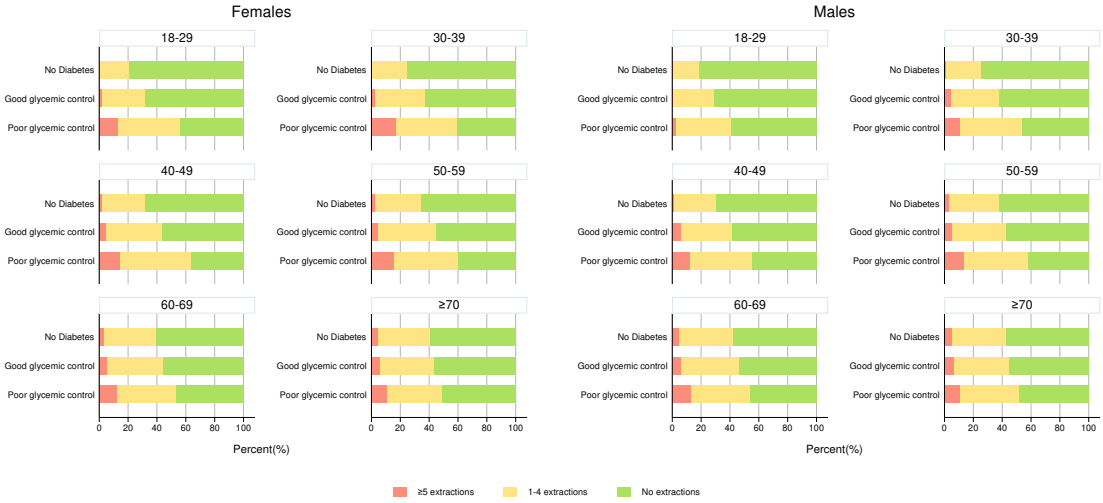


Figure A16. Prevalence of tooth loss (2010-2020) in T2D with good/poor glycemic control and matched controls without diabetes, females and males by age category.



Poisson regression model T2D with good/poor glycemic control versus matched controls without diabetes (outcome: tooth loss)

```
Poisson regression                              Number of obs =  167,362
                                                LR chi2(22)   = 46014.65
                                                Prob > chi2   =   0.0000
Log likelihood = -281481.23                     Pseudo R2     =   0.0756

------------------------------------------------------------------------------------------------------------------
                                  total_ex_any |        IRR   Std. err.      z    P>|z|     [95% conf. interval]
-----------------------------------------------+------------------------------------------------------------------
                                        cohort |
                                         18-29 |          1  (base)
                                         30-39 |   1.309136   .076325     4.62   0.000     1.167773    1.467613
                                         40-49 |    1.65734   .0900619    9.30   0.000     1.489897    1.843601
                                         50-59 |   2.200899   .1180298   14.71   0.000     1.981307    2.444828
                                         60-69 |   2.639027   .1410083   18.16   0.000     2.376635    2.930388
                                           ≥70 |   2.554277   .1369385   17.49   0.000     2.299502    2.837279
                                               |
                                Diabetes_Control |
                                    No Diabetes |          1  (base)
                                Good glycemic control |   1.775797   .1660569    6.14   0.000     1.478415    2.132996
                                Poor glycemic control |   4.112478   .3335796   17.43   0.000     3.507997    4.821121
                                               |
                             cohort#Diabetes_Control |
                  30-39#Good glycemic control |   1.043508   .1061688    0.42   0.676     .8548555    1.273793
                  30-39#Poor glycemic control |   1.136255   .1013559    1.43   0.152     .9539972    1.353332
                  40-49#Good glycemic control |   .9541886   .0910499   -0.49   0.623     .7914281    1.150421
                  40-49#Poor glycemic control |   .8999251   .0748191   -1.27   0.205     .7646067    1.059192
                  50-59#Good glycemic control |   .7290541   .0687531   -3.35   0.001     .6060209    .8770651
                  50-59#Poor glycemic control |   .6092117   .0501004   -6.03   0.000     .5185219    .7157632
                  60-69#Good glycemic control |    .598434   .0562053   -5.47   0.000     .4978183    .7193855
                  60-69#Poor glycemic control |   .3976949   .0326706  -11.22   0.000     .3385509    .4671712
                    ≥70#Good glycemic control |   .5563044   .0523649   -6.23   0.000     .4625822    .6690154
                    ≥70#Poor glycemic control |   .3156598    .026092  -13.95   0.000      .268448    .3711748
                                               |
                                           Kon |
                                          Male |          1  (base)
                                        Female |   .8919428   .0044515  -22.91   0.000     .8832606    .9007104
                                               |
                                     Education |
                        Up to Lower secondary education |   1.077024   .0060828   13.14   0.000     1.065168    1.089012
Upper secondary to Post-secondary education <2 years |          1  (base)
       Post-secondary ≥2 years to Tertiary education |   .8427826   .0059322  -24.30   0.000     .8312355    .8544901
                                               |
                                    maximum_AT |   .9544066   .0002876 -154.88   0.000     .9538431    .9549704
                                    No_5p_rank |   1.035262   .0010944   32.78   0.000      1.03312    1.037409
                                         _cons |   .1891663   .0101728  -30.96   0.000     .1702428    .2101932
                                ln(years_followup) |          1  (exposure)
------------------------------------------------------------------------------------------------------------------
Note: _cons estimates baseline incidence rate.
```

Multinomial logistic regression model T2D with good/poor glycemic control versus matched controls without diabetes (outcome: tooth loss, categorical - no extraction, 1-4 extractions, ≥5 extractions)

```
Multinomial logistic regression                 Number of obs =  167,362
                                                LR chi2(46)   = 24109.49
                                                Prob > chi2   =   0.0000
Log likelihood = -126462.81                     Pseudo R2     =   0.0870
```

ex	RRR	Std. err.	z	P>|z|	[95% conf.	interval]
0	(base outcome)					
1						
cohort						
18-29	1	(base)				
30-39	1.460426	.128547	4.30	0.000	1.229013	1.735411
40-49	1.749323	.1436888	6.81	0.000	1.489199	2.054884
50-59	2.319812	.1877886	10.40	0.000	1.979467	2.718677
60-69	2.869114	.2312241	13.08	0.000	2.449902	3.360058
≥70	2.89644	.235315	13.09	0.000	2.470077	3.396398
Diabetes_Control						
No Diabetes	1	(base)				
Good glycemic control	1.942406	.3026937	4.26	0.000	1.431178	2.63625
Poor glycemic control	3.685406	.6321375	7.60	0.000	2.633198	5.158071
cohort#Diabetes_Control						
30-39#Good glycemic control	.8490337	.1468017	-0.95	0.344	.6049903	1.19152
30-39#Poor glycemic control	.9271084	.1831143	-0.38	0.702	.6295188	1.365376
40-49#Good glycemic control	.8055841	.1294998	-1.34	0.179	.5878655	1.103936
40-49#Poor glycemic control	.8471019	.1516159	-0.93	0.354	.5964664	1.203055
50-59#Good glycemic control	.6644168	.1050324	-2.59	0.010	.4873948	.9057332
50-59#Poor glycemic control	.5909294	.1041304	-2.99	0.003	.4183515	.8346988
60-69#Good glycemic control	.5592127	.0878569	-3.70	0.000	.4110042	.7608653
60-69#Poor glycemic control	.3777197	.0663496	-5.54	0.000	.2677004	.5329546
≥70#Good glycemic control	.5173066	.0816275	-4.18	0.000	.3796943	.7047936
≥70#Poor glycemic control	.3301097	.0583363	-6.27	0.000	.2334725	.4667463
Kon						
Male	1	(base)				
Female	.9386101	.0103329	-5.75	0.000	.9185749	.9590823
Education						
Up to Lower secondary education	1.047035	.0139158	3.46	0.001	1.020112	1.074667
Upper secondary to Post-secondary education <2 years	1	(base)				
Post-secondary ≥2 years to Tertiary education	.8231902	.0115203	-13.90	0.000	.8009176	.8460822
maximum_AT	.9758209	.0008217	-29.07	0.000	.9742118	.9774327
No_5p_rank	1.02764	.0028959	9.68	0.000	1.02198	1.033332
years_followup	1.193758	.0018672	113.23	0.000	1.190104	1.197423
_cons	.1429248	.0119464	-23.27	0.000	.1213276	.1683664
2						
cohort						
18-29	1	(base)				
30-39	1.175118	.4214759	0.45	0.653	.5818133	2.373446
40-49	1.988471	.6516826	2.10	0.036	1.046055	3.779932
50-59	3.655348	1.180903	4.01	0.000	1.940609	6.885245
60-69	5.295101	1.70495	5.18	0.000	2.817079	9.952896
≥70	4.903662	1.581848	4.93	0.000	2.605768	9.227952
Diabetes_Control						
No Diabetes	1	(base)				
Good glycemic control	1.757159	1.060454	0.93	0.350	.5384023	5.734761
Poor glycemic control	12.68289	5.428544	5.93	0.000	5.481327	29.3461
cohort#Diabetes_Control						
30-39#Good glycemic control	2.312016	1.491553	1.30	0.194	.6529116	8.187045
30-39#Poor glycemic control	1.875612	.8921567	1.32	0.186	.7383445	4.764606
40-49#Good glycemic control	2.092873	1.279347	1.21	0.227	.6315588	6.935406
40-49#Poor glycemic control	1.030948	.4521737	0.07	0.945	.436415	2.435419
50-59#Good glycemic control	.9856135	.5979369	-0.02	0.981	.3001323	3.236686
50-59#Poor glycemic control	.4908538	.212539	-1.64	0.100	.2100793	1.146888
60-69#Good glycemic control	.6920849	.4187056	-0.61	0.543	.2114412	2.265318
60-69#Poor glycemic control	.2136246	.0923163	-3.57	0.000	.0915821	.4983011
≥70#Good glycemic control	.6083179	.3683955	-0.82	0.412	.1856289	1.993498
≥70#Poor glycemic control	.1418421	.0615486	-4.50	0.000	.0605967	.3320178
Kon						
Male	1	(base)				
Female	.7940541	.0193155	-9.48	0.000	.7570848	.8328287
Education						
Up to Lower secondary education	1.191304	.0318404	6.55	0.000	1.130505	1.255374
Upper secondary to Post-secondary education <2 years	1	(base)				
Post-secondary ≥2 years to Tertiary education	.65336	.0239938	-11.59	0.000	.6079856	.7021207
maximum_AT	.9123714	.0012799	-65.37	0.000	.9098662	.9148835
No_5p_rank	1.071333	.0052444	14.08	0.000	1.061104	1.081662
years_followup	1.225355	.0045031	55.30	0.000	1.216561	1.234213
_cons	.0327817	.0106056	-10.56	0.000	.0173879	.0618037

```
------------------------------------------------------------------------------------------------------------------------
Note: _cons estimates baseline relative risk for each outcome.
```

Figure A17. Probability estimates for tooth loss (based on multinomial logistic regression, stratified by gender) in T2D with good/poor glycemic control and matched controls without diabetes, by age category.

