THE LANCET
Diabetes & Endocrinology

Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Gregory GA, Robinson TIG, Linklater SE, et al. Global incidence, prevalence, and mortality of type 1 diabetes in 2021 with projection to 2040: a modelling study. *Lancet Diabetes Endocrinol* 2022; published online Sept 13. https://doi.org/10.1016/S2213-8587(22)00218-2.

Appendices

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APPENDIX 1: MARKOV MODEL OF T1D PREVALENCE

The prevalence model is a discrete-time illness-death Markov Chain Monte Carlo model of population cohorts with annual cycles, and is broadly similar to Honeycutt et al.[1], Palmer et al.[2], Ruwaard et al.[3], and Gregory et al.[4], with some differences in the modelling of incidence and mortality and the addition of a Monte Carlo component to better model uncertainty.

As with a conventional illness-death model, individuals are classified into three states: susceptible ('healthy population'), type 1 diabetes ('T1D' or 'prevalent population'), and death. All individuals begin life in the susceptible population, and the probability of transitioning from one state to another each year depends on three time-varying factors: incidence, background mortality, and diabetes-related mortality.

The model therefore requires:

(a) An incidence function I(k, t) representing the probability that a healthy individual aged $k - 1$ at time $t - 1$ acquires diabetes by time t
(b) A background mortality function $M^B(k, t)$ representing the probability that a healthy individual aged $k - 1$ at time $t - 1$ dies by time t
(c) A model for the effect of type 1 diabetes on mortality

The model assumes that the development of type 1 diabetes affects mortality in two ways:

1) There is a fixed probability, *d*, that a person who develops diabetes dies within a year of symptom onset, due to non-diagnosis.
2) In each subsequent year, the mortality risk for a person with diabetes (M^D) is higher than the background mortality rate (M^B), i.e. there is an excess mortality $M^E = M^D\text{-}M^B > 0$

Note that allowing for death prior to diagnosis has two major consequences for how the incidence and mortality of 'susceptible' individuals is represented.

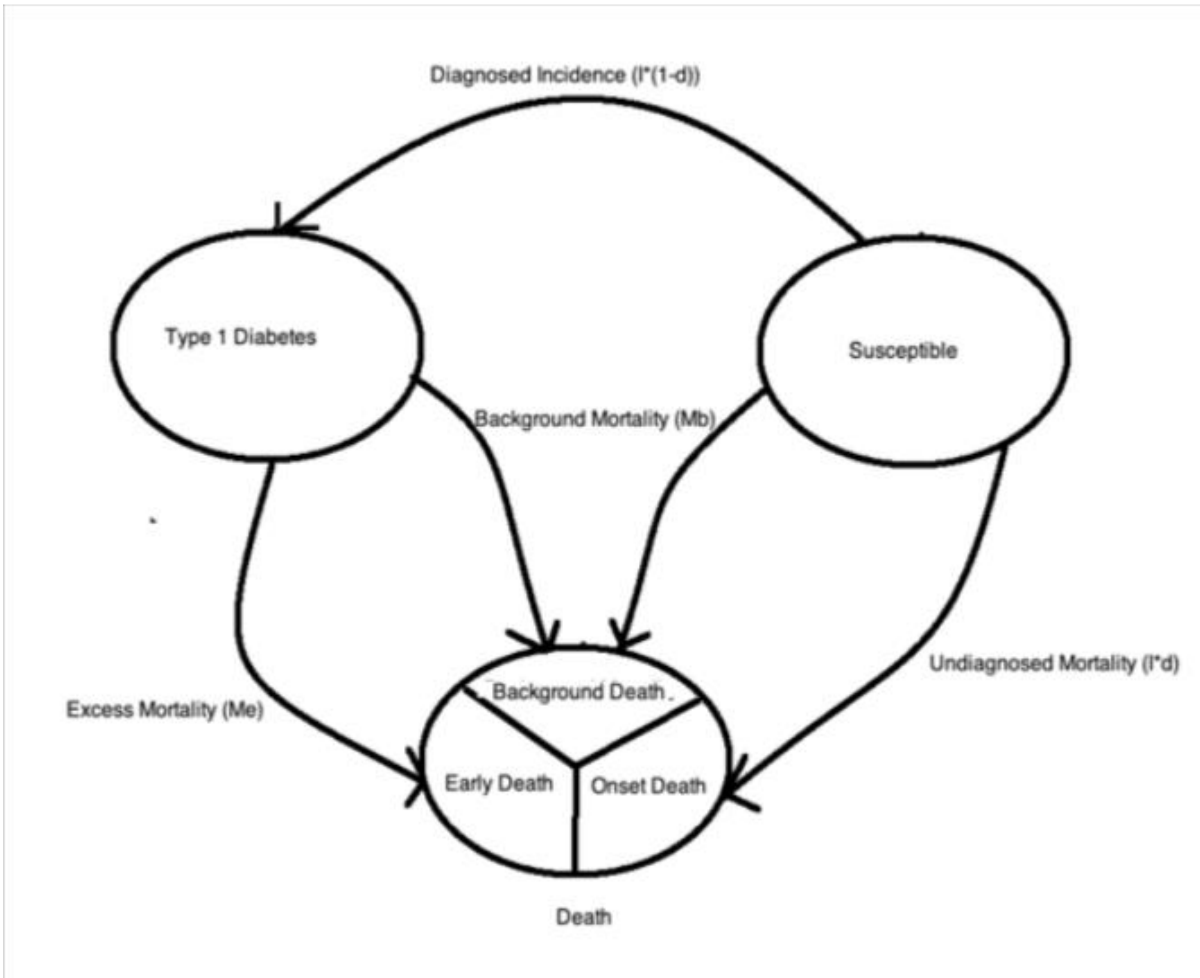
First, a distinction is made between the 'observed' incidence and the 'true' incidence, since non-diagnosed individuals are *not* picked up in incidence measurements. Susceptible individuals move into the prevalent population according to the observed incidence. However, the observed incidence (*i*) is equal to the 'true' incidence (*I*) multiplied by the probability of an individual surviving long enough for a diagnosis to be made, i.e., $i = I \cdot (1\text{-}d)$.

Second, the probability of transitioning from susceptible to dead in a given year is actually a mixture between the mortality for a 'true' susceptible individual (M^B) and the mortality for a non-diagnosed person with diabetes ('d'), with weighting corresponding to the true incidence. In other words, an individual registered as 'susceptible' may die in a given year via one of two pathways:

a) Not developing diabetes and dying according to the background mortality, with probability $(1\text{-}I) \cdot M^B$
b) Developing non-diagnosed diabetes, with probability $I \cdot d$, which is assumed to be 100% fatal within 12 months

The above analysis is summarised in **Figure 1**, which visually represents the transition matrix used in the Markov model.

Figure 1: Summary of model



Starting with a population that is 100% in the susceptible group, the above transition matrices are recursively applied to arrive at an estimate of the proportion of individuals born k years ago who are in each of the three classes. If we make the simplifying assumption that net migration has an identical T1D prevalence rate as the domestic population, i.e. that net migration has no effect on the incidence rate, then the prevalence is equal to the proportion with diabetes divided by the proportion surviving. Finally, these estimates are adjusted using a half-cycle correction to account for the fact that transitions occur throughout the year.

This entire Markov Chain is then repeated 1,000 times using the Monte Carlo method, making random draws of the incidence and mortality rates for each run, from the probability distribution of those values as calculated in the following sections.[5]

For each random draw of the Monte Carlo simulation, incidence numbers extracted from the published studies were assumed to be from a normal distribution based on the reported mean i and reported confidence intervals denoted as : i^{upper} and i^{lower}. To be specific, we construct incidence distribution as $I \sim N(i, s^2)$. where standard deviation s is calculated as : $s = (i^{upper} - i^{lower})/(1.96 * 2)$. To avoid negative values being generated, we used log transformation while implementing. Mortality rates are generated using the same process as described above. Where confidence intervals were are not provided, we use median confidence intervals expressed as a ratio from all other studies where confidence intervals were provided.

To better manage the complexity of the Monte Carlo simulation, we run the 1,000 Monte Carlo simulation for each of the sequential steps described as:

- Step 1: Estimate incidence for all countries, years and ages.
- Step 2: Estimate mortality rate for all countries, years and ages.
- Step 3: Using estimated incidence, mortality distribution from Step 1 and 2, run the Markov model to generate prevalence, missing prevalence and T1D deaths for all countries, years and ages.

We then report the median, 2.5th and 97.5th percentile values for each country. For global, regional or income summary groups we use the median, 2.5th and 97.5th percentile for each of the component countries and then take their straight sum for incidence, deaths and prevalence or their weighted average (weighted by sum of prevalence and missing prevalence) for life expectancy.

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APPENDIX 2: ESTIMATED RATES OF ONSET BY AGE

Historically, type 1 diabetes has largely been considered a condition with onset most commonly in childhood and adolescence. However, an increasing body of evidence shows that onset can occur at all adult ages[1], and recent evidence indicates that more than 40% of new T1D cases may in fact be adult or 'late' onset after the age of 30[2].

This analysis uses data from a systematic review conducted by the Adult T1D Special Interest Group of the 10th Edition IDF Diabetes Atlas[3]. The members of this group are Ronald CW Ma (Chair), Jessica L Harding, Pandora L Wander, Xinge Zhang, Xia Li, Suvi Karuranga, Hongzhi Chen, Hong Sun, Yuting Xie, Richard A Oram, Dianna J Magliano, Zhiguang Zhou, and Alicia J Jenkins. The modelling draws on data retrieved by this team from 34 studies on adult-onset T1D, as well as two additional publications from sub-Saharan Africa.

1. Rationale and selection of studies

Data was retrieved from 46 studies, 44 of them are from the Harding et al[3] systematic review (30 countries, 1973–2019), which extends on extend the earlier work by Diaz-Valencia et al.[1] For each study, the researchers extracted estimates of annual T1D incidence and ascribed these into age categories (e.g. 20-29 years, 30-39 years etc.) as appropriate. Two other studies known to the authors were included: a study from Rwanda[4] (Marshall et al. 2015) and a recent study from Eritrea[5] (Mebrahtu et al. 2021).

To ensure that the final curves are representative of adult onset across a range of age brackets, the modelling relies on studies that have data available across different age cohorts. For the modelling in the current study, 9 of these 46 studies were excluded (see **Table 1** below) as they only had data on one age bracket. An additional study was excluded as the study population was occupation-based and not representative of the wider population.

28 of the selected 36 studies also had data for the 0-19 age bracket. In 25 of these, data was in five-year age brackets. More data points and granularity across a wider range of age brackets is important for the modelling and analysis of the adult onset projections.

The 36 studies were analysed in two groups. The first group comprised 32 studies in countries across the world excluding sub-Saharan Africa. The second group comprised four studies[4–7] (Alemu, Sandy, Marshall, Mebrahtu) from countries in sub-Saharan Africa. Sub-Saharan Africa was analysed separately as peak age of onset of T1D is later in these populations[4–8] (Atun, Sandy, Marshall, Alemu, Mebrahtu).

2. Choosing a global curve

We tested two approaches to compare outcomes for the global curve. Using R version 4 and Excel, the raw data was mapped into individual age levels from 0 to 99 years. For example, if Study A reports an incidence rate as 3.0 for ages 0-4 years, then we use 3.0 for ages 0,1,2,3, and 4 years. Hence, we derive a $s \times a$ matrix I after applying the mapping, where s is the number of studies and $a = 99$ is the maximum possible age. As expected, matrix I contains missing values. Thus, the first step is to impute the missing values.

<u>Algorithm 1: Ratio-based imputation</u>

In the ratio-based imputation approach, we make the simplifying assumption that for a study, the ratio between incidence of a target age bracket (the one we are trying to impute) and the age brackets for which we have data is the same across all studies, i.e. the shape of the incidence curve is consistent across studies. In practice we use the sample mean of the age bracket across studies to estimate the incidence in that age bracket. Here we use a simple example to illustrate. Suppose matrix I is constructed as below:

$$I = \begin{vmatrix} paediatric\ mean & adult\ mean \\ 2 & 1 \\ 4 & 2 \\ 6 & missing \end{vmatrix}$$

Where we only have 3 studies with 2 age brackets, paediatric mean and adult mean. Then the value for $missing$ is calculated as:

$$\frac{missing}{6} = \frac{\left(\frac{1}{2} + \frac{2}{4}\right)}{2}$$

$$missing = 6 * \frac{\left(\frac{1}{2} + \frac{2}{4}\right)}{2} = 3$$

If we extend this simple case to 3 columns, with paediatric mean have 2 age brackets:

$$I = \begin{vmatrix} paediatric\ mean\ age1 & paediatric\ mean\ age2 & adult\ mean \\ 2 & 3 & 1 \\ 4 & 6 & 2 \\ 6 & 9 & missing \end{vmatrix}$$

Then the value for $missing$ is calculated as:

$$\frac{missing}{(6+9)/2} = \frac{\left(\frac{1}{(2+3)/2} + \frac{2}{(4+6)/2}\right)}{2}$$

$$\frac{missing}{(6+9)} = \frac{\left(\frac{1}{(2+3)} + \frac{2}{(4+6)}\right)}{2}$$

$$missing = (6+9) * \frac{\left(\frac{1}{(2+3)} + \frac{2}{(4+6)}\right)}{2} = 3$$

The above approach can be generalized to the case where the matrix I has more than one missing value. The detailed description of the algorithm is as follows:

Algorithm 1: Ratio based imputation of $s \times a$ matrix I

Input: $s \times a$ matrix I**,** where I contains missing value

Output: Imputed $s \times a$ matrix $I^{imputed}$

Initialize $I^{imputed} \leftarrow I$

for each missing value $I^{imputed}[i,j]$, **do:**

$index_{row} \leftarrow$ **index of values in column** $I[,j]$ **that is not missing**

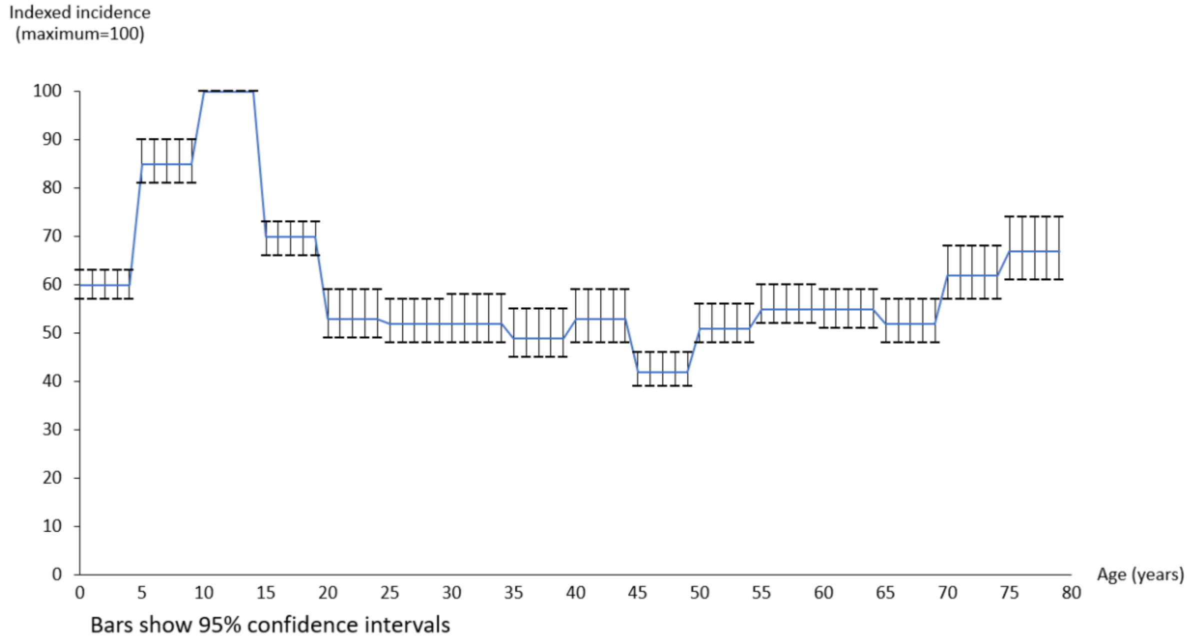
$index_{col} \leftarrow$ **index of values in any row of** $I[i, index_{row}]$ **that is not missing**

$$I^{imputed[i,j]} \leftarrow sum(I[i, index_{col}]) \frac{\sum_{p=1}^{length(index_{row})} \left(\frac{I[index_{row}[p], j]}{sum(I[index_{row}[p], index_{col}])} \right)}{length(index_{row})}$$

end for

Figure 1 shows the Global curve as plotted using the ratio-based approach described above, where we indexed each row of values in the matrix against its peak value and then took the mean of all studies. The X axis represents the value for age and the Y axis represents the ratio of the incidence as a percentage of the maximum value.

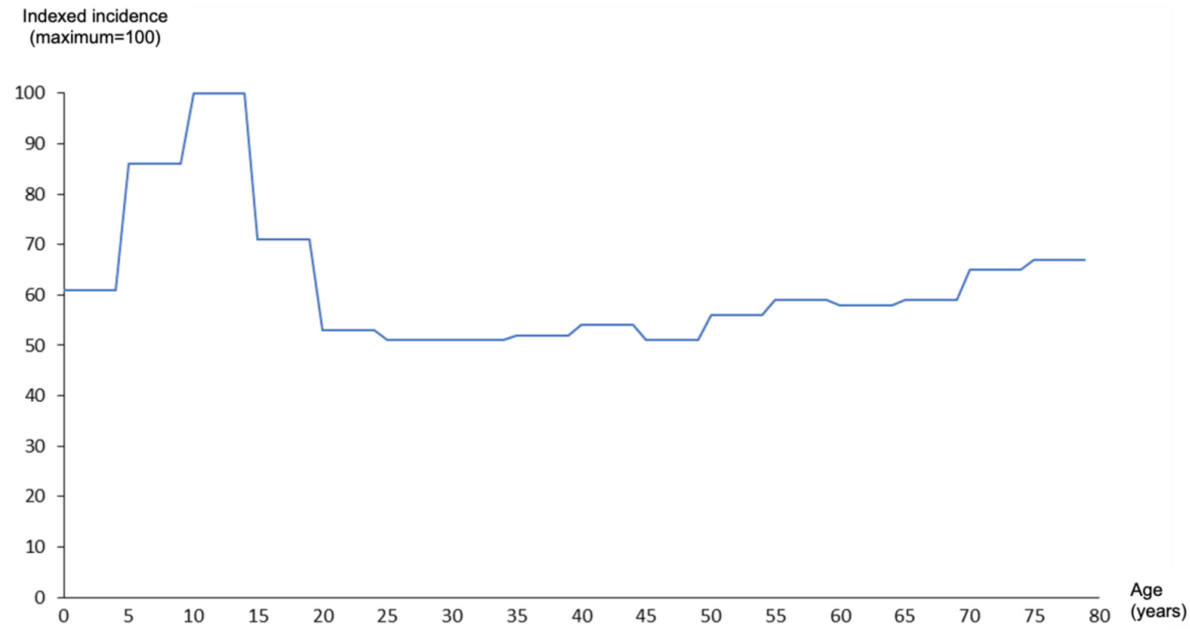
Figure 1 – Global curve ratio-based approach



Algorithm 2: Machine Learning
The machine learning approach was carried out using the matrix completion algorithm. Compared with the Ratio-based approach, the assumption is relaxed in that incidence data matrix is low rank, i.e., the data across age brackets and studies is correlated but not necessarily fixed across studies. The rank of the matrix is the number of linearly independent rows or columns. In general, we do not know the true rank of the underlying population matrix, the assumption is that it is substantially smaller than either the number of rows or columns. We use the 'XX' method for solving matrix completion which expresses the m x n incidence matrix I into a product of two matrices I = UV, where U is a m x k and V is a k x n matrix where k < min(m,n). The matrices U and V can then be estimated using least square minimization.

Figure 2 shows the Global curve using the machine learning based approach described above.

Figure 2 – Global curve machine learning approach

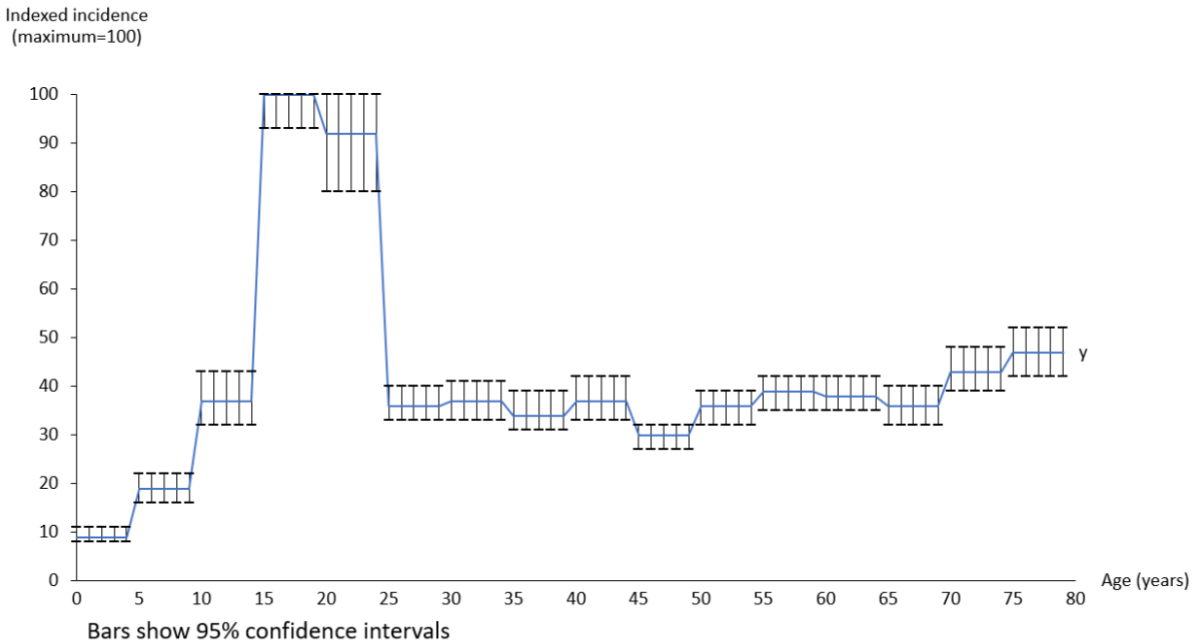


As both the ratio-based imputation and machine learning global curves are similar in terms of results, the current study uses ratio-based imputation, given the simplicity of the methodology. Further, we only calculate incidence up to age 79 as only 12 studies cover the 80+ cohorts.

3. Sub-Saharan Africa curve

For the age bracket of 0-24 years, four studies provided all the relevant data points. As only one study had any data beyond 24 years, the global ratio-based curve was used for ages 25-79 years.

Figure 3 – Sub-Saharan African curve



4. Sensitivity Analysis

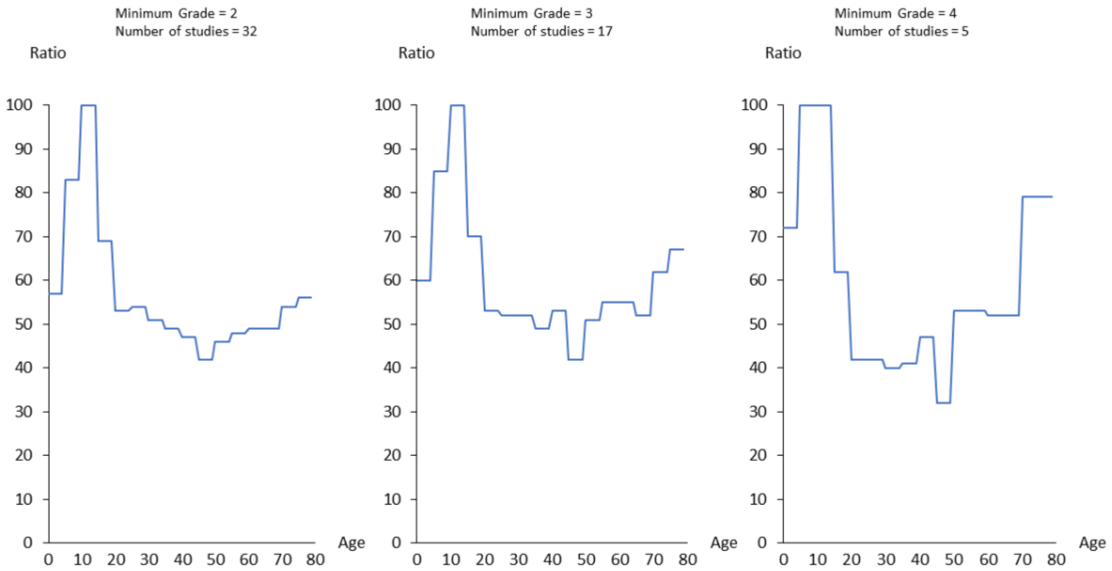
Two sensitivity analyses were conducted to determine if, firstly, the quality of studies impacted the results, particularly with respect to the rise in incidence at 70-79 years of age, and secondly whether the age of the data collected in the studies impacted the findings.

Quality of studies

The systematic review by Harding et al, 2021[3] scored the quality of the studies on various measures including representativeness of the study population, sample size and quality of diagnostic information. Quality of diagnostic information was scored as follows: self-report (1), clinical diagnosis (2), administrative algorithm (3), or the presence of one or more biomarkers (4).

We repeated the above ratio-based analysis stratifying studies by the quality of diagnostic information criterion into three categories: All studies (2-4), medium and high-quality studies (3-4) and high-quality studies only (4) **(Figure 4).** The resulting curves show that the higher the quality of the study, the more pronounced the adult-onset peak. The final global curve for adult onset was based on studies with a minimum grade of 3 (17 studies).

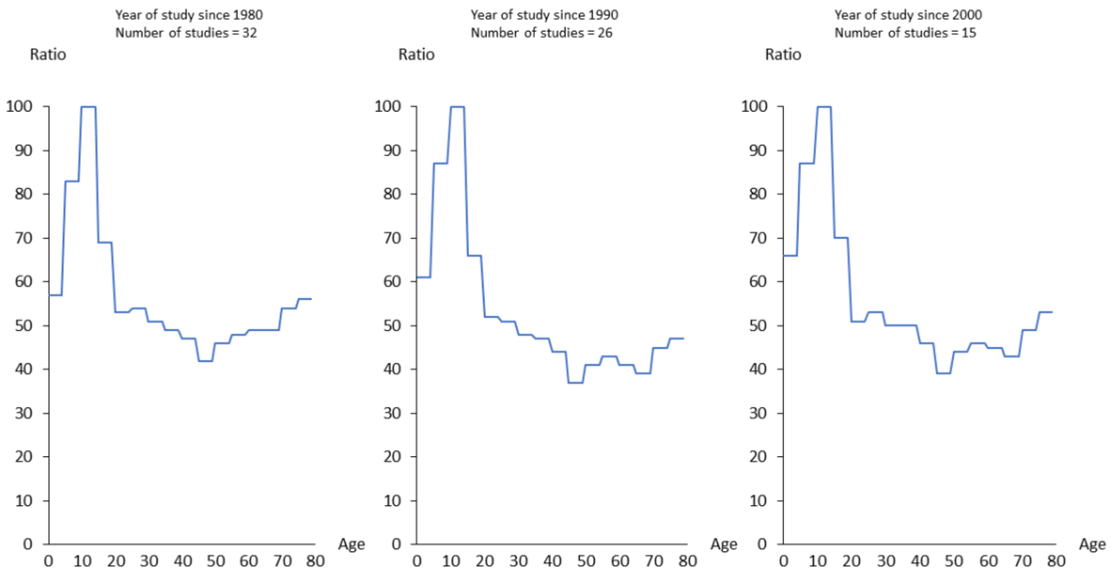
Figure 4 – Global Curve impact by quality of studies



Year of studies

When the data were plotted stratified by year of study, the resultant graphs were all similar (see **Figure 5**), demonstrating that the age-related pattern of incidence of T1D has not changed substantially over the course of the 20 year period.

Figure 5 – Global Curve impact by year of studies



5. Example Adult Onset Projections

We then used the ratio-based curve from the above analysis to construct country curves for 0-99 years using historical observed data where available and the ratio-based approach where age specific data were not available. See **Figures 6, 7, 8, 9**, for example adult onset projections for four countries, US, India, Brazil and Rwanda.

