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Global type 1 diabetes prevalence, incidence, and mortality estimates 2025: Results from the International diabetes Federation Atlas, 11th Edition, and the T1D Index Version 3.0

Graham D. Ogle[a,b,1,*], Fei Wang[c,1], Aveni Haynes[a], Gabriel A. Gregory[a], Thomas W. King[c], Kylie Deng[c], Dana Dabelea[d], Steven James[e], Alicia J. Jenkins[f], Xia Li[g,h,i], Ronald C.W. Ma[j,k,l], David M. Maahs[m], Richard A. Oram[n], Catherine Pihoker[o], Jannet Svensson[p,q], Zhiguang Zhou[g,h,i], Dianna J. Magliano[f,r], Jayanthi Maniam[a,s]

[a] Life for a Child, Diabetes Australia, 26 Arundel St, Glebe, New South Wales 2031, Australia
[b] Sydney Medical School, University of Sydney, Camperdown, New South Wales 2050, Australia
[c] Global Responsibility Department, Breakthrough T1D, 200 Vesey St NE, NY, United States
[d] Lifecourse Epidemiology of Adiposity and Diabetes Center, University of Colorado Anschutz Medical Campus, 13001 East 17th Place, Aurora 80045 CO, United States
[e] School of Health, University of the Sunshine Coast, 1 Moreton Bay Parade, Petrie, Queensland 4502, Australia
[f] Baker Heart and Diabetes Institute, 75 Commercial Road, Melbourne, Victoria 3004, Australia
[g] National Clinical Research Center for Metabolic Diseases, The Second Xiangya Hospital of Central South University, Changsha 410011 Hunan, China
[h] Key Laboratory of Diabetes Immunology, (Central South University), Ministry of Education, Changsha 410011 Hunan, China
[i] Department of Metabolism and Endocrinology, The Second Xiangya Hospital of Central South University, Changsha 410011 Hunan, China
[j] Department of Medicine and Therapeutics, The Chinese University of Hong Kong, Hong Kong
[k] Hong Kong Institute of Diabetes and Obesity, The Chinese University of Hong Kong, The Chinese University Of Hong Kong Central Ave, Hong Kong
[l] Li Ka Shing Institute of Health Sciences, The Chinese University of Hong Kong, The Chinese University Of Hong Kong Central Ave, Hong Kong
[m] Department of Pediatrics and Health Research and Policy, Epidemiology, Stanford University, 279 Campus Dr, Stanford, CA 94305, United States
[n] Clinical and Biomedical Science, University of Exeter, Exeter, United Kingdom
[o] Department of Pediatrics, University of Washington, 1410 NE Campus Parkway, Seattle, WA 98195, United States
[p] Department of Clinical and Translational Research, Steno Diabetes Center Borgmester Ib Juuls Vej 83, 2730 Herlev, Denmark
[q] Department of Clinical Medicine, Faculty of Health and Medicine, University of Copenhagen, Copenhagen, Denmark
[r] School of Public Health and Preventive Medicine, Monash University, 21 Chancellor's Walk, Clayton Victoria 3800, Australia
[s] University of New South Wales, UNSW, High St, Kensington NSW 2052, Australia

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ABSTRACT

Aims: Globally, symptomatic type 1 diabetes (T1D) prevalence varies markedly. The International Diabetes Federation 11th Edition Atlas/T1D Index Version 3.0 estimated 2025 numbers for 202 countries/territories ("countries"), and projected to 2040.

Methods: The T1D Index model, a Markov model with sub-models for incidence-over-time, adult incidence, and mortality-over-time, was updated with recent population-based T1D incidence, mortality and prevalence studies. For countries without studies, data were extrapolated from countries with similar settings.

Results: There are estimated 9.5 million people living with T1D globally (compared to 8.4 million in 2021, a 13 % increase), with 1.0 million of these aged 0–14, and 0.8 million aged 15–19 years. In lower-income countries, prevalent cases increased by 20 % from 1.8 million in 2021 to 2.1 million in 2025. Incident cases in 2025 are an estimated 513,000 (164,000 aged 0–14 and 58,000 aged 15–19 years), with incidence increasing by 2.4 % in the last year. Premature deaths are estimated at 174,000, with 17.2 % of these due to non-diagnosis soon after

* Corresponding author at: Life for a Child, Diabetes Australia, 26 Arundel St, Glebe New South Wales 2037, Australia.

E-mail addresses: gogle@diabetesaustralia.org.au (G.D. Ogle), fwang@breakthrought1d.org (F. Wang), AHaynes@diabetesaustralia.com.au (A. Haynes), gabrielandrew.gregory@health.nsw.gov.au (G.A. Gregory), t.w.king@student.unsw.edu.au (T.W. King), kylie.deng@svi.edu.au (K. Deng), dana.dabelea@cuanschutz.edu (D. Dabelea), sjames1@usc.edu.au (S. James), Alicia.Jenkins@baker.edu.au (A.J. Jenkins), lixia@csu.edu.cn (X. Li), rcwma@cuhk.edu.hk (R.C.W. Ma), dmaahs@stanford.edu (D.M. Maahs), R.Oram@exeter.ac.uk (R.A. Oram), catherine.pihoker@seattlechildrens.org (C. Pihoker), jannet.svensson.01@regionh.dk (J. Svensson), zhouzhiguang@csu.edu.cn (Z. Zhou), Dianna.Magliano@baker.edu.au (D.J. Magliano).

[1] Joint first authors.

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clinical onset. The estimated remaining life expectancy of a 10-year-old child diagnosed with T1D in 2025 varies between countries from 6 to 66 years. There are still no data available for 119 countries. The projected T1D population for 2040 is estimated to be14.7 million.

Conclusions: The number of global T1D cases is rising quickly, especially in lower-income settings, due to increasing diagnosed incidence, falling mortality and ageing, and population growth. Contemporary data are unavailable for over 50% of all countries, highlighting need for epidemiological studies.

1. Introduction

Type 1 diabetes (T1D) is the most frequently occurring form of diabetes in children and adolescents [1] and can also have clinical onset throughout adult life [2–4]. It is now understood that T1D generally commences with development of islet cell autoantibodies, often some years before clinical onset [5], though in some African [6] and South Asian [7] populations, currently used autoantibodies are less likely to be positive than among European populations even in individuals with low C-peptide. Even in affluent regions few countries have the capacity to screen for pre-clinical T1D and offer emerging T1D-onset delaying drugs. Once symptoms are present (Stage 3 T1D), multiple daily insulin injections are required, titrated to frequently measured blood or (where available) interstitial fluid glucose levels [8]. Comprehensive diabetes education, and management by health professionals skilled in T1D, are also essential.

As for any medical condition, understanding T1D health and socioeconomic burden is crucial for appropriate allocation of limited health resources, appropriate training of health professionals, national and global advocacy. T1D incidence and mortality differ greatly from country to country [9,10] and therefore country-level prevalence is highly variable. Furthermore, incidence has generally been rising [11,12] and mortality falling [9,13], and so individual country prevalences may be steadily increasing.

The International Diabetes Federation (IDF) Atlas has provided estimates of the number of children aged 0–14 years with symptomatic T1D since 2000 [14]. More recently, estimates for the 15–19-year age group were added. In 2022 [15], the Atlas incorporated the methodology of the T1D Index [9,16].

Complimentary to the release of the 11th edition of the IDF Atlas and the T1D Index Version 3.0, this article presents incidence, prevalence and mortality estimates for 202 countries and territories (hereafter labelled "countries").

2. Material and methods

The national and global estimates of symptomatic T1D for all age groups were generated by the 11th edition IDF Atlas T1D Special Interest Group and the T1D Index team, using the methodology of the T1D Index described in Gregory et al. (2022) [9].