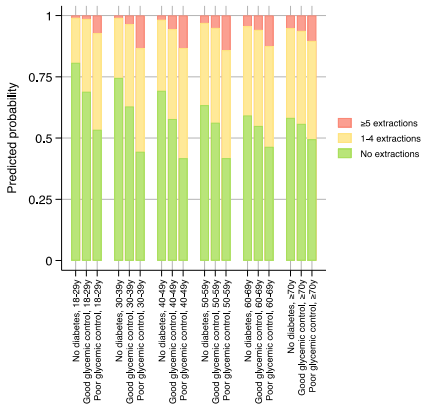
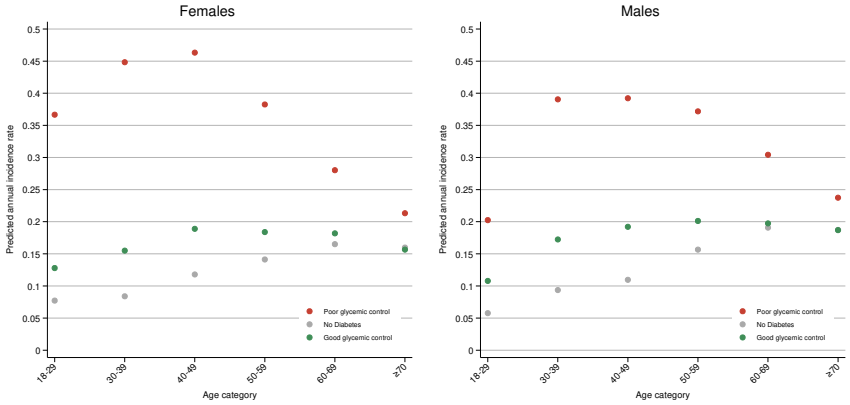


Figure A18. Estimated annual incidence rate of tooth loss (based on Poisson regression, stratified by gender) in T2D with good/poor glycemic control and matched controls without diabetes, females and males by age category.



Diabetes-related complications in T1D

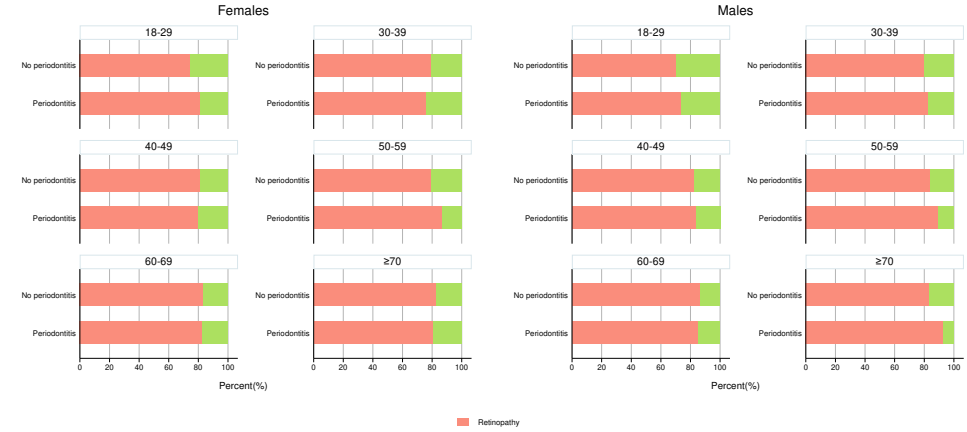
Table A13. Diabetes-related complications in individuals with Type 1 Diabetes (comparing periodontitis to no periodontitis).