Figure 6 – Adult onset projections for US

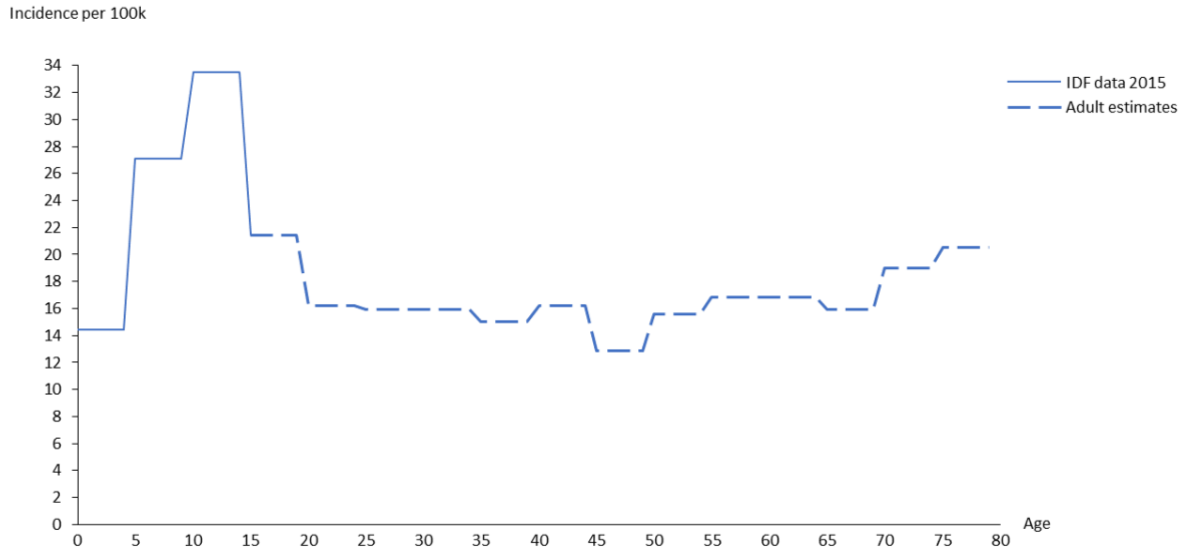


Figure 7 – Adult onset projections for Brazil

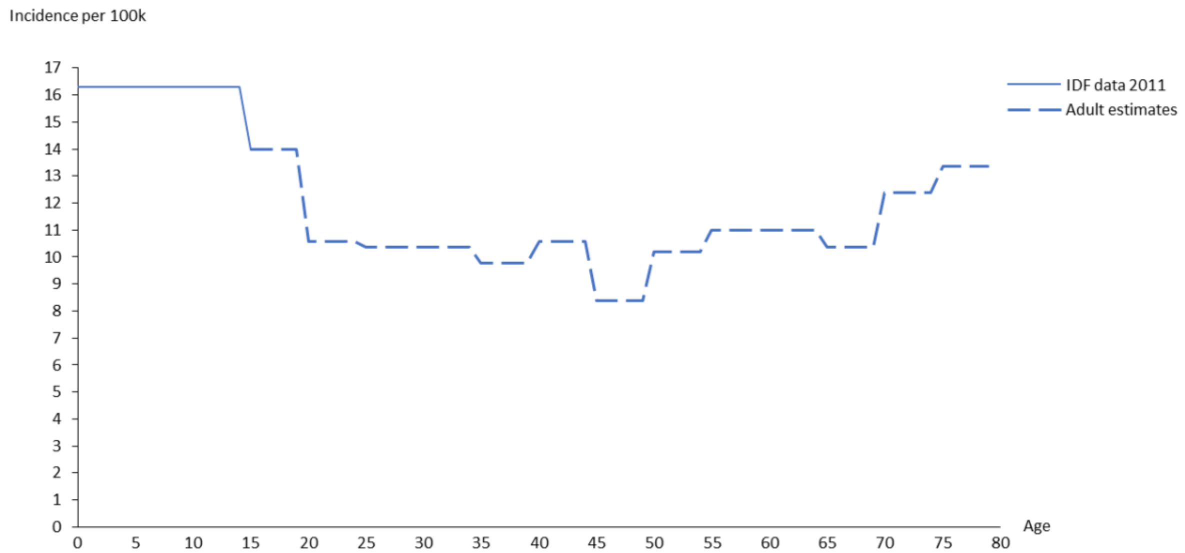


Figure 8 – Adult onset projections for India

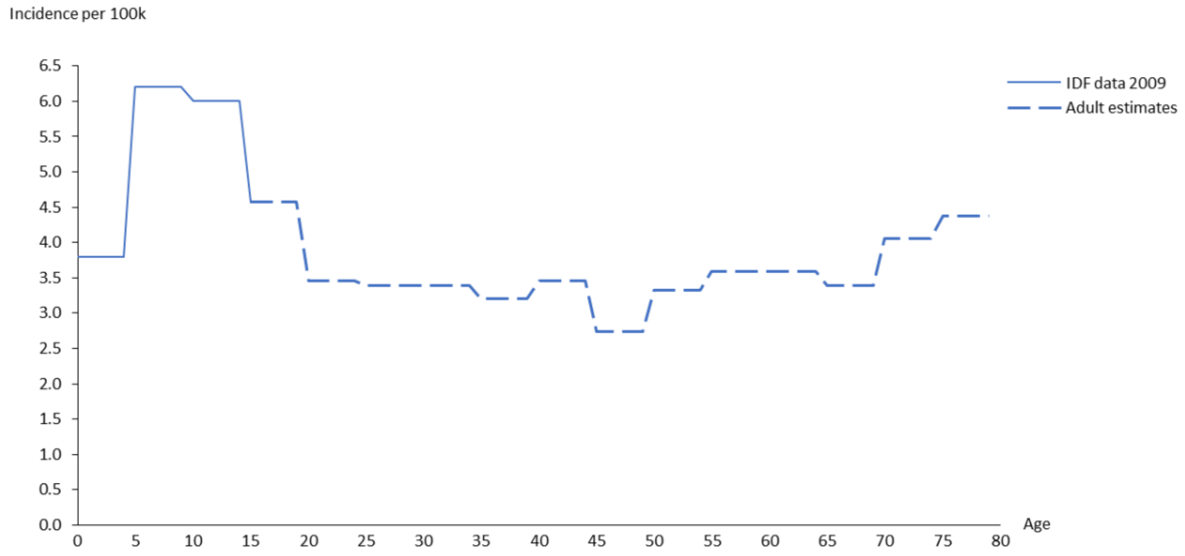
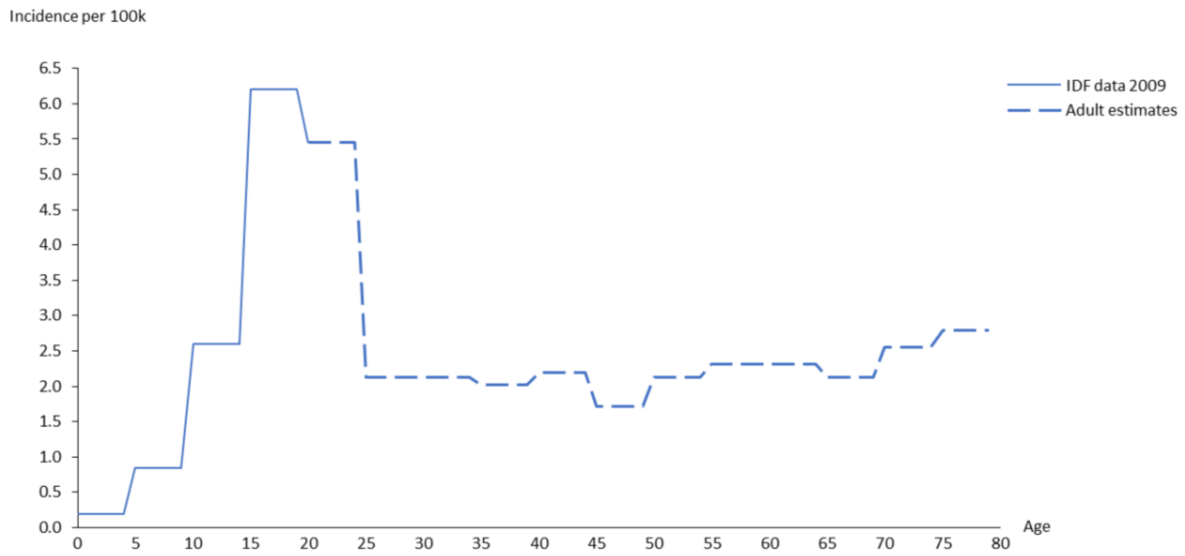


Figure 9 – Adult onset projections for Rwanda



6. Estimates of median and mean age by region

Using these inputs in the core model (**Appendix 1**), we derived the following estimates of median and mean age of prevalence and incidence by region (**Table 1**).

Table 1 – median and mean, prevalent and incident age by region (years)

Region	Age of prevalent cases (years)				Age of incident cases (years)			
	Median	IQR	Mean	SD	Median	IQR	Mean	SD
GLOBAL	**39.0**	**27.3**	**39.7**	**18.2**	**29**	**33.9**	**31.6**	**20.7**
South Asia	25.0	19.0	27.6	14.8	22.7	29.8	27.2	19.8
Europe & Central Asia	44.9	30.1	44.9	19.8	35.7	40.3	36.4	22.6
Middle East & North Africa	32.0	23.3	33.0	16.1	23.9	30.1	27.3	19.3
Sub-Saharan Africa	24.1	13.5	25.8	12.6	20.3	15.4	24.2	15.4
Latin America & Caribbean	35.2	26.9	36.6	17.9	27.4	33.9	30.8	21.0
East Asia & Pacific	39.3	27.1	40.3	18.0	32.8	37.5	34.3	21.5
North America	44.8	31.8	44.7	19.9	32.7	41.0	35.3	22.7

7. List of studies used

Table 2 - List of studies used

First author	Country (region)	Study year	Overall Score	Inclusion	note	Sub Saharan
Abassi[9]	UK	1994-2013T*	3	no	single widish window 16-25	no
Alemu[6]	Ethiopia	1995-2008	2	yes	NA	yes
Arffman[10]	Finland (FinDM)	2010-2017T*	2	yes	NA	no
Bruno[11]	Italy (Turin)	1984-2000	2	yes	NA	no
Crump[12]	Sweden	1973-2015	3	no	single wide window 18-1-43	no
Dahlquist[13]	Sweden	1983-2007T*	4	yes	NA	no

Dedov[14]	Russia	2016	NA	no	single wide window “adults”	no
Diabetes Australia[15]	Australia	2020	2	yes	NA	no
Feltbower[16]	UK (West Yorkshire)	1991-1999	3	no	single wide window 15-29	no
Forga[17]	Spain (Navarre)	2009-2016T*	4	yes	NA	no
Gajewska[18]	Ireland	2011-2016	3	yes	NA	no
Goday[19]	Spain (Catalonia)	1987-1990	3	yes	NA	no
Gorham[20]	US	1974-1988	2	no	sub group of population	no
Ionescu-Tirgoviste[21]	Romania (Bucharest)	1981-1991	2	yes	NA	no
Joner[22]	Norway	1978-1982	2	yes	NA	no
Kadiki[23]	Libya (Benghazi)	1981-1990	3	yes	NA	no
Kumar[24]	India	1990-2015	3	no	singe wide window >18	no
Kyvik[25]	Slovakia	1996-1997	2	yes	NA	no
Lammi[26]	Finland	1992-1996	3	yes	NA	no
Lawrence[27]	US	2017	4	yes	NA	no
Lee[28]	Korea	2007-2013	3	no	single wide window >20	no
Luk[29]	Hong Kong	2002-2015T*	3	yes	NA	no
Marshall[4]	Rwanda	2007-2011	NA	yes	NA	yes

Mebrahtu[5]	Eritrea	2019	NA	yes	NA	yes
Mølbak [30]	Denmark (Copenhagen & Freseriskborg)	1973-1977	3	no	single window >29	no
Morales-Perez[31]	Spain (Badajoz)	1992-1996	3	yes	NA	no
Muntoni[32]	Italy (Sardinia)	1989-1990	2	yes	NA	no
Nishioka[33]	Japan	2014-2017	3	yes	NA	no
Olsson[34]	Norway (HUNT)	1995-2008	4	no	single wide window >18	no
Ostraukas[35]	Lithuania	1991-2008	3	yes	NA	no
Pishdad[36]	Iran (Fars)	1991-1996	3	yes	NA	no
Rawshani[37]	Sweden	2011	4	yes	NA	no
Rogers[38]	US	2001-2015T	3	yes	NA	no
Roglic[39]	Croatia (Zagreb)	1988-1992	3	yes	NA	no
Sandy[7]	Mali	2007-2016	3	yes	NA	yes
Scott[40]	New Zealand (Canterbury)	1981-1986	2	yes	NA	no
Scottish Diabetes Data Group[41]	Scotland	2012-2019T*	2	yes	NA	no
Sheen[42]	Taiwan	2005-2014T*	2	yes	NA	no
Sobel-Maruniak[43]	Poland (Rzeszow)	1980-1999	2	yes	NA	no
Tenconi[44]	Italy (Pavia)	1988-1992	2	yes	NA	no
Thomas[2]	UK	2006-2010	4	no	single wide window 31-60	no
Thunander[45]	Sweden (Kronoberg)	1998-2001	4	yes	NA	no

Vojislav[46]	Serbia	2006-2017T*	2	yes	NA	no
Weets[47]	Belgium (Antwerp)	1989-2000	2	yes	NA	no
Weng[48]	China	2010-2013	3	yes	NA	no
Wysocki[49]	Poland (Warsaw)	1983-1988T	2	yes	NA	no

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APPENDIX 3: INCIDENCE OVER TIME

1. Study selection

The primary sources of data were the 315 papers on incidence in children and adolescents cited by the 2021 IDF Atlas 10th Edition[1] and all nine previous Atlases 2000-2019[2]. All relevant papers mentioned in the identified papers were also sourced, as well as any cited reviews.

Papers were included in the analysis if they had any one of: a) annual incidence data for at least five years; b) start- and end- year incidence data that covered at least a five-year period; or c) multiple studies with the same methodology, age-group, and catchment area that, combined, had data with at least a five-year age bracket.

Three hundred and fifteen studies were listed in the Atlases, and a further 19 studies were identified from backwards citations. Of these, 162 fulfilled the inclusion criteria above. Six of these studies were excluded as they were not representative of the whole population, and three studies were excluded as they had a mean of <20 cases per year, which led to marked divergence in calculated incidence from year to year. Seven other studies were excluded due to methodological weaknesses, or having very small numbers of cases which led to marked divergence in calculated incidence from year to year. Six other studies were excluded due to substantial overlapping geographies (see **Appendix A**) leaving 146 studies for data analysis.

These final 146 studies are listed in **Table 1**.

Only paediatric and adolescent data (<20 years) were used in analysis. Studies generally had data <15 y, however some were <20 y, and a few were <17 y, <18 y or <19 y. If <15 y and <20 y data was stated in the same paper, the <20 y data was used.

If a study stated data for an odd number of years, e.g. the EURODIAB study that has five-year intervals, the midpoint year was used: so 2001 was plotted for 1999-2003. If the periods used were an even number of years, then the incidence number in the later rather than earlier midpoint year was used (so in the case of the four-year period 1987-1990, 1989 was used as the midpoint year).

For 26 countries, we have used merged data from two or more studies with the same methodology and the same geography (**Appendix B**). When study periods overlapped, the study covering the most recent period overall was used for the years where the two studies overlapped.

2. Grouping of countries

Ten groups of similar countries were identified, in the following regions: North-western Europe, North-eastern Europe, South-western Europe, South-eastern Europe, Middle East/North Africa, Far Eastern Europe/Central Asia, Hong Kong/Taiwan, Australia/New

Zealand, US/Canada, and Latin South America. There were also individual country data from 11 countries that, due to diversity of country income level, ethnicity, and varying incidence over time patterns, could not be readily combined into regional groups: China, Japan, Republic of Korea, Thailand, Maldives, Bangladesh, Mexico, US Virgin Islands, Sudan, Mali and Gabon. All other countries were grouped in Group 22. Groups are listed in **Table 1** and **Appendix C**.

Table 1. Regional groupings and individual countries with Incidence over Time data

Group number	Region	Countries (n)	Countries with studies (n of studies)	Number of studies,	Year of study data:	Years covered with >+ 2 studies
1	North-western Europe	14	Austria (2)[3,4], Belgium[3], Denmark (2)[3,5], Finland (4)[6–9], France (3)[10–12], Germany (3)[3], Iceland (2)[13,14], Ireland (4)[3,15–17], Luxembourg[3], Netherlands (3)[13,18,19], Norway (3)[3,20,21], Sweden (4)[22–25], Switzerland (2)[3,26], UK (8)[3,27–31]	42	1938-2019	1953-2015
2	North-eastern Europe	8	Czechia[3], East Germany[32], Estonia (2)[33,34], Hungary (2)[3,35], Latvia[33], Lithuania (2)[3,33], Poland (5)[3,36–38], Slovakia (2)[3,39]	16	1960-2019	1970-2014
3	South-western Europe	6	Cyprus[40], Greece[41], Israel (2)[42,43], Italy (5)[3,44–47], Malta (2)[48,49], Spain (5)[3,50–53]	16	1984-2019	1985-2015
4	South-eastern Europe	9	Armenia[54], Bosnia & Herzegovina[55], Bulgaria[56], Croatia[3],	11	1974-2016	1982-2015

			Montenegro[3], Nth Macedonia (2)[3,57], Romania[3], Serbia (2)[58,59], Slovenia[3]			
5	Middle East/North Africa	5	Algeria[60], Jordan[61], Kuwait[62], Libya (2)[63,64], Qatar[65]	6	1975-2016	1982-2015
6	Far-Eastern Europe, Central Asia	4	Belarus (2)[66], Russia (4) [67–70], Ukraine[71], Uzbekistan[72]	8	1980-2014	1980-2011
7	Hong Kong, Taiwan	2	Hong Kong (2)[73,74], Taiwan (2)[75,76]	4	1984-2017	1992-2014
8	Australia/New Zealand	2	Australia (3)[77–79], New Zealand (2)[80,81]	5	1970-2019	1977-2016
9	Canada/USA	2	Canada (5)[82–86], USA (6)[87–92]	11	1948-2016	1967-2015
10	Latin South America	2	Brazil (2)[93,94], Chile (3)[95–97]	5	1986-2015	1990-2014
11	China	1	China (6)[98–103]	6	1980-2013	Use 1980-2013 as single country
12	Japan	1	Japan (3)[104,105]	3	1975-2010	Use 1975-2010 as single country
13	Republic of Korea	1	Rep. Korea (4)[106–109]	4	1987-2016	Use 1987-2016 as single country
14	Thailand	1	Thailand (2)[110,111]	2	1991 - 2005	Use 1991 - 2005 as single country
15	Maldives	1	Maldives (1)[112]	1	2009-2018	Use 2009-2018 as single country

16	Bangladesh	1	Bangladesh (1)[113]	1	2011-2018	Use 2009-2018 as single country
17	Mexico	1	Mexico (1)[114]	1	2000-2018	Use 2000-2018 as single country
18	US Virgin Islands	1	US Virgin Islands (1)[115]	1	2001-2010	Use 2001-2020 as single country
19	Sudan	1	Sudan (1)[116]	1	1991-1995	Use 1991-1995 as single country
20	Mali*	1	Mali* (1)[117]	1	2007-2016	Use 2007-2016 as single country
21	Gabon*	1	Gabon* (1)[118]	1	2011-2017	Use 2011-2017 as single country
22	All other countries	No specific data				

* Mali and Gabon incidence rises very likely to be inflated by improving diagnosis (i.e. less dying undiagnosed)

Note that there are no data for large parts of Central, Western and Southern Asia, the Pacific, the Caribbean and Central America, and sub-Saharan Africa.

3. Lines of best fit of annual incidence change for each group

A line of best fit of annual incidence change was calculated for each of Groups 1-10. The line of best fit was only calculated for a particular year when there are two or more studies in that group. **Table 1** lists the years the line was calculated for each group.

For each study, the annualised year-on-year incidence ratio was first calculated at the midpoint of each pair of consecutive years. The logarithms of these ratios were then regressed against year using local quadratic least squares regression with smoothing parameter 0.90 to produce a line of best fit.

Studies were not individually weighted for numbers of incident cases. However, we conducted a sensitivity analysis comparing the above technique to a modification that included inverse variance weighting, in a subset of studies from the EURODIAB dataset for which sufficient data was available. This produced no substantial change in the estimated line of best fit (data not shown).

The curve for North-western Europe (Group 1) is shown as an example in **Appendix D**.

A line of best fit was also developed for the four single countries in Groups 11-21 that had multiple studies: China, Japan, Republic of Korea and Thailand, using all available data and the method above.

Finally, a line of best fit was also calculated from the data from all countries for the period 1985-2015, to give a "global average" curve.

This curve is shown in **Appendix E**.

If data were missing in a series (e.g. there were measured incidences every two years), incidences were interpolated in a straight line from the known points at either end of the period.

4. Estimates for each country and region

Incidence data were estimated for a given country and year using the best available data as follows:

a) Within a period for which country incidence data were available, these data were used directly, with any missing values interpolated linearly.

For example, Belgium has data from 1989-2013. Therefore, method a) was used for the period 1989-2013. India has incidence data for 2010 only. Therefore, method a) was used for 2010 only.

b) If group- but not country-level data were available, we used the yearly incidence ratios derived from the group-level line of best fit curve to extrapolate incidence from the nearest available country-level incidence data-point.

For example, Belgium is in Group 1, which has a line of best fit running from 1953-2015. Therefore method b) was used to project the 2013 incidence estimate forward into 2014 and 2015, and the 1989 incidence estimate backwards to 1953 using ratio estimates from the line of best fit data from 1989-2013.

Liechtenstein is also in Group 1, but has no incidence data. Therefore, the Group 1 line of best fit was used for 1953-2015.

For countries not belonging to the geographic groups 1-10, the 'global average curve' over the period 1985-2015 was used as a replacement for the "group-level" data for that country.

For example, India is outside Groups 1-10. The global line of best fit was used to project the 2010 incidence value into the period 1985-2015.

c) Where no historical group-level data were available, we projected into the past by holding incidence constant at the value calculated as above for the nearest available time-point with group-level data.

For example, no group 1 data is available prior to 1953. Therefore, method c) was applied to generate incidence estimates for Belgium prior to 1953. In other words, the incidence in all years prior to 1953 was assumed to be equal to incidence estimated above for 1953 (from method b)).

Also for example, as there is no global average curve prior to 1985, incidence in India in all years prior to 1985 was assumed to be equal to the 1985 incidence estimate (from method b)).

d) We made an adjustment to method c) to produce future projections. Rather than holding incidence fixed going forward, we used the average yearly incidence ratio from the latest five years of group-level data and projected that incidence would continue to change at this rate for a further five years beyond the latest available data.

For example, no group 1 data is available more recent than 2015. Therefore, the mean annual change in incidence for the period 2011-2015 was calculated. Incidence estimates for Belgium in 2016-2021 were generated by taking the estimate for 2015 (calculated using method b) above) and assuming that incidence changed according to the same ratio in each successive year.

e) Finally, if no incidence data were available at all for a given country, a representative country for which the above approach could be followed was chosen using the IDF Atlas method, and the two countries were then assumed to have the same incidence.

For example, no incidence data was available for the United Arab Emirates (UAE). Incidence for the UAE was therefore assumed to be the same as incidence in Oman. A single data point (for 1994) was available for Oman (method a)). The 1994 incidence was then used to generate estimates for 1982-2015 (method b)) using Group 5 data, then extended to before 1982 (method c)) and forward to 2020 (method d)).

Similarly, for Sri Lanka (which also has no published incidence data, incidence estimates for India as outlined above were used as estimates of incidence in Sri Lanka).

Appendix 3A – Excluded studies due to overlapping geographies

For Finland, the Parvianen et al. (2020)[119] study, with different methodology, was excluded in favour of the Harjutsalo et al. (2013)[9] - Toumilehto et al. (1999)[6] - Somersalo et al. (1955)[120] study series with similar methodologies.

For Sweden, the EURODIAB Stockholm study (Patterson et al. 2019)[3] was excluded in favour of the whole-country study series Samuelsson et al. (2020)[24], Berhan et al. (2011)[22], and Nyström et al. (1990)[23] with similar methodologies.

For Croatia, the whole-country data from Rojnic Putarek et al. (2015)[121] and Stipancic et al. (2008)[122] were excluded in favour of the EURODIAB Zagreb study (Patterson et al, 2019)[3] as the latter had a longer study period.

For Romania, the whole-country data of Vlad et al. (2018)[123] was excluded in favour of the EURODIAB Bucharest study (Patterson et al. 2019)[3] as the latter had a longer study period and measured ascertainment.

For Australia, the whole-country data from Haynes et al. (2020)[124] and Haynes et al. (2015)[125] was excluded in favour of the New South Wales data from Taplin et al. (2005)[78] and Craig et al (2000)[77], and the Western Australian data from Haynes et al. (2018)[79], as the latter studies had a longer study period.

For US, Colorado data was available from 1978-1988 and 2002-2004 from Vehik et al. (2007)[87]. Colorado was also one of the five study sites in the combined SEARCH study data from 2002-2015 (Divers et al., 2020)[88]. Both studies were included as there was minimal overlap and Colorado was only a small part of the SEARCH data.

For Republic of Korea, there was whole-country data from 1995-2016 from Kim et al. (2016)[109] and Chae et al. (2020)[106], as well as Seoul data from 1985-1998 (Ko et al., 1994)[107] and the DIAMOND study (2006)[108]. Both were used as there was minimal overlap.

Appendix 3B – List of merged studies

Austria (whole country): Patterson et al. (2019)[3] from 1993-2013 was merged with Schober et al. (1995)[4] from 1980-1993.

Australia (New South Wales): Craig et al. (2000)[77] from 1990-1996 was merged with Taplin et al. (2005)[78] from 1997-2002.

Brazil (Bauru): Negrato et al. (2010)[93] from 1986-2006 was merged with Negrato et al. (2017)[94] from 2007-2015.

Chile (Santiago): Carrasco et al. (1996)[97] from 1990-2005 was merged with Torres-Aviles et al. (2010)[96] from 2000-2015.

China (Shanghai):Fu et al. (1994)[103] from 1980-1991 was merged with Shui-Xian et al. (1996)[102] from 1989-1993.

Denmark (whole country): Svensson et al. (2002)[5] from 1970-2000 was merged with Patterson et al. (2019)[3] from 1989-2013.

Estonia (whole country): Podar et al. (2001)[33] from 1983-1998 was merged with Teeäär et al. (2010)[34] from 1999-2006.

Finland (whole country): Tuomilehto et al. (1991)[7] from 1965-1984 was merged with Tuomilehto et al. (1999)[6] from 1987-1996 and Harjutsalo et al. (2013)[9] from 2006-2011.

Hong Kong (whole country): Huen et al. (2000)[73] from 1984-1996 was merged with Tung et al. (2020)[74] from 2008-2017.

Hungary (excluding Budapest): Soltész et al. (1990)[35] from 1978-1987 was merged with Patterson et al. (2019)[3] from 1989-2013.

Iceland (whole country): Helgason et al. (1992)[14] from 1980-1999 was merged with EURODIAB ACE Study Group (2000)[13] from 1989-1994.

Ireland (whole country): Patterson et al. (1996)[15] from 1989-1994 was merged with Roche et al. (2002)[16] for 1997, Roche et al. (2016)[17] from 2008-2009 and Patterson (2019)[3] from 2008-2013.

Israel (whole country): Israel IDDM Registry Study Group (2002)[42] from 1989-1993 was merged with Zung et al. (2012)[43] from 2002-2007.

Japan (whole country): Kawasaki et al. (2006)[104] from 1998-2001 was merged with Onda et al. (2017)[105] from 2005-2010.

Lithuania (whole country): Podar et al. (2001)[33] from 1983-1998 was merged with Patterson et al. (2019)[3] from 1999-2013.

Malta (whole country): Schranz et al. (1998)[48] from 1980-1996 was merged with Formosa et al. (2012)[49] from 2006-2010.

Netherlands (whole country): van Wouwe et al. (2002)[19] from 1996-1999 was merged with Spaans et al. (2015)[18] from 2010-2011.

North Macedonia (whole country): Kocova et al. (1993)[57] from 1985-1991 was merged with Patterson (2019) from 1994-2013.

Norway (whole country): Joner et al. (1989)[20] from 1973-1982 was merged with Skrivarhaug et al. (2014)[21] from 2004-2012 and Patterson et al. (2019)[3] from 1989-2013.