In summary, it is a Markov model supplemented by data-driven predictive modelling to combine published, and available unpublished, population-based data on T1D incidence and prevalence, as well as mortality among those with T1D and those without T1D, to estimate prevalence, incidence and life expectancy for those living with T1D in all countries. Incident case number modelling includes published incidence data as well as extrapolations to countries without in-country data, incidence over time and adult incidence models, and population, with those cases that die from non-diagnosis excluded. The mortality case model includes standardised mortality ratios data, information on levels of care, previous year's prevalence, and incident cases in the specific year, with the addition of deaths from non-diagnosis. Prevalent cases modelling includes previous year's prevalence, current year's incidence and mortality data.

Data included in the Index Version 1.0 [9,10] were updated via a literature search for population-based incidence, prevalence, and mortality data (**Supplementary Materials** Appendix 1), as well as unpublished registry and study data provided by in-country researchers from Australia, Costa Rica, Denmark, Egypt, Georgia, Laos, Mauritius, Moldova, New Zealand, Northern Ireland, Portugal, and Scotland.

The references for each country are listed in **Supplementary Materials** Appendices 2 and 3**.**

Childhood/childhood and adolescent incidence data were used from 89 studies/data sets in 83 countries, representing 73 % of the total global population. Nineteen countries had data from before 2000 with no new data since then. These pre-2000 data (mainly from the landmark DIAMOND study [17] were excluded as their relevance in informing incidence in 2025 is too uncertain, given changes in incidence over time. These countries were: Antigua and Barbuda, Argentina, Barbados, Belarus, Bulgaria, Cuba, Dominica, Jordan, Latvia, Oman, Papua New Guinea, Paraguay, Peru, Puerto Rico, Singapore, Tunisia, Ukraine, Uruguay, and Venezuela.

A population-weighted average was used from countries which reported data for most but not all regions. These countries were Australia, Canada, Spain, and the United Kingdom. For the United Kingdom, the studies from the four parts of the nation were in different years, and so the chosen single year of data that was modelled was also a weighted average by population. For China, where reported incidence varies widely across the country [18], a simple mean was used of two recent studies, one from Beijing [19], and the other from Henan Province [20].

For four countries, (Egypt, Georgia, Italy, and Russian Federation), incidence was back-calculated by the model from prevalence data (**Supplementary Materials** Appendix 2).

Data for the 119 countries without childhood incidence data were extrapolated from data from nearby countries similar in terms of language, culture, demography and income, as per past Atlas and Index V1.0 methodology [21]. For 11 Pacific Island nations, the incidence modelled was that of the Polynesian/Melanesian subset of the population of Fiji [22].

Adult incidence data were available from 30 studies/data sets in 21 countries, with study periods all being after 2000. The adult incidence curve as a function of age was then generated as described previously [9], with a curve for all countries excluding sub-Saharan Africa, and a separate curve specifically for sub-Saharan Africa (due to the later peak age of onset in that region [9,23] – see **Supplementary Materials** Appendix 4**.**

Trends in incidence were then estimated for the period between 1985 and 2025, using the most representative data for each country, either from local data or extrapolated from geographic groups (defined where sufficient overlapping multiple-country data was available from countries with comparable demography), or otherwise from global averages (**Supplementary Materials** Appendix 3). The geographic groups were north-western Europe, north-eastern Europe, south-western Europe, south-eastern Europe, Middle East/North Africa, Hong Kong/Taiwan, Australia/New Zealand. Incidence data from the COVID-19 pandemic years 2020–22 were excluded from the incidence over time model as a number of studies have shown marked temporal variations in incidence during this period [24,25]. To date there are very limited incidence trend data available from 2023 onwards. Incidence was assumed to be constant prior to 1985, unless there were historical data, and assumed to be increasing/decreasing into the period until 2025 at the average rate of the final three years of available data.

Prevalence data were available for 27 countries. Where prevalence data were available, the most recent year of data was used to overwrite the modelled prevalence for that year (**Supplementary Materials** Appendix 8).

Random Forest regression was used to model age-standardised mortality rate with the following covariates for each country where we had data (n = 39): infant mortality and under five-year mortality rates, percent of population living in cities, doctors per capita, and gross domestic product per capita, as well as the standardised mortality rate associated with the varying levels of T1D care across countries. Two levels of care were used – 'minimal' versus 'non-minimal' as defined by the T1D 'Levels of Care' paradigm in Ogle et al. (2019) [26], and Chan et al. (2021) [27]. T1D levels of care (minimal or non-minimal) were estimated in each World Bank income-level bracket for each decade from 2000 to 2030 by author opinion [9], updated for this study (**Supplementary Materials** Appendix 6).

As it is recognised that the diagnosis of T1D in children and youth at clinical onset is often delayed and sometimes not made at all, with the young person dying from diabetic ketoacidosis misdiagnosed as another condition or without a diagnosis [26,28–32], diagnosis rates (expressed as a proportion of total onset cases) by decade, world region and income level were developed from a survey of ISPAD (International Society for Pediatric and Adolescent Diabetes) members in 2020. These proportions were then compared to published data from Mali, Rwanda and Gabon, which suggested that they were underestimated. However, we used the more conservative results from the expert survey in Version 1 and this current version of the T1D Index [9], (**Supplementary Materials** Appendix 6) Deaths from non-diagnosis at clinical onset were then calculated [9].

Life expectancy was calculated using standard methods [33], assuming the 'medium' projection from the United Nations for background mortality, and that the standardised mortality rates for T1D continue to improve at current rates until 2030 and then remain constant.

Missing prevalence – the number of people who have died prematurely, due to having T1D either at clinical onset, or later in the course of the condition, who would otherwise still be alive in 2025 given the life expectancy of the general population – was calculated as the change in prevalent T1D cases between the base case with the model-generated excess mortality assumptions, and the scenario with the assumption that T1D cases had no excess mortality as compared to the general population [9].

Finally, the model was used to project the global burden (prevalence) of T1D in 2040. The assumptions were: population growth as per United Nations 'medium' projections [34], and the current change in incidence, mortality, diagnosis rate, and levels of care continuing until 2030 and then remaining constant.

3. Results

3.1. Model validation

When the T1D Index Version 3.0 modelled prevalence estimates were compared to published prevalence in 28 studies from 27 countries, the median [IQR] per-country variation for the < 20 years age group was 8 [12] (range 2–37)%, and for all age groups was 13 [16] (range 2–111)%. Among the 34 reported prevalence data points (stratified by country, age group, and year), the model overestimated in 14 instances, with a median relative error of 6 %. In contrast, it underestimated in 20 instances, with a median relative error of −17 %. (Supplementary Materials **Appendix 8**).

3.2. Prevalence

The model estimates a total of 9.5 (95 % CI: 9.0 – 10.0) million people with a median age of 36 [IQR 26] years living with clinically diagnosed T1D globally in 2025. Of these, 1.9 million (19.0 %) are < 20 years (with 1.0 million aged < 15 years), 6.5 million (68.4 %) aged between 20 and 59 years and 1.1 million (11.6 %) aged ≥ 60 years.

The 10 countries with the highest estimated number of people living with T1D are, in order, the United States of America, India, China, Brazil, United Kingdom, Germany, Russian Federation, Canada, Saudia Arabia and Turkey (Table 1). The ten countries with highest number of people with T1D aged < 20 years differs in its order and composition to the list of all-age prevalent counts. (Table 1).

The IDF world regions with the highest number of people living with T1D are Europe, followed by North America/Caribbean and the Middle East and North Africa (Fig. 1A). When classified according to World Bank country income level [35], 2.2 million (22.6 %) of the 9.5 million people living with diagnosed T1D, live in low- and low-middle-income countries (Fig. 1B).

3.3. Incidence

Globally, in 2025 there will be an estimated 513,000 newly diagnosed cases of T1D. Of these, 222,000 (43.3 %) of global newly diagnosed cases of T1D are estimated to occur in people aged < 20 years (with 164,000 of these in those aged < 15 years). The mean (SD) and median [IQR] age at clinical diagnosis of T1D is 28 [19] years, and 24 [29] years, respectively.