		Retinopathy (2010-2020)			Albuminuria (2010-2020)			Ischemic heart disease (2010-2020)			Stroke (2010-2020)			Mortality (2010-2020)		
Age	Gender	No periodontitis	Periodontitis	Crude RR (95%CI)	No periodontitis	Periodontitis	Crude RR (95%CI)	No periodontitis	Periodontitis	Crude RR (95%CI)	No periodontitis	Periodontitis	Crude RR (95%CI)	No periodontitis	Periodontitis	Crude RR (95%CI)
18-29	Female	2 471 / 3 325 (74.3%)	148 / 181 (81.8%)	**1.10 (1.02, 1.18)**	584 / 3 328 (17.5%)	47 / 179 (26.3%)	**1.50 (1.16, 1.93)**	10 / 3 402 (0.3%)	1 / 183 (0.5%)	1.86 (0.24, 14.44)	15 / 3 402 (0.4%)	1 / 183 (0.5%)	1.24 (0.16, 9.33)	19 / 3 402 (0.6%)	2 / 183 (1.1%)	1.96 (0.46, 8.34)
	Male	2 871 / 4 093 (70.1%)	165 / 223 (74.0%)	1.05 (0.97, 1.14)	551 / 4 098 (13.4%)	44 / 224 (19.6%)	**1.46 (1.11, 1.93)**	12 / 4 192 (0.3%)	1 / 232 (0.4%)	1.51 (0.20, 11.53)	6 / 4 192 (0.1%)	2 / 232 (0.9%)	**6.02 (1.22, 29.68)**	48 / 4 192 (1.1%)	1 / 232 (0.4%)	0.38 (0.05, 2.72)
	Total	5 342 / 7 418 (72.0%)	313 / 404 (77.5%)	**1.08 (1.02, 1.14)**	1 135 / 7 426 (15.3%)	91 / 403 (22.6%)	**1.48 (1.22, 1.78)**	22 / 7 594 (0.3%)	2 / 415 (0.5%)	1.66 (0.39, 7.05)	21 / 7 594 (0.3%)	3 / 415 (0.7%)	2.61 (0.78, 8.73)	67 / 7 594 (0.9%)	3 / 415 (0.7%)	0.82 (0.26, 2.59)
30-39	Female	1 653 / 2 076 (79.6%)	134 / 176 (76.1%)	0.96 (0.88, 1.04)	441 / 2 074 (21.3%)	52 / 178 (29.2%)	**1.37 (1.08, 1.75)**	40 / 2 100 (1.9%)	6 / 181 (3.3%)	1.74 (0.75, 4.05)	25 / 2 100 (1.2%)	4 / 181 (2.2%)	1.86 (0.65, 5.28)	28 / 2 100 (1.3%)	3 / 181 (1.7%)	1.24 (0.38, 4.05)
	Male	1 958 / 2 452 (79.9%)	232 / 280 (82.9%)	1.04 (0.98, 1.10)	521 / 2 457 (21.2%)	80 / 281 (28.5%)	**1.34 (1.10, 1.64)**	42 / 2 495 (1.7%)	7 / 284 (2.5%)	1.46 (0.66, 3.23)	32 / 2 495 (1.3%)	4 / 284 (1.4%)	1.10 (0.39, 3.08)	35 / 2 495 (1.4%)	3 / 284 (1.1%)	0.75 (0.23, 2.43)
	Total	3 611 / 4 528 (79.7%)	366 / 456 (80.3%)	1.01 (0.96, 1.06)	962 / 4 531 (21.2%)	132 / 459 (28.8%)	**1.35 (1.16, 1.58)**	82 / 4 595 (1.8%)	13 / 465 (2.8%)	1.57 (0.88, 2.79)	57 / 4 595 (1.2%)	8 / 465 (1.7%)	1.39 (0.67, 2.89)	63 / 4 595 (1.4%)	6 / 465 (1.3%)	0.94 (0.41, 2.16)
40-49	Female	1 740 / 2 129 (81.7%)	251 / 313 (80.2%)	0.98 (0.93, 1.04)	576 / 2 130 (27.0%)	110 / 313 (35.1%)	**1.30 (1.10, 1.53)**	168 / 2 164 (7.8%)	24 / 314 (7.6%)	0.98 (0.65, 1.48)	55 / 2 164 (2.5%)	12 / 314 (3.8%)	1.50 (0.81, 2.78)	59 / 2 164 (2.7%)	8 / 314 (2.5%)	0.93 (0.45, 1.94)
	Male	2 195 / 2 649 (82.9%)	393 / 468 (84.0%)	1.01 (0.97, 1.06)	777 / 2 652 (29.3%)	166 / 470 (35.3%)	**1.21 (1.05, 1.38)**	177 / 2 691 (6.6%)	45 / 476 (9.5%)	**1.44 (1.05, 1.96)**	83 / 2 691 (3.1%)	16 / 476 (3.4%)	1.09 (0.64, 1.84)	104 / 2 691 (3.9%)	16 / 476 (3.4%)	0.87 (0.52, 1.46)
	Total	3 935 / 4 778 (82.4%)	644 / 781 (82.5%)	1.00 (0.97, 1.04)	1 353 / 4 782 (28.3%)	276 / 783 (35.2%)	**1.25 (1.12, 1.38)**	345 / 4 855 (7.1%)	69 / 790 (8.7%)	1.23 (0.96, 1.57)	138 / 4 855 (2.8%)	28 / 790 (3.5%)	1.25 (0.84, 1.86)	163 / 4 855 (3.4%)	24 / 790 (3.0%)	0.90 (0.59, 1.38)
50-59	Female	1 334 / 1 672 (79.8%)	307 / 352 (87.2%)	**1.09 (1.04, 1.15)**	546 / 1 669 (32.7%)	116 / 352 (33.0%)	1.01 (0.85, 1.19)	260 / 1 693 (15.4%)	49 / 357 (13.7%)	0.89 (0.67, 1.19)	74 / 1 693 (4.4%)	14 / 357 (3.9%)	0.90 (0.51, 1.57)	92 / 1 693 (5.4%)	23 / 357 (6.4%)	1.19 (0.76, 1.85)
	Male	1 642 / 1 941 (84.6%)	459 / 516 (89.0%)	**1.05 (1.01, 1.09)**	734 / 1 948 (37.7%)	224 / 518 (43.2%)	**1.15 (1.02, 1.29)**	370 / 1 980 (18.7%)	92 / 523 (17.6%)	0.94 (0.77, 1.16)	110 / 1 980 (5.6%)	29 / 523 (5.5%)	1.00 (0.67, 1.49)	159 / 1 980 (8.0%)	52 / 523 (9.9%)	1.24 (0.92, 1.67)
	Total	2 976 / 3 613 (82.4%)	766 / 868 (88.2%)	**1.07 (1.04, 1.10)**	1 280 / 3 617 (35.4%)	340 / 870 (39.1%)	**1.10 (1.01, 1.21)**	630 / 3 673 (17.2%)	141 / 880 (16.0%)	0.93 (0.79, 1.10)	184 / 3 673 (5.0%)	43 / 880 (4.9%)	0.98 (0.71, 1.35)	251 / 3 673 (6.8%)	75 / 880 (8.5%)	1.25 (0.97, 1.60)
60-69	Female	1 045 / 1 256 (83.2%)	237 / 286 (82.9%)	1.00 (0.94, 1.06)	469 / 1 266 (37.0%)	95 / 286 (33.2%)	0.90 (0.75, 1.07)	261 / 1 292 (20.2%)	48 / 289 (16.6%)	0.82 (0.62, 1.09)	73 / 1 292 (5.7%)	19 / 289 (6.6%)	1.16 (0.71, 1.90)	194 / 1 292 (15.0%)	42 / 289 (14.5%)	0.97 (0.71, 1.32)
	Male	1 228 / 1 412 (87.0%)	388 / 456 (85.1%)	0.98 (0.94, 1.02)	733 / 1 431 (51.2%)	219 / 462 (47.4%)	0.93 (0.83, 1.03)	433 / 1 456 (29.7%)	120 / 468 (25.6%)	0.86 (0.73, 1.03)	132 / 1 456 (9.1%)	40 / 468 (8.5%)	0.94 (0.67, 1.32)	272 / 1 456 (18.7%)	75 / 468 (16.0%)	0.86 (0.68, 1.08)
	Total	2 273 / 2 668 (85.2%)	625 / 742 (84.2%)	0.99 (0.95, 1.02)	1 202 / 2 697 (44.6%)	314 / 748 (42.0%)	0.94 (0.86, 1.03)	694 / 2 748 (25.3%)	168 / 757 (22.2%)	0.88 (0.76, 1.02)	205 / 2 748 (7.5%)	59 / 757 (7.8%)	1.04 (0.79, 1.38)	466 / 2 748 (17.0%)	117 / 757 (15.5%)	0.91 (0.76, 1.10)
≥70	Female	528 / 643 (82.1%)	102 / 127 (80.3%)	0.98 (0.89, 1.07)	319 / 658 (48.5%)	55 / 128 (43.0%)	0.89 (0.72, 1.10)	241 / 715 (33.7%)	42 / 131 (32.1%)	0.95 (0.73, 1.25)	103 / 715 (14.4%)	14 / 131 (10.7%)	0.74 (0.44, 1.26)	317 / 715 (44.3%)	51 / 131 (38.9%)	0.88 (0.70, 1.10)
	Male	453 / 561 (80.7%)	107 / 128 (83.6%)	1.04 (0.95, 1.13)	341 / 580 (58.8%)	80 / 130 (61.5%)	1.05 (0.90, 1.22)	249 / 627 (39.7%)	55 / 137 (40.1%)	1.01 (0.81, 1.27)	94 / 627 (15.0%)	26 / 137 (19.0%)	1.27 (0.85, 1.88)	321 / 627 (51.2%)	67 / 137 (48.9%)	0.96 (0.79, 1.15)
	Total	981 / 1 204 (81.5%)	209 / 255 (82.0%)	1.01 (0.94, 1.07)	660 / 1 238 (53.3%)	135 / 258 (52.3%)	0.98 (0.86, 1.12)	490 / 1 342 (36.5%)	97 / 268 (36.2%)	0.99 (0.83, 1.18)	197 / 1 342 (14.7%)	40 / 268 (14.9%)	1.02 (0.74, 1.39)	638 / 1 342 (47.5%)	118 / 268 (44.0%)	0.93 (0.80, 1.07)
Overall	Female	8 771 / 11 101 (79.0%)	1 179 / 1 435 (82.2%)	**1.04 (1.01, 1.07)**	2 935 / 11 125 (26.4%)	475 / 1 436 (33.1%)	**1.25 (1.16, 1.36)**	980 / 11 366 (8.6%)	170 / 1 455 (11.7%)	**1.36 (1.16, 1.58)**	345 / 11 366 (3.0%)	64 / 1 455 (4.4%)	**1.45 (1.12, 1.88)**	709 / 11 366 (6.2%)	129 / 1 455 (8.9%)	**1.42 (1.19, 1.70)**
	Male	10 347 / 13 108 (78.9%)	1 744 / 2 071 (84.2%)	**1.07 (1.05, 1.09)**	3 657 / 13 166 (27.8%)	813 / 2 085 (39.0%)	**1.40 (1.32, 1.49)**	1283 / 13 441 (9.5%)	320 / 2 120 (15.1%)	**1.58 (1.41, 1.77)**	457 / 13 441 (3.4%)	117 / 2 120 (5.5%)	**1.62 (1.33, 1.98)**	939 / 13 441 (7.0%)	214 / 2 120 (10.1%)	**1.44 (1.25, 1.66)**
	Total	19 118 / 24 209 (79.0%)	2 923 / 3 506 (83.4%)	**1.06 (1.04, 1.07)**	6 592 / 24 291 (27.1%)	1288 / 3 521 (36.6%)	**1.35 (1.28,1.41)**	2263 / 24 807 (9.1%)	490 / 3 575 (13.7%)	**1.50 (1.37, 1.65)**	802 / 24 807 (3.2%)	181 / 3 575 (5.1%)	**1.57 (1.34, 1.83)**	1 648 / 24 807 (6.6%)	343 / 3 575 (9.6%)	**1.44 (1.29, 1.61)**
		Adjusted HR* (95%CI)		**1.08 (1.02, 1.14)**	Adjusted HR* (95%CI)		**1.14 (1.06, 1.23)**	Adjusted HR* (95%CI)		0.96 (0.86, 1.08)	Adjusted HR* (95%CI)		1.05 (0.89, 1.25)	Adjusted HR* (95%CI)		0.91 (0.81, 1.02)

Prevalence is presented as frequency / n (%)
*Adjusted HRs originate from cox regression models, which included periodontitis, age category, gender, level of education and number of years in the 5Th lowest percentile of income.
Statistically significant crude RRs and adjusted HRs are highlighted in **bold**

Retinopathy

Figure A19. Prevalence of retinopathy (2010-2020) in T1D with and without periodontitis, females and males by age category (excluding individuals deceased over the observation period).

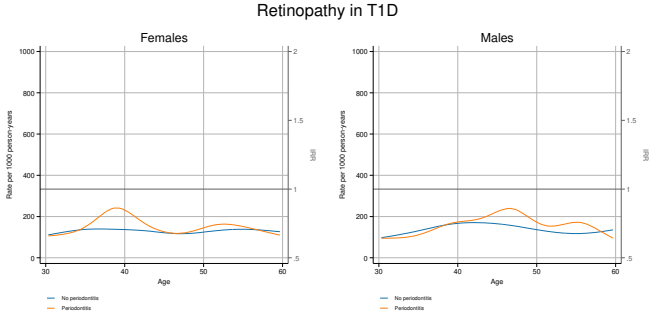


Cox regression model T1D with and without periodontitis (outcome: retinopathy)

```
Cox regression with Breslow method for ties

No. of subjects = 17,788                          Number of obs = 17,788
No. of failures = 12,239
Time at risk    = 88,930
                                                  LR chi2(10)   =  90.05
Log likelihood = -113562.24                       Prob > chi2   = 0.0000
```

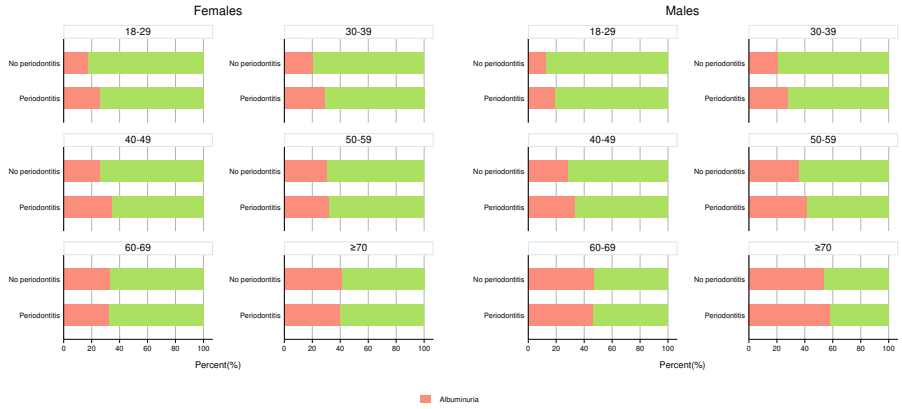
_t	Haz. ratio	Std. err.	z	P>|z|	[95% conf.	interval]
everParod2						
Yes	1.077569	.030458	2.64	0.008	1.019496	1.13895
cohort						
30-39	1.119987	.0295901	4.29	0.000	1.063467	1.17951
40-49	1.136841	.0299639	4.87	0.000	1.079604	1.197113
50-59	1.147288	.0336357	4.69	0.000	1.083222	1.215144
60-69	1.180817	.0390356	5.03	0.000	1.106735	1.259858
≥70	1.198709	.0568038	3.82	0.000	1.09239	1.315377
Kon						
Female	.9894082	.0181565	-0.58	0.562	.9544545	1.025642
Education						
Up to Lower secondary education	.981754	.0286358	-0.63	0.528	.927203	1.039515
Post-secondary ≥2 years to Tertiary ..	.9400824	.0189617	-3.06	0.002	.9036431	.977991
No_5p_rank	1.012706	.0047084	2.72	0.007	1.003519	1.021976

Figure A20. Retinopathy in T1D with and without periodontitis. Cohort-adjusted rates by age and IRR for females and males, based on age-period-cohort models (truncated at 30-60 years and period 2011-2019).