Republic of Korea (whole country): Kim et al. (2016)[109] from 1995-2015 was merged with Chae et al. (2020)[106] from 2008-2016.

Republic of Korea (Seoul): Ko et al. (1994)[107] from 1985-1998 was merged with DIAMOND Project Group (2006)[108] from 1990-1991.

Slovakia (whole country): Michalkova et al. (1995)[39] from 1985-1992 was merged with Patterson et al. (2019)[3] from 1994-2003.

Sweden (whole country): Nyström et al. (1990)[23] from 1978-1987 was merged with Samuelsson et al. (2020)[24] from 2006-2011.

Switzerland (whole country): Schoenle et al. (2001)[26] from 1983-1999 was merged with Patterson et al. (2019)[3] from 1994-2013.

Thailand (North East): Tuchinda et al. (2002)[110] from 1991-1995 was merged with Panamonta et al. (2011)[111] from 1996-2005.

United Kingdom (Oxford): Patterson et al. (2019)[3] from 1985-1986 was merged with Gardner et al. (1997)[28] from 1994-1995.

Appendix 3C – Country groupings

Group 1: North-western Europe - Austria, Belgium, Channel Islands, Denmark, Faroe Islands, Finland, France, Germany, Greenland, Holy See, Iceland, Ireland, Isle of Man, Italy, Liechtenstein, Luxembourg, Monaco, Netherlands, Norway, San Marino, Sweden, Switzerland, United Kingdom

Group 2: North-eastern Europe - Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia

Group 3: South-western Europe - Andorra, Cyprus, Greece, Israel, Malta, Portugal, Spain

Group 4: South-eastern Europe - Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Moldova, Montenegro, North Macedonia, Romania, Serbia, Slovenia

Group 5: Middle East/North Africa - Algeria, Bahrain, Egypt, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, State of Palestine, Syria, Tunisia, United Arab Emirates

Group 6: Far Eastern Europe/Central Asia - Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

Group 7: Hong Kong/Taiwan – Hong Kong/Macao/Taiwan

Group 8: Australia/New Zealand – Australia, New Zealand

Group 9: Canada/US - Australia, New Zealand

Group 10: Latin South America - Argentina, Bolivia (Bolivarian Republic of), Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela

Group 11: China

Group 12: Japan

Group 13: Republic of Korea

Group 14: Thailand

Group 15: Maldives

Group 16: Bangladesh

Group 17: Mexico

Group 18: US Virgin Islands

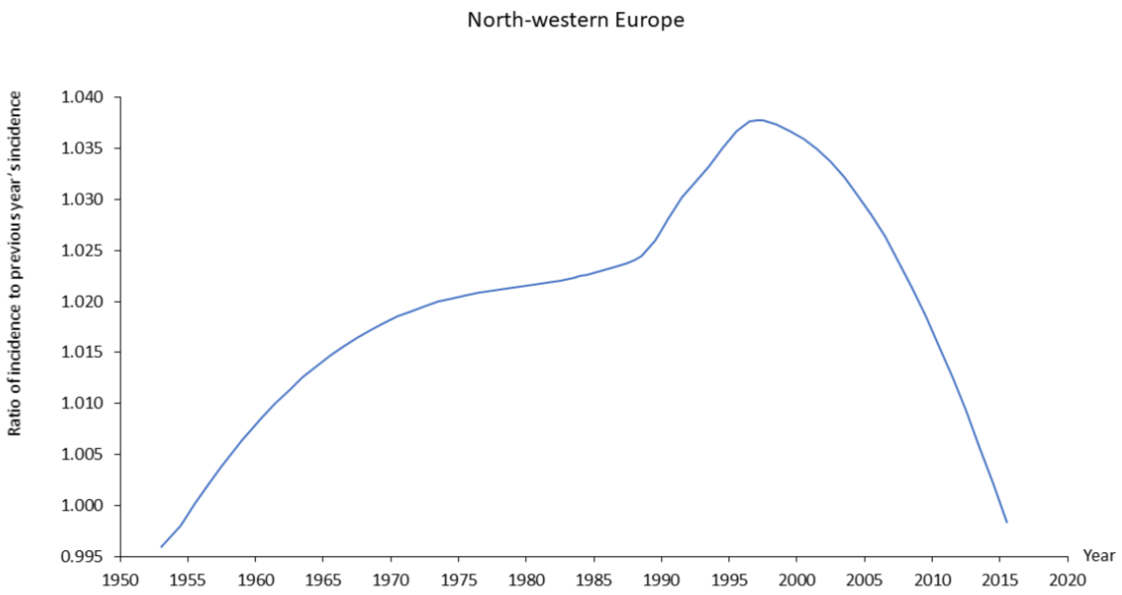
Group 19: Sudan

Group 20: Mali

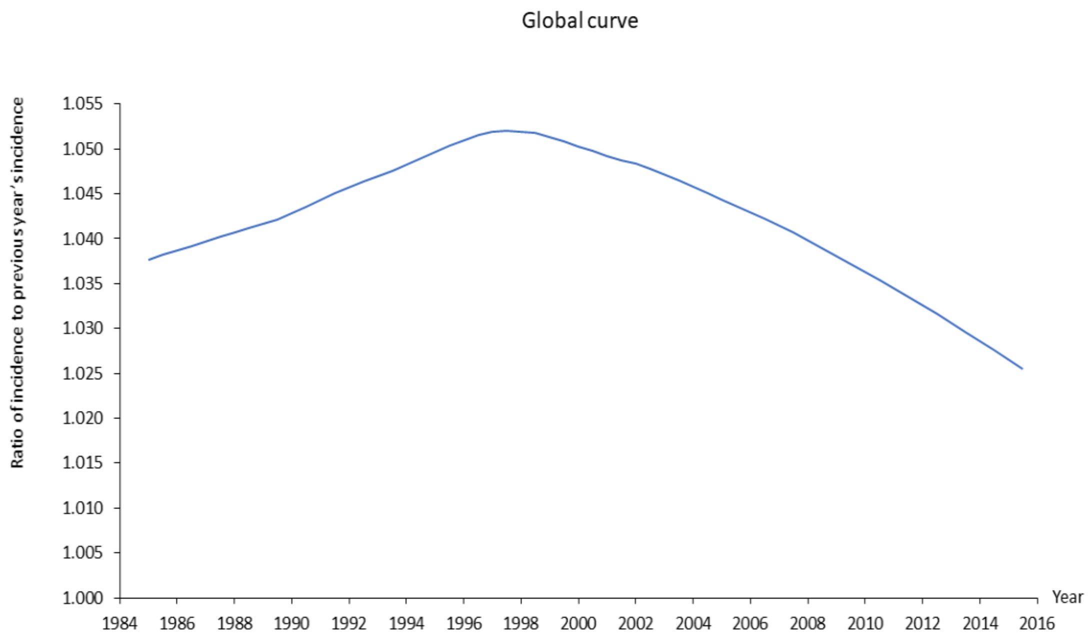
Group 21: Gabon

Group 22: All other countries: Afghanistan, American Samoa, Angola, Antigua and Barbuda, Aruba
Bahamas, Barbados, Belize, Benin, Bermuda, Bhutan, Botswana, British Virgin Islands, Brunei Darussalam, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Cayman Islands, Central African Republic, Chad, Comoros, Congo, Costa Rica, Côte d'Ivoire, Cuba, Curaçao, Democratic People's Republic of Korea, Democratic Republic of the Congo, Djibouti, Dominica, Dominican Republic, El Salvador, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Fiji, French Polynesia, Gambia, Ghana, Grenada, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, India, Indonesia, Iran (Islamic Republic of), Iraq, Jamaica, Kenya, Kiribati, Laos, Lesotho, Liberia, Madagascar, Malawi, Malaysia, Marshall Islands, Mauritania, Mauritius, Mayotte, Micronesia (Federated States of), Mongolia, Mozambique, Myanmar, Namibia, Nauru, Nepal, New Caledonia, Nicaragua, Niger, Nigeria, Northern Mariana Islands, Pakistan, Palau, Panama, Papua New Guinea, Philippines, Puerto Rico, Rwanda, Samoa, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Singapore, Solomon Islands, Somalia, South Africa, South Sudan, Sri Lanka, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Suriname, Timor L'Este, Togo, Tonga, Trinidad and Tobago, Turkey, Tuvalu, Uganda, United Republic of Tanzania, Vanuatu, Viet Nam, Yemen, Zambia, Zimbabwe

Appendix 3D – Line of best fit example – Group 1 – North-western Europe



Appendix 3E – Average of year-on-year incidence change for all countries for 1985-2015 – "Global curve"



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APPENDIX 4: DIAGNOSED MORTALITY

1. Background and objective

The model requires estimates of all-cause and T1D-related mortality for each country (201), year, and age cohort from 0 to 99 years. For example, an estimate of the mortality rate of 5 year olds in China in 2010, as well as for 50 year olds in France in 1980 is needed. However, the information for these data points is incomplete.

A previous published approach trialled a general linear regression model with Infant Mortality Rate as an independent variable[1]. That model used mortality data from 23 independent studies of paediatric mortality. It is presently used to estimate mortality in paediatric populations for the IDF Atlas prevalence estimates. Our analysis of this model showed it had an average R-squared of 20% with 10-fold cross-validation.

In the current study, this work was built on by:

Updating and expanding the set of studies from 23 to 48, including more recent studies and studies of mortality in non-paediatric populations. The 48 studies cover 37 countries. This translates into 71 country-year pairs of data.

Estimating SMR by age, so that for each of the 71 country-year pairings with at least one observed SMR, we had estimates of SMR for all age cohorts, as well as an "age-standardised SMR" (aSMR) that was the simple average of all age cohorts.

Estimating SMR over time, so that for each of the 37 countries with at least one observed SMR, we had an estimate of aSMR for each year from 1963 to 2017.

Estimating SMR across countries based on a number of country characteristics, so that for each of the 164 countries without any reported SMR data, we could estimate their aSMR based on those country characteristics.

Adjusting for standard of care, by predicting SMRs for both minimal and non-minimal levels of care and then calculating an overall SMR for each country using the proportions of different levels of care referred to in Lancet Commission Report 2020, Supplementary materials[2], with some adjustments for change in those proportions over time.

Accuracy of the model is reported with parameter tuning using cross validation. This approach, described in detail below, was found to have an R-squared of 67%.

2. Updating and expanding the set of studies

The initial pool of studies was sourced from a systematic review of childhood- and adolescent-diagnosed cohorts conducted by Morgan et al[3]. These data were supplemented with more recent paediatric studies,[2] as well as studies of mortality in adult and adult-diagnosed populations sourced from a literature search conducted in November 2020.

In total we identified 131 observations where SMR was stated or could be calculated. These were extracted from 48 independent studies covering 37 countries (see **Table 3**).

Four transformations were performed on the study data set:

SMR observations were assigned to the year in which mortality took place. Where SMRs were not reported by year, study average SMRs were assigned to a **mid-point year** for the study period as follows:

mid-point year = average (census year, first diagnosis year)

Where **age attainment at death** was not reported, a range was calculated:

min. age attainment = min. age diagnosed + (census year - last diagnosis year)
max. age attainment = max. age diagnosed + (census year - first diagnosis year)

Studies were weighted in the model by **person years;** where person years were not reported, we gave the study a weighting equal to the mean person years for studies in the data set.

Because these data are biased towards clinics offering intermediate or comprehensive care[2,4] we classified studies by their **level of care** so we could account for the bias in our modelling. Given that the model perceived no mathematical distinction between mortality outcomes from intermediate and comprehensive standards of care, the classification we ultimately used was either minimal care (for which there are only two studies) or non-minimal care (all others).

3. Estimating SMR by age

Four studies reported granular breakdowns of SMR by age. These exhibited a similar distribution, with a peak SMR at ages 30-39 years which was approximately twice the SMR observed at ages 0-4 and 70+ years (**Figure 1A**).

Figure 1A - SMR distribution by age

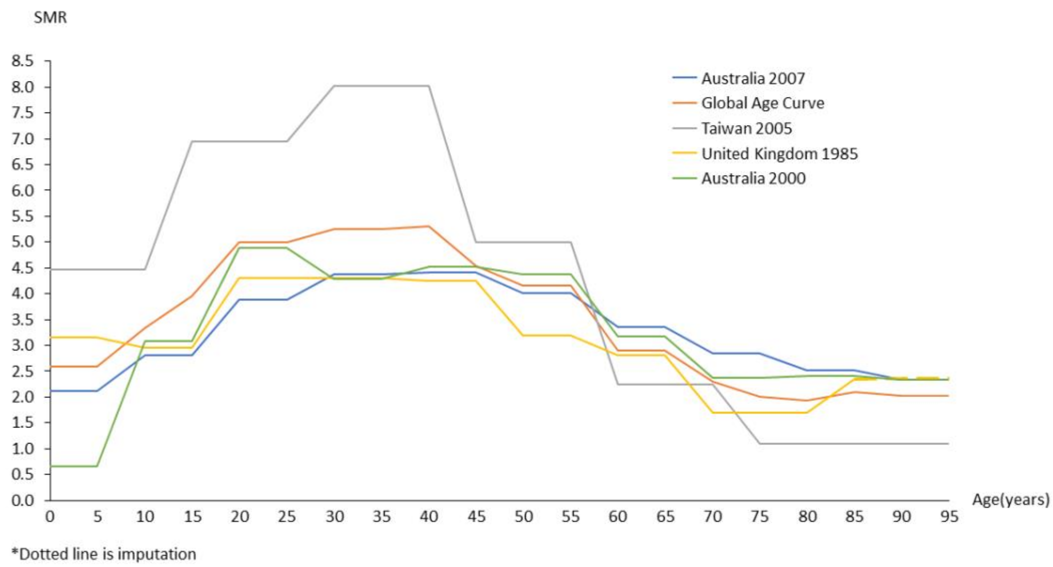
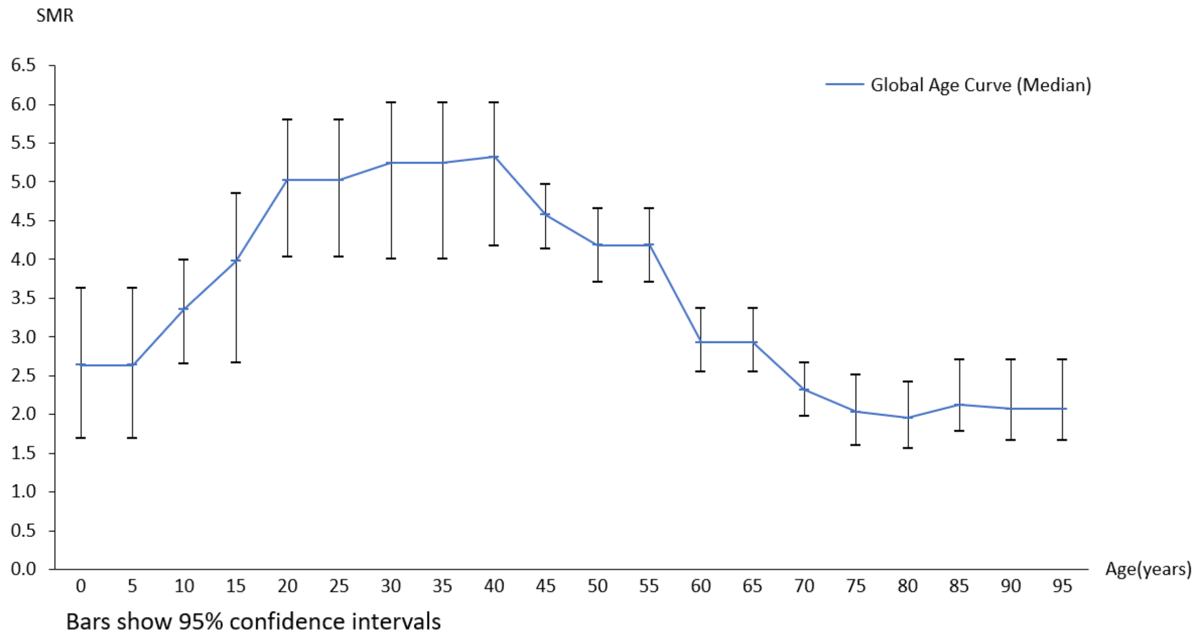


Figure 1B - global age curve with confidence intervals



The four curves were then averaged together to derive a standard global curve (Figure 1B). To be able to include the UK study as one of the four, a "Random Forest" regression model was used to impute values for gaps from 85 years onwards (Figure 1A).

The model adjusts for the substantial variation of SMRs by age when making comparisons over time or across different countries. For example, if a study reports an SMR of 5 for a 30-39 year old cohort in a given year, using the ratio in the global curve we infer that the equivalent SMR would have been approximately 2 for a 70-79 year old cohort in that same year.

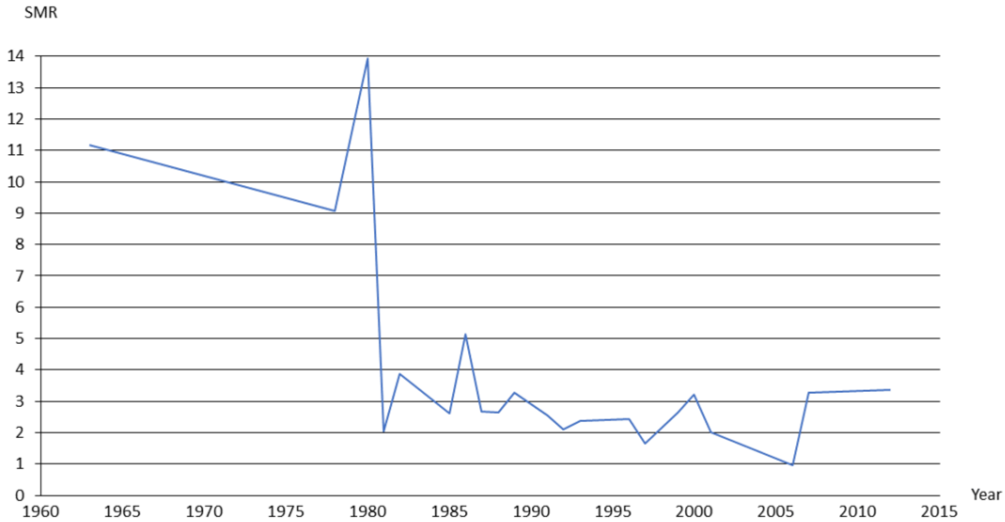
Repeating this process for all age cohorts from 0 to 99 allowed us to develop an estimate of mortality rates across all age cohorts for any country-year pairing in which at least one SMR observation was reported.

We then developed a simple average of SMR across all age cohorts which we used subsequently as an "age-standardised SMR" (aSMR) for any country-wise and longitudinal comparisons.

4. Estimating SMR over time

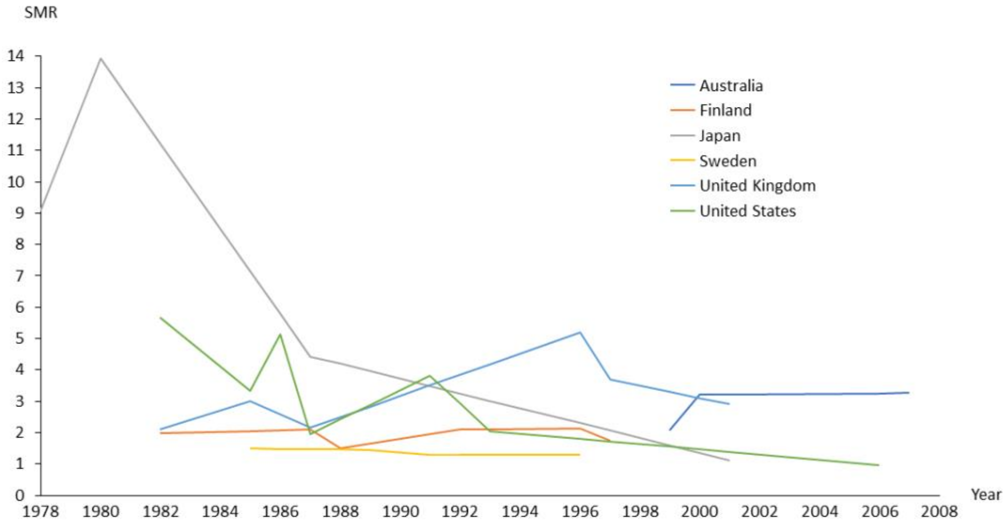
The aSMRs observed in high-income countries over time show a higher relative SMR of 9-14 up until 1980, followed by a sharp fall to lower relative aSMRs mostly of 2-4 from 1982 onwards, with a predominantly flat slope thereafter (**Figure 2**). Note that background mortality rates have declined in high income countries during this time, so the flat SMR slope indicates that outcomes for people with T1D have improved at about the same rate as the background population.

Figure 2 - Age-standardised SMR by year in high income countries



In our data set, six high-income countries reported SMR in three or more years. When these were plotted longitudinally, the pattern was consistent with **Figure 2 (Figure 3)**.

Figure 3 - Age-standardised SMR by year for six countries



We then built a non-linear machine learning regression model to estimate the change in SMR over time in the 37 countries with SMR data. The model was coded in R version 4.0 and used a “Random Forest” regression training approach. Random Forest is an ensemble method, where the algorithm builds regression trees by randomly bootstrapping the number of samples and the number of variables. Training, or tree building, produces a forest of random, unique and distinctive regression trees. During the prediction phase, each tree will make a prediction and the final outcome is made by averaging them.

There are two factors considered when choosing Random Forest as the underlying algorithm compared to general linear regression:
Features used in the model are mostly correlated, which contradicts the assumptions that linear regressions have.
Features used in the model could be numeric or categorical, where Random Forest can take them as input directly without transformation.

We designed a model that predicts aSMR conditional on a number of country characteristics:

$$SMR_{t,i} \;=\; \frac{MR_{t,i}^{T1D}}{MR_{t,i}^{BG}} = f_\theta\left(X_{i,t}\right) + \varepsilon_{i,t}$$

where $SMR_{t,i}$ denotes the SMR at time *t* for country *i*, $MR_{t,i}^{T1D}$ denotes all-cause mortality, $MR_{t,i}^{BG}$ the background mortality rate of the general population, f_θ represent the Random Forest model and $X_{i,t}$ are characteristics specific to country *i* and time period *t*. The regression noise term $\varepsilon_{i,t}$ is regarded as a zero mean variable.

The following features were considered:

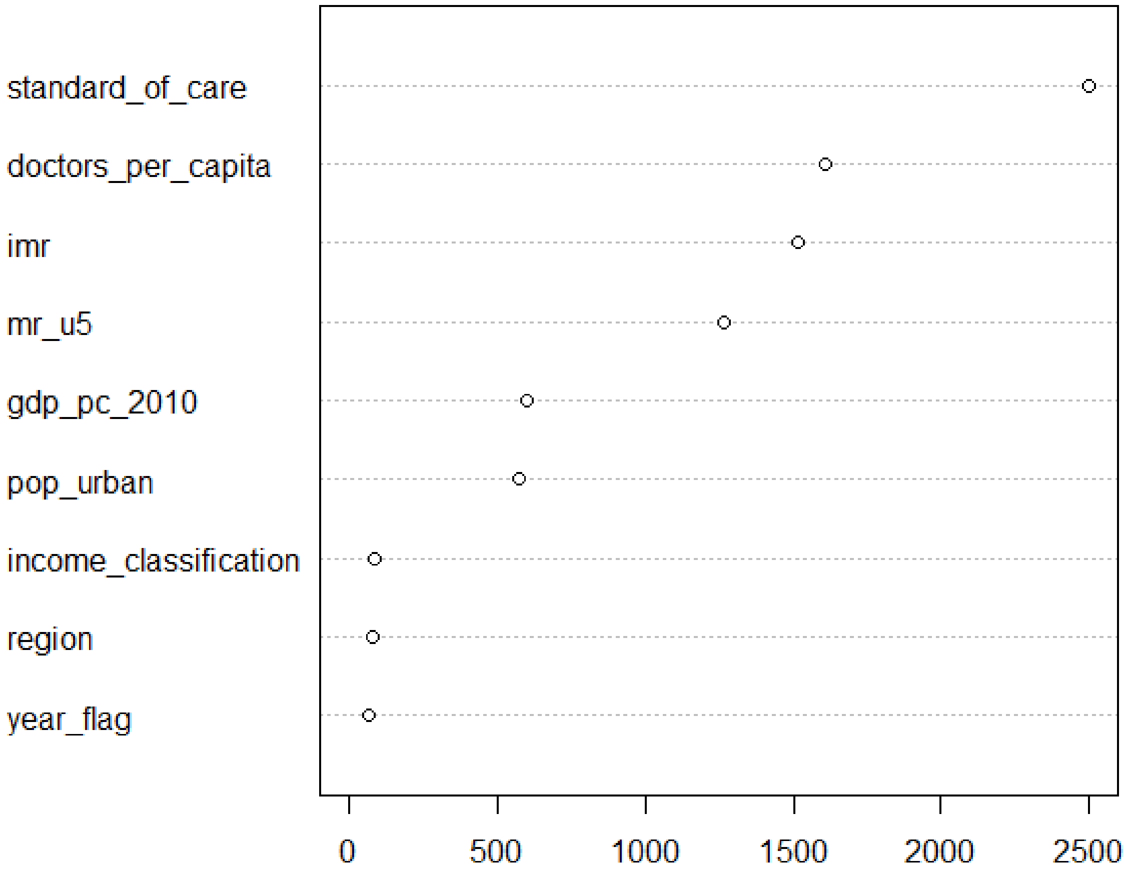
Table 1 - Features used in “Random Forest” regression model

Feature notation	Value Type	Feature description	Notes
f_mr_u5	Numerical	Mortality under age 5	World Bank data[5]
f_imr	Numerical	Infant mortality	World Bank data[5]
f_doc	Numerical	Doctors per capita	World Bank data[5]
f_pop_urban	Numerical	Percentage of people living in cities	World Bank data[5]
f_gdp	Numerical	GDP	World Bank data[5]
Standard_of_care	Categorical	Minimal / Non-minimal care	Lancet Commission[2]
year_flag	Boolean	Before or after 1982	See “change in mortality over time” section above

Note that the age of the studied cohort was not included as a feature, as this was separately recognised and adjusted for using “age-standardised SMRs”. Further, the model was unaware of which country it was predicting SMR for at any particular time - which meant that its accuracy when compared to observed mortality was a function of the above features and the “Random Forest” algorithm developed using those features.

The relative importance of each of these features to the output of the algorithm is reported in **Figure 4**. We can see that standard of care, doctors_per_capita and both infant and under five mortality are the most informative variables in terms of predicting mortality rates.

Figure 4 - feature importance



Here are examples of longitudinal predictions made for three countries, where we plot both the estimated aSMR over time as well as the “real world” observations of aSMR for those countries **(Figures 5-7)**.