Fig. 2 shows the reported incidence in 0–14 year-olds in the 83 countries with country-specific data, listing both published and unpublished available data and observation period, and their modelled incidence in 2025. T1D incidence varies widely between regions and countries. For example, modelled incidence in 0–14 year-olds for 2025 ranges from 64.2 per 100,000 population in Finland to 0.24 per 100,000 population in Burkina Faso (Table 2, Fig. 2).

In the geographical groups where multiple country analysis of incidence over time was possible, the highest annual growth to 2019 was in south-eastern Europe and the lowest in north-western Europe (where incidence was declining). The annual percentage change for this period up until 2025 was, by geographic grouping, north-western Europe (−0.7 %), north-eastern Europe (3.2 %), south-western Europe (1.5 %), south-eastern Europe (4.0 %), Middle East/North Africa (1.8 %), Hong Kong/Taiwan (0.7 %), Australia/New Zealand (2.0 %), and 2.4 % for the global curve. For further details, see **Supplementary Materials** Appendix **3.**

In terms of published incidence data, the 10 countries with the highest incidence are, in order, Finland, Sweden, Norway, Kuwait, Qatar, Denmark, Algeria, Estonia, Ireland, United Kingdom, and Saudi Arabia. However, the order is different for modelled 2025 incidences, as in some countries the last available observed data was quite old (e.g. Saudi Arabia and Slovakia) and with the incidence over time adjustment, the modelled incidence rose. In 2025, the 10 highest projected incidence were in Finland, Saudi Arabia, Kuwait, Estonia, Qatar, Algeria, Sweden, Canada, Slovakia, and Norway.

Fig. 3 shows modelled incidence of all countries, and Table 2 shows

Table 1
The ten countries with the highest estimated number of people living with type 1 diabetes in 2025 by age group.

	People living with T1D of all ages		People living with T1D aged < 20 years	
Ranking	Country	Number	Country	Number
1	USA	1,513,000	India	307,000
2	India	987,000	USA	198,000
3	China	626,000	China	120,000
4	Brazil	517,000	Brazil	101,000
5	United Kingdom	341,000	Egypt	72,000
6	Germany	338,000	Russian Federation	64,000
7	Russian Federation	289,000	Algeria	59,000
8	Canada	251,000	Turkey	49,000
9	Saudi Arabia	237,000	Saudi Arabia	48,000
10	Turkey	207,000	Morocco	44,000

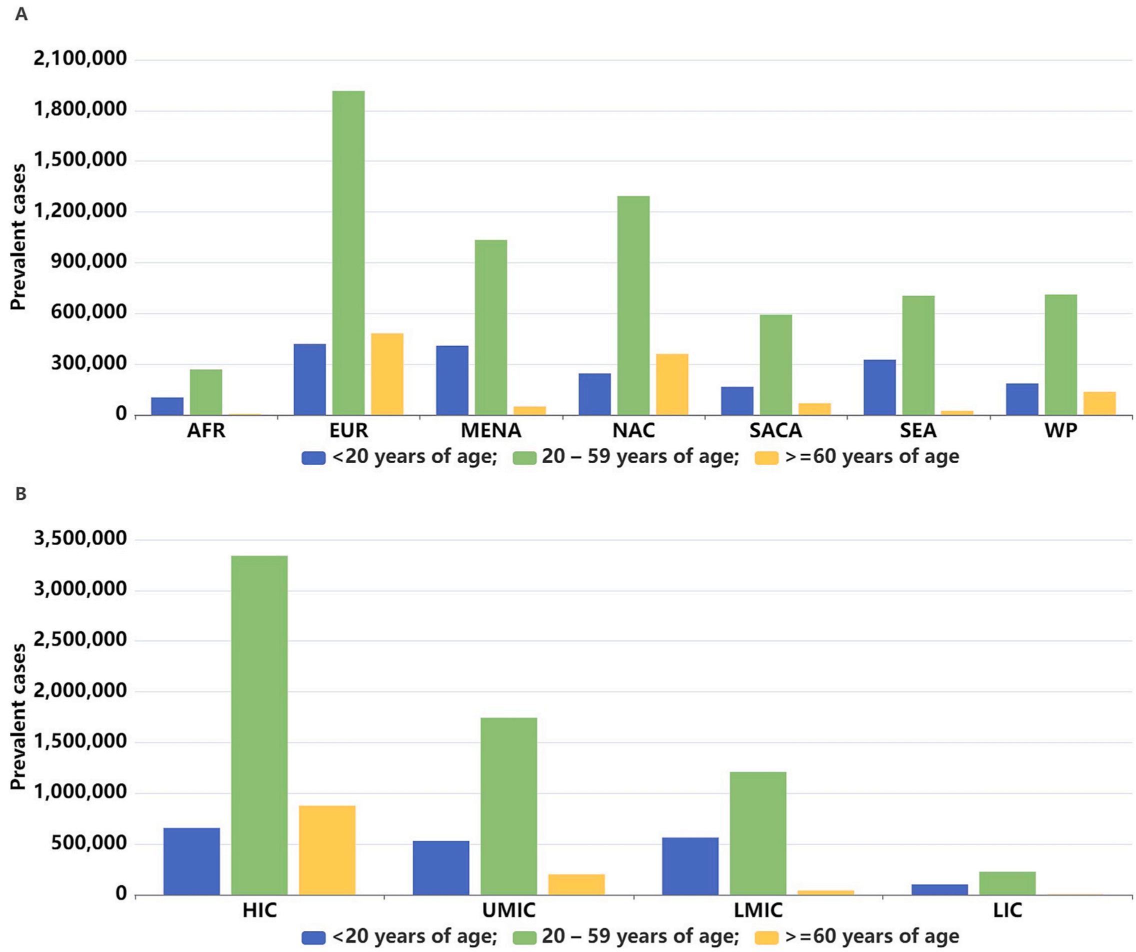

Fig. 1. Numbers of people living with Type 1 Diabetes in 2025 by world region (A) and by country income level (B) Footnote: AFR = African,EUR = Europe, MENA = Middle East and North Africa, NAC=North America and Caribbean, SACA=South and Central America, SEA=Southeast Asia, WP = Western Pacific, HIC=High income country, UMIC = Upper middle income country, LMIC = Lower middle income country, LIC = Low income country.

incidence estimates for all countries for 2025.

3.4. Mortality and life expectancy

The model estimates that there will be 174,000 (95 % CI: 109,000–266,000) deaths due to T1D worldwide in 2025, of which 30,000 (27.3 %), may be attributable to non-diagnosis: 10,000 and 6,000 in the African and Southeast Asia region, respectively. These deaths without a T1D diagnosis represent 64.8 % of the total deaths from T1D in ≤ 25-year age-group (46,000 deaths).

Globally, there is an estimated 60-year gap in the remaining life expectancy for a 10-year-old diagnosed with T1D in 2025. The remaining life expectancy was lowest in South Sudan at 6 years (compared to 55 years for the general population) and highest in Norway at 66 years (compared to 74 years for the general population). Model estimates of life expectancy for those with, and without a diagnosis of T1D for each country are shown in Table 2 and in Fig. 4.

3.5. Missing prevalence

The estimated missing prevalence (i.e. the number of additional people who would be alive with T1D if their mortality matched general population rates) in 2025 is 3.4 million, including an estimated 669,000 dying due to non-diagnosis at clinical onset. The estimated missing prevalence varies widely by country and region (Table 2). The lowest proportion of missing prevalence is estimated in the North American and Caribbean region where there are 3.8 prevalent cases for every missing prevalent case and no missing prevalence attributable to non-diagnosis at clinical onset. In contrast, the highest proportion is estimated in the African region where there are 0.6 prevalent cases for every missing prevalent case and 17.8 % (108,000 cases) of missing prevalence is due to non-diagnosis.