Albuminuria

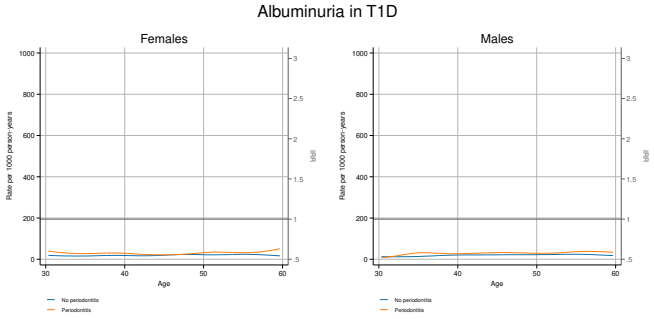
Figure A21. Prevalence of albuminuria (2010-2020) in T1D with and without periodontitis, females and males by age category (excluding individuals deceased over the observation period).



Cox regression model T1D with and without periodontitis (outcome: albuminuria)

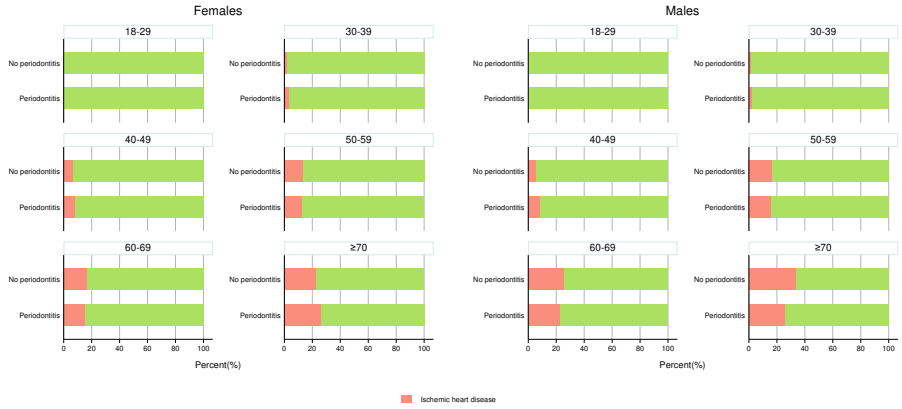
```
Cox regression with Breslow method for ties

No. of subjects =  24,817                         Number of obs =  24,817
No. of failures =   5,083
Time at risk    = 204,357
                                                  LR chi2(10)   = 1171.81
Log likelihood = -50053.262                       Prob > chi2   =  0.0000

------------------------------------------------------------------------------
          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
   everParod2 |
         Yes |   1.141491   .0441582     3.42   0.001     1.058142    1.231405
             |
      cohort |
       30-39 |   1.202359   .0598248     3.70   0.000     1.090641    1.325521
       40-49 |   1.529729   .0697801     9.32   0.000     1.398898    1.672796
       50-59 |    1.91287   .0887314    13.98   0.000     1.746631    2.094931
       60-69 |   2.608472   .1230409    20.33   0.000     2.378128    2.861127
         ≥70 |   3.641806    .208591    22.57   0.000     3.255088    4.074468
             |
         Kon |
      Female |   .9505759    .027122    -1.78   0.076     .8988768    1.005248
             |
   Education |
Up to Lower secondary education |   1.193817   .0459271     4.60   0.000     1.107112    1.287313
Post-secondary ≥2 years to Tertiary .. |   .7503793   .0257584    -8.37   0.000     .7015546     .802602
             |
   No_5p_rank |   1.045092   .0065476     7.04   0.000     1.032337    1.058004
------------------------------------------------------------------------------
```

Figure A22. Albuminuria in T1D with and without periodontitis. Cohort-adjusted rates by age and IRR for females and males, based on age-period-cohort models (truncated at 30-60 years and period 2011-2019).



Ischemic heart disease

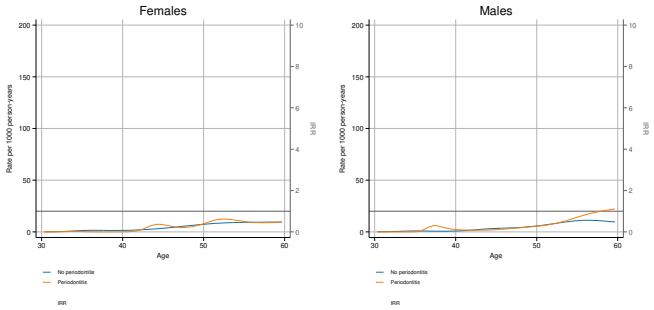
Figure A23. Prevalence of ischemic heart disease (2010-2020) in T1D with and without periodontitis, females and males by age category (excluding individuals deceased over the observation period).



Cox regression model T1D with and without periodontitis (outcome: ischemic heart disease)

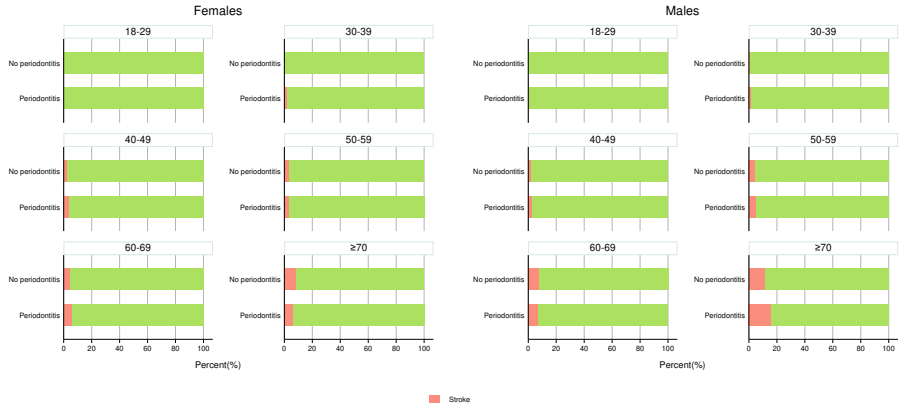
```
Cox regression with Breslow method for ties

No. of subjects =  27,290                         Number of obs =  27,290
No. of failures =   1,982
Time at risk    = 243,289
                                                  LR chi2(10)   = 2573.16
Log likelihood = -18756.165                       Prob > chi2   =  0.0000

------------------------------------------------------------------------------------------------------
                                  _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------------------------------+----------------------------------------------------------------
                          everParod2 |
                                 Yes |   .9588335    .056007    -0.72   0.472     .8551122    1.075136
                                     |
                              cohort |
                               30-39 |    5.78838   1.390131     7.31   0.000     3.615209    9.267885
                               40-49 |   20.77068   4.575729    13.77   0.000     13.48755    31.98661
                               50-59 |   46.07698    10.0328    17.59   0.000      30.0707    70.60323
                               60-69 |   68.86273   14.99341    19.44   0.000     44.94206    105.5153
                                 ≥70 |   114.1858   25.20605    21.46   0.000     74.08201    175.9994
                                     |
                                 Kon |
                              Female |   .8268193   .0380352    -4.13   0.000     .7555335     .904831
                                     |
                           Education |
      Up to Lower secondary education |   1.186337    .065407     3.10   0.002     1.064825    1.321715
Post-secondary ≥2 years to Tertiary .. |   .7924792   .0469291    -3.93   0.000      .705637     .890009
                                     |
                            No_5p_rank |   1.028323   .0109145     2.63   0.009     1.007152    1.049939
------------------------------------------------------------------------------------------------------
```

Figure A24. Ischemic heart disease in T1D with and without periodontitis. Cohort-adjusted rates by age and IRR for females and males, based on age-period-cohort models (truncated at 30-60 years and period 2011-2019).



Stroke

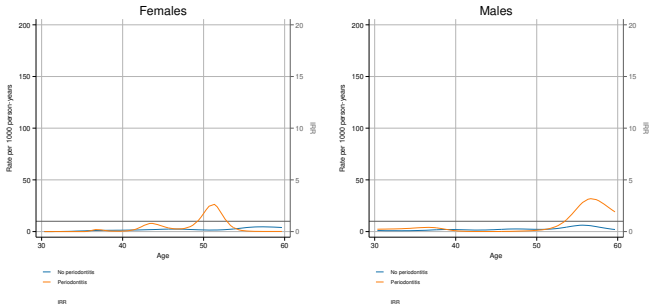
Figure A25. Prevalence of stroke (2010-2020) in T1D with and without periodontitis, females and males by age category (excluding individuals deceased over the observation period).