Figure 5 - Estimated vs observed SMR for United States

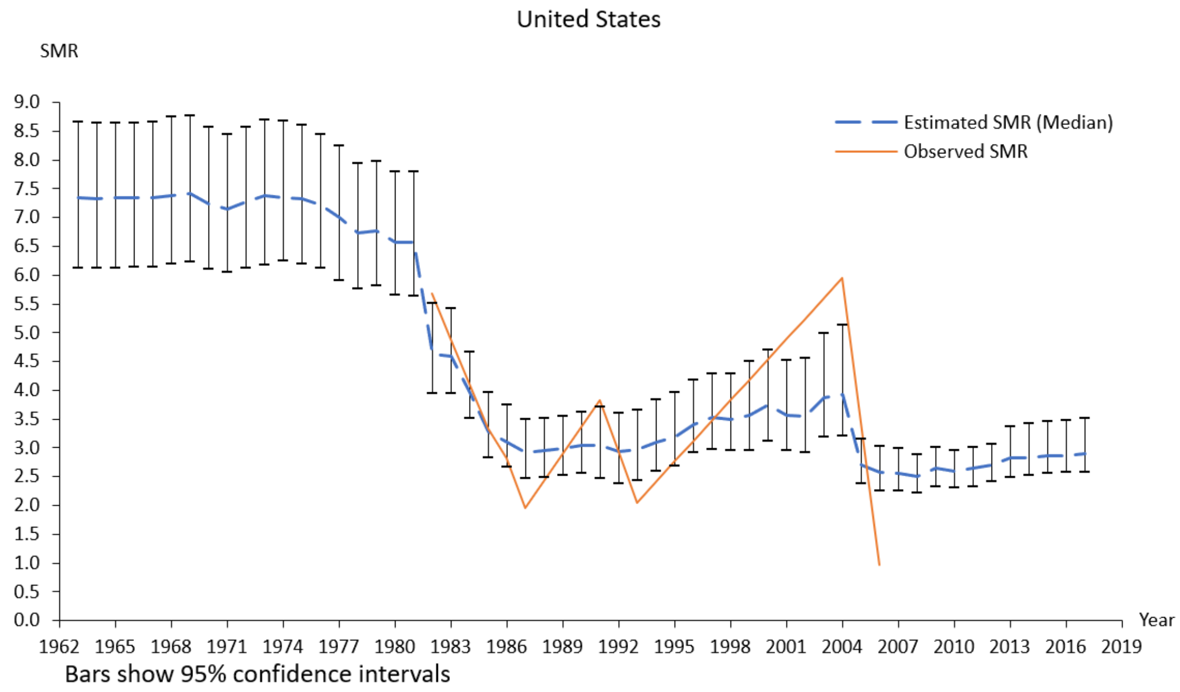


Figure 6 - Estimated vs observed SMR for United Kingdom

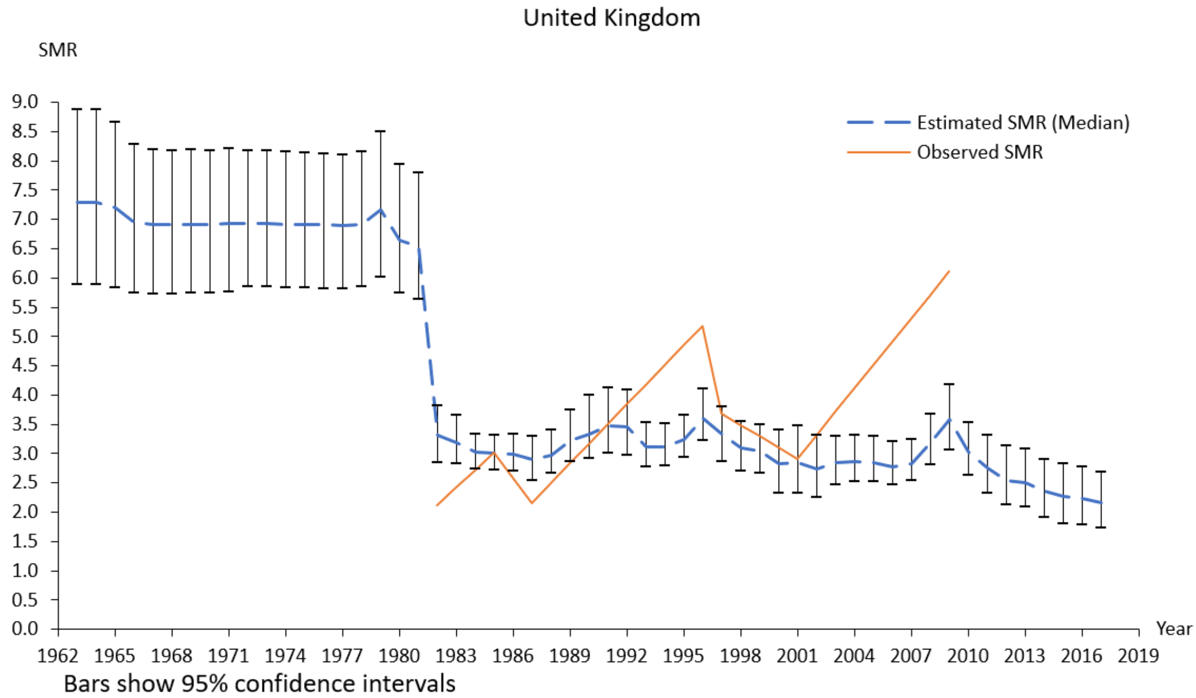
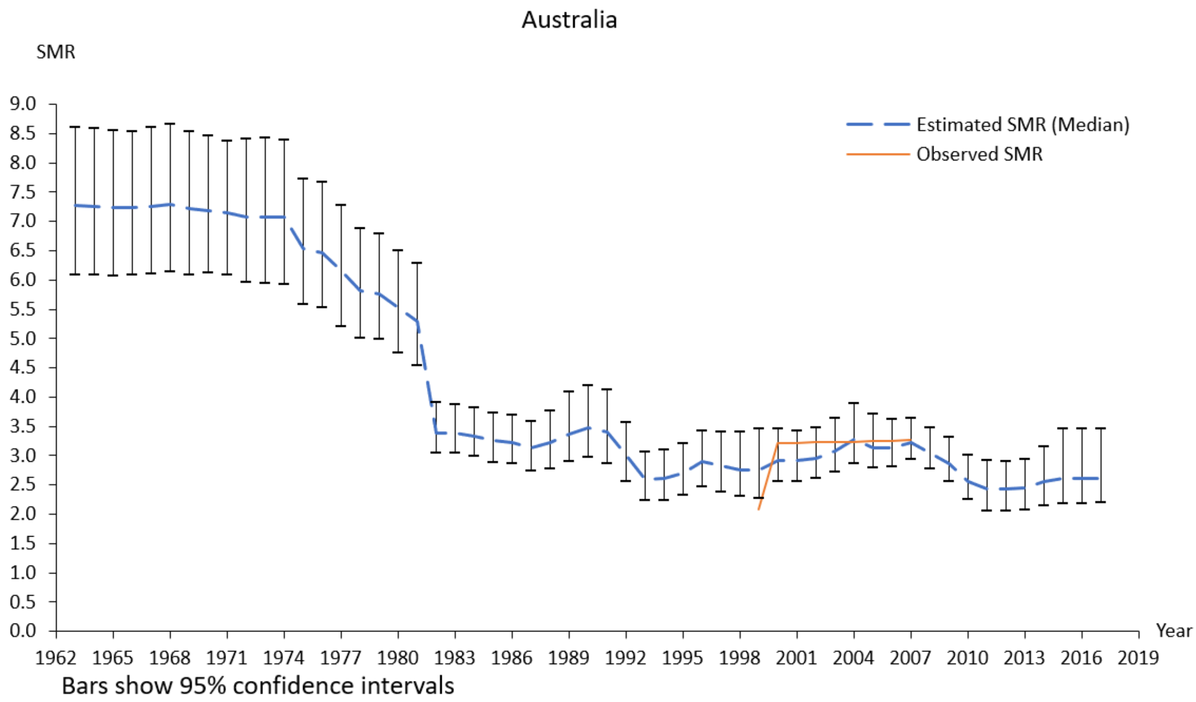


Figure 7 - Estimated vs observed SMR for Australia



The performance of these predictions for 37 countries was tested using 10-fold cross validation. For each of the 10-fold cross validations, we trained the model with 90% of data and made predictions for the other 10%.

Using the above cross validation approach, the parameters of the algorithm were tuned and the model was able to achieve an R-squared of 67%.

5. Estimating SMR across countries

A second Random Forest model was then trained to predict aSMRs for the 164 countries with no reported SMR data, using both observed and estimated aSMR from the 37 countries with data.

Here we also used cross-validation, taking data from 33 or 34 of the 37 countries to develop our predictive algorithm and then measuring how well it performed against the other 2 or 3 countries. Repeating this process 18 times and taking the average of the results, we were able to achieve R-squared of 99%. High R-squared values are expected as we are using imputed aSMRs to train the model. Here also, parameters of the model are tuned using the cross-validation.

Having retrained the model in this way, we used it to predict aSMRs for the other 164 countries. Here are three examples:

Figure 8 - Estimated SMR for Nigeria

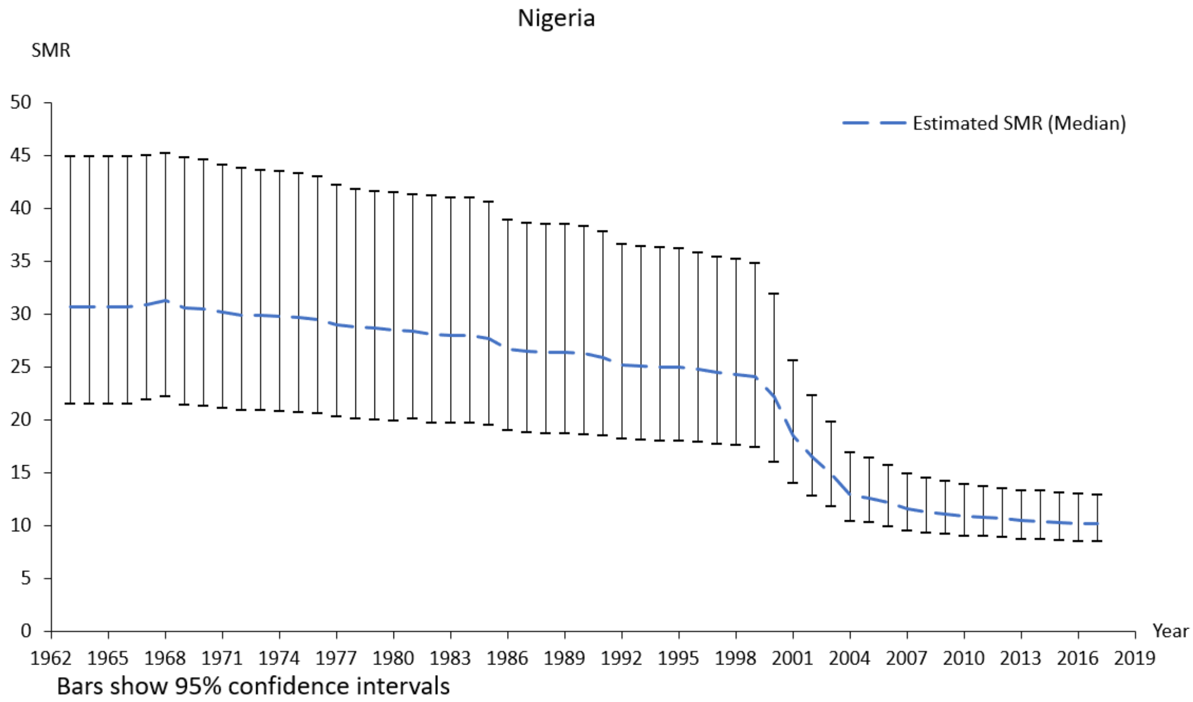


Figure 9 - Estimated SMR for Qatar

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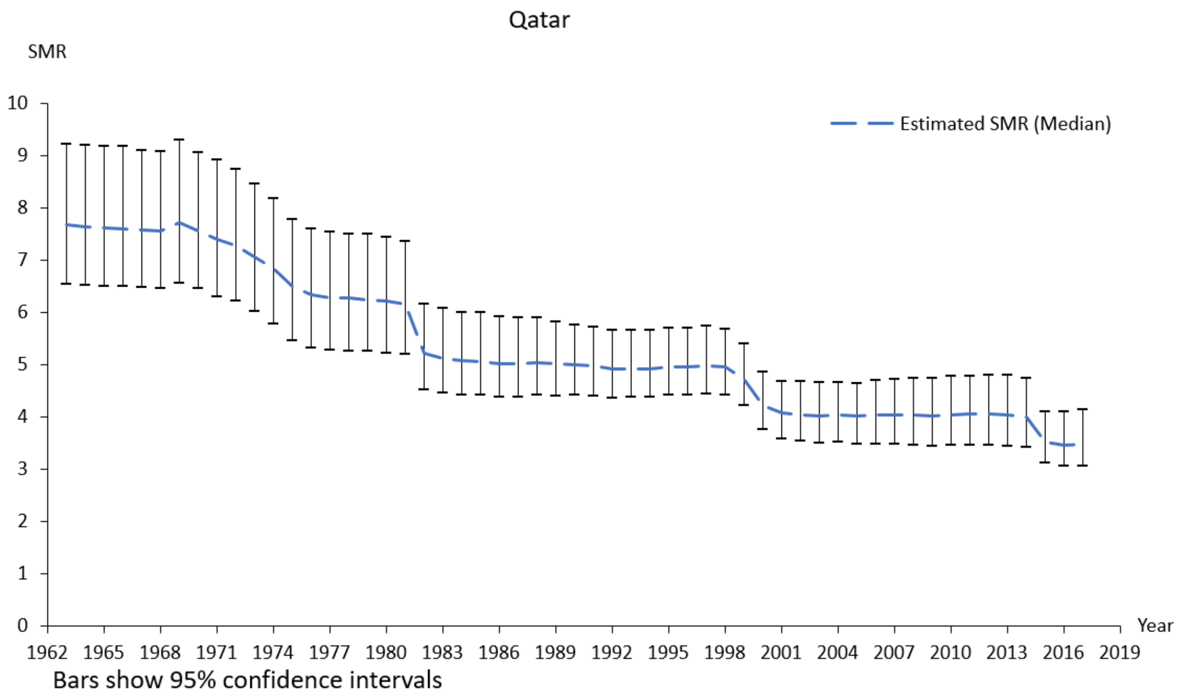

Figure 10 - Estimated SMR for Canada

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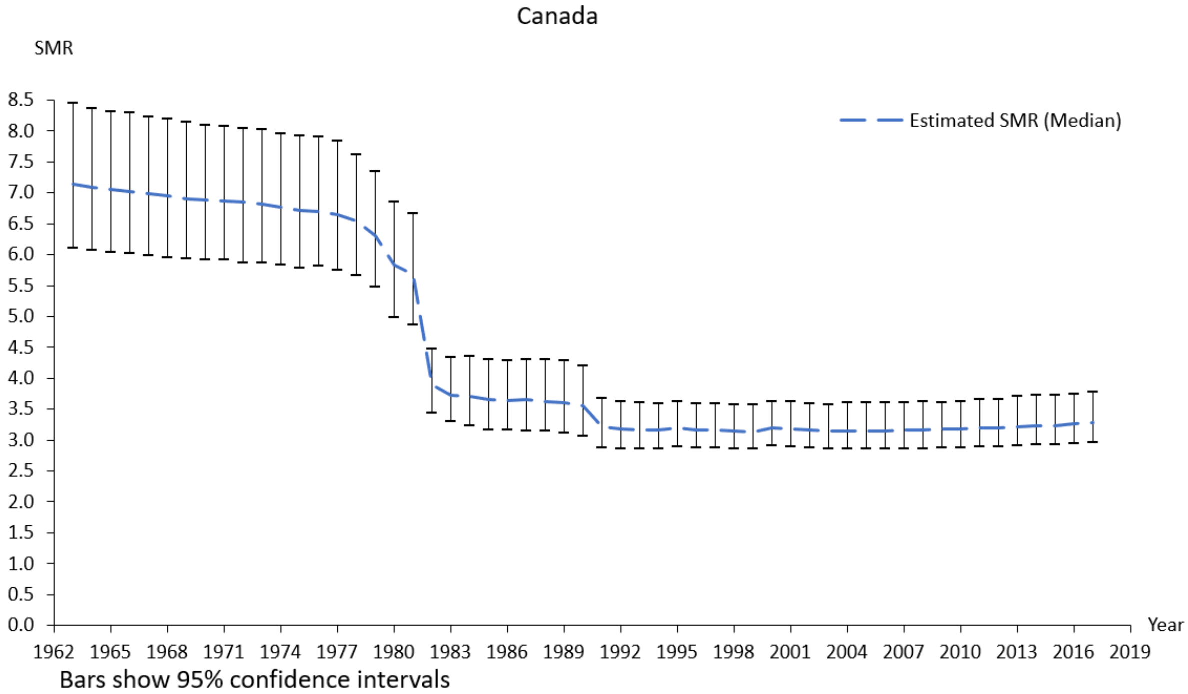

6. Adjusting for standards of care

For countries with at least some prevalence of minimal care, our final step was to make an adjustment to account for this by estimating, based on combined clinical experience of the authors, the percent of people with T1D in each income band that were receiving minimal or non-minimal levels of care in 2020, 2010 and 2000 **(Table 2)**. This is an extension of the method used in the Lancet Commission 2020 Chan et al[2] appendix. For years in-between these point estimates, the rate was interpolated linearly; before and after these point estimates, the rate was held constant.

The 'level of care' feature of the model was then used to predict SMRs for both minimal care and non-minimal care. We then separate the prevalent population into different compartments, using the proportions below and applying a different level of care and associated SMR to each.

Table 2 - Relative proportion of levels of care by income group and year

Year	Income class	Non-minimal care	Minimal care
2020	HIC	100%	0%

2020	UMIC	100%	0%
2020	LMIC	50%	50%
2020	LIC	35%	65%
2010	HIC	100%	0%
2010	UMIC	100%	0%
2010	LMIC	35%	65%
2010	LIC	20%	80%
2000	HIC	100%	0%
2000	UMIC	100%	0%
2000	LMIC	20%	80%
2000	LIC	5%	95%

7. Estimates of mortality due to type 1 diabetes by region (2021)

Using the above estimates of mortality rates in the core model (**Appendix 1**), we developed estimates of T1D-associated mortality (**Table 3**).

Table 3 – Estimated mortality due to T1D by region (2021)

Region	T1D-associated mortality				
	<25 non-diagnosis	<25 early mortality	<25 total mortality	25+ early mortality	Total
Global	34,963 (29,865-40,718)	17,550 (13,973-22,127)	52,588 (46,019-60,149)	122,308 (85,765-159,827)	174,953 (133,655-217,792)
North America	0 (0.0-0.0)	345 (267-446)	345 (267-446)	16,798 (10,160-23,667)	17,145 (10,427-24,113)
Latin America & Caribbean	2,550 (2,236-2,922)	892 (707-1,109)	3,447 (3,083-3,897)	11,391 (8,446-14,389)	14,833 (11,747-18,070)
Europe & Central Asia	2,758 (2,551-2,987)	658 (482-885)	3,417 (3,111-3,775)	29,048 (14,076-43,895)	32,470 (17,335-47,571)
Middle East & North Africa	4,056 (3,599-4,567)	1,126 (895-1,421)	5,189 (4,642-5,806)	9,044 (6,981-11,212)	14,236 (11,869-16,767)
Sub-Saharan Africa	14,462 (12,086-17,196)	8,334 (6,784-10,203)	22,827 (19,906-26,134)	17,546 (15,185-19,931)	40,358 (35,688-45,362)
South Asia	8,660 (7,568-9,915)	5,490 (4,287-7,160)	14,173 (12,522-16,187)	28,036 (23,456-33,231)	42,272 (36,217-48,945)
East Asia & Pacific	2,477 (1,823-3,131)	705 (551-903)	3,190 (2,487-3,904)	10,446 (7,461-13,502)	13,639 (10,371-16,964)

8. Mortality studies used

Table 4 - Studies of mortality in type 1 diabetes

Authors	Year	Country	Person years
Lestradet[6]	1981	France	6,324
Lester et al[7]	1992	Ethiopia	2,767
Elamin et al[8]	1992	Sudan	399
Nyström[9]	1992	Sweden	3,842
Collado-Mesa et al[10]	1997	Cuba	8,820
Warner[11]	1998	United Kingdom	17,350

Nishimura et al[12]	1998	Japan	14,860
Sidibe et al[13]	1999	Mali	35
Laing[14]	1999	United Kingdom	320,041
Podar et al[15]	2000	Estonia, Finland, Lithuania	49,896
Morrish[16]	2001	United Kingdom, Switzerland, Poland, Germany, Croatia, China, Hong Kong,Cuba	12,193
Laron-Kenet et al[17]	2001	Israel	23,877
Nishimura[18]	2001	United States	27,093
Roper[19]	2002	United Kingdom	4,393
Dahlquist et al[20]	2005	Sweden	81,600
Soedamah-Muthu[21]	2006	United Kingdom	208,284
Waernbaum[22]	2006	Sweden	43,531
Patterson et al[23]	2007	Austria, Germany, Hungary, Iceland, Lithuania, Spain, Bulgaria	64,796
Burnet[24]	2007	United States	9,596
Bruno et al[25]	2009	Italy, Denmark,United Kingdom, Norway, Sweden, Finland	170,232
Secrest[26]	2010	United States	30,046
Muyer et al[27]	2010	DRC	4,392
Hartjusalo[28]	2011	Finland	190,031
Spain[29]	2012	Spain	-
Morimoto[30]	2013	Japan	24,122
O'Grady et al[31]	2013	Australia	17,453
Washington et al[32]	2014	United States	1,453
Lin[33]	2014	Taiwan	NA
Harding[34]	2014	Australia	NA
Gagnum et al[35]	2015	Norway	132,420
Otani et al[36]	2015	Japan	4,170
Livingstone[37]	2015	United Kingdom	67,826
Gupta et al[38]	2016	India	233
Miller[39]	2016	United States	4,600

DCCT[40]	2016	United States	39,082
Gomes et al[41]	2017	Brazil	18,180
Ameyaw et al[42]	2017	Ghana	186
Duarte-Gomez et al[43]	2017	Bolivia	870
Sandahl et al[44]	2017	Denmark	17,337
Gagnum et al[45]	2017	Norway	21,272
Marshall et al[46]	2017	Rwanda	1,823
Rakhimova et al[47]	2018	Uzbekistan	680
Groop et al[48]	2018	Finland	106,992
Evans et al[49]	2018	United Kingdom	100,959
Morgan[50]	2018	United Kingdom	39,764
Reynolds et al[51]	2018	United States	36,810
Condie et al[52]	2020	Pakistan	246
Sandy[53]	2021	Mali	1,504

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APPENDIX 5: DIAGNOSIS RATES

1. Background and objectives

It is thought that many young people in some lower income countries die of ketoacidosis soon after onset of symptomatic T1D without ever being diagnosed[1–7]. To estimate this number, we reviewed both a set of studies that had relevant data and a more general survey of expert opinions.

2. Case study method

Case studies can be used to begin to quantify this phenomenon. There are a number of instances where interventions took place to improve health system diagnostic capability, and a rapid increase was observed in the number of T1D diagnoses. If we compare these observations with a counterfactual where no diagnostic intervention was made but incidence grew at a posited, rapid rate of 5-7% (cf. **Appendix 3 - Incidence Over Time**), we can infer a reasonable upper limit for diagnosis rates prior to the intervention.

For example, in Gabon[6] the 0-30 years incidence rate observed in 2011 was 1.9 per 100,000. If that incidence rate had grown at 5-7% p.a. it would have reached 2.4-2.6 per 100,000 in 2016. However, the observed incidence rate in 2016 was 3.7 per 100,000. To achieve a rate of 3.7 in 2016 with 5-7% p.a. growth, the 'true' incidence rate in 2011 must have been at least 2.7-2.9. This implies a diagnosis rate no higher than 65-71% in 2011.

This establishes an upper bound, as the true diagnosis rate in 2011 could well have been lower than 65-71%. For example, if the diagnosis rate in 2016 was still only 80%, then the rate in 2011 could have been no higher than 52-57%. Or if there was no growth in incidence in the period 2011-2016, the diagnosis rate in 2011 might have been no higher than 51%.

In addition to the figures for Gabon, this "case study" method suggests diagnosis rates no higher than 25-40% in Rwanda in 2004[2] and Mali in 2007[1]; with the necessary consequence that mortality soon after onset of symptoms would have been at least as high as 60-75% (**Table 1**).

Table 1 - case study analysis

Country (years)	Observed incidence pre-intervention	Counterfactual incidence post-intervention (at 5-7% p.a.)	Observed incidence post-intervention	Implied maximum diagnosis rate
Gabon[6] (2011-2016)	1.9	2.4-2.6	3.7	65-71% in 2011
Mali[1] (2007-2016)	0.12	0.19-0.22	0.74	25-30% in 2007

Rwanda[2] (2004-2007)	0.79	0.91-0.97	2.40	38-40% in 2004

The case study method has the advantage of making a strong case for the existence and scale of the problem in Gabon, Mali and Rwanda. But it does not allow us to construct a more general global estimate.

3. Survey method

Polling of a large number of expert opinions was used to build a more general estimate.

JDRF and the International Society for Pediatric and Adolescent Diabetes (ISPAD) conducted a survey of healthcare professionals in 2020. The survey consisted of 22 multiple-choice questions addressing patient outcomes, care models, and cost and affordability. These questions were co-designed by JDRF and ISPAD. It was circulated amongst ISPAD members and also promoted amongst International Diabetes Federation (IDF) and Life for a Child (LFAC) networks.

The survey received 564 responses from 73 countries. Of these, 314 came from high income countries, 169 from upper-middle income countries, 72 from lower-middle income and nine from low income countries.

The ninth question, responded to by 351 respondents in 64 countries, was:

"In some countries, as many as 50-80% of people who develop T1D have died without ever being diagnosed. We want to develop an estimate of how significant this problem is globally. What is your best estimate of that figure for your region?"

Respondents could then choose between options 0%, 0-10%, 10-20% and so on up to 70-80% and 80%+. The question also asked for these rates to be estimated for three time periods: before 2000, between 2000 and 2010, and after 2010.

Given the 185 respondents from high-income countries responded most often with a non-diagnosis rate of 0% or sometimes 0-10%, we concluded it was unsafe to interpret '0-10%' as indicative of its midpoint value of 5% and therefore could not construct an estimate for high-income countries. Therefore, high-income country data comprising 185 responses from 32 countries, were excluded and we instead assumed a diagnosis rate of 100% for those countries for the purposes of this exercise.

4. Survey results

Our remaining 166 survey responses from upper-middle income, lower-middle income and low-income countries showed significant variation by region and income group (**Table 2**). The general trends were:

- Diagnosis rates are often reported to be substantially below 100% and therefore would be a substantial driver of global T1D mortality

- Diagnosis rates fall with country income levels, but also exhibit some degree of regional variation (e.g. lower rates in sub-Saharan Africa)
- Diagnosis rates were lower in the past than currently

Table 2: Survey results by region and income class

	Diagnosis rate: raw midpoint mean		
	Before 2000	2000-2010	2010-2020
By region (excluding high income countries)			
North America	n/a	n/a	n/a
Latin America & Caribbean	73%	82%	88%
Europe & Central Asia	84%	90%	92%
Middle East & North Africa	80%	85%	86%
Sub-Saharan Africa	40%	55%	67%
South Asia	72%	77%	85%
East Asia & Pacific	76%	80%	84%
By income group			
High income	n/a	n/a	n/a
Upper-middle	77%	84%	88%
Lower-middle	72%	78%	83%
Low income	41%	50%	65%

Given the strong representation of ISPAD members amongst the respondents, and the very limited information on diabetic ketoacidosis rates in adult-onset T1D subjects, the survey data are most relevant to those under 25 years of age (i.e. the scope of ISPAD). The survey data was therefore only used to estimate diagnosis rates and non-diagnosed mortality in those under 25 years. For a diagnosis from 25 years of age onwards, the diagnosis rate was assumed to be 100%.

5. General model

To generalise these results for all countries (excluding high income countries), we built a simple model that for each country calculated average diagnosis rates for its region and its income group and then took the average of both (**Table 3**). These values were calculated for each of the time periods in the survey, and treated as indicative of the diagnosis rate in the mid-point of the time period (i.e. 2015 for the period 2010-2020). Values between these dates were interpolated linearly, but held constant outside of those mid-point dates.

Table 3: Diagnosis rate matrix (regional vs income group) for 2010-2020

	Region average	LIC	LMIC	UMIC
Income average		65%	83%	88%
Latin America & Caribbean	88%	76.5% (88%+65%) / 2	86%	88%
Europe & Central Asia	92%	79%	88%	90%
Middle East & North Africa	86%	76%	85%	87%
Sub-Saharan Africa	67%	66%	75%	78%
South Asia	85%	75%	84%	87%
East Asia & Pacific	84%	75%	84%	86%

This matrix allows estimation of a diagnosis rate for any given country in any given year. Comparison of this more general approach with the case study method (**Table 4**), shows that the survey method estimates higher diagnosis rates than the upper bounds inferred from the case studies.

Table 4: Comparison of diagnosis rates in case studies and survey methods

Country (years)	Case study method (upper bound estimate)	Survey method
Gabon (2011-2016)	<65-71% in 2011	73-76%
Mali (2007-2016)	<25-30% in 2007	44-67%
Rwanda (2004-2007)	<38-40% in 2004	39-63%

For the current study, the more conservative, general approach from the survey results has been used.

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APPENDIX 6: COMPARISONS WITH PUBLISHED ESTIMATES

We evaluated the gap between our estimates and other data sources, including both **prevalence observations** (published and registry) and **prevalence estimates** (i.e. the alternate prevalence estimation methodologies employed in the IDF Atlas 2021[1], Green 2021[2] or the Global Burden of Disease 2019 estimates)[3].