3.6. Projected prevalence in 2040

The projected number of people living with T1D in 2040 is 14.7 (95 %CI:11.5–19.3) million. The largest increase will be in people aged ≥ 20 years.

World regions expected to see the largest relative increases in prevalence are those with predominantly non-European populations, with the projected increase from 2025 being 120 % in the African Region, 86 % in Middle East and North Africa 71 % in Southeast Asia 58 % in the Western Pacific, 55 % in South and Central America, 37 % in Europe 37 % and 34 % in North America and Caribbean (**Supplementary Materials** Appendix 10).

4. Discussion

Globally, an estimated 9.5 million people are living with T1D in 2025, an increase of 1.1 million people (13 %) since the previous estimate of 8.4 million in 2021 (9). Of concern, a significant proportion of this burden is accounted for by youth aged < 20 years who are overly represented in low- and low to middle-income countries. Additionally, these prevalence estimates do not account for those missing due to

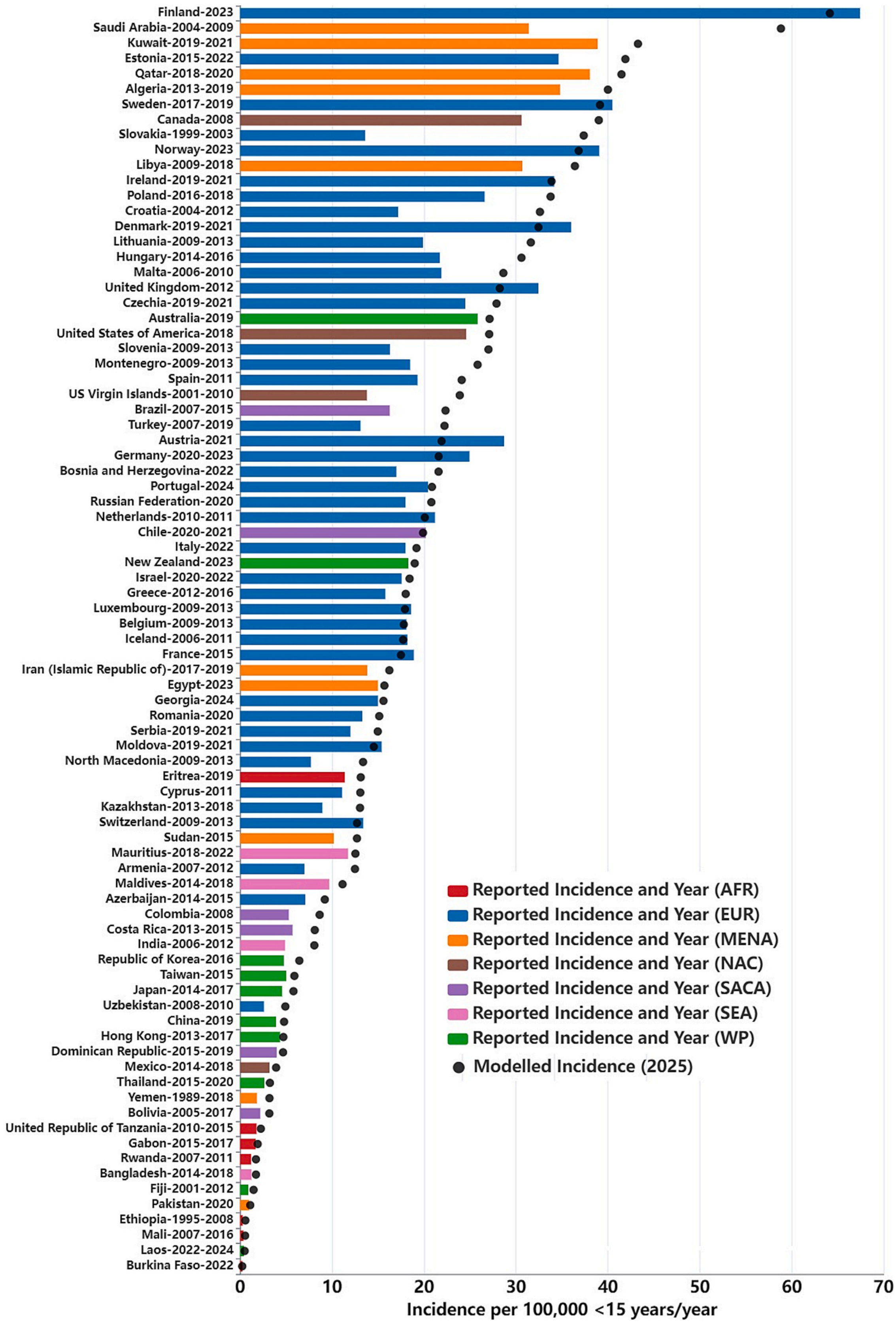

Fig. 2. Most recent reported Type 1 Diabetes incidence 0–14 years, and 2025 modelled incidence, for all countries with reported data.

Table 2
Estimated number of people of all ages (<20 year olds) living with T1D, incident cases for all ages (<20 year olds), incidence for < 15 year olds, average life expectancy at diagnosis and missing prevalent cases of T1D in all countries by IDF region, world income group, by country (2025).