Cox regression model T1D with and without periodontitis (outcome: stroke)

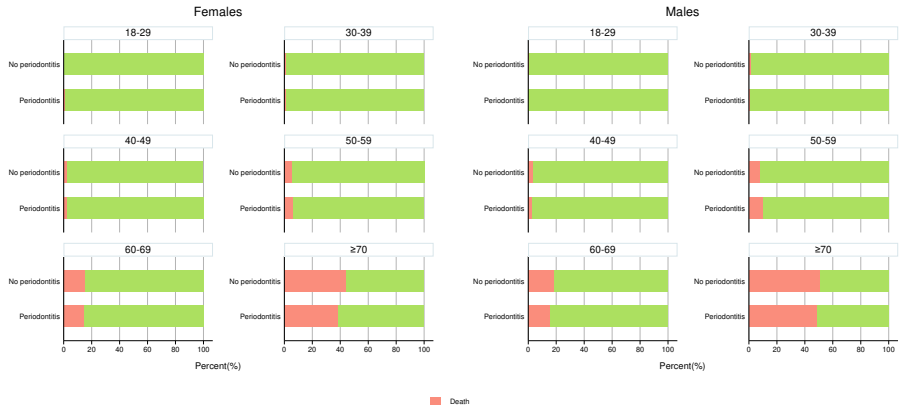
```
Cox regression with Breslow method for ties

No. of subjects =  27,938                         Number of obs = 27,938
No. of failures =     873
Time at risk    = 253,965
                                                  LR chi2(10)   = 968.82
Log likelihood = -8365.7897                       Prob > chi2   = 0.0000

------------------------------------------------------------------------------
          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
  everParod2 |
         Yes |   1.051505   .0916025     0.58   0.564     .8864582    1.247281
             |
      cohort |
       30-39 |   4.373842   1.111817     5.81   0.000     2.657604      7.1984
       40-49 |   9.557269   2.227679     9.68   0.000     6.052425     15.0917
       50-59 |   15.52832   3.576795    11.91   0.000     9.886865     24.38879
       60-69 |   24.99873   5.729264    14.04   0.000     15.95283     39.17402
         ≥70 |   57.88885   13.41648    17.51   0.000     36.75514     91.17415
             |
         Kon |
      Female |   .7738809   .0540874    -3.67   0.000     .6748119     .8874942
             |
   Education |
 Up to Lower secondary education |   1.070656   .0894718     0.82   0.414     .9089027    1.261196
Post-secondary ≥2 years to Tertiary .. |   .7193453   .0654684    -3.62   0.000     .6018229    .8598172
             |
   No_5p_rank |   1.060291   .0144745     4.29   0.000     1.032298    1.089044
------------------------------------------------------------------------------
```

Figure A26. Stroke in T1D with and without periodontitis. Cohort-adjusted rates by age and IRR for females and males, based on age-period-cohort models (truncated at 30-60 years and period 2011-2019).



Mortality

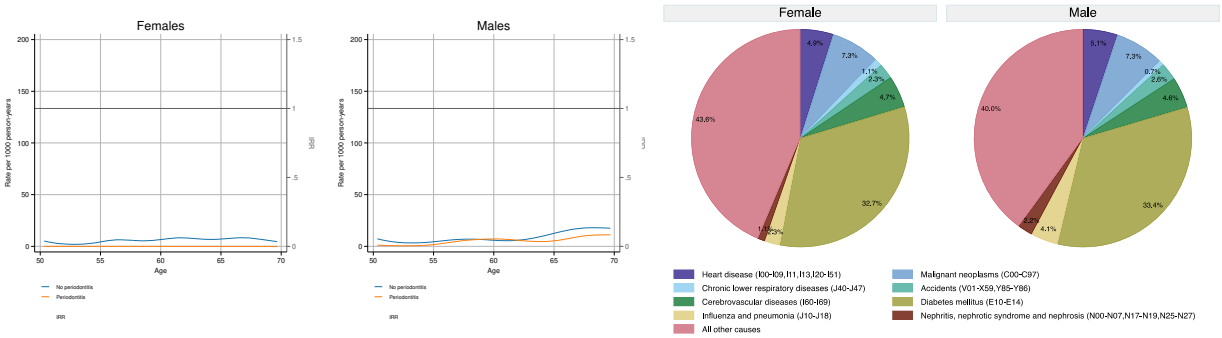
Figure A27. Mortality (2010-2020) in T1D with and without periodontitis, females and males by age category.



Cox regression model T1D with and without periodontitis (outcome: death)

```
Cox regression with Breslow method for ties

No. of subjects =  28,041                         Number of obs =  28,041
No. of failures =   1,942
Time at risk    = 257,631
                                                  LR chi2(10)   = 3451.87
Log likelihood = -17965.405                       Prob > chi2   =  0.0000

------------------------------------------------------------------------------
          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
  everParod2 |
         Yes |   .9101192   .0547377    -1.57   0.117     .8089172    1.023982
             |
      cohort |
       30-39 |   1.600409   .2777436     2.71   0.007     1.138961    2.248811
       40-49 |   3.559205   .5146056     8.78   0.000     2.680912    4.725236
       50-59 |   7.596664   1.038113    14.84   0.000     5.811698    9.929853
       60-69 |   17.66509   2.333664    21.74   0.000     13.63537    22.88572
         ≥70 |   57.19521   7.530414    30.73   0.000     44.18644    74.03383
             |
         Kon |
      Female |   .7956467   .0371664    -4.89   0.000     .7260371    .8719303
             |
   Education |
Up to Lower secondary education |   1.290286   .0670712     4.90   0.000     1.165304    1.428673
Post-secondary ≥2 years to Tertiary .. |   .5818712   .0398608    -7.90   0.000     .5087633    .6654846
             |
   No_5p_rank |   1.024102   .0105159     2.32   0.020     1.003697    1.044921
------------------------------------------------------------------------------
```

Figure A28. Mortality in T1D with and without periodontitis. Cohort-adjusted rates by age and IRR for females and males, based on age-period-cohort models (truncated at 50-70 years and period 2011-2019) (left). Main cause of mortality in T1D, females and males (right).



Diabetes-related complications in T2D

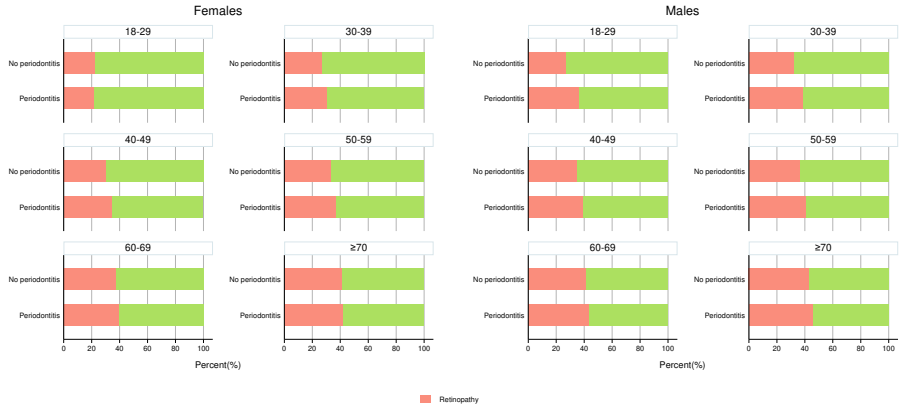
Table A14. Diabetes-related complications in individuals with Type 2 Diabetes (comparing periodontitis to no periodontitis).