Three key findings emerged from these comparisons, which are laid out in the sections and tables below:

- Our estimates are close to observed paediatric prevalence, with a median per-country variation of 7% (**Table 1**).
- Other available global paediatric estimates are 18-31% lower than ours overall (**Table 2** and **Table 3**), with median per-country variations of 25%[1] (IDF Atlas 2021), 45%[2] (Green 2021) and 73%[3] (Global Burden of Disease, 2019 estimates). These variations are substantially driven by adjustments we have made to older incidence studies to account for increasing incidence rates over time (see **Appendix 3**).
- Other available global all-ages estimates are 25% to 183% higher than ours, with median country variations of 37%[2] (Green 2021) and 320%[3] (Global Burden of Disease, 2019 estimates). The largest driver of this difference in our estimates is that we follow the literature in assigning higher mortality rates to previous decades, in particular before 1980 (see **Appendix 4**). The variation may also be attributed to our accounting for increasing incidence rates over time; today's adults were generally diagnosed 20+ years ago, and our estimated incidence rates for that period are lower than they would be if we simply used the figure from the most recent studies without accounting for change in incidence over time. Finally, the GBD work uses a broad range of different indicators to estimate incidence and prevalence, which may be sensitive to insulin users who do not have T1D. Green 2021[2] has a useful discussion of this topic.

Given the methodological limitations of these other global all-age estimates, we prefer the observations of prevalence data as the most useful comparison scorecard for evaluating both current and future versions of our model.

1. Comparison with observed prevalence data

Paediatric prevalence data were collected for 15 countries from data from the 2021 IDF Atlas,[1,4] and also direct approaches made to T1D registries. In all cases we used the most recent data available for any given country.

These observations were largely consistent with our estimates for the same years and age groups (**Table 1**). Our total estimate of 278,466 for paediatric populations across all 15 countries was 3% lower than observed data, and median variation between our estimates and observed data was 6% on a per-country basis with no clear change in variation between higher and lower income countries.

Table 1: Comparison of estimates with published studies / registry data

Observed prevalence							Our estimates	
Income	**Country**	**Source**	**Year of data**	**Age (years)**		**Published prevalence**	**Est. prevalence**	**Variance**
HIC	Australia	NDSS[5]	2021	0	19	14,356	13,941	3%
HIC	Belgium	IQED[6]	2017	0	19	4,450	4,180	6%
HIC	Canada	Fox[8]	2013	0	19	18,203	29,683	63%
HIC	Finland	Oilinki[10]	2007	0	14	3585	3,641	2%
HIC	Ireland	Gajewska[11]	2016	0	14	1,846	1,776	4%
HIC	Italy	Bruno[12]	2012	0	19	14,337	12,486	13%
HIC	Netherlands	Fazeli[15]	2011	0	19	6,841	7,420	8%
HIC	Spain	Alvarez[16]	2014	0	14	10,138	9,524	6%
HIC	Taiwan	Sheen[18]	2014	0	19	2,415	2,312	4%
HIC	United States	Lawrence[20]	2017	0	19	177,581	160,242	10%
High-income countries*								**6%**
UMIC	Fiji	Ogle[9]	2012	0	14	15	16	7%
UMIC	Maldives	Majeed[13]	2018	0	19	70	62	11%
UMIC	Turkey	Yesilkaya[19]	2013	0	17	17,843	17,623	1%
Upper middle-income countries*								**7%**
LIC	Mali	Sandy[14]	2016	0	19	215	163	24%
LIC	Sudan	Saad[17]	2015	0	19	15,089	15,397	2%
Low-income countries*								13%
GLOBAL*								6%

* median variance shown

Two countries exhibited larger variations:

- In Canada, our estimate of 30K was 39% higher than the 18K implied by applying Fox's observed prevalence rates in British Columbia to the whole of Canada. This is not surprising given that observed incidence per 100,000 in British Columbia is 40-50% lower than in Nova Scotia, Newfoundland, and Labrador [21,22]. It does, however, highlight the value in future research of building sub-national models that distinguish between different regions.
- In Mali, our estimate of 163 was 32% lower than the 215 observed by Sandy in 2016[14]. Our model does not account for the impact of the intervention made by Santé Diabète, the Malian Ministry of Health and Life For a Child in Mali, which increased diagnosis rates and prevalence[14]. In that sense, the difference between the two estimates could be inferred as a measure of that intervention, but it points to a need in future work to adjust our estimates in LICs and LMICs where interventions have taken place.

2. Comparison with other available estimates of T1D prevalence

Three other recent estimates of T1D prevalence were identified as comparators:

- IDF Atlas 2021[1], which contains prevalence estimates for 0-19 years in 2021
- Green et al 2021[2], which contains prevalence estimates for all ages in 2017
- Global Burden of Disease (2019 edition)[3], which contains prevalence estimates for all ages from 1990 to 2019

Our model was run three times under different parameters, to produce comparison estimates for 0-19 years in 2021 (**Table 2**), 0-14 years in 2017 (**Table 3**) and 0-99 years in 2017 (**Table 4**).

Table 2: Comparison with other published prevalence estimates

Region or country	Paediatric and adolescent estimates (2021, 0-19)			Paediatric estimates (2017, 0-14)					All-ages estimates (2017)				
	T1D Index	IDF Atlas	% variation	T1D Index	Green (2021)	% variation	GBD (2019)	% variation	T1D Index	Green (2021)	% variation	GBD (2019)	% variation
GLOBAL	1,476,023	1,210,849	-18%	737,777	541,270	-27%	1,381,530	+87%	7,216,215	9,003,840	+25%	20,393,691	+183%
North America	199,751	177,705	-11%	101,851	95,730	-6%	137,463	+35%	1,528,652	1,749,900	+14%	2,898,174	+90%
Latin America & Caribbean	164,690	136,078	-17%	85,800	68,890	-20%	113,729	+33%	743,447	1,154,190	+55%	1,515,658	+104%
Europe & Central Asia	364,639	289,245	-21%	184,648	143,600	-22%	200,060	+8%	2,579,296	2,728,230	+6%	4,983,774	+93%
Middle East & North Africa	204,338	171,219	-16%	95,645	67,080	-30%	118,629	+24%	656,415	1,034,320	+58%	1,472,541	+124%
Sub-Saharan Africa	111,436	75,987	-32%	45,735	26,250	-43%	256,589	+461%	272,532	222,070	-19%	1,924,285	+606%
South Asia	305,564	253,558	-17%	161,038	90,750	-44%	384,145	+139%	732,603	1,222,660	+67%	4,236,141	+478%
East Asia & Pacific	125,605	107,057	-15%	63,060	48,970	-22%	170,914	+171%	703,270	892,470	+27%	3,363,118	+378%
Afghanistan	5,244	3,493	-33%	2,903	1,770	-39%	14,984	+416%	7,148	15,820	+121%	83,338	+1066%
Albania	704	493	-30%	338	230	-32%	448	+32%	3,444	4,380	+27%	9,120	+165%
Algeria	42,536	50,812	+19%	19,792	16,010	-19%	10,093	-49%	112,486	231,010	+105%	129,667	+15%
Angola	3,698	2,388	-35%	1,493	690	-54%	7,166	+380%	8,213	5,010	-39%	46,200	+463%
Antigua and Barbuda	25	10	-61%	14	10	-29%	10	-30%	103	80	-22%	182	+76%
Argentina	16,608	8,581	-48%	8,205	4,320	-47%	17,238	+110%	68,845	69,630	+1%	162,634	+136%
Armenia	721	498	-31%	356	230	-35%	461	+30%	2,737	4,170	+52%	10,184	+272%
Aruba	1.0	0.4	-63%	1.0	-	-	-	+0%	5.0	-	-	-	-
Australia	13,941	14,854	+7%	6,773	6,490	-4%	7,755	+14%	107,264	119,140	+11%	167,880	+57%
Austria	3,417	3,592	+5%	1,826	1,430	-22%	2,148	+18%	27,894	29,960	+7%	62,453	+124%
Azerbaijan	2,041	1,908	-7%	972	890	-8%	1,757	+81%	6,540	14,350	+119%	30,457	+366%
Bahamas	187	123	-34%	102	50	-51%	51	-50%	710	870	+23%	817	+15%
Bahrain	306	94	-69%	124	40	-68%	255	+105%	1,437	880	-39%	5,809	+304%
Bangladesh	5,780	5,932	+3%	2,911	2,720	-7%	29,765	+923%	22,178	38,730	+75%	330,976	+1392%
Barbados	106	35	-67%	58	20	-66%	27	-54%	529	270	-49%	520	-2%
Belarus	2,684	1,062	-60%	1,298	530	-59%	1,095	-16%	12,275	10,260	-16%	31,687	+158%
Belgium	4,499	4,330	-4%	2,311	2,090	-10%	3,214	+39%	37,786	39,230	+4%	74,498	+97%
Belize	39	49	+26%	17	40	+135%	66	+291%	120	620	+417%	640	+433%
Benin	1,043	544	-48%	415	210	-49%	2,663	+542%	2,608	1,150	-56%	17,761	+581%
Bhutan	148	124	-16%	78	50	-36%	129	+65%	371	730	+97%	1,581	+326%
Bolivia	1,023	921	-10%	556	400	-28%	-	+0%	2,130	5,260	+147%	-	-
Bosnia and Herzegovina	829	497	-40%	407	240	-41%	476	+17%	5,086	5,070	-0%	12,381	+143%
Botswana	142	108	-24%	41	40	-2%	420	+924%	684	590	-14%	4,889	+615%
Brazil	109,827	92,348	-16%	58,491	41,980	-28%	43,709	-25%	475,818	727,090	+53%	746,598	+57%
Brunei Darussalam	19	12	-35%	10	10	+0%	195	+1851%	79	100	+27%	1,660	+2002%
Bulgaria	2,986	1,129	-62%	1,391	550	-60%	933	-33%	18,864	11,120	-41%	28,103	+49%
Burkina Faso	330	254	-23%	94	430	+357%	4,733	+4935%	786	3,170	+303%	31,143	+3862%
Burundi	669	608	-9%	201	270	+34%	2,599	+1193%	1,514	2,520	+66%	17,832	+1078%
Cambodia	838	583	-30%	457	260	-43%	1,201	+163%	1,709	3,600	+111%	11,900	+596%
Cameroon	2,406	1,458	-39%	966	500	-48%	6,317	+554%	5,807	3,630	-37%	47,008	+710%
Canada	31,601	19,831	-37%	16,957	10,320	-39%	13,377	-21%	241,788	203,380	-16%	379,415	+57%
Cape Verde	42	43	+2%	17	10	-41%	87	+414%	226	170	-25%	1,123	+397%
Central African Republic	78	17	-78%	23	80	+248%	1,179	+5026%	153	130	-15%	8,389	+5383%
Chad	240	91	-62%	71	270	+280%	3,666	+5063%	490	350	-29%	20,576	+4099%
Channel Islands	95	73	-23%	48	-	-	-	+0%	840	-	-	-	-
Chile	6,117	6,008	-2%	2,928	2,970	+1%	5,844	+100%	28,080	53,550	+91%	66,196	+136%
China	64,224	56,013	-13%	31,375	27,680	-12%	67,684	+116%	360,673	524,990	+46%	1,712,533	+375%
Colombia	3,519	3,222	-8%	1,765	850	-52%	5,668	+221%	14,445	14,120	-2%	73,940	+412%
Comoros	107	53	-50%	49	20	-59%	138	+181%	233	180	-23%	1,445	+520%
Congo	527	488	-7%	213	130	-39%	1,169	+449%	1,349	1,400	+4%	10,465	+676%
Costa Rica	380	295	-22%	191	80	-58%	508	+166%	1,840	1,410	-23%	6,647	+261%
Cote d'Ivoire	2,380	1,014	-57%	945	490	-48%	5,213	+452%	5,496	3,260	-41%	41,188	+649%
Croatia	1,906	1,278	-33%	919	620	-33%	685	-25%	11,027	12,640	+15%	24,189	+119%
Cuba	1,136	492	-57%	552	250	-55%	904	+64%	7,925	4,850	-39%	21,246	+168%
Curacao	1.0	0.6	-41%	1.0	-	-	-	+0%	7.0	-	-	-	-
Cyprus	399	390	-2%	211	170	-19%	346	+64%	3,659	3,480	-5%	9,037	+147%
Czechia	5,235	4,284	-18%	2,511	2,110	-16%	1,675	-33%	35,658	41,910	+18%	50,428	+41%
Democratic Republic of the Congo	5,451	2,156	-60%	1,638	1,760	+7%	21,032	+1184%	12,832	10,780	-16%	148,320	+1056%
Denmark	3,197	3,103	-3%	1,618	1,510	-7%	1,706	+5%	29,503	28,700	-3%	41,888	+42%
Djibouti	396	357	-10%	143	10	-93%	207	+45%	1,543	50	-97%	2,183	+41%
Dominican Republic	376	184	-51%	204	80	-61%	1,476	+624%	1,137	1,160	+2%	17,813	+1467%
Ecuador	1,400	1,290	-8%	700	350	-50%	2,615	+274%	4,690	5,310	+13%	29,276	+524%
Egypt	13,309	12,210	-8%	6,924	5,560	-20%	29,766	+330%	29,174	76,290	+161%	278,082	+853%
El Salvador	550	711	+29%	254	610	+140%	806	+217%	1,477	9,550	+547%	7,962	+439%
Equatorial Guinea	118	54	-55%	46	20	-57%	348	+655%	425	160	-62%	2,477	+483%
Eritrea	1,872	1,928	+3%	742	30	-96%	1,421	+92%	4,799	360	-92%	11,249	+134%
Estonia	916	473	-48%	476	220	-54%	173	-64%	5,051	4,190	-17%	5,619	+11%
Eswatini	125	97	-22%	52	20	-62%	245	+371%	315	240	-24%	2,176	+591%
Ethiopia	4,057	2,363	-42%	784	590	-25%	24,765	+3059%	12,647	5,980	-53%	177,337	+1302%
Fiji	36	27	-26%	20	30	+50%	73	+265%	99	180	+82%	892	+801%
Finland	6,239	5,410	-13%	3,427	3,360	-2%	1,936	-44%	64,085	64,240	+0%	59,460	-7%
France	24,483	27,128	+11%	12,948	13,110	+1%	20,277	+57%	172,524	236,280	+37%	414,123	+140%
French Guiana	210	-	-	110	-	-	-	+0%	581	-	-	-	-
French Polynesia	9	7	-18%	5	-	-	-	+0%	37	-	-	-	-
Gabon	181	171	-6%	65	40	-38%	352	+441%	667	490	-27%	3,619	+443%
Gambia	37	47	+27%	10	50	+400%	481	+4705%	97	470	+385%	3,550	+3559%
Georgia	1,151	429	-63%	563	200	-64%	562	-0%	3,274	3,490	+7%	13,690	+318%
Germany	40,153	35,144	-12%	20,137	15,430	-23%	18,717	-7%	381,007	328,870	-14%	569,415	+49%
Ghana	2,636	2,551	-3%	1,052	650	-38%	6,275	+497%	7,880	7,150	-9%	59,264	+652%
Greece	2,444	2,905	+19%	1,331	1,470	+10%	2,595	+95%	25,134	29,880	+19%	73,524	+193%
Grenada	51	16	-68%	28	10	-64%	13	-55%	192	130	-32%	205	+7%
Guadeloupe	154	-	-	86	-	-	-	+0%	684	-	-	-	-
Guam	1.0	0.5	-48%	1.0	-	-	13	+1159%	4.0	-	-	-	-
Guatemala	1,911	2,398	+26%	844	1,970	+133%	2,704	+220%	5,043	26,260	+421%	20,272	+302%
Guinea	211	113	-47%	60	260	+333%	2,688	+4380%	512	1,830	+257%	17,984	+3412%
Guinea-Bissau	29	26	-9%	8	40	+400%	399	+4893%	70	270	+286%	2,918	+4068%
Guyana	10	4	-61%	5	10	+100%	110	+2100%	25	20	-20%	1,340	+5261%
Haiti	377	144	-62%	213	80	-62%	2,114	+893%	645	750	+16%	18,873	+2826%
Honduras	977	1,274	+30%	439	1,010	+130%	1,522	+247%	2,416	14,880	+516%	11,102	+360%
Hong Kong	512	485	-5%	258	-	-	-	+0%	3,977	-	-	-	-
Hungary	4,419	3,496	-21%	2,165	1,650	-24%	1,432	-34%	30,018	34,250	+14%	43,847	+46%
Iceland	148	137	-8%	73	60	-18%	109	+49%	1,230	1,060	-14%	1,779	+45%
India	276,294	229,442	-17%	145,541	81,450	-44%	275,171	+89%	663,174	1,106,050	+67%	3,312,227	+399%
Indonesia	12,942	8,580	-34%	6,993	3,790	-46%	18,703	+167%	32,635	55,930	+71%	252,572	+674%
Iran	18,893	8,154	-57%	9,138	4,020	-56%	19,215	+110%	81,072	69,010	-15%	304,742	+276%
Iraq	11,834	5,011	-58%	5,386	2,620	-51%	13,230	+146%	29,441	32,120	+9%	119,541	+306%
Ireland	3,493	3,364	-4%	1,822	1,680	-8%	2,140	+17%	22,248	28,540	+28%	40,809	+83%
Israel	4,095	4,077	-0%	2,097	2,040	-3%	2,117	+1%	19,534	31,700	+62%	32,063	+64%
Italy	12,138	13,715	+13%	6,295	7,700	+22%	14,274	+127%	174,862	156,440	-11%	525,778	+201%
Jamaica	421	197	-53%	207	90	-57%	364	+76%	1,748	1,440	-18%	5,730	+228%
Japan	5,380	4,460	-17%	2,699	2,150	-20%	31,235	+1057%	72,563	44,610	-39%	548,558	+656%
Jordan	1,297	1,246	-4%	650	620	-5%	3,336	+413%	5,593	8,570	+53%	27,740	+396%
Kazakhstan	1,163	1,001	-14%	554	560	+1%	3,547	+540%	3,985	8,690	+118%	55,550	+1294%
Kenya	5,971	5,279	-12%	2,407	900	-63%	11,478	+377%	16,126	10,050	-38%	96,097	+496%
Kiribati	5.0	3.7	-26%	3.0	10	+233%	11	+273%	10	20	+100%	101	+910%
Kuwait	5,408	4,428	-18%	2,409	2,110	-12%	1,320	-45%	25,221	39,480	+57%	29,308	+16%
Kyrgyzstan	454	400	-12%	217	200	-8%	1,474	+579%	1,113	2,910	+161%	17,734	+1493%

Region or country	Paediatric and adolescent estimates (2021, 0-19)			Paediatric estimates (2017, 0-14)					All-ages estimates (2017)				
	T1D Index	IDF Atlas	% variation	T1D Index	Green (2021)	% variation	GBD (2019)	% variation	T1D Index	Green (2021)	% variation	GBD (2019)	% variation
Laos	397	240	-40%	217	100	-54%	-	+0%	777	1,050	+35%	-	+0%
Latvia	674	256	-62%	337	130	-61%	216	-36%	4,094	2,620	-36%	6,656	+63%
Lebanon	664	639	-4%	345	260	-25%	1,222	+254%	4,613	4,600	-0%	17,546	+280%
Lesotho	189	60	-68%	75	30	-60%	416	+455%	507	220	-57%	4,343	+757%
Liberia	80	54	-33%	23	100	+335%	1,019	+4330%	211	840	+298%	8,078	+3728%
Libya	5,083	1,759	-65%	2,046	920	-55%	1,851	-10%	18,144	14,540	-20%	28,928	+59%
Lithuania	1,137	907	-20%	560	500	-11%	299	-47%	7,437	10,200	+37%	9,743	+31%
Luxembourg	237	223	-6%	116	110	-5%	163	+41%	2,026	2,120	+5%	4,069	+101%
Macao	48	45	-7%	23	-	-	-	+0%	342	-	-	-	-
Macedonia	468	330	-30%	223	150	-33%	325	+46%	2,498	2,920	+17%	7,943	+218%
Madagascar	2,853	2,566	-10%	1,132	470	-58%	5,800	+412%	7,409	5,250	-29%	44,604	+502%
Malawi	2,116	1,979	-6%	848	350	-59%	4,339	+412%	4,383	3,490	-20%	29,080	+563%
Malaysia	1,458	955	-34%	770	430	-44%	2,066	+168%	5,610	7,530	+34%	28,211	+403%
Maldives	81	70	-14%	36	20	-44%	24	-33%	290	350	+21%	379	+31%
Mali	277	249	-10%	77	380	+394%	4,667	+5961%	493	1,550	+214%	29,168	+5816%
Malta	192	189	-2%	110	80	-27%	113	+2%	2,347	1,660	-29%	3,754	+60%
Martinique	124	-	#VALUE!	69	-	-	-	+0%	669	-	-	-	-
Mauritania	422	321	-24%	167	90	-46%	908	+444%	1,322	710	-46%	6,937	+425%
Mauritius	101	38	-62%	46	20	-57%	65	+41%	673	340	-49%	1,284	+91%
Mayotte	39	24	-40%	18	-	-	-	+0%	98	-	-	-	-
Mexico	11,414	13,952	+22%	5,666	12,150	+114%	14,785	+161%	87,129	192,700	+121%	159,167	+83%
Micronesia	1	-	#VALUE!	-	10	-	10	-	2.0	10	+400%	93	+4558%
Moldova	1,389	802	-42%	699	280	-60%	452	-35%	5,226	5,640	+8%	12,301	+135%
Mongolia	208	185	-11%	99	100	+1%	663	+570%	535	1,470	+175%	9,359	+1649%
Montenegro	364	277	-24%	184	120	-35%	115	-38%	1,743	2,350	+35%	2,645	+52%
Morocco	34,904	43,266	+24%	16,708	12,990	-22%	9,458	-43%	86,047	192,680	+124%	114,511	+33%
Mozambique	3,460	1,945	-44%	1,370	520	-62%	6,650	+385%	6,913	4,300	-38%	42,157	+510%
Myanmar	2,513	1,603	-36%	1,396	680	-51%	3,901	+179%	5,434	8,720	+60%	43,743	+705%
Namibia	262	225	-14%	106	60	-43%	491	+363%	957	660	-31%	4,818	+403%
Nepal	6,539	5,607	-14%	3,434	2,030	-41%	6,101	+78%	13,182	27,420	+108%	58,199	+342%
Netherlands	7,738	6,393	-17%	3,996	3,500	-12%	4,911	+23%	71,912	66,840	-7%	122,828	+71%
New Caledonia	9	7.4	-18%	5.0	-	-	-	+0%	39	-	-	-	-
New Zealand	2,207	2,172	-2%	1,185	1,220	+3%	1,469	+24%	15,736	21,700	+38%	32,199	+105%
Nicaragua	600	769	+28%	271	630	+132%	922	+240%	1,582	9,560	+504%	7,690	+386%
Niger	384	333	-13%	110	520	+373%	5,179	+4608%	771	3,480	+351%	28,155	+3552%
Nigeria	16,689	4,440	-73%	6,737	3,720	-45%	51,971	+671%	36,315	18,850	-48%	382,675	+954%
North Korea	2,503	2,700	+8%	1,151	930	-19%	1,811	+57%	8,785	15,740	+79%	32,178	+266%
Norway	4,004	3,821	-5%	2,019	1,880	-7%	2,210	+9%	36,283	35,470	-2%	53,425	+47%
Oman	936	280	-70%	391	150	-62%	870	+123%	4,243	2,820	-34%	16,488	+289%
Pakistan	7,601	5,595	-26%	4,078	1,460	-64%	56,536	+1286%	14,837	13,110	-12%	428,402	+2787%
Palestine	676	658	-3%	328	-	-	-	+0%	2,052	-	-	-	-
Panama	391	303	-22%	196	80	-59%	527	+169%	1,364	1,250	-8%	5,627	+313%
Papua New Guinea	63	34	-46%	34	10	-71%	831	+2345%	106	160	+51%	6,923	+6431%
Paraguay	398	208	-48%	196	100	-49%	1,574	+703%	1,287	1,470	+14%	16,597	+1190%
Peru	1,115	441	-60%	572	250	-56%	4,690	+720%	4,543	3,860	-15%	59,122	+1201%
Philippines	5,918	3,936	-33%	3,221	1,730	-46%	9,007	+180%	12,813	23,640	+85%	98,838	+671%
Poland	14,557	12,447	-14%	7,377	6,260	-15%	5,416	-27%	98,758	130,930	+33%	142,166	+44%
Portugal	3,350	2,443	-27%	1,890	1,100	-42%	2,753	+46%	35,823	22,830	-36%	87,259	+144%
Puerto Rico	2,593	1,140	-56%	1,587	-	-	412	-74%	14,448	-	-	12,037	-17%
Qatar	1,457	1,900	+30%	726	610	-16%	357	-51%	17,520	16,160	-8%	11,051	-37%
Réunion	82	-	#VALUE!	37	-	-	-	+0%	334	-	-	-	-
Romania	6,706	3,860	-42%	3,445	1,350	-61%	2,903	-16%	34,638	26,620	-23%	69,766	+101%
Russian Federation	54,034	38,140	-29%	25,991	18,310	-30%	22,921	-12%	267,999	344,040	+28%	601,676	+125%
Rwanda	829	671	-19%	246	300	+22%	2,680	+989%	2,502	3,560	+42%	21,997	+779%
Samoa	10	7.5	-25%	6.0	10	+67%	22	+264%	22	50	+127%	183	+733%
Sao Tome and Principe	23	23	-2%	9.0	10	+11%	45	+395%	68	70	+3%	381	+460%
Saudi Arabia	45,348	28,926	-36%	20,512	15,170	-26%	9,422	-54%	167,180	258,610	+55%	185,711	+11%
Senegal	1,613	1,451	-10%	650	400	-38%	3,140	+383%	4,350	4,400	+1%	24,106	+454%
Serbia	3,259	2,820	-13%	1,525	1,230	-19%	1,547	+1%	18,929	23,830	+26%	38,324	+102%
Seychelles	9.0	5.0	-45%	4.0	10	+150%	6	+45%	50	30	-40%	102	+104%
Sierra Leone	112	27	-76%	34	130	+282%	1,644	+4734%	243	480	+98%	12,644	+5103%
Singapore	552	226	-59%	273	120	-56%	1,393	+410%	5,068	2,550	-50%	24,026	+374%
Slovakia	2,940	1,375	-53%	1,415	670	-53%	775	-45%	16,864	13,710	-19%	20,755	+23%
Slovenia	766	603	-21%	364	300	-18%	283	-22%	5,314	6,070	+14%	8,633	+62%
Solomon Islands	5.0	3.1	-39%	3.0	10	+233%	62	+1977%	9	20	+122%	466	+5081%
Somalia	7,433	2,405	-68%	2,784	30	-99%	4,594	+65%	14,848	40	-100%	29,483	+99%
South Africa	5,125	4,526	-12%	2,059	760	-63%	9,816	+377%	24,439	10,370	-58%	143,251	+486%
South Korea	3,597	3,592	-0%	1,627	1,300	-20%	14,264	+777%	27,946	28,850	+3%	234,451	+739%
South Sudan	3,760	2,695	-28%	2,049	180	-91%	2,148	+5%	6,355	1,020	-84%	13,725	+116%
Spain	17,142	17,221	+0%	9,907	7,140	-28%	13,474	+36%	190,985	142,500	-25%	362,830	+90%
Sri Lanka	3,877	3,294	-15%	2,057	1,250	-39%	1,435	-30%	11,423	20,450	+79%	21,039	+84%
St Lucia	71	23	-67%	38	-	-	-	+0%	311	-	-	-	-
St Vincent and the Grenadines	52	17	-68%	28	10	-64%	-	+0%	190	120	-37%	-	+0%
Sudan	17,501	16,807	-4%	9,466	7,590	-20%	14,763	+56%	40,690	72,250	+78%	101,346	+149%
Suriname	7.0	2.8	-60%	4.0	10	+150%	77	+1836%	22	10	-55%	1,043	+4639%
Sweden	10,040	9,167	-9%	5,129	4,460	-13%	3,167	-38%	87,548	82,830	-5%	82,446	-6%
Switzerland	2,193	2,092	-5%	1,122	1,000	-11%	2,264	+102%	23,512	20,290	-14%	69,945	+197%
Syria	1,967	1,787	-9%	1,017	1,200	+18%	-	+0%	5,747	16,340	+184%	-	+0%
Taiwan	2,031	2,086	+3%	1,106	-	-	-	+0%	20,023	-	-	-	-
Tajikistan	1,410	944	-33%	678	430	-37%	2,304	+240%	2,351	5,460	+132%	23,213	+887%
Tanzania	6,517	5,655	-13%	2,625	1,100	-58%	12,397	+372%	15,042	10,970	-27%	90,973	+505%
Thailand	2,171	1,531	-29%	1,186	670	-44%	3,074	+159%	8,903	12,740	+43%	71,656	+705%
Timor L'Este	83	52	-38%	46	30	-35%	-	+0%	147	280	+90%	-	+0%
Togo	124	125	+0%	36	170	+372%	1,634	+4439%	312	1,430	+358%	13,256	+4149%
Tonga	5.0	4.1	-18%	3.0	10	+233%	11	+252%	11	30	+173%	96	+771%
Trinidad and Tobago	573	184	-68%	312	80	-74%	150	-52%	2,463	1,250	-49%	3,015	+22%
Tunisia	6,800	2,224	-67%	2,901	1,150	-60%	2,605	-10%	21,262	18,970	-11%	42,515	+100%
Turkey	28,454	25,759	-9%	13,992	12,710	-9%	17,351	+24%	110,452	207,070	+87%	300,741	+172%
Turkmenistan	2,298	1,998	-13%	1,110	960	-14%	1,073	-3%	6,817	11,800	+73%	13,615	+100%
Uganda	5,254	4,578	-13%	2,088	1,190	-43%	9,803	+369%	10,663	12,180	+14%	61,280	+475%
Ukraine	29,927	6,697	-78%	14,869	3,170	-79%	4,997	-66%	96,000	62,410	-35%	150,516	+57%
United Arab Emirates	1,416	433	-69%	568	190	-67%	1,321	+133%	9,486	4,850	-49%	47,634	+402%
United Kingdom	41,591	31,623	-24%	21,502	20,330	-5%	20,371	-5%	363,017	376,360	+4%	496,317	+37%
United States of America	168,150	157,874	-6%	84,894	85,410	+1%	124,086	+46%	1,286,864	1,546,520	+20%	2,518,760	+96%
Uruguay	1,547	604	-61%	665	350	-47%	1,404	+111%	8,793	6,060	-31%	20,709	+136%
US Virgin Islands	49	35	-28%	27	-	-	-	+0%	256	-	-	-	-
Uzbekistan	4,047	2,811	-31%	1,984	1,270	-36%	7,589	+282%	9,226	19,210	+108%	90,209	+878%
Vanuatu	15	12	-20%	8.0	10	+25%	28	+252%	28	60	+114%	223	+695%
Venezuela	350	132	-62%	198	50	-75%	3,439	+1637%	1,195	660	-45%	38,661	+3135%
Viet Nam	3,904	2,607	-33%	2,107	1,180	-44%	5,435	+158%	11,884	19,300	+62%	84,379	+610%
Western Sahara	7.0	-	#VALUE!	2.0	-	-	-	+0%	39	-	-	-	-
Yemen	6,821	2,769	-59%	3,330	1,330	-60%	11,870	+256%	12,273	13,980	+14%	75,269	+513%
Zambia	2,166	1,594	-26%	867	320	-63%	4,098	+373%	4,925	3,040	-38%	29,836	+506%
Zimbabwe	1,659	1,343	-19%	678	300	-56%	3,486	+414%	3,691	3,200	-13%	27,597	+648%

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APPENDIX 7: SENSITIVITY ANALYSIS

Our modelling approach produces point estimates rather than confidence intervals or probability distributions. To develop a better appreciation for the uncertainty in this work, we tested the sensitivity of the model to its inputs by measuring change in global prevalence and missing prevalence in 2021 under a variety of scenarios (**Table 1**).