Country	Number living with T1D, all ages (<20 years)	Incident cases, all ages (<20 years)	Incidence per 100,000 < 15 years	Remaining life expectancy in years, T1D (non-T1D)	Missing Prevalent cases[a]
Global	9,500,188 (1,854,849)	513,125 (221,962)	8.2	41 (67)	4,084,579
World Region					
African	377,508 (103,301)	50,465 (25,040)	2	14 (57)	605,365
Europe	2,816,750 (419,276)	114,331 (42,901)	20.6	52 (69)	857,737
Middle East and North Africa	1,492,534 (408,857)	98,589 (47,523)	13.7	38 (66)	571,582
North America and Caribbean	1,898,909 (245,097)	66,669 (26,047)	19.5	56 (70)	504,070
South and Central America	827,014 (165,675)	46,315 (19,833)	13.6	42 (68)	378,537
Southeast Asia	1,054,287 (326,566)	78,722 (38,429)	7.3	30 (65)	849,951
Western Pacific	1,033,186 (186,076)	58,034 (22,189)	3.9	46 (69)	317,339
World Bank Income Level					
High-income countries	4,875,959 (658,282)	184,471 (68,052)	24.7	57 (71)	1,189,442
Upper-middle income countries	2,475,373 (530,477)	146,426 (63,035)	8.7	44 (68)	1,000,003
Lower-middle income countries	1,815,156 (564,082)	142,791 (72,299)	5.6	30 (64)	1,344,702
Low-income countries	333,700 (102,008)	39,438 (18,576)	3.4	16 (60)	550,433
Individual country data					
Afghanistan	14,553 (7,639)	1,716 (1,131)	5	16 (61)	17,225
Albania	3,626 (653)	214 (79)	13.4	50 (71)	1,481
Algeria	198,288 (58,927)	12,629 (6,874)	40	44 (68)	59,733
Angola	15,012 (3,966)	1,688 (860)	2.3	21 (60)	16,833
Antigua and Barbuda	74 (15)	5 (2)	8	45 (69)	35
Argentina	90,932 (21,510)	5,441 (2,426)	19.5	44 (69)	36,288
Armenia	3,490 (715)	220 (89)	12.5	43 (67)	1,655
Aruba	90 (17)	5 (2)	8.2	45 (68)	36
Australia	117,929 (14,423)	4,207 (1,652)	27.1	64 (74)	17,569
Austria	27,625 (3,564)	1,072 (359)	21.9	54 (73)	8,509
Azerbaijan	9,976 (2,253)	594 (260)	9.2	43 (66)	4,238
Bahamas	353 (66)	19 (8)	8.1	43 (66)	115
Bahrain	8,244 (1,346)	439 (159)	42.4	58 (72)	504
Bangladesh	26,835 (7,629)	2,131 (1,118)	1.7	30 (67)	18,208
Barbados	236 (43)	13 (5)	7.9	45 (67)	88
Belarus	28,886 (5,417)	1,681 (620)	34.1	46 (65)	13,643
Belgium	40,140 (4,734)	1,147 (426)	17.8	62 (73)	9,081
Belize	400 (54)	16 (10)	3.9	38 (65)	214
Benin	4,334 (1,209)	575 (300)	1.9	16 (57)	4,732
Bhutan	597 (155)	39 (17)	8.2	32 (65)	416
Bolivia	3,404 (1,134)	279 (149)	3.2	27 (62)	2,585
Bosnia and Herzegovina	6,277 (936)	360 (115)	21.6	47 (69)	3,826
Botswana	1,411 (226)	114 (46)	2.3	32 (62)	1,073
Brazil	517,290 (100,889)	28,927 (11,829)	22.3	41 (67)	246,389
Brunei Darussalam	141 (31)	10 (5)	3.1	50 (66)	11
Bulgaria	9,543 (1,536)	551 (190)	15.3	49 (66)	3,882
Burkina Faso	606 (205)	111 (56)	0.2	14 (58)	634
Burundi	3,079 (1,021)	501 (272)	1.8	11 (58)	7,393
Cambodia	613 (241)	61 (33)	0.5	22 (63)	537
Cameroon	9,404 (2,578)	1,161 (605)	1.9	19 (59)	8,925
Canada	250,506 (28,153)	8,670 (3,027)	39	60 (73)	49,236
Cape Verde	228 (39)	20 (8)	2.1	29 (67)	159
Central African Republic	283 (117)	62 (32)	0.6	12 (54)	608
Chad	1,260 (399)	224 (107)	0.5	9 (53)	2,237
Chile	42,558 (7,309)	2,272 (844)	19.9	57 (72)	7,687
China	626,423 (119,672)	37,407 (13,553)	4.8	47 (69)	217,544
Colombia	49,960 (9,952)	2,891 (1,196)	8.7	45 (69)	21,936
Comoros	364 (82)	39 (18)	2.4	21 (61)	443
Congo	2,128 (579)	252 (132)	1.9	21 (59)	1,865
Costa Rica	4,956 (876)	249 (100)	8.1	50 (72)	1,763
Croatia	11,784 (1,897)	666 (225)	32.6	52 (69)	4,054
Cuba	6,553 (861)	286 (101)	4.8	46 (69)	3,401
Curaçao	118 (15)	5 (2)	5	49 (68)	34
Cyprus	3,052 (318)	103 (36)	13.1	57 (72)	749
Czechia	33,743 (5,016)	1,605 (576)	27.9	53 (70)	9,935
Côte d’Ivoire	9,994 (2,842)	1,275 (666)	1.9	18 (57)	10,188
Democratic People’s Republic of Korea	12,699 (2,640)	915 (358)	5.6	27 (65)	10,141
Democratic Republic of the Congo	25,911 (7,494)	3,692 (1,936)	1.6	13 (58)	53,078
Denmark	31,401 (3,687)	1,129 (399)	32.5	62 (73)	7,540
Djibouti	1,883 (532)	164 (112)	13.4	22 (60)	1,757

(continued on next page)

Table 2 (*continued*)

Country	Number living with T1D, all ages (<20 years)	Incident cases, all ages (<20 years)	Incidence per 100,000 < 15 years	Remaining life expectancy in years, T1D (non-T1D)	Missing Prevalent cases[a]
Dominican Republic	6,717 (1,460)	358 (178)	4.7	41 (66)	2,979
Ecuador	16,878 (4,140)	1,032 (489)	8.7	43 (69)	7,142
Egypt	203,020 (72,001)	13,005 (7,242)	15.7	33 (63)	73,467
El Salvador	5,396 (781)	233 (147)	3.9	35 (63)	3,876
Equatorial Guinea	719 (157)	72 (35)	1.9	26 (59)	485
Eritrea	7,423 (1,987)	900 (426)	13.1	17 (62)	12,526
Estonia	5,381 (959)	299 (111)	41.9	49 (70)	1,940
Eswatini	450 (114)	57 (25)	2.4	17 (58)	779
Ethiopia	17,807 (4,733)	2,259 (1,457)	0.6	15 (61)	36,032
Fiji	125 (36)	9 (5)	1.5	33 (59)	71
Finland	55,538 (7,667)	1,504 (626)	64.2	64 (72)	9,408
France	178,585 (26,224)	6,413 (2,468)	17.5	58 (74)	58,850
French Guiana	288 (83)	19 (10)	8.5	50 (68)	52
French Polynesia	14 (3)	1 (0)	0.4	57 (75)	2
Gabon	1,054 (209)	97 (47)	1.9	32 (61)	578
Gambia	243 (61)	32 (14)	0.6	15 (60)	272
Georgia	7,594 (1,667)	352 (152)	15.6	43 (65)	2,871
Germany	341,380 (41,973)	9,563 (3,189)	21.6	53 (72)	96,982
Ghana	10,899 (2,717)	1,348 (651)	1.9	16 (59)	12,187
Greece	24,031 (2,914)	906 (305)	18	59 (73)	8,304
Grenada	96 (20)	6 (2)	8.1	37 (67)	56
Guam	7 (2)	0 (0)	0.4	48 (69)	2
Guatemala	15,774 (2,716)	757 (523)	3.9	34 (65)	9,502
Guernsey	355 (35)	10 (3)	28.2	62 (74)	75
Guinea	1,275 (313)	166 (75)	0.6	16 (58)	1,162
Guinea-Bissau	196 (48)	25 (11)	0.6	16 (59)	222
Guyana	416 (111)	26 (14)	4.6	35 (62)	189
Haiti	4,699 (1,595)	389 (212)	4.6	22 (59)	5,213
Honduras	9,029 (1,505)	427 (289)	3.7	33 (64)	6,480
Hong Kong	4,557 (460)	178 (50)	4.7	63 (76)	692
Hungary	31,381 (4,630)	1,604 (546)	30.6	48 (68)	11,033
Iceland	1,444 (152)	42 (16)	17.7	65 (73)	180
India	987,311 (306,914)	73,567 (35,853)	8.1	30 (65)	798,932
Indonesia	12,341 (3,617)	935 (444)	0.5	35 (63)	6,180
Iran (Islamic Republic of)	141,997 (34,210)	9,214 (4,021)	16.2	43 (69)	46,535
Iraq	70,018 (26,474)	5,343 (3,193)	15.7	38 (64)	20,708
Ireland	26,326 (3,808)	1,040 (424)	33.9	55 (73)	7,332
Israel	23,707 (4,957)	1,146 (591)	18.4	59 (73)	3,446
Italy	185,825 (18,508)	5,685 (1,760)	19.2	56 (74)	73,716
Jamaica	1,694 (290)	83 (33)	4.8	38 (63)	900
Japan	81,792 (9,517)	3,453 (1,061)	5.8	63 (75)	14,518
Jersey	564 (57)	16 (5)	28.2	58 (71)	129
Jordan	26,450 (7,092)	1,493 (820)	18.6	41 (69)	10,526
Kazakhstan	24,692 (7,390)	1,827 (970)	13.1	43 (65)	9,665
Kenya	22,063 (5,806)	2,674 (1,250)	2.4	17 (57)	31,009
Kiribati	4 (2)	0 (0)	0.4	23 (61)	4
Kosovo	2,335 (525)	140 (60)	13.5	51 (69)	717
Kuwait	30,263 (4,226)	1,337 (489)	43.3	61 (71)	1,779
Kyrgyzstan	2,714 (1,000)	231 (129)	4.5	30 (63)	1,365
Laos	146 (54)	27 (15)	0.5	28 (62)	203
Latvia	7,085 (1,304)	410 (152)	42.1	44 (67)	3,023
Lebanon	12,882 (3,219)	710 (362)	18.9	40 (70)	6,659
Lesotho	760 (214)	107 (47)	2.4	14 (53)	1,532
Liberia	386 (119)	64 (29)	0.6	11 (57)	653
Libya	29,536 (9,289)	1,833 (931)	36.4	42 (64)	8,586
Lithuania	7,885 (1,352)	482 (165)	31.6	45 (67)	3,112
Luxembourg	2,387 (242)	69 (24)	17.9	63 (73)	387
Macao	478 (55)	19 (6)	4.7	62 (74)	47
Madagascar	10,573 (2,832)	1,459 (686)	2.3	12 (59)	23,048
Malawi	7,871 (2,303)	1,025 (506)	2.3	18 (61)	14,447
Malaysia	11,043 (2,703)	824 (417)	3.2	44 (68)	2,224
Maldives	515 (116)	37 (14)	11.1	51 (72)	111
Mali	1,546 (439)	277 (137)	0.6	15 (58)	2,191
Malta	2,589 (253)	83 (25)	28.6	59 (74)	655
Martinique	285 (47)	14 (5)	8.1	55 (74)	101
Mauritania	502 (118)	58 (27)	0.6	24 (62)	321
Mauritius	4,291 (356)	275 (73)	12.5	33 (66)	3,766
Mayotte	1,015 (188)	77 (40)	11.6	34 (67)	744
Mexico	124,895 (15,791)	4,721 (2,969)	3.9	40 (66)	67,277
Micronesia (Federated States of)	4 (1)	0 (0)	0.4	22 (59)	3
Moldova	3,145 (895)	254 (107)	14.6	35 (62)	1,730
Mongolia	1,455 (490)	111 (62)	4.6	37 (63)	545
Montenegro	1,701 (328)	95 (37)	25.8	45 (68)	815
Morocco	146,159 (43,598)	9,917 (4,889)	40	35 (67)	73,956