Age	Gender	Retinopathy (2010-2020)			Albuminuria (2010-2020)			Ischemic heart disease (2010-2020)			Stroke (2010-2020)			Mortality (2010-2020)		
		No periodontitis	Periodontitis	Crude RR (95%CI)	No periodontitis	Periodontitis	Crude RR (95%CI)	No periodontitis	Periodontitis	Crude RR (95%CI)	No periodontitis	Periodontitis	Crude RR (95%CI)	No periodontitis	Periodontitis	Crude RR (95%CI)
18-29	Female	309 / 1 369 (22.6%)	31 / 141 (22.0%)	0.97 (0.70, 1.35)	396 / 1 541 (25.7%)	39 / 166 (23.5%)	0.91 (0.69, 1.22)	11 / 1 892 (0.6%)	3 / 185 (1.6%)	2.79 (0.79, 9.91)	10 / 1 892 (0.5%)	2 / 185 (1.1%)	2.05 (0.45, 9.27)	11 / 1 892 (0.6%)	2 / 185 (1.1%)	1.86 (0.42, 8.33)
	Male	379 / 1 379 (27.5%)	58 / 158 (36.7%)	**1.34 (1.07, 1.67)**	427 / 1 555 (27.5%)	50 / 182 (27.5%)	1.00 (0.78, 1.28)	15 / 1 865 (0.8%)	3 / 205 (1.5%)	1.82 (0.53, 6.23)	13 / 1 865 (0.7%)	0 / 205 (0.0%)	-	18 / 1 865 (1.0%)	4 / 205 (2.0%)	2.02 (0.69, 5.92)
	Total	688 / 2 748 (25.0%)	89 / 299 (29.8%)	1.19 (0.99, 1.43)	823 / 3 096 (26.6%)	89 / 348 (25.6%)	0.96 (0.80, 1.16)	26 / 3 757 (0.7%)	6 / 390 (1.5%)	2.22 (0.92, 5.37)	23 / 3 757 (0.6%)	2 / 390 (0.5%)	0.84 (0.20, 3.54)	29 / 3 757 (0.8%)	6 / 390 (1.5%)	1.99 (0.83, 4.77)
30-39	Female	927 / 3 435 (27.0%)	202 / 652 (31.0%)	**1.15 (1.01, 1.30)**	1 000 / 3 776 (26.5%)	230 / 689 (33.4%)	**1.26 (1.12, 1.42)**	78 / 4 341 (1.8%)	18 / 790 (2.3%)	1.27 (0.76, 2.11)	52 / 4 341 (1.2%)	9 / 790 (1.1%)	0.95 (0.47, 1.92)	47 / 4 341 (1.1%)	11 / 790 (1.4%)	1.29 (0.67, 2.47)
	Male	1 333 / 4 085 (32.6%)	349 / 909 (38.4%)	**1.18 (1.07, 1.29)**	1 207 / 4 424 (27.3%)	315 / 1 029 (30.6%)	**1.12 (1.01, 1.24)**	206 / 5 022 (4.1%)	73 / 1 140 (6.4%)	**1.56 (1.20, 2.02)**	79 / 5 022 (1.6%)	14 / 1140 (1.2%)	0.78 (0.44, 1.37)	68 / 5 022 (1.4%)	8 / 1140 (0.7%)	0.52 (0.25, 1.08)
	Total	2 260 / 7 520 (30.1%)	551 / 1 561 (35.3%)	**1.17 (1.09, 1.27)**	2 207 / 8 200 (26.9%)	545 / 1 718 (31.7%)	**1.18 (1.09, 1.27)**	284 / 9 363 (3.0%)	91 / 1 930 (4.7%)	**1.55 (1.23, 1.96)**	131 / 9 363 (1.4%)	23 / 1 930 (1.2%)	0.85 (0.55, 1.32)	115 / 9 363 (1.2%)	19 / 1 930 (1.0%)	0.80 (0.49, 1.30)
40-49	Female	2 792 / 9 232 (30.2%)	759 / 2 158 (35.2%)	**1.16 (1.09, 1.24)**	2 725 / 9 830 (27.7%)	769 / 2 292 (33.6%)	**1.21 (1.13, 1.29)**	563 / 11 007 (5.1%)	164 / 2 506 (6.5%)	**1.28 (1.08, 1.51)**	284 / 11 007 (2.6%)	63 / 2 506 (2.5%)	0.97 (0.74, 1.28)	164 / 11 007 (1.5%)	36 / 2 506 (1.4%)	0.96 (0.67, 1.38)
	Male	4 523 / 12 780 (35.4%)	1 513 / 3 792 (39.9%)	**1.13 (1.08, 1.18)**	4 170 / 13 548 (30.8%)	1 369 / 4 004 (34.2%)	**1.11 (1.06, 1.17)**	1 442 / 14 960 (9.6%)	511 / 4 378 (11.7%)	**1.21 (1.10, 1.33)**	394 / 14 960 (2.6%)	119 / 4 378 (2.7%)	1.03 (0.84, 1.26)	352 / 14 960 (2.4%)	98 / 4 378 (2.2%)	0.95 (0.76, 1.19)
	Total	7 315 / 22 012 (33.2%)	2 272 / 5 950 (38.2%)	**1.15 (1.11, 1.19)**	6 895 / 23 378 (29.5%)	2 138 / 6 296 (34.0%)	**1.15 (1.11, 1.20)**	2 005 / 25 967 (7.7%)	675 / 6 884 (9.8%)	**1.27 (1.17, 1.38)**	678 / 25 967 (2.6%)	182 / 6 884 (2.6%)	1.01 (0.86, 1.19)	516 / 25 967 (2.0%)	134 / 6 884 (1.9%)	0.98 (0.81, 1.18)
50-59	Female	5 313 / 15 659 (33.9%)	1 592 / 4 219 (37.7%)	**1.11 (1.06, 1.16)**	4 652 / 16 374 (28.4%)	1 546 / 4 478 (34.5%)	**1.22 (1.16, 1.27)**	1 761 / 17 985 (9.8%)	512 / 4 859 (10.5%)	1.08 (0.98, 1.18)	635 / 17 985 (3.5%)	194 / 4 859 (4.0%)	1.13 (0.97, 1.32)	683 / 17 985 (3.8%)	185 / 4 859 (3.8%)	1.00 (0.85, 1.18)
	Male	8 207 / 22 000 (37.3%)	3 335 / 8 002 (41.7%)	**1.12 (1.08, 1.15)**	8141 / 22896 (35.6%)	3 306 / 8 348 (39.6%)	**1.11 (1.08, 1.15)**	4 562 / 24 947 (18.3%)	1 839 / 8 992 (20.5%)	**1.12 (1.07, 1.17)**	1 217 / 24 947 (4.9%)	475 / 8 992 (5.3%)	1.08 (0.98, 1.20)	1 284 / 24 947 (5.1%)	434 / 8 992 (4.8%)	0.94 (0.84, 1.04)
	Total	13 520 / 37 659 (35.9%)	4 927 / 12 221 (40.3%)	**1.12 (1.09, 1.15)**	12 793 / 39 270 (32.6%)	4 852 / 12 826 (37.8%)	**1.16 (1.13, 1.19)**	6 323 / 42 932 (14.7%)	2 351 / 13 851 (17.0%)	**1.15 (1.10, 1.20)**	1 852 / 42 932 (4.3%)	669 / 13 851 (4.8%)	**1.12 (1.03, 1.22)**	1 967 / 42 932 (4.6%)	619 / 13 851 (4.5%)	0.98 (0.89, 1.07)
60-69	Female	8 927 / 23 420 (38.1%)	2 347 / 5 831 (40.3%)	**1.06 (1.02, 1.09)**	8 340 / 24 287 (34.3%)	2 313 / 6 086 (38.0%)	**1.11 (1.07, 1.15)**	4 147 / 26 400 (15.7%)	977 / 6 569 (14.9%)	0.95 (0.89, 1.01)	1 709 / 26 400 (6.5%)	453 / 6 569 (6.9%)	1.07 (0.96, 1.18)	2 377 / 26 400 (9.0%)	557 / 6 569 (8.5%)	0.94 (0.86, 1.03)
	Male	12 709 / 29 781 (42.7%)	5 044 / 11 374 (44.3%)	**1.04 (1.01, 1.06)**	13 669 / 30 740 (44.5%)	5 546/ 11 774 (47.1%)	**1.06 (1.04, 1.08)**	9 297 / 33 234 (28.0%)	3 527 / 12 613 (28.0%)	1.00 (0.97, 1.03)	2 914 / 33 234 (8.8%)	1 144 / 12 613 (9.1%)	1.03 (0.97, 1.10)	3 906 / 33 234 (11.8%)	1 432 / 12 613 (11.4%)	0.97 (0.91, 1.02)
	Total	21 636 / 53 201 (40.7%)	7 391 / 17 205 (43.0%)	**1.06 (1.04, 1.08)**	22 009 / 55 027 (40.0%)	7 859 / 17 860 (44.0%)	**1.10 (1.08, 1.12)**	13 444 / 59 634 (22.5%)	4 504 / 19 182 (23.5%)	**1.04 (1.01, 1.07)**	4 623 / 59 634 (7.8%)	1 597 / 19 182 (8.3%)	**1.07 (1.02, 1.13)**	6 283 / 59 634 (10.5%)	1 989 / 19 182 (10.4%)	0.98 (0.94, 1.03)
≥70	Female	9 236 / 21 798 (42.4%)	1 730 / 3 952 (43.8%)	1.03 (0.99, 1.07)	10 293 / 23 112 (44.5%)	1 914 / 4 185 (45.7%)	1.03 (0.99, 1.06)	7 551 / 27 068 (27.9%)	1 141 / 4 718 (24.2%)	**0.87 (0.82, 0.92)**	3 648 / 27 068 (13.5%)	643 / 4 718 (13.6%)	1.01 (0.94, 1.09)	10 079 / 27 068 (37.2%)	1 389 / 4 718 (29.4%)	**0.79 (0.75, 0.83)**
	Male	8 801 / 20 185 (43.6%)	2 527 / 5 486 (46.1%)	**1.06 (1.02, 1.09)**	11 919 / 21 379 (55.8%)	3 300 / 5 788 (57.0%)	1.02 (1.00, 1.05)	10 030 / 24 451 (41.0%)	2 413 / 6 362 (37.9%)	**0.92 (0.89, 0.96)**	3 832 / 24 451 (15.7%)	982 / 6 362 (15.4%)	0.98 (0.92, 1.05)	10 538 / 24 451 (43.1%)	2 217 / 6 362 (34.8%)	**0.81 (0.78, 0.84)**
	Total	18 037 / 41 983 (43.0%)	4 257 / 9438 (45.1%)	**1.05 (1.02, 1.08)**	22 212 / 44 491 (49.9%)	5 214 / 9 973 (52.3%)	**1.05 (1.03, 1.07)**	17 581 / 51 519 (34.1%)	3 554 / 11 080 (32.1%)	**0.94 (0.91, 0.97)**	7 480 / 51 519 (14.5%)	1 625 / 11 080 (14.7%)	1.01 (0.96, 1.06)	20 617 / 51 519 (40.0%)	3 606 / 11 080 (32.5%)	**0.81 (0.79, 0.84)**
Overall	Female	27 504 / 74 913 (36.7%)	6 661 / 16 953 (39.3%)	**1.07 (1.05, 1.09)**	27 406 / 78 920 (34.7%)	6 811 / 17 896 (38.1%)	**1.10 (1.07, 1.12)**	14 111 / 88 693 (15.9%)	2 815 / 19 627 (14.3%)	**0.90 (0.87, 0.94)**	6 338 / 88 693 (7.1%)	1 364 / 19 627 (6.9%)	0.97 (0.92, 1.03)	13 361 / 88 693 (15.1%)	2 180 / 19 627 (11.1%)	**0.74 (0.71, 0.77)**
	Male	35 952 / 90 210 (39.9%)	12 826 / 29 721 (43.2%)	**1.08 (1.07, 1.10)**	39 533 / 94 542 (41.8%)	13 886 / 31 125 (44.6%)	**1.07 (1.05, 1.08)**	25 552 / 104 479 (24.5%)	8 366 / 33690 (24.8%)	1.02 (0.99, 1.04)	8 449 / 104 479 (8.1%)	2 734 / 33 690 (8.1%)	1.00 (0.96, 1.05)	16 166 / 104 479 (15.5%)	4 193 / 33 690 (12.4%)	**0.80 (0.78, 0.83)**
	Total	63 456 / 165 123 (38.4%)	19 487 / 46 674 (41.8%)	**1.09 (1.07, 1.10)**	66 939 / 173 462 (38.6%)	20 697 / 49 021 (42.2%)	**1.09 (1.08, 1.11)**	39 663 / 193 172 (20.5%)	11 181 / 53317 (21.0%)	1.02 (1.00, 1.04)	14 787 / 193 172 (7.7%)	4 098 / 53 317 (7.7%)	1.00 (0.97, 1.04)	29 527 / 193 172 (15.3%)	6 373 / 53 317 (12.0%)	**0.78 (0.76, 0.80)**
		Adjusted HR* (95%CI)		**1.08 (1.06, 1.10)**	Adjusted HR* (95%CI)		**1.09 (1.07, 1.11)**	Adjusted HR* (95%CI)		**0.96 (0.94, 0.99)**	Adjusted HR* (95%CI)		0.99 (0.95, 1.03)	Adjusted HR* (95%CI)		**0.81 (0.79, 0.83)**