This analysis suggests that while the model is highly responsive to its inputs, if we constrain the sensitivity analysis to reasonable input ranges the most significant sensitivities are around the assumptions used for change in incidence over time (scenario 3a) and mortality rates (scenario 4b). Both of these scenarios substantially affect the "missing prevalence" estimates but have limited impact on living prevalence.

Table 1: Sensitivity analysis results

Element	**Scenario**	**Change in all ages global prevalence (2021)**	**Change in all ages global missing prevalence (2021)**
1. Paediatric incidence	a. Paediatric incidence +/-10%	+/-5%	+/-5%
	b. Paediatric incidence +/-25% (for countries without direct studies) else +/-10%	+/-12%	+/-13%
2. Adult incidence	a. Model run with the "all studies" adult onset curve (**cf. Appendix 2)**	-1%	-1%
3. Incidence over time	a. No change in incidence rates modelled (other than historical data)	-3%	35%
	b. Use the global curve instead of group curve for all countries in all groups	-1%	0%
4. Mortality of diagnosed	a. Set age curve to a flat average across all ages	2%	-5%
	b. SMR +/-10%	-2 to +6%	-14 to +5%

5. Diagnosis Rate	Upper and Lower bound with 95% CI	0%	-7 to 9%

Paediatric incidence is a key input to the model, with some degree of uncertainty for the 98 countries with published paediatric studies and a greater degree of uncertainty for the 103 countries where we have imputed incidence rates using countries with similar characteristics using the IDF Atlas method[1]. Therefore we conducted two sensitivity analyses: scenario 1a where we varied all incidence and 1b where we varied incidence by a greater degree for the 103 countries with imputed values.

Adult incidence is not well-observed and accounts for half of all prevalence (scenario 2a). In scenario 2a we therefore test two adult onset curves; the one based on 17 higher-quality studies that exhibits a second peak in late adulthood which we used in the modelling (**Appendix 2**) as well as a second curve using all available studies. The difference in overall prevalence was negligible.

Addressing the change in **incidence over time** is a novel aspect of the model, accounting for substantial differences in paediatric and adult estimates relative to others' estimates (**Appendix 6**). There are two ways that we account for this in the model. The first is to use historical data where available, and we have conducted no sensitivity analyses varying these data. The second is to use regional and global "best fit" growth rates where historical data are not available (**Appendix 3**).

Here we have tested the impact of different choices of curve (scenario 3b) which is negligible, as well as the impact of making no growth assumptions at all and holding incidence constant outside of historical data (scenario 3a) where we see a significant increase in global missing prevalence but negligible impact on living prevalence. This slightly counter-intuitive result occurs because assuming no change in incidence over time means that we model lower incidence today, contributing to a smaller paediatric prevalence, and higher incidence rates before 1980, when mortality rates were higher (**Appendix 4)**. As a consequence, the living prevalence under scenario 3a is largely stable with lower paediatric prevalence today offset by a slightly higher adult prevalence and substantially higher 'missing prevalent' adult population.

Given the relatively smaller number of observations of SMR, we tested **+/-10% variation in SMR** (a 20pp range) and saw a muted response in living prevalence of -2 to 6% (an 8pp range) and a larger change in missing prevalence of -14 to +5% (19 pp range).

Finally we modelled the upper and lower bounds of the calculated 95% confidence intervals from the diagnosis rate survey data (**Appendix 5**). This does not capture the methodological uncertainty in polling experts, but does allow us to model the variation in the data itself. Here we saw a change in global missing prevalence of -7 to +9%.

References

1 International Diabetes Federation. IDF Diabetes Atlas, 10th edition. Brussels, Belgium, 2021.

APPENDIX 8: SUPPLEMENTARY RESULTS

Table 1: Supplementary country results (2021)

Note: 95% UIs shown in parentheses

Region or country	Incident cases				Diagnosis	Living prevalence				Missing prevalence			Life expectancy remaining at 10 years		
	Total	0-19 years	20-59 years	60+ years	Rate < 25 years	Total	0-19 years	20-59 years	60+ years	Total	Diagnosed	Non-diagnosed	T1D onset	Non-T1D	Difference
GLOBAL	**509,603** (446,557-580,557)	**193,516** (167,778-222,347)	**244,974** (215,649-278,116)	**71,113** (63,130-80,094)	**94** (93-94)	**8,423,530** (8,103,139-8,749,702)	**1,476,030** (1,412,988-1,542,713)	**5,365,410** (5,177,088-5,558,564)	**1,582,343** (1,471,044-1,695,302)	**3,749,846** (3,532,184-3,982,899)	**3,151,280** (2,929,699-3,389,579)	**598,058** (571,021-625,023)	**40** (37-43)	**64**	**25** (22-27)
High-income	191,733 (169,741-216,618)	61,526 (54,028-69,968)	93,235 (82,778-105,102)	36,971 (32,936-41,548)	100 (100-100)	4,584,200 (4,435,431-4,742,083)	525,174 (504,759-547,223)	2,825,074 (2,749,728-2,908,651)	1,235,028 (1,156,028-1,313,377)	696,387 (605,202-792,124)	692,803 (601,584-788,605)	3,574 (3,497-3,654)	61 (57-65)	72	11 (7-14)
Upper-middle income	130,411 (113,311-149,148)	47,767 (40,561-55,517)	64,465 (56,663-73,141)	18,179 (16,087-20,491)	95 (94-95)	2,049,417 (1,968,012-2,128,509)	375,345 (356,088-394,971)	1,406,438 (1,355,206-1,457,227)	266,748 (244,950-289,579)	929,694 (883,035-978,033)	689,936 (644,610-735,538)	239,623 (230,027-249,180)	43 (40-46)	67	25 (22-27)
Lower-middle income	157,847 (138,656-179,654)	69,785 (61,166-79,627)	73,459 (64,543-83,564)	14,604 (12,948-16,463)	90 (88-91)	1,574,314 (1,500,333-1,647,053)	499,991 (481,241-519,961)	998,607 (948,744-1,046,167)	75,802 (66,088-86,639)	1,627,862 (1,565,709-1,697,699)	1,357,015 (1,291,451-1,432,140)	270,624 (259,424-281,831)	26 (23-28)	62	36 (34-39)
Low-income	29,612 (24,848-35,136)	14,438 (12,024-17,235)	13,814 (11,665-16,308)	1,360 (1,160-1,592)	77 (73-79)	215,599 (199,363-232,056)	75,521 (70,901-80,558)	135,292 (123,410-146,518)	4,765 (3,978-5,708)	495,903 (478,238-515,042)	411,526 (392,054-433,296)	84,237 (78,073-90,357)	13 (12-15)	60	46 (45-48)
North America	**68,201** (60,247-77,047)	**22,572** (19,781-25,654)	**32,088** (28,444-36,154)	**13,540** (12,022-15,239)	**100** (100-100)	**1,690,726** (1,638,926-1,749,197)	**199,751** (192,435-208,482)	**1,039,337** (1,011,758-1,071,871)	**452,636** (425,939-480,173)	**329,022** (296,329-363,326)	**329,022** (296,329-363,326)	**0** (0.0-0.0)	**58** (55-61)	**70**	**13** (9-16)
Canada	11,262 (9,410-13,546)	3,298 (2,791-3,923)	5,524 (4,588-6,679)	2,440 (2,032-2,944)	100 (100-100)	276,284 (267,612-285,679)	31,601 (30,182-32,979)	173,067 (167,661-178,553)	71,688 (68,112-75,423)	35,125 (31,053-38,977)	35,125 (31,053-38,977)	0 (0.0-0.0)	63 (60-66)	74	11 (8-13)
United States of America	56,939 (50,836-63,500)	19,274 (16,990-21,730)	26,564 (23,856-29,475)	11,100 (9,990-12,295)	100 (100-100)	1,414,441 (1,371,314-1,463,518)	168,150 (162,253-175,503)	866,270 (844,096-893,318)	380,948 (357,827-404,749)	293,897 (265,276-324,349)	293,897 (265,276-324,349)	0 (0.0-0.0)	57 (53-60)	70	13 (10-17)
Latin America & Caribbean	**49,965** (43,369-57,798)	**19,231** (16,854-22,043)	**24,536** (21,156-28,558)	**6,198** (5,359-7,197)	**95** (94-96)	**868,281** (832,566-903,470)	**164,693** (156,626-172,852)	**595,456** (571,857-618,526)	**107,757** (99,530-116,421)	**353,526** (335,136-372,272)	**254,860** (237,314-272,307)	**98,579** (94,732-102,453)	**43** (40-46)	**68**	**24** (21-27)
Antigua and Barbuda	7.8 (6.3-10)	3 (2.4-3.6)	3.8 (3.1-4.7)	1 (0.8-1.2)	100 (100-100)	121 (116-127)	25 (24-27)	84 (80-87)	12 (11-14)	37 (33-40)	37 (33-40)	0 (0.0-0.0)	45 (42-49)	68	23 (19-27)
Argentina	4,984 (4,360-5,691)	2,107 (1,825-2,427)	2,243 (1,976-2,546)	634 (559-718)	100 (100-100)	82,015 (79,663-84,487)	16,608 (15,966-17,337)	54,210 (52,992-55,513)	11,180 (10,274-12,143)	18,568 (17,223-19,998)	18,568 (17,223-19,998)	0 (0.0-0.0)	51 (48-54)	68	17 (14-20)
Aruba	0.1 (0.0-0.2)	0.1 (0.0-0.1)	0 (0.0-0.1)	0 (0.0-0.0)	100 (100-100)	5.2 (5.0-5.4)	0.9 (0.9-1.0)	3.4 (3.3-3.5)	0.8 (0.8-0.9)	1.8 (1.6-1.9)	1.8 (1.6-1.9)	0 (0.0-0.0)	48 (46-51)	68	20 (18-23)
Bahamas	53 (43-66)	21 (17-25)	26 (21-33)	5.9 (4.7-7.3)	100 (100-100)	844 (806-885)	187 (177-199)	575 (551-599)	82 (74-90)	238 (223-256)	238 (223-256)	0 (0.0-0.0)	44 (41-46)	65	22 (19-24)
Barbados	36 (29-45)	12 (9.3-14)	18 (14-22)	7.2 (5.7-8.9)	100 (100-100)	605 (576-633)	106 (101-112)	389 (373-404)	109 (98-120)	230 (215-249)	230 (215-249)	0 (0.0-0.0)	47 (44-50)	71	24 (21-27)
Belize	11 (9.4-12)	5.3 (4.5-6.0)	4.8 (4.2-5.5)	0.7 (0.6-0.8)	93 (92-94)	149 (144-154)	39 (37-40)	102 (99-105)	8.6 (7.6-9.4)	70 (67-73)	50 (47-53)	20 (20-21)	34 (31-37)	66	32 (29-35)
Bolivia	260 (206-322)	130 (104-160)	108 (85-135)	21 (17-27)	91 (89-93)	2,636 (2,457-2,805)	1,023 (968-1,083)	1,491 (1,381-1,595)	122 (102-142)	2,954 (2,811-3,124)	2,552 (2,407-2,728)	403 (379-425)	21 (18-24)	66	45 (42-48)
Brazil	33,708 (29,228-39,095)	12,560 (11,081-14,338)	17,001 (14,575-19,917)	4,147 (3,572-4,840)	94 (94-95)	564,249 (538,458-589,365)	109,827 (103,978-115,582)	386,325 (368,637-403,390)	67,768 (62,846-73,122)	228,361 (216,058-240,687)	153,705 (142,413-164,490)	74,592 (71,431-77,812)	42 (40-46)	68	26 (22-28)
Chile	2,232 (1,953-2,578)	779 (676-907)	1,118 (982-1,288)	335 (296-383)	100 (100-100)	35,243 (33,920-36,540)	6,117 (5,834-6,410)	23,194 (22,371-24,024)	5,919 (5,537-6,294)	5,067 (4,578-5,561)	5,067 (4,578-5,561)	0 (0.0-0.0)	57 (54-61)	71	14 (11-17)
Colombia	1,069 (939-1,217)	424 (370-486)	523 (461-593)	122 (108-138)	94 (93-95)	17,374 (16,845-17,934)	3,519 (3,387-3,666)	11,804 (11,503-12,119)	2,054 (1,899-2,214)	7,689 (7,389-8,021)	5,389 (5,077-5,731)	2,299 (2,243-2,359)	41 (38-44)	69	28 (25-31)
Costa Rica	124 (109-140)	46 (40-52)	62 (55-70)	16 (14-18)	94 (94-95)	2,196 (2,138-2,253)	380 (366-395)	1,482 (1,449-1,517)	334 (311-355)	715 (684-752)	423 (390-463)	291 (285-298)	49 (46-52)	72	23 (20-26)
Cuba	470 (416-530)	141 (124-160)	242 (214-272)	87 (78-98)	95 (95-96)	9,063 (8,773-9,373)	1,136 (1,094-1,179)	5,995 (5,854-6,137)	1,928 (1,771-2,103)	3,079 (2,862-3,301)	1,961 (1,720-2,208)	1,117 (1,091-1,147)	50 (47-55)	70	19 (15-23)

Region or country	Incident cases				Diagnosis	Living prevalence				Missing prevalence			Life expectancy remaining at 10 years		
	Total	0-19 years	20-59 years	60+ years	Rate < 25 years	Total	0-19 years	20-59 years	60+ years	Total	Diagnosed	Non-diagnosed	T1D onset	Non-T1D	Difference
Curacao	0.6 (0.3-0.7)	0.2 (0.2-0.2)	0.2 (0.1-0.4)	0.1 (0.0-0.1)	100 (100-100)	8.4 (8.1-8.7)	1.5 (1.4-1.6)	5 (4.9-5.2)	1.9 (1.7-2.0)	2.4 (2.2-2.6)	2.4 (2.2-2.6)	0 (0.0-0.0)	51 (48-54)	70	20 (16-23)
Dominican Republic	95 (82-108)	44 (37-51)	42 (37-48)	8.7 (7.7-10)	93 (92-94)	1,361 (1,318-1,409)	376 (362-393)	870 (845-897)	115 (105-126)	665 (638-693)	483 (456-510)	182 (177-187)	36 (34-39)	67	31 (28-33)
Ecuador	382 (334-432)	176 (153-201)	171 (150-192)	35 (31-39)	93 (92-94)	5,742 (5,556-5,914)	1,400 (1,340-1,456)	3,789 (3,685-3,885)	551 (504-593)	2,567 (2,468-2,675)	1,792 (1,691-1,911)	774 (754-793)	40 (37-43)	69	29 (26-32)
El Salvador	171 (149-196)	78 (67-89)	77 (67-87)	17 (15-19)	92 (91-93)	1,743 (1,639-1,837)	550 (526-573)	1,088 (1,012-1,155)	106 (91-121)	1,999 (1,913-2,090)	1,747 (1,654-1,847)	252 (239-265)	21 (18-24)	66	44 (42-47)
French Guiana	49 (38-61)	25 (20-31)	20 (16-25)	3.7 (2.9-4.6)	93 (91-94)	740 (706-773)	210 (197-223)	472 (454-491)	57 (52-63)	232 (222-243)	128 (120-138)	104 (100-107)	46 (44-49)	72	25 (23-28)
Grenada	15 (12-19)	6.2 (4.9-7.4)	7.2 (5.6-8.8)	2 (1.5-2.4)	94 (93-95)	223 (212-233)	51 (49-54)	150 (144-156)	21 (18-24)	123 (117-129)	93 (87-100)	30 (29-31)	35 (33-38)	64	29 (26-31)
Guadeloupe	48 (39-59)	17 (14-21)	21 (17-25)	10 (8.4-13)	95 (93-96)	781 (743-816)	154 (145-162)	460 (441-477)	167 (151-182)	433 (412-456)	342 (321-364)	91 (88-94)	44 (42-47)	73	29 (26-32)
Guatemala	495 (432-563)	266 (232-304)	200 (176-227)	29 (25-32)	92 (91-93)	6,348 (6,121-6,554)	1,911 (1,831-1,997)	4,101 (3,970-4,230)	336 (305-370)	3,105 (2,980-3,234)	2,252 (2,124-2,385)	851 (825-874)	33 (31-36)	67	34 (31-36)
Guyana	2.4 (2.2-2.9)	1.1 (1.0-1.4)	1 (1.0-1.3)	0.2 (0.2-0.3)	91 (90-92)	29 (28-30)	10 (9.5-10)	17 (16-18)	1.7 (1.5-2.0)	24 (23-25)	20 (19-21)	3.8 (3.6-3.9)	23 (20-26)	63	40 (37-43)
Haiti	104 (89-118)	54 (46-62)	42 (37-48)	6.7 (5.9-7.4)	84 (82-86)	799 (745-854)	377 (359-398)	397 (362-430)	25 (21-30)	1,585 (1,532-1,649)	1,367 (1,305-1,440)	219 (205-232)	13 (11-15)	61	48 (46-50)
Honduras	270 (235-311)	137 (119-159)	117 (102-134)	16 (14-18)	91 (90-92)	3,008 (2,861-3,143)	977 (933-1,022)	1,923 (1,823-2,015)	109 (95-124)	2,492 (2,383-2,618)	2,020 (1,905-2,156)	471 (450-491)	24 (21-27)	68	44 (41-47)
Jamaica	130 (113-147)	53 (46-60)	62 (54-70)	15 (13-16)	94 (93-95)	2,026 (1,962-2,095)	421 (404-438)	1,400 (1,361-1,437)	204 (184-227)	909 (862-951)	634 (587-680)	274 (267-280)	39 (36-42)	66	28 (25-30)
Martinique	43 (35-54)	13 (11-16)	19 (15-24)	11 (8.5-13)	95 (94-96)	758 (723-792)	124 (117-131)	443 (426-460)	192 (176-207)	408 (387-432)	321 (299-345)	87 (84-90)	46 (43-49)	74	28 (25-31)
Mexico	2,719 (2,414-3,072)	1,206 (1,067-1,366)	1,255 (1,117-1,416)	258 (229-291)	93 (93-94)	89,408 (86,764-92,059)	11,414 (11,031-11,835)	68,650 (66,805-70,456)	9,333 (8,466-10,165)	56,796 (54,788-58,853)	41,771 (39,671-43,967)	15,006 (14,594-15,388)	39 (37-42)	67	27 (25-30)
Nicaragua	179 (154-203)	87 (75-99)	79 (68-89)	13 (11-15)	91 (90-92)	1,941 (1,847-2,033)	600 (573-628)	1,261 (1,195-1,329)	79 (68-90)	1,769 (1,695-1,853)	1,474 (1,395-1,562)	296 (284-309)	24 (21-27)	67	42 (40-46)
Panama	108 (95-123)	49 (42-55)	49 (43-55)	11 (10-12)	100 (100-100)	1,673 (1,625-1,721)	391 (377-407)	1,091 (1,065-1,117)	190 (177-203)	392 (366-421)	392 (366-421)	0 (0.0-0.0)	47 (44-50)	71	23 (20-27)
Paraguay	107 (94-122)	51 (45-59)	47 (42-53)	8.8 (7.9-10)	93 (92-94)	1,550 (1,503-1,596)	398 (383-414)	1,030 (1,002-1,059)	120 (108-131)	720 (691-751)	505 (475-538)	214 (209-220)	37 (34-40)	66	30 (27-32)
Peru	352 (309-400)	149 (129-170)	166 (147-188)	37 (33-42)	94 (93-94)	5,553 (5,398-5,718)	1,115 (1,072-1,161)	3,851 (3,753-3,950)	587 (540-628)	2,460 (2,372-2,559)	1,719 (1,630-1,823)	740 (722-758)	42 (39-45)	69	27 (24-30)
Puerto Rico	835 (675-1,026)	252 (206-307)	385 (310-474)	199 (160-245)	100 (100-100)	14,837 (14,218-15,487)	2,593 (2,468-2,731)	8,664 (8,364-9,000)	3,577 (3,299-3,855)	5,157 (4,785-5,547)	5,157 (4,785-5,547)	0 (0.0-0.0)	50 (47-54)	71	21 (18-24)
St Lucia	24 (19-29)	7.9 (6.5-10)	13 (10-16)	3.1 (2.5-3.8)	95 (94-96)	361 (343-379)	71 (67-75)	257 (245-269)	32 (28-37)	226 (215-240)	179 (167-193)	48 (46-50)	34 (31-38)	68	34 (31-37)
St Vincent and the Grenadines	15 (12-19)	5.7 (4.6-7.3)	7.1 (5.7-9.1)	1.9 (1.5-2.4)	94 (93-95)	221 (211-232)	52 (49-55)	147 (141-154)	22 (19-25)	124 (117-130)	95 (88-102)	29 (28-30)	36 (33-39)	64	29 (26-31)
Suriname	1.9 (1.6-2.2)	0.8 (0.8-1.0)	0.9 (0.7-0.9)	0.2 (0.2-0.2)	97 (97-98)	27 (26-28)	7.3 (7.0-7.6)	17 (17-18)	2.1 (1.8-2.3)	13 (13-14)	10 (8.9-10)	3.6 (3.5-3.7)	41 (32-44)	64	23 (20-32)