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Table 2 (*continued*)

Country	Number living with T1D, all ages (<20 years)	Incident cases, all ages (<20 years)	Incidence per 100,000 < 15 years	Remaining life expectancy in years, T1D (non-T1D)	Missing Prevalent cases[a]
Mozambique	12,371 (3,591)	1,579 (801)	2.3	16 (58)	21,217
Myanmar	1,826 (631)	179 (83)	0.5	22 (60)	1,820
Namibia	1,422 (283)	133 (59)	2.3	26 (60)	1,386
Nepal	18,763 (6,898)	1,569 (842)	8.1	26 (63)	16,389
Netherlands	68,097 (6,859)	2,045 (713)	20.1	61 (73)	16,380
New Caledonia	14 (3)	1 (0)	0.4	51 (70)	3
New Zealand	17,978 (2,392)	583 (230)	19	59 (73)	2,609
Nicaragua	5,436 (928)	267 (178)	3.9	32 (66)	4,681
Niger	1,739 (578)	302 (149)	0.5	10 (60)	2,833
Nigeria	63,248 (18,904)	9,388 (4,941)	1.9	11 (53)	83,986
Niue	0 (0)	0 (0)	0.4	41 (62)	0
North Macedonia	2,381 (426)	137 (51)	13.4	50 (68)	946
Norway	37,452 (4,327)	1,173 (431)	36.8	66 (74)	6,961
Oman	37,813 (6,993)	2,169 (928)	58.3	59 (71)	1,893
Pakistan	25,659 (9,992)	2,217 (1,394)	1.1	25 (62)	17,974
Panama	4,100 (940)	235 (113)	8	49 (71)	922
Papua New Guinea	351 (139)	32 (18)	0.4	23 (59)	314
Paraguay	6,219 (1,672)	413 (212)	8.6	40 (66)	2,653
Peru	19,920 (4,089)	1,043 (490)	4.7	41 (69)	9,820
Philippines	31,888 (10,862)	2,902 (1,704)	3.2	27 (62)	12,530
Poland	134,165 (20,654)	6,988 (2,406)	33.8	53 (69)	32,265
Portugal	33,889 (3,641)	1,125 (362)	20.9	55 (73)	15,428
Puerto Rico	2,798 (392)	135 (42)	8.2	52 (73)	1,012
Qatar	13,766 (1,616)	815 (237)	41.5	65 (73)	422
Republic of Korea	33,975 (3,704)	1,612 (448)	6.4	65 (75)	2,865
Romania	26,436 (4,748)	1,582 (577)	15.1	47 (67)	11,035
Russian Federation	333,034 (63,684)	16,830 (6,426)	20.8	44 (64)	119,075
Rwanda	4,399 (1,044)	507 (242)	1.7	18 (61)	7,522
Samoa	8 (3)	1 (0)	0.4	27 (63)	5
Sao Tome and Principe	83 (22)	10 (5)	1.9	23 (61)	69
Saudi Arabia	236,780 (48,021)	13,631 (5,975)	58.8	58 (70)	13,139
Senegal	6,838 (1,653)	753 (380)	1.9	22 (62)	5,331
Serbia	13,950 (2,317)	542 (183)	15	45 (68)	5,299
Seychelles	460 (39)	29 (8)	12.1	39 (64)	191
Sierra Leone	763 (185)	100 (44)	0.6	17 (59)	887
Singapore	4,076 (434)	159 (47)	4.6	65 (74)	285
Slovakia	19,310 (3,362)	1,136 (403)	37.4	50 (69)	5,603
Slovenia	5,648 (883)	306 (106)	27	52 (72)	2,074
Solomon Islands	30 (12)	3 (2)	0.4	25 (62)	21
Somalia	21,218 (8,069)	4,641 (2,364)	12.6	7 (57)	75,024
South Africa	32,253 (4,914)	2,774 (1,011)	2.4	26 (59)	35,882
South Sudan	10,120 (3,619)	2,356 (797)	13.2	6 (55)	41,051
Spain	192,956 (18,777)	5,940 (1,943)	24.1	65 (74)	49,400
Sri Lanka	15,975 (4,499)	1,104 (511)	8.1	33 (68)	12,129
St Lucia	148 (28)	9 (3)	7.9	36 (64)	91
St Vincent and the Grenadines	74 (19)	5 (2)	8.1	33 (63)	54
State of Palestine	11,449 (3,788)	770 (474)	18.4	37 (65)	5,203
Sudan	100,571 (26,852)	9,765 (3,295)	12.7	15 (61)	131,992
Suriname	537 (145)	36 (18)	8.5	37 (65)	288
Sweden	84,525 (9,330)	2,311 (893)	39.2	66 (74)	13,221
Switzerland	21,091 (2,206)	620 (215)	12.7	57 (75)	7,261
Syria	45,328 (15,431)	3,366 (1,802)	18.6	25 (65)	48,374
Taiwan	26,862 (1,882)	706 (202)	5.9	59 (71)	9,478
Tajikistan	4,746 (1,797)	395 (234)	5	32 (64)	2,269
Thailand	21,795 (4,699)	1,412 (591)	3.2	34 (68)	6,119
Timor L'Este	52 (23)	5 (3)	0.5	24 (61)	38
Togo	751 (198)	106 (48)	0.6	14 (58)	1,008
Tonga	4 (2)	0 (0)	0.4	33 (64)	2
Trinidad and Tobago	1,254 (233)	72 (27)	8.1	40 (65)	510
Tunisia	43,071 (13,052)	2,898 (1,336)	36.6	35 (68)	21,209
Turkey	207,079 (48,689)	11,998 (5,203)	22.2	51 (69)	48,040
Turkmenistan	3,685 (1,113)	265 (142)	5	38 (63)	1,329
US Virgin Islands	183 (39)	12 (5)	23.9	46 (66)	56
Uganda	19,550 (5,409)	2,339 (1,175)	2.3	17 (62)	29,563
Ukraine	117,850 (21,654)	7,139 (2,412)	34.3	41 (65)	69,073
United Arab Emirates	85,248 (10,285)	4,286 (1,309)	59	66 (74)	2,184
United Kingdom	347,869 (42,107)	10,998 (4,270)	28.2	60 (72)	79,726
United Republic of Tanzania	26,948 (7,127)	3,102 (1,529)	2.3	21 (60)	32,245
United States of America	1,512,851 (198,418)	52,563 (19,701)	27.1	57 (70)	379,578
Uruguay	3,229 (607)	170 (69)	8.7	51 (69)	850
Uzbekistan	16,400 (5,139)	1,285 (689)	4.9	33 (64)	8,025
Vanuatu	12 (5)	1 (1)	0.4	27 (63)	8