Prevalence is presented as frequency / n (%)
*Adjusted HRs originate from cox regression models, which included periodontitis, age category, gender, level of education and number of years in the 5th lowest percentile of income.
Statistically significant crude RRs and adjusted HRs are highlighted in **bold**

Retinopathy

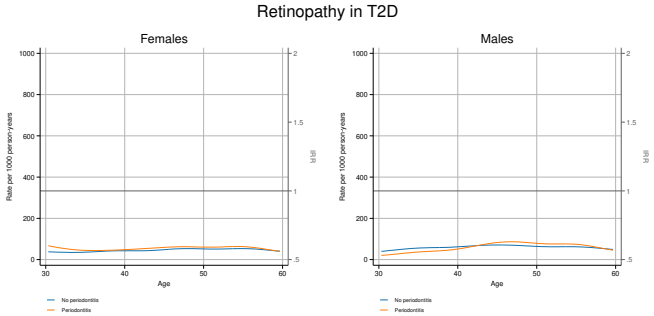
Figure A29. Prevalence of retinopathy (2010-2020) in T2D with and without periodontitis, females and males by age category (excluding individuals deceased over the observation period).



Cox regression model T2D with and without periodontitis (outcome: retinopathy)

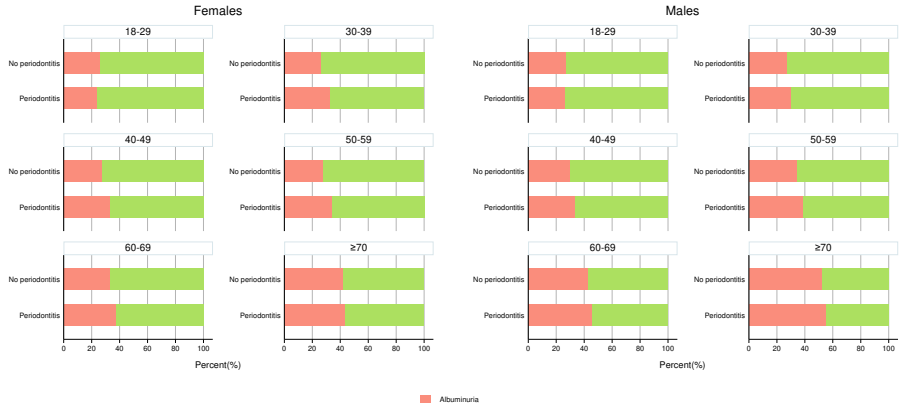
```
Cox regression with Breslow method for ties

No. of subjects =   187,388                         Number of obs = 187,388
No. of failures =    63,032
Time at risk    = 1,100,711
                                                    LR chi2(10)   =  441.26
Log likelihood = -739357.21                         Prob > chi2   =  0.0000

------------------------------------------------------------------------------
          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
    everParod2 |
         Yes |   1.084212   .0102077     8.59   0.000     1.064389    1.104405
             |
      cohort |
       30-39 |   1.119513   .0505874     2.50   0.012     1.024627    1.223185
       40-49 |   1.121695   .0467643     2.75   0.006     1.033683      1.2172
       50-59 |   1.106595   .0453456     2.47   0.013     1.021194    1.199137
       60-69 |   1.137167   .0463119     3.16   0.002     1.049925    1.231657
         ≥70 |   1.130179   .0463529     2.98   0.003     1.042884     1.22478
             |
         Kon |
      Female |   .8812678   .0071989   -15.47   0.000     .8672706    .8954909
             |
   Education |
Up to Lower secondary education |   1.070908   .0097521     7.52   0.000     1.051964    1.090194
Post-secondary ≥2 years to Tertiary .. |   .9871461   .0111478    -1.15   0.252     .9655369    1.009239
             |
      No_5p_rank |   1.005081   .0017967     2.83   0.005     1.001565    1.008608
------------------------------------------------------------------------------
```

Figure A30. Retinopathy in T2D with and without periodontitis. Cohort-adjusted rates by age and IRR for females and males, based on age-period-cohort models (truncated at 30-60 years and period 2011-2019).



Albuminuria

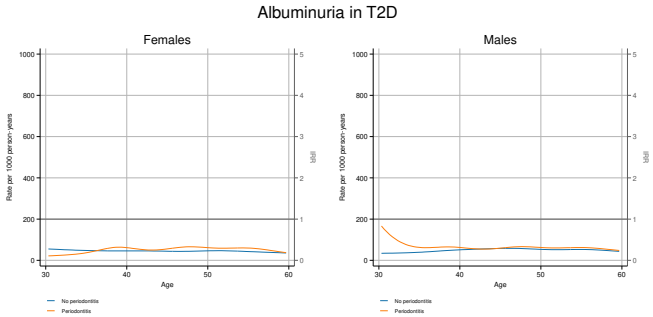
Figure A31. Prevalence of albuminuria (2010-2020) in T2D with and without periodontitis, females and males by age category (excluding individuals deceased over the observation period).



Cox regression model T2D with and without periodontitis (outcome: albuminuria)

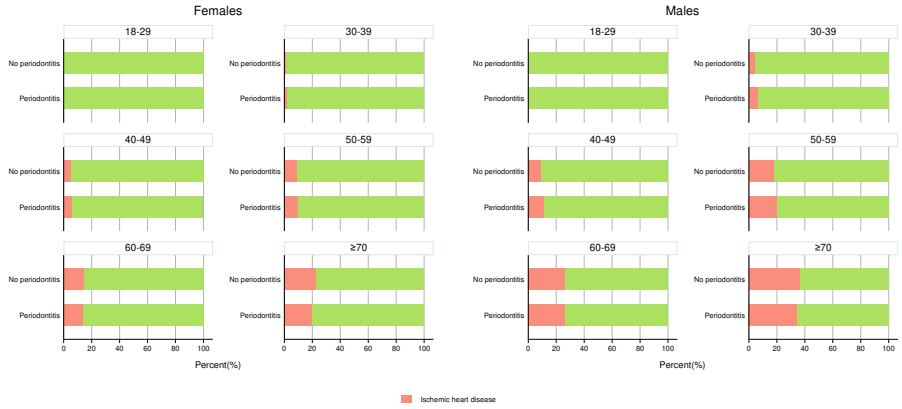
```
Cox regression with Breslow method for ties

No. of subjects =   190,677                         Number of obs = 190,677
No. of failures =    62,289
Time at risk    = 1,133,619
                                                    LR chi2(10)   = 2887.58
Log likelihood = -730138.99                         Prob > chi2   =  0.0000

------------------------------------------------------------------------------
          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
   everParod2 |
         Yes |   1.088601   .0103184     8.96   0.000     1.068564    1.109014
             |
      cohort |
       30-39 |    .946996   .0447136    -1.15   0.249     .8632917    1.038816
       40-49 |   .9560376   .0410938    -1.05   0.296     .8787947     1.04007
       50-59 |    1.01626   .0427423     0.38   0.701     .9358462    1.103583
       60-69 |   1.179034   .0491755     3.95   0.000     1.086486    1.279465
         ≥70 |   1.507396   .0630713     9.81   0.000     1.388711    1.636223
             |
         Kon |
      Female |   .7739548   .0064105   -30.94   0.000     .7614919    .7866218
             |
   Education |
Up to Lower secondary education |   1.057499   .0095914     6.16   0.000     1.038866    1.076465
Post-secondary ≥2 years to Tertiary .. |   .9248584   .0107364    -6.73   0.000      .904053    .9461425
             |
    No_5p_rank |   1.011989   .0017723     6.80   0.000     1.008521    1.015469
------------------------------------------------------------------------------
```

Figure A32. Albuminuria in T2D with and without periodontitis. Cohort-adjusted rates by age and IRR for females and males, based on age-period-cohort models (truncated at 30-60 years and period 2011-2019).



Ischemic heart disease

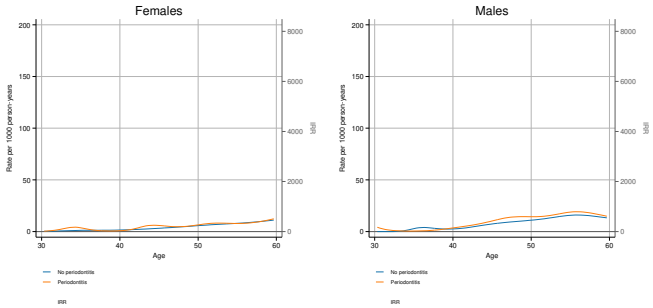
Figure A33. Prevalence of ischemic heart disease (2010-2020) in T2D with and without periodontitis, females and males by age category (excluding individuals deceased over the observation period).