Region or country	Incident cases				Diagnosis	Living prevalence				Missing prevalence			Life expectancy remaining at 10 years		
	Total	0-19 years	20-59 years	60+ years	Rate < 25 years	Total	0-19 years	20-59 years	60+ years	Total	Diagnosed	Non-diagnosed	T1D onset	Non-T1D	Difference
Trinidad and Tobago	184 (150-228)	65 (53-80)	91 (74-113)	28 (23-35)	100 (100-100)	2,859 (2,732-2,994)	573 (544-607)	1,933 (1,860-2,014)	354 (316-389)	1,058 (991-1,129)	1,058 (991-1,129)	0 (0.0-0.0)	43 (40-46)	66	23 (20-26)
Uruguay	579 (502-673)	215 (184-251)	271 (236-313)	94 (82-108)	100 (100-100)	10,179 (9,847-10,516)	1,547 (1,471-1,623)	6,790 (6,617-6,970)	1,844 (1,684-1,987)	2,592 (2,388-2,811)	2,592 (2,388-2,811)	0 (0.0-0.0)	52 (49-56)	69	17 (14-20)
Venezuela	87 (75-100)	40 (35-46)	38 (33-44)	8.9 (7.8-10)	93 (92-94)	1,318 (1,276-1,361)	350 (337-364)	838 (815-861)	130 (117-141)	610 (584-640)	431 (405-462)	180 (175-184)	36 (34-39)	65	29 (26-31)
Europe & Central Asia	**142,630** (127,596-159,549)	**44,374** (39,909-49,399)	**68,979** (61,505-77,388)	**29,277** (26,182-32,762)	**98** (98-98)	**2,927,826** (2,823,691-3,034,192)	**364,641** (352,295-377,337)	**1,784,801** (1,732,560-1,839,678)	**778,252** (722,043-834,054)	**735,980** (663,724-810,772)	**665,138** (592,202-740,697)	**70,762** (68,657-72,942)	**53** (50-57)	**69**	**16** (12-19)
Albania	296 (213-399)	95 (68-130)	144 (104-194)	56 (40-76)	96 (94-97)	4,200 (3,936-4,469)	704 (641-772)	2,673 (2,516-2,836)	825 (753-900)	1,274 (1,189-1,370)	902 (820-990)	372 (354-392)	51 (48-54)	70	19 (16-22)
Armenia	284 (261-309)	103 (97-109)	136 (124-151)	45 (41-49)	96 (95-96)	3,443 (3,346-3,538)	721 (707-736)	2,228 (2,181-2,280)	494 (447-542)	1,272 (1,198-1,348)	961 (884-1,042)	310 (304-316)	44 (42-47)	67	23 (20-25)
Austria	1,270 (1,153-1,398)	352 (329-377)	642 (576-715)	276 (249-306)	100 (100-100)	31,631 (30,566-32,734)	3,418 (3,339-3,501)	19,500 (19,006-19,990)	8,703 (8,073-9,345)	4,205 (3,446-4,977)	4,205 (3,446-4,977)	0 (0.0-0.0)	63 (59-68)	73	9 (4-14)
Azerbaijan	751 (599-943)	295 (238-368)	377 (299-476)	79 (63-99)	95 (94-96)	8,590 (8,170-9,001)	2,041 (1,920-2,168)	5,809 (5,554-6,064)	737 (661-816)	2,999 (2,841-3,176)	2,214 (2,059-2,385)	785 (757-813)	41 (39-43)	65	25 (22-27)
Belarus	1,241 (991-1,549)	381 (307-473)	617 (491-771)	243 (193-305)	96 (95-97)	15,421 (14,604-16,209)	2,684 (2,525-2,840)	9,739 (9,316-10,148)	2,990 (2,660-3,280)	5,942 (5,494-6,433)	4,687 (4,249-5,198)	1,248 (1,203-1,293)	45 (42-49)	66	21 (17-24)
Belgium	1,574 (1,414-1,727)	500 (442-555)	742 (671-810)	332 (300-362)	100 (100-100)	41,713 (40,461-43,119)	4,499 (4,347-4,671)	25,410 (24,880-25,992)	11,807 (11,031-12,652)	6,539 (5,600-7,525)	6,539 (5,600-7,525)	0 (0.0-0.0)	63 (59-67)	73	10 (5-14)
Bosnia and Herzegovina	408 (361-458)	111 (96-128)	204 (182-227)	93 (83-103)	96 (96-97)	5,960 (5,739-6,168)	829 (794-866)	3,869 (3,756-3,969)	1,262 (1,154-1,370)	2,333 (2,193-2,502)	1,811 (1,668-1,981)	522 (508-536)	49 (46-51)	69	20 (17-23)
Bulgaria	1,562 (1,389-1,757)	431 (378-490)	743 (663-833)	388 (348-434)	97 (96-97)	22,538 (21,712-23,351)	2,986 (2,875-3,104)	13,774 (13,447-14,103)	5,776 (5,228-6,271)	7,928 (7,319-8,660)	6,073 (5,437-6,841)	1,856 (1,802-1,911)	50 (46-53)	66	17 (13-20)
Channel Islands	35 (31-39)	10 (8.8-11)	18 (16-20)	7.2 (6.5-7.9)	100 (100-100)	941 (911-974)	96 (91-101)	655 (637-673)	191 (175-205)	243 (224-261)	243 (224-261)	0 (0.0-0.0)	58 (55-61)	74	17 (14-19)
Croatia	962 (886-1,049)	265 (243-289)	465 (428-507)	232 (214-253)	100 (100-100)	13,503 (13,101-13,873)	1,906 (1,857-1,957)	7,953 (7,801-8,099)	3,643 (3,368-3,913)	2,037 (1,719-2,350)	2,037 (1,719-2,350)	0 (0.0-0.0)	60 (57-64)	70	9 (5-13)
Cyprus	123 (108-140)	38 (33-44)	63 (56-72)	21 (19-24)	100 (100-100)	3,967 (3,819-4,114)	399 (384-415)	2,575 (2,490-2,661)	991 (914-1,067)	512 (434-605)	512 (434-605)	0 (0.0-0.0)	64 (60-68)	72	8 (4-12)
Czechia	2,512 (2,251-2,771)	722 (633-810)	1,211 (1,093-1,327)	579 (525-633)	100 (100-100)	42,307 (40,843-43,598)	5,235 (5,038-5,445)	26,188 (25,569-26,774)	10,849 (10,027-11,644)	5,783 (4,841-6,823)	5,783 (4,841-6,823)	0 (0.0-0.0)	60 (56-65)	70	10 (6-14)
Denmark	1,154 (1,034-1,286)	355 (314-400)	540 (486-599)	259 (234-287)	100 (100-100)	32,229 (31,191-33,289)	3,197 (3,080-3,312)	19,102 (18,558-19,666)	9,937 (9,315-10,556)	4,429 (3,746-5,163)	4,429 (3,746-5,163)	0 (0.0-0.0)	65 (61-68)	72	7 (4-11)
Estonia	388 (329-465)	118 (96-146)	184 (159-218)	86 (74-102)	100 (100-100)	6,144 (5,844-6,429)	916 (864-973)	3,593 (3,452-3,728)	1,632 (1,482-1,770)	999 (829-1,188)	999 (829-1,188)	0 (0.0-0.0)	60 (54-66)	70	9 (3-15)
Finland	2,065 (1,889-2,261)	618 (565-676)	938 (857-1,028)	509 (467-557)	100 (100-100)	68,562 (66,437-70,749)	6,239 (6,073-6,401)	38,541 (37,795-39,262)	23,833 (22,216-25,356)	8,422 (6,578-10,453)	8,422 (6,578-10,453)	0 (0.0-0.0)	66 (61-71)	73	7 (2-12)
France	8,160 (7,430-9,018)	2,697 (2,488-2,942)	3,676 (3,323-4,091)	1,787 (1,619-1,985)	100 (100-100)	196,153 (189,558-203,856)	24,483 (23,529-25,490)	110,056 (106,350-114,458)	61,615 (58,668-64,637)	17,195 (14,242-19,976)	17,195 (14,242-19,976)	0 (0.0-0.0)	68 (65-72)	74	5 (2-8)
Georgia	472 (380-582)	166 (136-203)	219 (176-272)	86 (68-107)	95 (93-96)	4,209 (3,957-4,484)	1,151 (1,091-1,223)	2,631 (2,481-2,789)	426 (363-502)	3,707 (3,500-3,898)	3,266 (3,055-3,460)	440 (422-460)	30 (27-33)	65	35 (32-38)
Germany	16,047 (14,534-17,735)	4,361 (3,892-4,886)	7,906 (7,199-8,696)	3,779 (3,444-4,153)	100 (100-100)	422,087 (408,062-436,936)	40,153 (38,793-41,577)	249,432 (243,886-255,202)	132,703 (122,904-142,334)	48,015 (37,058-59,184)	48,015 (37,058-59,184)	0 (0.0-0.0)	64 (60-69)	72	8 (3-12)

Region or country	Incident cases				Diagnosis	Living prevalence				Missing prevalence			Life expectancy remaining at 10 years		
	Total	0-19 years	20-59 years	60+ years	Rate < 25 years	Total	0-19 years	20-59 years	60+ years	Total	Diagnosed	Non-diagnosed	T1D onset	Non-T1D	Difference
Greece	903 (669-1,191)	247 (182-327)	446 (330-588)	210 (157-276)	100 (100-100)	26,731 (25,376-28,309)	2,444 (2,248-2,696)	15,392 (14,654-16,274)	8,878 (8,271-9,574)	4,697 (4,093-5,306)	4,697 (4,093-5,306)	0 (0.0-0.0)	64 (61-68)	73	9 (6-12)
Hungary	2,091 (1,632-2,707)	576 (412-795)	1,027 (827-1,296)	488 (393-616)	100 (100-100)	35,595 (33,217-38,499)	4,419 (3,939-4,915)	22,127 (20,647-23,941)	9,038 (8,294-9,835)	5,049 (4,224-5,859)	5,049 (4,224-5,859)	0 (0.0-0.0)	60 (57-64)	68	8 (4-11)
Iceland	49 (35-66)	17 (12-23)	23 (16-31)	9 (6.4-12)	100 (100-100)	1,370 (1,299-1,437)	148 (136-162)	841 (798-880)	381 (354-407)	89 (63-115)	89 (63-115)	0 (0.0-0.0)	68 (64-73)	74	5 (1-10)
Ireland	1,049 (946-1,149)	387 (344-427)	488 (442-532)	175 (159-190)	100 (100-100)	25,646 (24,692-26,680)	3,493 (3,371-3,619)	16,431 (15,786-17,182)	5,716 (5,365-6,048)	3,091 (2,690-3,545)	3,091 (2,690-3,545)	0 (0.0-0.0)	63 (60-67)	73	10 (6-13)
Italy	4,977 (4,491-5,467)	1,294 (1,153-1,436)	2,456 (2,226-2,689)	1,227 (1,113-1,342)	100 (100-100)	184,476 (177,333-190,335)	12,138 (11,734-12,561)	106,661 (104,335-108,768)	65,652 (60,188-70,520)	19,734 (14,409-25,968)	19,734 (14,409-25,968)	0 (0.0-0.0)	69 (64-74)	74	6 (1-11)
Kazakhstan	355 (278-439)	160 (103-223)	158 (142-175)	37 (33-41)	95 (93-96)	4,967 (4,696-5,238)	1,163 (1,033-1,303)	3,338 (3,182-3,494)	464 (418-506)	1,963 (1,849-2,096)	1,495 (1,395-1,611)	469 (438-499)	42 (40-45)	65	22 (20-25)
Kyrgyzstan	127 (96-158)	63 (39-88)	55 (49-61)	9 (8.0-10)	93 (90-94)	1,401 (1,305-1,494)	454 (398-508)	905 (850-955)	42 (36-49)	981 (923-1,044)	801 (746-860)	180 (167-194)	27 (25-29)	64	37 (34-39)
Latvia	323 (285-364)	97 (82-114)	151 (136-167)	75 (68-83)	100 (100-100)	4,689 (4,494-4,860)	674 (639-709)	2,839 (2,760-2,909)	1,178 (1,070-1,271)	1,340 (1,208-1,489)	1,340 (1,208-1,489)	0 (0.0-0.0)	53 (49-57)	66	14 (10-18)
Lithuania	575 (509-646)	164 (142-189)	278 (249-310)	133 (119-148)	100 (100-100)	8,494 (8,132-8,831)	1,137 (1,082-1,194)	5,079 (4,913-5,242)	2,274 (2,069-2,468)	1,739 (1,467-2,036)	1,739 (1,467-2,036)	0 (0.0-0.0)	55 (50-61)	67	12 (6-17)
Luxembourg	89 (80-98)	26 (23-29)	48 (43-52)	15 (14-16)	100 (100-100)	2,371 (2,307-2,431)	237 (229-245)	1,626 (1,590-1,659)	508 (477-542)	321 (281-361)	321 (281-361)	0 (0.0-0.0)	63 (60-68)	73	10 (6-13)
Macedonia	211 (151-285)	64 (45-87)	108 (78-145)	40 (28-53)	96 (95-97)	3,040 (2,851-3,234)	468 (429-509)	2,044 (1,924-2,163)	530 (474-585)	949 (878-1,030)	675 (607-753)	274 (260-287)	49 (46-52)	67	19 (16-21)
Moldova	653 (594-716)	188 (176-200)	352 (316-390)	113 (102-125)	95 (95-96)	6,409 (6,123-6,723)	1,389 (1,357-1,418)	4,560 (4,355-4,782)	465 (399-539)	5,809 (5,563-6,095)	5,096 (4,833-5,387)	714 (691-738)	29 (27-32)	64	34 (32-37)
Montenegro	146 (132-161)	48 (43-54)	70 (64-77)	28 (26-31)	96 (96-96)	2,098 (2,033-2,169)	364 (353-377)	1,325 (1,295-1,357)	409 (371-446)	641 (593-696)	453 (404-509)	188 (184-192)	50 (47-53)	68	18 (15-21)
Netherlands	2,783 (2,546-3,053)	837 (770-912)	1,308 (1,193-1,439)	638 (583-702)	100 (100-100)	78,588 (76,644-80,313)	7,738 (7,544-7,915)	46,885 (46,137-47,566)	23,990 (22,679-25,213)	9,511 (8,068-10,989)	9,511 (8,068-10,989)	0 (0.0-0.0)	65 (62-69)	73	8 (4-11)
Norway	1,381 (1,231-1,530)	444 (391-496)	664 (595-733)	273 (244-301)	100 (100-100)	40,301 (38,198-43,872)	4,004 (3,852-4,155)	24,797 (23,526-27,320)	11,510 (10,574-12,726)	5,012 (4,115-6,238)	5,012 (4,115-6,238)	0 (0.0-0.0)	66 (62-71)	73	7 (2-12)
Poland	6,709 (5,984-7,468)	1,885 (1,635-2,146)	3,310 (2,981-3,655)	1,514 (1,368-1,667)	100 (100-100)	115,158 (110,938-119,477)	14,557 (13,801-15,287)	72,392 (70,301-74,784)	28,268 (26,218-30,225)	20,284 (17,982-22,850)	20,284 (17,982-22,850)	0 (0.0-0.0)	58 (55-62)	70	11 (7-15)
Portugal	1,212 (1,076-1,370)	316 (277-363)	595 (531-670)	301 (269-337)	100 (100-100)	38,009 (36,744-39,107)	3,350 (3,236-3,474)	22,625 (22,129-23,079)	12,024 (11,150-12,815)	10,522 (9,518-11,619)	10,522 (9,518-11,619)	0 (0.0-0.0)	63 (59-67)	73	10 (6-14)
Romania	3,045 (2,785-3,356)	888 (834-952)	1,484 (1,341-1,654)	673 (610-749)	96 (96-97)	41,159 (39,781-42,538)	6,706 (6,561-6,848)	26,273 (25,608-26,959)	8,179 (7,400-8,959)	16,483 (15,403-17,550)	13,102 (11,991-14,231)	3,371 (3,300-3,446)	46 (44-49)	67	21 (18-24)
Russia	23,937 (21,905-26,127)	7,795 (7,318-8,311)	11,544 (10,420-12,756)	4,598 (4,168-5,060)	96 (96-96)	321,460 (309,930-333,042)	54,034 (53,013-55,110)	206,916 (200,255-213,616)	60,344 (54,869-66,530)	200,610 (190,025-211,146)	170,727 (159,942-181,343)	29,874 (28,771-31,022)	41 (38-45)	64	23 (19-26)
Serbia	1,537 (1,391-1,695)	451 (404-501)	744 (675-818)	343 (312-376)	96 (96-97)	22,407 (21,695-23,102)	3,259 (3,156-3,371)	14,443 (14,133-14,750)	4,700 (4,273-5,152)	8,636 (8,052-9,250)	6,606 (5,983-7,250)	2,033 (1,986-2,077)	48 (45-51)	67	19 (16-22)
Slovakia	1,406 (1,097-1,770)	403 (312-510)	709 (556-890)	294 (230-371)	100 (100-100)	20,549 (19,514-21,585)	2,940 (2,743-3,156)	13,368 (12,792-13,965)	4,234 (3,889-4,612)	3,520 (3,101-3,956)	3,520 (3,101-3,956)	0 (0.0-0.0)	55 (52-58)	69	14 (10-17)
Slovenia	386 (348-428)	108 (96-121)	186 (169-205)	92 (83-101)	100 (100-100)	6,283 (6,069-6,473)	766 (737-797)	3,842 (3,747-3,941)	1,670 (1,553-1,798)	1,310 (1,158-1,455)	1,310 (1,158-1,455)	0 (0.0-0.0)	60 (56-64)	72	12 (8-16)

Region or country	Incident cases				Diagnosis	Living prevalence				Missing prevalence			Life expectancy remaining at 10 years		
	Total	0-19 years	20-59 years	60+ years	Rate < 25 years	Total	0-19 years	20-59 years	60+ years	Total	Diagnosed	Non-diagnosed	T1D onset	Non-T1D	Difference
Spain	5,868 (4,768-7,295)	1,616 (1,324-1,994)	2,967 (2,398-3,704)	1,286 (1,046-1,597)	100 (100-100)	203,865 (195,216-211,870)	17,142 (16,293-18,026)	119,375 (115,640-123,073)	67,255 (61,769-72,215)	25,895 (20,389-32,478)	25,895 (20,389-32,478)	0 (0.0-0.0)	68 (63-74)	74	6 (0-11)
Sweden	3,550 (3,031-4,203)	1,147 (966-1,375)	1,636 (1,405-1,925)	767 (659-903)	100 (100-100)	97,024 (93,501-100,843)	10,040 (9,563-10,547)	56,612 (54,803-58,414)	30,323 (28,127-32,538)	9,656 (7,099-12,080)	9,656 (7,099-12,080)	0 (0.0-0.0)	67 (63-72)	74	7 (2-11)
Switzerland	857 (781-942)	241 (216-268)	432 (396-473)	184 (169-201)	100 (100-100)	26,022 (25,419-26,600)	2,193 (2,128-2,264)	15,778 (15,497-16,039)	8,053 (7,676-8,447)	3,058 (2,622-3,471)	3,058 (2,622-3,471)	0 (0.0-0.0)	68 (65-72)	75	6 (3-9)
Tajikistan	383 (354-416)	216 (204-231)	148 (134-164)	19 (17-21)	85 (84-86)	3,292 (3,177-3,409)	1,410 (1,378-1,447)	1,817 (1,736-1,899)	64 (54-75)	2,718 (2,629-2,802)	1,865 (1,776-1,953)	852 (826-879)	25 (23-27)	64	39 (37-41)
Turkey	8,481 (7,913-9,121)	3,523 (3,372-3,692)	4,006 (3,665-4,390)	952 (876-1,039)	95 (95-95)	137,072 (134,746-139,297)	28,454 (28,134-28,800)	92,139 (90,801-93,468)	16,445 (15,494-17,433)	47,981 (46,288-49,699)	34,911 (33,157-36,728)	13,071 (12,933-13,223)	49 (47-53)	70	20 (17-23)
Turkmenistan	631 (587-674)	307 (293-321)	279 (254-305)	44 (40-48)	94 (94-95)	8,366 (8,172-8,570)	2,298 (2,269-2,327)	5,665 (5,532-5,796)	404 (352-462)	3,952 (3,775-4,139)	3,082 (2,899-3,282)	868 (854-882)	34 (32-37)	62	28 (26-30)
Ukraine	14,459 (13,144-15,848)	4,178 (3,919-4,452)	7,312 (6,550-8,117)	2,969 (2,675-3,279)	95 (95-96)	121,481 (114,932-128,214)	29,927 (29,446-30,463)	77,962 (73,656-82,146)	13,559 (11,600-15,696)	142,142 (135,847-148,273)	130,246 (123,633-136,812)	11,838 (11,447-12,240)	27 (24-30)	63	37 (34-39)
United Kingdom	13,885 (12,338-15,530)	4,477 (3,900-5,092)	6,586 (5,899-7,317)	2,821 (2,538-3,122)	100 (100-100)	403,608 (391,064-416,028)	41,591 (39,593-43,434)	249,191 (242,030-256,429)	112,865 (106,783-118,721)	46,867 (39,724-53,271)	46,867 (39,724-53,271)	0 (0.0-0.0)	66 (63-70)	72	6 (3-9)
Uzbekistan	1,273 (1,166-1,388)	594 (557-634)	586 (526-652)	92 (83-102)	93 (92-93)	12,296 (11,839-12,725)	4,047 (3,955-4,147)	7,826 (7,474-8,133)	420 (358-487)	7,584 (7,238-7,975)	6,090 (5,737-6,490)	1,497 (1,449-1,541)	30 (27-32)	64	35 (32-37)
Middle East & North Africa	**67,550** (59,594-76,482)	**30,084** (26,564-34,047)	**32,366** (28,515-36,683)	**5,100** (4,515-5,752)	**94** (94-95)	**853,387** (827,891-879,324)	**204,338** (196,804-212,130)	**591,213** (574,980-607,948)	**57,880** (53,182-62,537)	**260,305** (248,464-273,363)	**188,681** (176,605-202,323)	**71,542** (69,621-73,555)	**42** (40-45)	**66**	**24** (21-27)
Algeria	13,694 (12,387-15,060)	6,608 (6,084-7,155)	5,959 (5,296-6,651)	1,127 (1,006-1,254)	93 (92-93)	151,824 (148,280-155,660)	42,536 (41,515-43,568)	97,203 (95,091-99,610)	12,103 (11,194-12,998)	41,125 (39,431-43,096)	23,872 (22,133-25,899)	17,206 (16,912-17,533)	43 (41-46)	70	27 (24-29)
Bahrain	148 (130-167)	47 (41-54)	93 (83-105)	7.6 (6.8-8.6)	100 (100-100)	2,116 (2,060-2,171)	306 (293-319)	1,694 (1,652-1,734)	116 (110-122)	103 (93-115)	103 (93-115)	0 (0.0-0.0)	58 (56-61)	69	10 (7-13)
Djibouti	233 (196-276)	83 (68-101)	135 (115-158)	15 (13-18)	91 (89-92)	1,979 (1,852-2,117)	396 (367-425)	1,517 (1,414-1,616)	67 (57-79)	2,683 (2,563-2,803)	2,412 (2,285-2,540)	270 (254-287)	19 (17-21)	62	43 (41-45)
Egypt	3,178 (2,519-3,947)	1,682 (1,343-2,078)	1,274 (1,002-1,592)	222 (175-277)	90 (88-92)	36,997 (35,064-39,046)	13,309 (12,532-14,090)	22,657 (21,499-23,921)	1,042 (875-1,230)	25,556 (24,399-26,826)	19,676 (18,573-21,013)	5,874 (5,632-6,153)	29 (26-31)	64	36 (33-38)
Iran	6,114 (5,393-6,912)	2,495 (2,180-2,843)	3,057 (2,712-3,439)	562 (500-630)	94 (93-94)	99,327 (96,736-101,953)	18,893 (18,199-19,697)	72,220 (70,527-73,849)	8,202 (7,583-8,858)	35,211 (33,997-36,529)	23,347 (22,148-24,649)	11,859 (11,596-12,119)	47 (45-50)	69	22 (19-24)
Iraq	2,887 (2,537-3,297)	1,663 (1,450-1,912)	1,103 (979-1,247)	122 (108-138)	91 (90-92)	37,602 (36,469-38,755)	11,834 (11,359-12,340)	24,418 (23,764-25,134)	1,326 (1,175-1,476)	13,899 (13,357-14,489)	8,894 (8,378-9,493)	5,010 (4,879-5,150)	36 (34-38)	63	27 (25-30)
Israel	1,017 (903-1,133)	468 (411-526)	416 (372-460)	133 (119-147)	100 (100-100)	22,902 (22,193-23,565)	4,095 (3,957-4,242)	13,655 (13,209-14,082)	5,161 (4,857-5,411)	1,198 (896-1,531)	1,198 (896-1,531)	0 (0.0-0.0)	70 (66-74)	74	4 (0-8)
Jordan	288 (246-342)	153 (130-183)	120 (103-142)	15 (13-17)	92 (91-93)	6,239 (6,043-6,432)	1,297 (1,234-1,367)	4,588 (4,455-4,717)	356 (320-389)	2,551 (2,463-2,656)	1,599 (1,513-1,703)	952 (925-978)	42 (40-44)	67	24 (22-27)
Kuwait	2,176 (1,922-2,466)	798 (694-916)	1,237 (1,102-1,392)	141 (126-158)	100 (100-100)	32,463 (31,675-33,366)	5,408 (5,194-5,658)	24,784 (24,246-25,393)	2,278 (2,139-2,417)	2,392 (2,149-2,649)	2,392 (2,149-2,649)	0 (0.0-0.0)	56 (54-59)	67	11 (8-13)
Lebanon	180 (150-213)	77 (64-91)	85 (72-101)	17 (15-21)	93 (92-94)	4,884 (4,733-5,032)	664 (630-699)	3,572 (3,469-3,665)	649 (603-697)	1,762 (1,686-1,842)	1,041 (966-1,116)	721 (701-739)	51 (48-54)	70	19 (16-22)
Libya	1,772 (1,543-2,045)	817 (695-963)	849 (753-963)	106 (95-120)	93 (92-94)	23,135 (22,380-23,876)	5,083 (4,791-5,366)	16,713 (16,283-17,165)	1,341 (1,219-1,470)	7,960 (7,618-8,322)	5,047 (4,692-5,415)	2,912 (2,829-2,998)	41 (38-44)	65	24 (21-26)

Region or country	Incident cases				Diagnosis	Living prevalence				Missing prevalence			Life expectancy remaining at 10 years		
	Total	0-19 years	20-59 years	60+ years	Rate < 25 years	Total	0-19 years	20-59 years	60+ years	Total	Diagnosed	Non-diagnosed	T1D onset	Non-T1D	Difference
Malta	67 (57-79)	18 (15-21)	32 (28-38)	17 (14-19)	100 (100-100)	2,469 (2,259-2,722)	192 (182-203)	1,464 (1,320-1,655)	814 (749-890)	409 (355-469)	409 (355-469)	0 (0.0-0.0)	64 (62-67)	74	9 (6-12)
Morocco	11,345 (10,246-12,528)	5,070 (4,665-5,507)	5,096 (4,530-5,707)	1,178 (1,051-1,314)	92 (91-92)	116,097 (112,299-119,685)	34,904 (34,053-35,809)	73,239 (70,899-75,482)	7,957 (7,099-8,832)	54,768 (52,381-57,467)	39,076 (36,575-41,927)	15,673 (15,308-16,037)	35 (32-38)	69	34 (31-37)
Oman	446 (390-505)	160 (138-183)	268 (237-303)	18 (16-20)	100 (100-100)	5,923 (5,758-6,070)	936 (894-978)	4,762 (4,642-4,869)	224 (210-237)	450 (423-485)	450 (423-485)	0 (0.0-0.0)	55 (53-58)	69	14 (11-17)
Palestine	147 (120-172)	85 (69-100)	55 (46-65)	6.1 (5.0-7.2)	89 (87-91)	2,396 (2,301-2,496)	676 (641-713)	1,675 (1,605-1,742)	47 (39-55)	1,764 (1,697-1,841)	1,335 (1,266-1,413)	431 (415-447)	31 (28-34)	66	35 (32-38)
Qatar	639 (543-752)	159 (137-186)	456 (385-538)	24 (20-28)	100 (100-100)	19,766 (19,255-20,314)	1,457 (1,400-1,525)	17,272 (16,839-17,752)	1,035 (990-1,079)	1,328 (1,241-1,425)	1,328 (1,241-1,425)	0 (0.0-0.0)	61 (58-64)	71	10 (8-13)
Saudi Arabia	17,502 (15,315-20,020)	7,149 (6,171-8,276)	9,405 (8,303-10,673)	948 (841-1,071)	100 (100-100)	224,636 (218,500-230,734)	45,348 (43,316-47,319)	166,892 (162,990-170,947)	12,392 (11,530-13,171)	19,447 (17,928-21,023)	19,447 (17,928-21,023)	0 (0.0-0.0)	55 (52-58)	67	12 (9-14)
Syria	497 (410-592)	245 (200-293)	221 (183-262)	31 (26-37)	85 (82-87)	6,736 (6,385-7,144)	1,967 (1,866-2,078)	4,566 (4,280-4,871)	212 (176-253)	12,358 (11,959-12,791)	10,218 (9,750-10,692)	2,145 (2,025-2,276)	28 (25-30)	68	40 (37-42)
Tunisia	2,684 (2,360-3,087)	1,081 (942-1,253)	1,289 (1,138-1,475)	315 (280-359)	92 (91-93)	28,012 (26,917-29,142)	6,800 (6,520-7,099)	19,301 (18,626-19,943)	1,921 (1,672-2,180)	15,419 (14,681-16,223)	11,652 (10,900-12,513)	3,759 (3,649-3,866)	34 (32-37)	69	34 (31-37)
United Arab Emirates	833 (731-945)	222 (192-254)	583 (514-658)	29 (25-32)	100 (100-100)	12,439 (12,118-12,742)	1,416 (1,358-1,478)	10,598 (10,337-10,842)	424 (404-442)	517 (478-562)	517 (478-562)	0 (0.0-0.0)	59 (57-62)	69	10 (7-13)
Western Sahara	5 (4.2-5.8)	1.6 (1.4-1.9)	3.1 (2.6-3.5)	0.3 (0.2-0.4)	88 (86-89)	51 (47-54)	7.2 (6.8-7.6)	42 (40-45)	1.2 (0.9-1.5)	66 (63-69)	53 (50-57)	12 (12-13)	21 (19-24)	64	42 (39-45)
Yemen	1,704 (1,496-1,943)	1,005 (876-1,153)	633 (561-715)	67 (59-75)	82 (80-84)	15,445 (14,615-16,303)	6,821 (6,503-7,158)	8,426 (7,833-8,962)	212 (178-252)	19,405 (18,667-20,221)	14,668 (13,864-15,692)	4,731 (4,494-4,970)	16 (14-18)	61	45 (43-47)
Sub-Saharan Africa	**51,745** (43,534-61,237)	**24,105** (20,097-28,747)	**25,352** (21,483-29,817)	**2,289** (1,955-2,674)	**78** (75-81)	**357,155** (330,726-383,483)	**111,435** (104,384-118,867)	**237,234** (217,406-256,009)	**8,418** (7,124-9,976)	**785,086** (756,747-815,774)	**656,848** (625,790-691,161)	**127,989** (118,782-136,962)	**12** (11-14)	**58**	**46** (44-47)
Angola	1,620 (1,384-1,901)	809 (686-956)	755 (650-880)	55 (48-64)	81 (79-84)	11,339 (10,523-12,051)	3,698 (3,459-3,918)	7,446 (6,870-7,971)	189 (160-224)	18,006 (17,294-18,730)	14,736 (13,972-15,558)	3,265 (3,046-3,454)	14 (13-16)	58	43 (42-45)
Benin	530 (446-627)	247 (206-294)	259 (220-305)	24 (21-28)	75 (71-78)	3,439 (3,155-3,718)	1,043 (980-1,112)	2,314 (2,104-2,523)	80 (67-95)	8,549 (8,258-8,894)	7,009 (6,658-7,409)	1,539 (1,420-1,658)	11 (9-12)	60	49 (48-51)
Botswana	82 (70-93)	32 (27-37)	45 (38-51)	5.2 (4.5-5.8)	86 (84-87)	892 (858-927)	142 (135-150)	710 (684-736)	40 (36-45)	829 (804-856)	600 (575-627)	229 (221-237)	26 (25-28)	63	36 (34-38)
Burkina Faso	174 (150-200)	83 (72-96)	84 (73-97)	6.4 (5.6-7.3)	74 (71-77)	1,065 (976-1,155)	330 (310-351)	716 (648-782)	18 (15-22)	2,654 (2,561-2,753)	2,185 (2,075-2,305)	469 (431-508)	10 (9-12)	59	48 (47-50)
Burundi	398 (342-458)	188 (162-217)	194 (167-223)	15 (13-17)	74 (71-77)	1,994 (1,789-2,193)	669 (621-717)	1,286 (1,122-1,435)	39 (32-47)	6,733 (6,500-6,982)	5,883 (5,608-6,180)	855 (765-936)	7 (6-8)	58	50 (49-51)
Cameroon	1,158 (988-1,371)	543 (459-647)	570 (490-671)	45 (39-53)	82 (79-84)	7,671 (7,096-8,249)	2,406 (2,251-2,559)	5,111 (4,688-5,552)	149 (128-180)	14,472 (13,877-15,073)	12,294 (11,679-12,947)	2,170 (2,020-2,320)	12 (11-14)	56	44 (42-46)
Cape Verde	24 (20-28)	8.3 (7.0-10)	14 (12-16)	1.5 (1.3-1.8)	85 (83-87)	277 (265-290)	42 (40-45)	227 (217-237)	8.4 (7.2-10)	292 (281-304)	208 (196-222)	84 (80-87)	25 (22-27)	65	41 (38-43)
Central African Republic	42 (36-48)	21 (18-24)	20 (17-23)	1.6 (1.4-1.9)	73 (70-76)	198 (180-217)	78 (74-83)	116 (103-130)	3.8 (3.3-4.6)	658 (635-681)	569 (543-598)	88 (80-96)	8 (7-9)	52	44 (43-45)
Chad	136 (117-156)	67 (58-77)	64 (55-73)	4.9 (4.3-5.6)	73 (70-76)	647 (579-712)	240 (223-257)	393 (341-439)	13 (11-16)	2,156 (2,083-2,230)	1,873 (1,786-1,967)	283 (253-310)	7 (6-8)	54	47 (46-48)