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Table 2 (*continued*)

Country	Number living with T1D, all ages (<20 years)	Incident cases, all ages (<20 years)	Incidence per 100,000 < 15 years	Remaining life expectancy in years, T1D (non-T1D)	Missing Prevalent cases[a]
Venezuela (Bolivarian Republic of)	15,577 (3,830)	880 (448)	4.9	35 (64)	8,518
Viet Nam	24,544 (7,341)	2,279 (1,197)	3.2	28 (67)	10,949
Western Sahara	65 (9)	6 (2)	0.6	25 (64)	49
Yemen	11,439 (4,808)	1,036 (662)	3.2	24 (63)	9,512
Zambia	8,735 (2,243)	984 (484)	2.3	21 (60)	10,211
Zimbabwe	5,866 (1,766)	780 (387)	2.4	17 (56)	8,801

[a] Missing prevalent cases are the number of additional people who would be alive with T1D if their mortality matched general population rates.

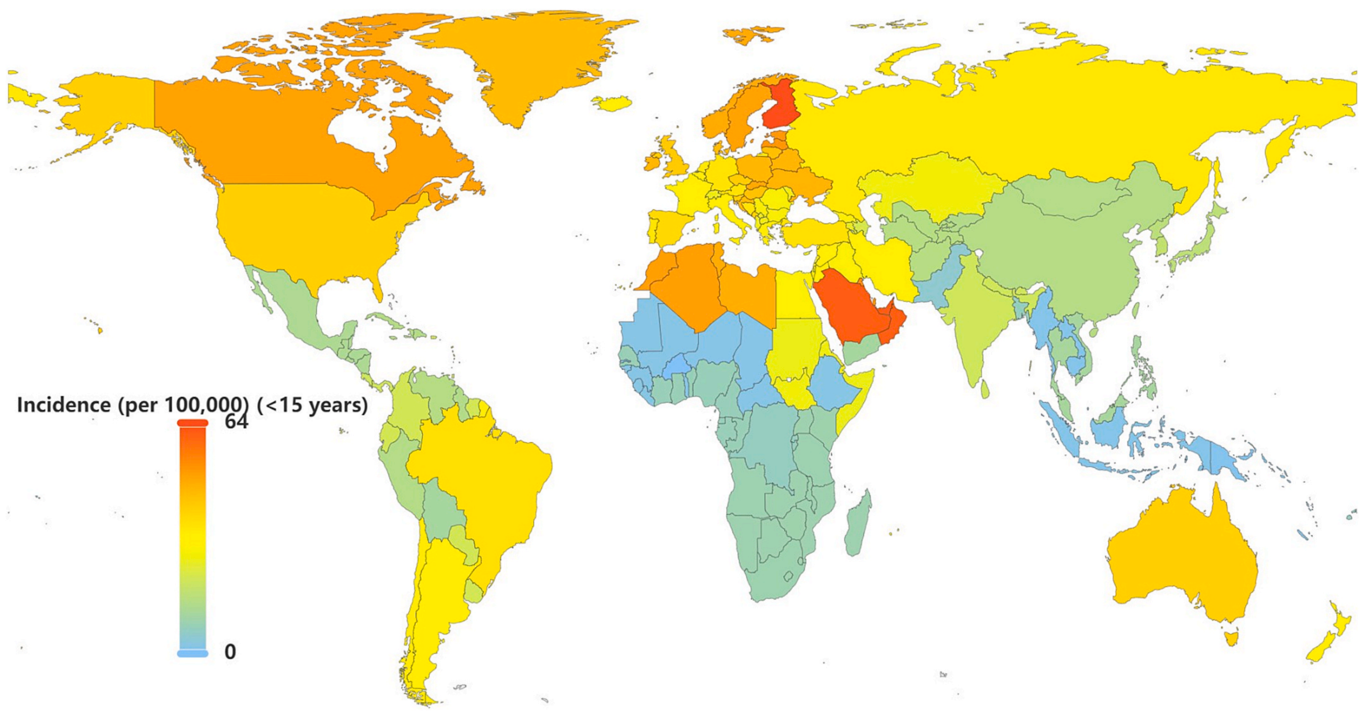

Fig. 3. Modelled Type 1 Diabetes incidence < 15 years by country (2025).

premature death with T1D. Globally, if the mortality of people with T1D matched that of the general population in their country, the number of people living with T1D in 2025 would be 13.9 million (46 % higher). The estimated remaining life expectancy of a 10-year-old diagnosed with T1D ranges from 6 to 66 years depending on which country they live in and thereby access to care, is a stark reminder of the impact of T1D, particularly in less-resourced countries.

The increase in the global number of prevalent cases (9.5 million cases in 2025 compared to 8.4 in 2021 – a 13 % increase) is due to combined impact of increasing incidence (including improved diagnosis rates), population growth and, ageing and falling mortality. In lower-income countries (lower-middle and low-income countries), prevalent cases increased by 20 % from 1.8 million in 2021 to 2.1 million in 2025. Temporal trends in incidence remain variable with most regions of the world where there are multiple year-overlapping studies from similar countries showing a continued increase in incidence (from 0.7-4.0 % depending on the geographic grouping), with the notable exception of north-western Europe (where incidence was modelled to be declining by 0.7 % per year, after at least 40 years of increase). There is, however, individual country data from countries, such as Moldova (Personal communication, Dr Natalia Palarie), Kazakhstan [36], and Maldives [37] which show substantially higher annual increases in incidence than the modelled incidence over time estimate in their respective regions.

Most of the deaths occurring in children and youth with T1D are due to non-diagnosis with the young person dying in ketoacidosis, misdiagnosed as another condition or not reaching care [26,28–32]. These tragic deaths are entirely preventable with education of health professionals and the wider community, and practices such as checking of blood glucose in all ill children in emergency departments. Diagnoses rapidly rise where there is more effective health professional education on this topic, combined with access to insulin and other supplies [29,30].

The impact of population size and age distribution is illustrated by India having the highest prevalence of T1D in youth aged < 20 years, and both India and China being in the 10 countries with the highest numbers of T1D in people of all ages (Table 1), despite having lower reported incidence rates of T1D when compared to European populations such as Finland and Sweden. Strongly associated with World Bank income classification, mortality rates for both the general and T1D affected populations have recently been reported as falling in some high-income countries [13], most likely due to ongoing advances in health care, including diabetes-related technology and therapies in these populations. The differences in access to advanced technologies is likely to increase the life-expectancy gap even more given the marked improvement in clinical outcomes observed in countries with access to these technologies [38].