Cox regression model T2D with and without periodontitis (outcome: ischemic heart disease)

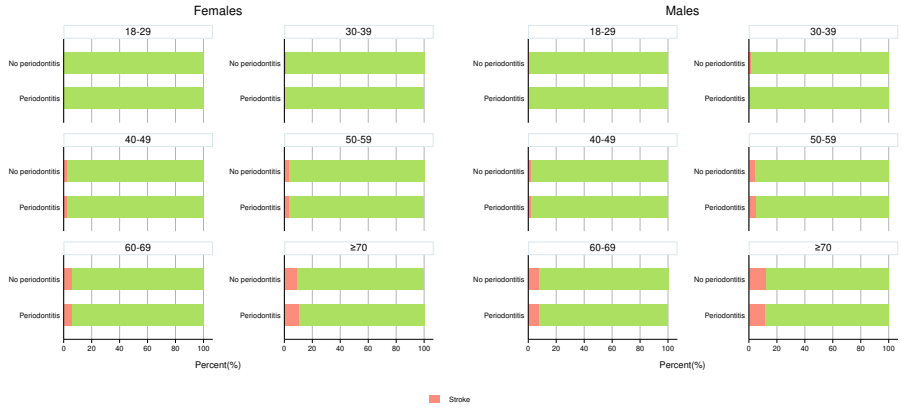
```
Cox regression with Breslow method for ties

No. of subjects =    214,426                     Number of obs =  214,426
No. of failures =     29,867
Time at risk    = 1,430,544
                                                 LR chi2(10)   = 11318.87
Log likelihood = -351088.21                      Prob > chi2   =   0.0000

------------------------------------------------------------------------------------------------------
                                  _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------------------------------+----------------------------------------------------------------
                          everParod2 |
                                 Yes |   .9634705   .0135089    -2.65   0.008      .937354    .9903146
                                     |
                              cohort |
                               30-39 |   2.808062   .6626881     4.38   0.000     1.768184    4.459497
                               40-49 |   6.536366   1.472487     8.33   0.000     4.203209    10.16463
                               50-59 |   12.09876   2.711692    11.12   0.000     7.797605    18.77243
                               60-69 |   18.91549   4.234728    13.13   0.000     12.19702    29.33468
                                 ≥70 |   34.67288   7.761491    15.84   0.000     22.35884    53.76883
                                     |
                                 Kon |
                              Female |   .5665987   .0070064   -45.94   0.000     .5530314    .5804989
                                     |
                           Education |
      Up to Lower secondary education |   1.110698   .0141919     8.22   0.000     1.083228    1.138865
Post-secondary ≥2 years to Tertiary .. |   .8973458   .0158973    -6.11   0.000     .8667225    .9290511
                                     |
                           No_5p_rank |   1.023663   .0025446     9.41   0.000     1.018688    1.028662
------------------------------------------------------------------------------------------------------
```

Figure A34. Ischemic heart disease in T2D with and without periodontitis. Cohort-adjusted rates by age and IRR for females and males, based on age-period-cohort models (truncated at 30-60 years and period 2011-2019).



Stroke

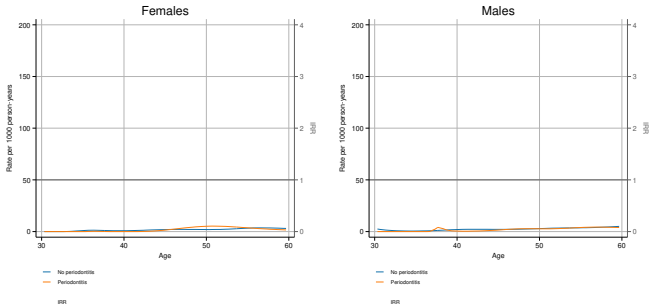
Figure A35. Prevalence of stroke (2010-2020) in T2D with and without periodontitis, females and males by age category (excluding individuals deceased over the observation period).



Cox regression model T2D with and without periodontitis (outcome: stroke)

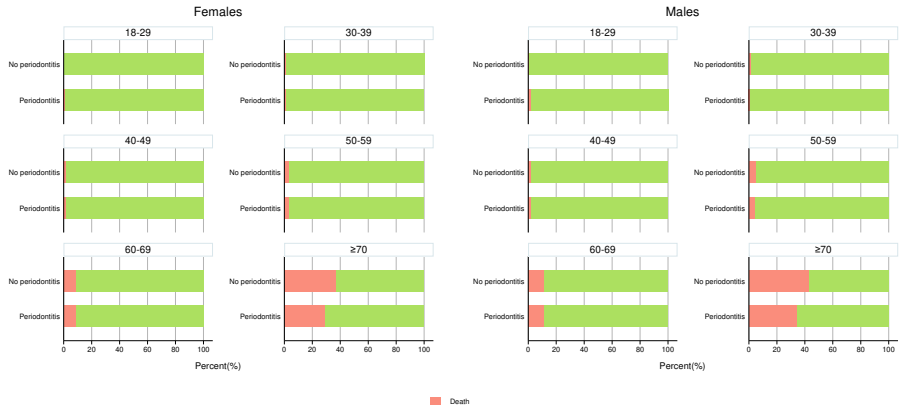
```
Cox regression with Breslow method for ties

No. of subjects =   228,866                     Number of obs = 228,866
No. of failures =    13,561
Time at risk    = 1,597,660
                                                LR chi2(10)   = 5844.14
Log likelihood = -159640.54                     Prob > chi2   =  0.0000

------------------------------------------------------------------------------
          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
  everParod2 |
         Yes |   .9902574   .0207852    -0.47   0.641     .9503459    1.031845
             |
      cohort |
       30-39 |   1.606414    .486334     1.57   0.117     .8874833    2.907733
       40-49 |   3.389064   .9525362     4.34   0.000     1.953618    5.879223
       50-59 |   5.468745   1.523599     6.10   0.000     3.167685    9.441335
       60-69 |   10.21857   2.839374     8.36   0.000     5.927506    17.61605
         ≥70 |   22.43727   6.231618    11.20   0.000     13.01851    38.67039
             |
         Kon |
      Female |   .7849306   .0139436   -13.63   0.000     .7580719    .8127409
             |
   Education |
Up to Lower secondary education |   1.069953   .0202194     3.58   0.000     1.031049    1.110325
Post-secondary ≥2 years to Tertiary .. |   .9186518   .0242805    -3.21   0.001     .8722745    .9674949
             |
  No_5p_rank |   1.014373   .0037697     3.84   0.000     1.007011    1.021788
------------------------------------------------------------------------------
```

Figure A36. Stroke in T2D with and without periodontitis. Cohort-adjusted rates by age and IRR for females and males, based on age-period-cohort models (truncated at 30-60 years and period 2011-2019).



Mortality

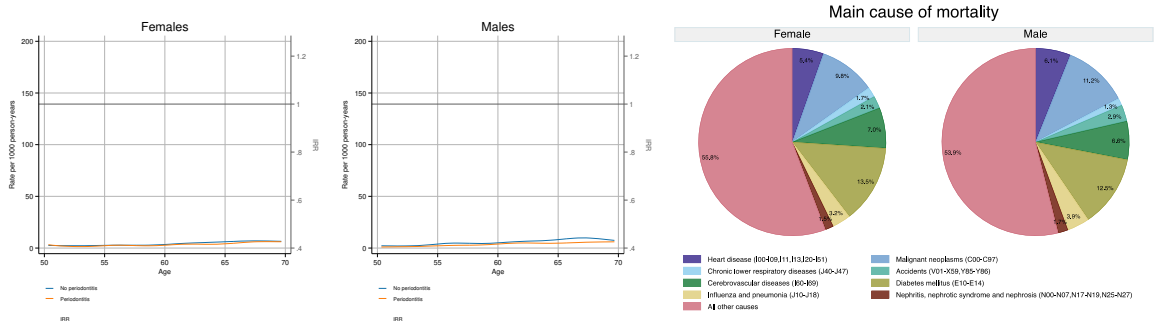
Figure A37. Mortality (2010-2020) in T2D with and without periodontitis, females and males by age category.



Cox regression model T2D with and without periodontitis (outcome: death)

```
Cox regression with Breslow method for ties

No. of subjects =   233,478                     Number of obs =  233,478
No. of failures =    34,743
Time at risk    = 1,661,307
                                                LR chi2(10)   = 28931.02
Log likelihood = -400561.99                     Prob > chi2   =   0.0000

------------------------------------------------------------------------------
          _t | Haz. ratio   Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
  everParod2 |
         Yes |    .811194   .0114349   -14.84   0.000     .7890887    .8339185
             |
      cohort |
       30-39 |   1.240035   .2517562     1.06   0.289     .8329525    1.846069
       40-49 |   1.706707    .319157     2.86   0.004     1.182995    2.462266
       50-59 |   3.446902   .6332709     6.74   0.000      2.40461     4.94098
       60-69 |   6.946668   1.271102    10.59   0.000     4.853149    9.943275
         ≥70 |   25.79855    4.71542    17.78   0.000     18.03075    36.91276
             |
         Kon |
      Female |   .8082466   .0089208   -19.29   0.000     .7909499    .8259215
             |
   Education |
 Up to Lower secondary education |   1.219202   .0141982    17.02   0.000     1.191689     1.24735
Post-secondary ≥2 years to Tertiary .. |   .8254675   .0148687   -10.65   0.000     .7968337    .8551302
             |
   No_5p_rank |   .9942444   .0024722    -2.32   0.020     .9894107    .9991017
------------------------------------------------------------------------------
```

Figure A38. Mortality in T2D with and without periodontitis. Cohort-adjusted rates by age and IRR for females and males, based on age-period-cohort models (truncated at 50-70 years and period 2011-2019) (left). Main cause of mortality in T2D, females and males (right).



STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	2
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3, 4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4, 5, appendix
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	4, appendix
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	4, figure 1, appendix
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	4, 5, appendix
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5, appendix
Bias	9	Describe any efforts to address potential sources of bias	4, 5, appendix
Study size	10	Explain how the study size was arrived at	4, figure 1
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5, appendix
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	5
		(*b*) Describe any methods used to examine subgroups and interactions	5
		(*c*) Explain how missing data were addressed	5
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	5

		(*e*) Describe any sensitivity analyses	5
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Figure 1
		(b) Give reasons for non-participation at each stage	Figure 1
		(c) Consider use of a flow diagram	Figure 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Table 1, appendix
		(b) Indicate number of participants with missing data for each variable of interest	Appendix
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	Figure captions, appendix
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	Appendix
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	-
		Cross-sectional study—Report numbers of outcome events or summary measures	-
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	6, figure captions, appendix
		(*b*) Report category boundaries when continuous variables were categorized	Appendix
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	-
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Appendix
Discussion			
Key results	18	Summarise key results with reference to study objectives	7
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	8
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	3, 8
Generalisability	21	Discuss the generalisability (external validity) of the study results	7, 8
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	2, 9

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.