The impact of variable T1D incidence, demography, and mortality between different countries and world regions highlights the importance of country-specific data for enabling accurate estimates of current and future burden of T1D. Following a rigorous review of published and grey

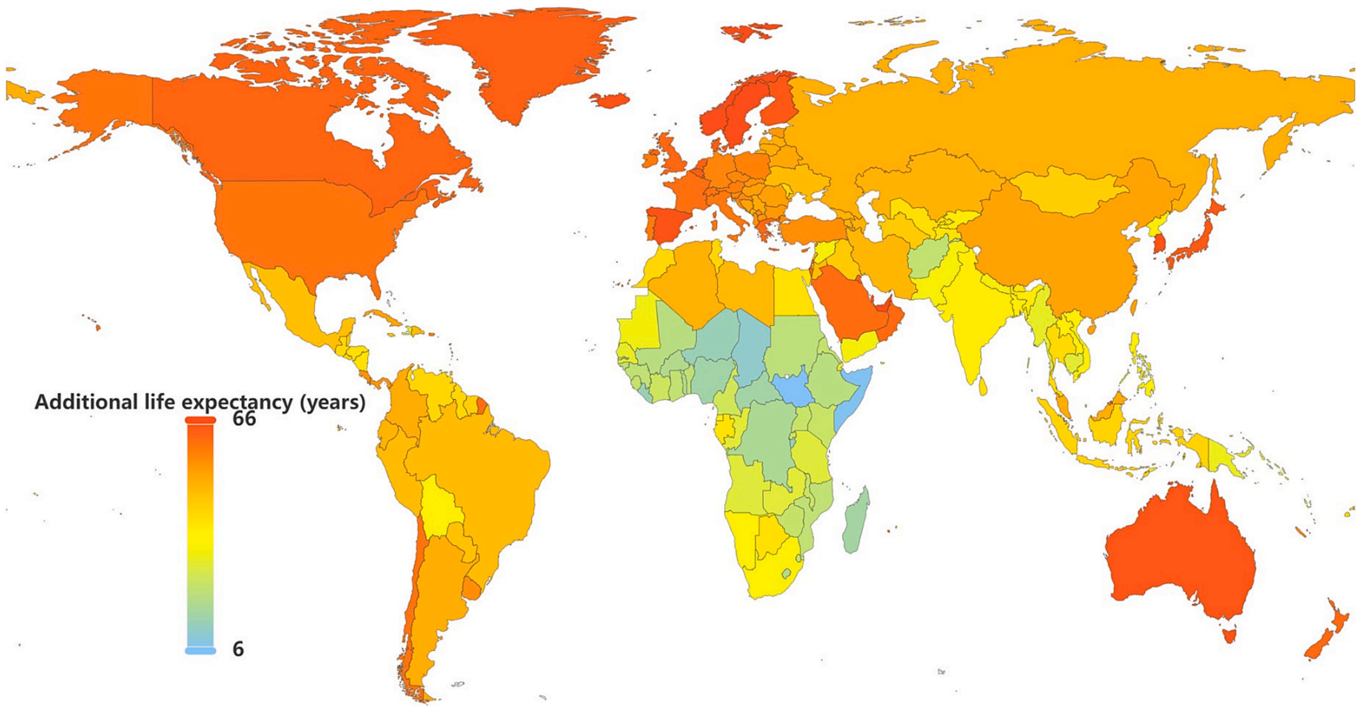

Fig. 4. Projected additional life years of a 10-year old diagnosed with Type 1 Diabetes in 2025.

literature, as well as personal communications requesting access to unpublished data, only 83 of the 202 countries included in the Atlas and T1D Index Version 3.0 had incidence data available. Furthermore, much of the identified published data were not contemporary, with only 48 of these countries reporting data since 2015. Data are particularly scant from Africa, South America, and parts of Asia.

Notably, most people diagnosed with T1D are adults, even though the peak age of onset is in childhood. Also, with the median global age for a person living with T1D being 36 years, and 1.1 million people living with T1D being aged $\geq$ 60 years, efforts to improve T1D care should focus on adult as well as younger age-groups [8]. Data such as that presented in the Atlas 11th Edition and available in the T1D Index Version 3.0, provide important insights needed for informing current and future healthcare systems.

The strengths of the estimates provided in the Atlas/T1D Index include the use of all available data including published prevalence data, as well as modelling for incidence over time, mortality, levels of care, and diagnostic proportion. Modelled estimates are validated against published data where possible. Further details are available on the T1D Index website [16].

The up-to-60-year difference in mean remaining life expectancy of a 10-year-old child newly diagnosed in 2025 illustrates the very substantial differences in both T1D-associated, and general mortality across the globe. A further widening of the T1D-associated gap is likely as early and long-term adoption of technological advancements in T1D care is proportionally higher in higher-resourced settings compared to middle income and lower income settings [38,39]. All people with T1D should be able to access affordable insulin, blood glucose and ketone monitoring regularly as well as diabetes education, and health professionals knowledgeable about T1D detection and care [26,40]. There has been much progress since 2000 with national initiatives, often aided by support programs such as Life for a Child [41], Changing Diabetes in Children [42], Insulin for Life [43], Action4Diabetes [44], and Pen-PLUS [45]. These efforts have led to rapid increases in diagnosis and is related to increasing prevalence, for instance in Mali [29], Burkina Faso [30], and Laos [46], and indeed make estimating numbers in these countries quite challenging as prevalence is changing quickly. The goal of Universal Health Coverage from a sustainable health system in all countries[27] must remain in front of mind, despite the availability of, newer, more expensive therapies.

The T1D index methodology has limitations which have been discussed in detail in Gregory et al. (2022) [9] and Ogle et al. (2023) [10]. The most prominent limitation is that many countries do not have incidence, prevalence or mortality data. Secondly, there is substantial diagnostic uncertainty about the diagnosis of T1D versus type 2 diabetes, especially in age groups where type 2 is highly prevalent such as in older ages, and even in young adults where numbers of people with type 2 diabetes are growing. This is also problematic when the presence of autoantibodies is included in the definition of T1D, as autoantibody-negative forms of T1D do occur, and are more common in non-European populations [6,7,23]. This complex area has been discussed by various groups and is the focus on ongoing studies [3,8,47]. Finally, the screening for pre-symptomatic stages of T1D in some countries may be affecting T1D incidence registries in some countries in very recent years.

National and global efforts to monitor T1D incidence, prevalence and mortality are essential for understanding current and future T1D burden. This in turn is fundamental to informing current and future health care service delivery for people with T1D and optimising the care of all those affected. An IDF guideline on conducting epidemiological studies is available [48] and a “DIAMOND 2A” study group has also been formed [49]. Should advice be desired, the IDF Atlas, T1D Index, and DIAMOND 2A teams are very willing to assist researchers to study and publish their own data.

Author Contributions

GDO, FW, JM, GAG and DJM designed the methodology. All authors contributed to analysis of the data. GO wrote the first draft of the manuscript, and all authors contributed to the manuscript.

Ethics Statement

All procedures were performed in compliance with relevant laws and institutional guidelines. Ethical review was not needed as this was a modelling study based on published data.

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CRediT authorship contribution statement

Graham D. Ogle: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Fei Wang:** Writing – review & editing, Visualization, Validation, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Aveni Haynes:** Writing – review & editing, Writing – original draft, Validation, Data curation. **Gabriel A. Gregory:** Writing – review & editing, Software, Methodology, Conceptualization. **Thomas W. King:** Writing – review & editing, Formal analysis, Data curation. **Kylie Deng:** Writing – review & editing, Data curation. **Dana Dabelea:** Writing – review & editing, Formal analysis. **Steven James:** Writing – review & editing, Methodology, Formal analysis. **Alicia J. Jenkins:** Writing – review & editing, Formal analysis. **Xia Li:** Writing – review & editing, Formal analysis. **Ronald C.W. Ma:** Writing – review & editing, Formal analysis. **David M. Maahs:** Writing – review & editing, Formal analysis. **Richard A. Oram:** Writing – review & editing, Formal analysis. **Catherine Pihoker:** Writing – review & editing, Formal analysis. **Jannet Svensson:** Writing – review & editing, Formal analysis. **Zhiguang Zhou:** Writing – review & editing, Formal analysis. **Dianna J. Magliano:** Writing – review & editing, Validation, Supervision, Methodology, Formal analysis. **Jayanthi Maniam:** Writing – review & editing, Methodology, Formal analysis, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.diabres.2025.112277.

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