Region or country	Incident cases				Diagnosis	Living prevalence				Missing prevalence			Life expectancy remaining at 10 years		
	Total	0-19 years	20-59 years	60+ years	Rate < 25 years	Total	0-19 years	20-59 years	60+ years	Total	Diagnosed	Non-diagnosed	T1D onset	Non-T1D	Difference
Comoros	39 (34-45)	18 (15-20)	20 (17-22)	1.8 (1.6-2.0)	75 (72-77)	298 (279-318)	107 (101-113)	186 (172-201)	5.4 (4.5-6.5)	643 (623-665)	500 (475-526)	143 (134-152)	13 (11-14)	60	48 (46-49)
Cote d'Ivoire	1,174 (986-1,376)	546 (454-644)	579 (490-674)	50 (43-57)	82 (79-84)	7,317 (6,710-7,818)	2,380 (2,233-2,517)	4,780 (4,321-5,151)	154 (129-181)	14,807 (14,237-15,436)	12,728 (12,116-13,467)	2,078 (1,916-2,210)	12 (10-13)	55	43 (42-44)
Democratic Republic of the Cor	3,021 (2,590-3,469)	1,460 (1,248-1,679)	1,430 (1,228-1,640)	132 (114-150)	74 (71-77)	17,259 (15,743-18,792)	5,451 (5,139-5,826)	11,399 (10,182-12,584)	396 (332-481)	47,279 (45,637-49,268)	39,774 (37,827-42,196)	7,480 (6,829-8,125)	9 (8-11)	59	50 (48-51)
Equatorial Guinea	62 (52-73)	25 (20-29)	35 (30-41)	2.1 (1.8-2.4)	85 (83-87)	582 (550-616)	118 (111-124)	453 (428-480)	11 (9.2-13)	677 (650-707)	524 (495-558)	152 (145-161)	18 (17-20)	56	38 (36-40)
Eritrea	814 (694-976)	387 (322-473)	382 (332-449)	46 (40-54)	75 (72-78)	6,073 (5,634-6,505)	1,872 (1,744-2,018)	4,075 (3,749-4,373)	126 (105-155)	12,991 (12,524-13,489)	10,090 (9,613-10,602)	2,897 (2,702-3,081)	14 (13-16)	61	46 (45-48)
Eswatini	59 (49-68)	26 (22-30)	30 (25-35)	2.8 (2.4-3.3)	82 (80-84)	392 (367-421)	125 (118-132)	259 (239-282)	8.7 (7.4-10)	787 (756-816)	670 (638-703)	116 (109-124)	14 (13-15)	55	41 (40-42)
Ethiopia	2,882 (2,450-3,378)	1,282 (1,101-1,490)	1,465 (1,235-1,729)	135 (114-159)	75 (71-77)	18,454 (17,019-19,863)	4,057 (3,805-4,302)	13,965 (12,776-15,102)	443 (374-530)	44,822 (43,267-46,463)	36,750 (34,944-38,631)	8,058 (7,471-8,636)	12 (10-14)	62	50 (48-51)
Gabon	94 (77-110)	38 (31-45)	51 (42-59)	4.6 (3.9-5.4)	86 (83-87)	919 (872-965)	181 (170-194)	705 (671-736)	33 (28-37)	947 (915-978)	709 (676-739)	238 (227-248)	25 (23-27)	61	36 (34-38)
Gambia	20 (17-23)	9.3 (8.0-11)	10 (8.5-11)	0.8 (0.6-0.8)	74 (71-77)	128 (118-138)	37 (35-39)	89 (81-97)	2.2 (1.9-2.6)	306 (294-318)	248 (235-263)	58 (53-62)	11 (9-12)	58	47 (46-49)
Ghana	1,353 (1,134-1,601)	573 (475-684)	713 (602-839)	67 (57-77)	83 (80-85)	10,261 (9,572-10,939)	2,636 (2,482-2,801)	7,370 (6,837-7,873)	253 (215-298)	17,673 (16,981-18,427)	14,849 (14,088-15,648)	2,823 (2,647-2,997)	15 (13-17)	59	44 (42-46)
Guinea	112 (96-129)	53 (45-61)	54 (47-62)	4.7 (4.1-5.4)	74 (71-76)	697 (638-751)	211 (199-224)	472 (425-514)	14 (12-17)	1,680 (1,622-1,745)	1,368 (1,299-1,450)	312 (286-335)	10 (9-12)	58	48 (46-49)
Guinea-Bissau	16 (14-19)	7.5 (6.4-8.7)	8.2 (7.0-10)	0.7 (0.6-0.8)	75 (72-77)	91 (82-99)	29 (27-31)	60 (53-67)	1.8 (1.5-2.2)	276 (266-286)	236 (224-249)	40 (36-43)	9 (8-10)	55	46 (45-47)
Kenya	2,760 (2,319-3,264)	1,235 (1,030-1,470)	1,421 (1,202-1,673)	103 (88-121)	82 (79-84)	21,602 (20,261-22,815)	5,971 (5,650-6,312)	15,248 (14,192-16,138)	393 (333-457)	32,412 (31,286-33,681)	26,115 (24,906-27,432)	6,302 (5,939-6,620)	17 (15-18)	61	44 (43-46)
Lesotho	108 (93-127)	42 (36-50)	59 (51-69)	7 (6.1-8.2)	84 (81-86)	614 (567-664)	189 (179-201)	404 (368-442)	20 (17-24)	1,728 (1,668-1,788)	1,556 (1,493-1,624)	171 (159-184)	11 (10-12)	51	39 (38-40)
Liberia	43 (37-49)	19 (17-22)	21 (18-25)	2 (1.8-2.3)	75 (72-77)	282 (261-303)	80 (76-84)	196 (179-213)	6.2 (5.2-7.4)	682 (659-707)	556 (531-584)	125 (117-134)	12 (10-13)	60	48 (47-50)
Madagascar	1,403 (1,173-1,645)	635 (526-750)	706 (594-823)	62 (53-73)	75 (71-78)	10,003 (9,264-10,673)	2,853 (2,674-3,037)	6,955 (6,392-7,451)	194 (162-232)	22,189 (21,419-23,008)	17,555 (16,711-18,530)	4,625 (4,309-4,911)	13 (11-14)	61	49 (47-51)
Malawi	974 (816-1,154)	468 (389-558)	470 (397-554)	36 (30-42)	74 (70-77)	6,054 (5,595-6,512)	2,116 (1,990-2,252)	3,843 (3,478-4,186)	92 (76-110)	15,224 (14,668-15,786)	12,425 (11,807-13,067)	2,809 (2,606-3,003)	11 (10-13)	59	48 (47-49)
Mali	139 (114-164)	70 (57-83)	64 (53-76)	5 (4.2-5.8)	73 (69-77)	775 (712-841)	277 (255-297)	483 (438-528)	16 (13-18)	1,354 (1,295-1,419)	1,032 (966-1,109)	321 (296-346)	10 (8-12)	58	48 (46-49)
Mauritania	201 (171-237)	89 (75-106)	103 (88-120)	9.3 (8.1-11)	82 (80-85)	1,726 (1,629-1,824)	422 (398-448)	1,268 (1,194-1,345)	36 (31-42)	2,314 (2,226-2,413)	1,801 (1,704-1,911)	510 (484-537)	18 (16-20)	61	43 (41-45)
Mauritius	54 (47-62)	13 (11-15)	32 (28-36)	8.8 (7.8-10)	90 (88-91)	776 (746-807)	101 (96-105)	584 (567-603)	92 (80-103)	686 (662-715)	483 (456-514)	202 (196-209)	31 (29-33)	67	36 (33-38)
Mayotte	12 (11-14)	5.8 (4.9-6.7)	6 (5.2-6.9)	0.6 (0.6-0.7)	84 (82-86)	125 (118-132)	39 (37-41)	84 (78-89)	2.7 (2.1-3.5)	117 (111-124)	82 (75-89)	36 (34-37)	23 (20-26)	70	47 (44-50)

Region or country	Incident cases Total	Incident cases 0-19 years	Incident cases 20-59 years	Incident cases 60+ years	Diagnosis Rate < 25 years	Living prevalence Total	Living prevalence 0-19 years	Living prevalence 20-59 years	Living prevalence 60+ years	Missing prevalence Total	Missing prevalence Diagnosed	Missing prevalence Non-diagnosed	Life expectancy remaining at 10 years T1D onset	Life expectancy remaining at 10 years Non-T1D	Life expectancy remaining at 10 years Difference
Mozambique	1,575 (1,334-1,836)	769 (646-903)	744 (635-863)	62 (53-71)	74 (70-77)	9,599 (8,831-10,334)	3,460 (3,265-3,683)	5,958 (5,394-6,504)	168 (141-205)	24,458 (23,611-25,366)	19,972 (19,025-20,970)	4,484 (4,157-4,810)	11 (10-12)	57	46 (45-47)
Namibia	127 (107-150)	52 (44-62)	68 (58-80)	6.3 (5.4-7.4)	85 (83-87)	1,222 (1,165-1,280)	262 (247-277)	923 (881-965)	37 (32-43)	1,335 (1,288-1,383)	1,014 (969-1,063)	320 (307-334)	22 (20-23)	58	37 (35-38)
Niger	194 (166-225)	99 (85-115)	87 (74-101)	7.7 (6.7-8.9)	73 (70-76)	1,087 (993-1,169)	384 (360-407)	682 (613-746)	20 (16-24)	2,808 (2,714-2,906)	2,323 (2,212-2,446)	486 (446-521)	10 (9-11)	59	50 (48-51)
Nigeria	8,884 (7,553-10,437)	4,243 (3,574-5,024)	4,263 (3,651-4,976)	377 (327-436)	82 (79-84)	47,807 (43,881-51,859)	16,689 (15,571-17,829)	29,966 (26,934-32,933)	1,131 (966-1,327)	120,094 (115,548-125,176)	107,374 (102,240-112,930)	12,650 (11,591-13,666)	9 (8-10)	53	44 (43-45)
Congo	239 (204-277)	110 (93-129)	119 (102-137)	10 (8.8-12)	82 (80-84)	1,792 (1,678-1,910)	527 (495-557)	1,228 (1,140-1,315)	40 (33-46)	2,871 (2,769-2,978)	2,358 (2,250-2,479)	513 (483-544)	16 (14-18)	59	43 (41-45)
Reunion	38 (33-43)	11 (10-13)	21 (18-23)	5.9 (5.2-6.7)	88 (87-90)	398 (370-425)	82 (78-86)	287 (267-305)	29 (23-37)	573 (549-599)	474 (446-503)	99 (94-104)	25 (22-29)	72	47 (43-50)
Rwanda	448 (383-514)	197 (168-226)	230 (197-264)	21 (19-24)	75 (72-78)	3,402 (3,177-3,609)	829 (786-874)	2,493 (2,301-2,658)	80 (66-94)	7,036 (6,813-7,290)	5,509 (5,269-5,813)	1,528 (1,434-1,615)	15 (13-17)	63	48 (46-50)
Sao Tome and Principe	10 (8.2-11)	4.7 (3.9-5.4)	4.6 (3.9-5.3)	0.4 (0.4-0.5)	82 (79-84)	88 (83-92)	23 (22-24)	63 (59-66)	1.9 (1.6-2.2)	94 (90-97)	67 (63-71)	27 (25-28)	22 (20-24)	64	41 (39-44)
Senegal	724 (615-852)	339 (286-402)	353 (302-413)	32 (27-37)	74 (71-77)	5,826 (5,441-6,198)	1,613 (1,518-1,707)	4,093 (3,794-4,374)	117 (97-140)	10,597 (10,240-10,970)	7,816 (7,414-8,282)	2,778 (2,609-2,945)	15 (13-17)	62	47 (45-49)
Seychelles	4.1 (3.6-4.7)	1.2 (1.0-1.4)	2.4 (2.1-2.7)	0.5 (0.4-0.5)	100 (100-100)	58 (56-60)	8.5 (8.1-8.9)	44 (43-46)	5.1 (4.5-5.7)	24 (23-26)	24 (23-26)	0 (0.0-0.0)	39 (37-42)	65	26 (23-28)
Sierra Leone	68 (58-78)	31 (26-35)	34 (29-39)	2.8 (2.4-3.2)	75 (72-77)	315 (280-344)	112 (104-120)	196 (171-219)	6.6 (5.6-7.8)	1,206 (1,166-1,249)	1,076 (1,031-1,126)	130 (116-142)	7 (6-8)	53	46 (45-47)
Somalia	3,718 (3,086-4,435)	1,865 (1,506-2,271)	1,701 (1,448-1,988)	152 (131-176)	73 (69-77)	19,812 (17,924-21,811)	7,433 (6,828-8,074)	11,984 (10,654-13,261)	417 (349-504)	58,182 (55,977-60,654)	49,256 (46,819-52,157)	8,886 (8,038-9,742)	8 (7-9)	56	49 (47-50)
South Africa	2,934 (2,472-3,404)	1,014 (845-1,185)	1,693 (1,434-1,956)	227 (193-262)	87 (85-89)	30,075 (28,698-31,504)	5,125 (4,866-5,404)	23,500 (22,465-24,553)	1,445 (1,253-1,688)	37,246 (35,939-38,594)	29,662 (28,346-31,053)	7,563 (7,263-7,882)	22 (20-23)	58	36 (34-37)
South Sudan	1,381 (1,192-1,574)	665 (567-764)	656 (572-742)	61 (54-68)	74 (71-77)	7,803 (7,065-8,463)	3,760 (3,510-4,000)	3,870 (3,420-4,292)	165 (138-198)	24,640 (23,791-25,492)	21,042 (20,068-22,056)	3,593 (3,262-3,878)	8 (7-9)	56	48 (47-49)
Sudan	4,886 (3,862-6,249)	2,286 (1,789-2,948)	2,364 (1,883-3,004)	236 (190-297)	82 (78-85)	48,369 (44,667-52,124)	17,501 (16,318-18,834)	29,696 (27,170-32,025)	1,129 (939-1,336)	117,881 (113,804-122,248)	102,334 (98,146-106,908)	15,496 (14,377-16,632)	15 (13-17)	61	46 (44-48)
Tanzania	2,960 (2,499-3,487)	1,422 (1,190-1,687)	1,423 (1,210-1,666)	116 (99-135)	74 (71-77)	20,664 (19,283-22,131)	6,517 (6,132-6,918)	13,770 (12,701-14,807)	381 (319-460)	45,286 (43,751-47,045)	35,793 (34,132-37,747)	9,501 (8,875-10,107)	13 (11-14)	60	48 (46-49)
Togo	70 (60-81)	32 (27-37)	35 (30-41)	3 (2.6-3.5)	75 (72-78)	414 (378-448)	124 (117-132)	282 (253-308)	8.5 (7.1-10)	1,160 (1,119-1,205)	984 (936-1,035)	176 (162-190)	10 (8-11)	58	48 (46-49)
Uganda	2,306 (1,943-2,730)	1,159 (968-1,381)	1,079 (916-1,269)	68 (58-80)	73 (70-76)	14,931 (13,830-16,086)	5,254 (4,933-5,592)	9,486 (8,606-10,300)	201 (169-240)	33,359 (32,031-34,658)	26,309 (24,851-27,840)	7,047 (6,562-7,560)	12 (10-13)	59	47 (46-49)
Zambia	929 (794-1,096)	455 (386-540)	445 (383-522)	29 (25-33)	81 (79-84)	6,784 (6,392-7,210)	2,166 (2,042-2,288)	4,515 (4,231-4,819)	105 (90-124)	10,174 (9,772-10,574)	8,156 (7,746-8,603)	2,013 (1,905-2,131)	16 (14-17)	59	43 (42-45)
Zimbabwe	743 (631-882)	349 (294-417)	364 (311-429)	30 (26-36)	74 (71-77)	4,706 (4,326-5,064)	1,659 (1,566-1,758)	2,960 (2,673-3,212)	90 (74-108)	12,056 (11,630-12,453)	9,844 (9,382-10,289)	2,210 (2,049-2,358)	12 (10-13)	56	44 (43-45)

Region or country	Incident cases				Diagnosis	Living prevalence				Missing prevalence			Life expectancy remaining at 10 years		
	Total	0-19 years	20-59 years	60+ years	Rate < 25 years	Total	0-19 years	20-59 years	60+ years	Total	Diagnosed	Non-diagnosed	T1D onset	Non-T1D	Difference
South Asia	83,078	37,687	38,144	7,248	91	902,541	305,565	563,972	33,097	980,570	821,243	159,335	24	64	40
	(73,151-94,528)	(32,895-43,212)	(33,810-43,142)	(6,446-8,174)	(89-92)	(859,980-943,633)	(294,068-318,045)	(535,527-590,476)	(28,447-38,527)	(944,808-1,021,966)	(783,655-865,815)	(153,263-165,526)	(21-26)		(37-43)
Afghanistan	1,136	719	378	39	81	9,358	5,244	3,998	112	14,202	11,100	3,111	14	61	47
	(907-1,390)	(578-875)	(298-465)	(31-49)	(77-84)	(8,740-10,091)	(4,947-5,605)	(3,656-4,352)	(94-137)	(13,609-14,902)	(10,479-11,797)	(2,919-3,319)	(12-16)		(45-48)
Bangladesh	1,516	700	713	103	91	24,338	5,780	17,986	572	37,755	32,927	4,840	26	66	40
	(1,129-1,958)	(518-908)	(534-917)	(77-132)	(88-93)	(22,636-25,924)	(5,334-6,248)	(16,690-19,183)	(481-674)	(35,866-39,677)	(31,135-34,788)	(4,507-5,141)	(23-29)		(38-43)
Bhutan	42	18	21	3.1	91	454	148	290	15	501	421	80	22	65	43
	(37-48)	(16-21)	(18-23)	(2.8-3.5)	(90-92)	(430-474)	(142-154)	(273-305)	(13-18)	(482-522)	(401-444)	(76-83)	(20-24)		(41-45)
India	75,767	33,979	35,078	6,710	91	818,620	276,294	511,922	30,518	874,478	734,484	139,979	24	63	39
	(67,166-85,698)	(29,872-38,721)	(31,297-39,444)	(5,997-7,534)	(90-92)	(780,950-854,953)	(266,378-287,049)	(486,732-535,380)	(26,254-35,513)	(843,144-911,070)	(701,324-774,193)	(134,908-145,203)	(21-26)		(37-42)
Maldives	35	12	21	1.8	94	429	81	330	19	139	76	64	46	71	25
	(30-41)	(10-14)	(18-25)	(1.5-2.1)	(93-95)	(414-446)	(77-85)	(319-342)	(17-20)	(135-143)	(72-79)	(62-65)	(44-49)		(22-27)
Nepal	1,651	805	723	123	84	17,045	6,539	10,079	421	23,386	17,760	5,621	20	64	44
	(1,443-1,863)	(698-914)	(636-811)	(109-138)	(82-85)	(16,201-17,781)	(6,278-6,822)	(9,515-10,562)	(356-506)	(22,700-24,209)	(17,031-18,625)	(5,390-5,841)	(18-23)		(42-46)
Pakistan	1,788	986	702	100	89	18,754	7,601	10,718	424	16,698	13,265	3,438	23	63	40
	(1,434-2,230)	(797-1,223)	(558-881)	(79-126)	(87-91)	(17,658-19,827)	(7,172-8,045)	(10,070-11,349)	(352-505)	(15,928-17,498)	(12,483-14,105)	(3,269-3,601)	(21-26)		(38-43)
Sri Lanka	1,143	468	508	167	92	13,544	3,877	8,648	1,016	13,411	11,212	2,203	29	69	40
	(1,006-1,301)	(407-537)	(450-575)	(148-189)	(91-93)	(12,951-14,136)	(3,740-4,036)	(8,272-9,004)	(880-1,154)	(12,943-13,945)	(10,731-11,785)	(2,131-2,273)	(26-32)		(37-42)
East Asia & Pacific	46,433	15,464	23,509	7,461	95	823,615	125,607	553,398	144,304	305,355	235,487	69,850	43	68	24
	(39,066-53,915)	(11,678-19,245)	(20,736-26,374)	(6,651-8,297)	(94-96)	(789,357-856,404)	(116,376-135,000)	(533,001-574,056)	(134,781-153,613)	(286,977-325,426)	(217,804-253,950)	(65,965-73,586)	(41-46)		(22-27)
Australia	4,679	1,630	2,200	850	100	122,139	13,941	76,995	31,166	11,927	11,927	0	67	74	8
	(4,408-4,999)	(1,587-1,680)	(2,033-2,396)	(788-923)	(100-100)	(120,052-124,192)	(13,845-14,043)	(76,151-77,814)	(29,806-32,543)	(10,196-13,604)	(10,196-13,604)	(0.0-0.0)	(64-70)		(4-11)
Brunei Darussalam	5.4	2.1	2.8	0.5	100	94	19	67	8.5	15	15	0	50	67	17
	(4.3-6.7)	(1.7-2.6)	(2.2-3.5)	(0.4-0.6)	(100-100)	(91-98)	(18-20)	(64-70)	(7.9-9.2)	(14-16)	(14-16)	(0.0-0.0)	(48-53)		(14-19)
Cambodia	220	109	96	15	90	2,148	838	1,252	60	2,425	2,069	355	21	63	42
	(177-270)	(88-134)	(77-118)	(12-18)	(88-92)	(2,012-2,278)	(786-889)	(1,170-1,331)	(50-72)	(2,319-2,536)	(1,960-2,184)	(337-374)	(18-23)		(40-45)
China	25,866	8,149	13,573	4,143	94	430,647	64,224	307,738	58,424	163,169	111,552	51,610	46	69	23
	(21,208-30,365)	(5,334-10,870)	(12,160-14,937)	(3,715-4,557)	(93-95)	(409,404-450,012)	(57,279-71,202)	(294,550-320,867)	(53,804-62,781)	(154,119-172,932)	(103,216-119,655)	(48,537-54,494)	(44-48)		(21-25)
Fiji	9	4.2	4	0.8	92	116	36	74	6.7	72	56	16	30	60	30
	(7.2-11)	(3.4-5.3)	(3.1-5.0)	(0.6-1.0)	(90-93)	(110-122)	(33-38)	(70-77)	(5.7-7.6)	(69-76)	(53-59)	(16-17)	(28-32)		(28-32)
French Polynesia	2.7	1.1	1.3	0.3	100	44	9.4	30	4.4	11	11	0	49	69	20
	(2.2-3.3)	(0.9-1.3)	(1.1-1.7)	(0.3-0.4)	(100-100)	(42-46)	(8.8-10)	(29-31)	(3.9-4.8)	(10-12)	(10-12)	(0.0-0.0)	(47-52)		(17-22)
Guam	0.1	0.1	0	0	100	4.3	0.9	2.8	0.6	0.7	0.7	0	56	72	16
	(0.0-0.2)	(0.0-0.2)	(0.0-0.0)	(0.0-0.0)	(NaN-100)	(4.1-4.5)	(0.9-1.0)	(2.7-2.9)	(0.5-0.6)	(0.7-0.8)	(0.7-0.8)	(0.0-0.0)	(54-58)		(13-18)
Hong Kong	263	63	140	60	100	4,770	512	3,111	1,148	706	706	0	61	75	15
	(239-288)	(59-67)	(126-154)	(54-67)	(100-100)	(4,628-4,910)	(496-528)	(3,023-3,196)	(1,090-1,206)	(640-768)	(640-768)	(0.0-0.0)	(58-64)		(12-17)
Indonesia	3,499	1,540	1,644	314	91	39,919	12,942	25,388	1,580	37,886	31,388	6,495	26	64	39
	(2,761-4,284)	(1,223-1,878)	(1,292-2,020)	(246-386)	(89-92)	(37,659-42,281)	(12,208-13,666)	(23,975-26,960)	(1,337-1,860)	(36,090-39,874)	(29,630-33,353)	(6,209-6,811)	(23-28)		(36-42)
Japan	2,514	632	1,173	710	100	77,874	5,380	42,829	29,670	11,029	11,029	0	69	75	7
	(2,284-2,767)	(581-688)	(1,060-1,296)	(643-783)	(100-100)	(75,506-80,338)	(5,239-5,524)	(41,861-43,884)	(27,936-31,357)	(9,231-13,159)	(9,231-13,159)	(0.0-0.0)	(64-73)		(2-11)
Kiribati	1.3	0.7	0.6	0	89	12	5.2	6.8	0.3	12	10	2.1	20	63	43
	(1.0-1.5)	(0.6-0.9)	(0.4-0.6)	(0.0-0.1)	(86-90)	(12-13)	(4.9-5.5)	(6.3-7.2)	(0.3-0.4)	(11-13)	(9.3-11)	(2.0-2.2)	(17-22)		(41-46)

Region or country	Incident cases				Diagnosis	Living prevalence				Missing prevalence			Life expectancy remaining at 10 years		
	Total	0-19 years	20-59 years	60+ years	Rate < 25 years	Total	0-19 years	20-59 years	60+ years	Total	Diagnosed	Non-diagnosed	T1D onset	Non-T1D	Difference
South Korea	1,861 (1,708-2,036)	461 (423-504)	1,009 (925-1,105)	392 (360-427)	100 (100-100)	33,684 (32,510-34,981)	3,597 (3,479-3,732)	22,493 (21,719-23,377)	7,595 (7,202-8,000)	4,453 (4,036-4,956)	4,453 (4,036-4,956)	0 (0.0-0.0)	63 (60-66)	74	11 (8-14)
Laos	96 (75-118)	50 (39-61)	41 (32-50)	5.6 (4.4-6.9)	90 (87-91)	982 (923-1,040)	397 (374-420)	562 (525-597)	23 (20-28)	984 (942-1,029)	817 (775-863)	167 (158-175)	23 (20-25)	62	40 (37-42)
Macao	24 (22-26)	6 (5.7-6.4)	13 (12-15)	4.2 (3.9-4.7)	100 (100-100)	423 (410-436)	48 (46-49)	298 (290-308)	77 (73-80)	47 (44-52)	47 (44-52)	0 (0.0-0.0)	60 (58-63)	75	15 (12-17)
Malaysia	406 (323-506)	166 (133-206)	200 (159-250)	39 (31-49)	93 (91-94)	6,772 (6,463-7,047)	1,458 (1,373-1,538)	4,676 (4,479-4,842)	639 (578-694)	2,391 (2,283-2,515)	1,416 (1,317-1,532)	976 (940-1,008)	43 (40-45)	67	25 (22-27)
Micronesia	0 (0.0-0.1)	0 (0.0-0.1)	0 (0.0-0.0)	0 (0.0-0.0)	100 (NaN-100)	2 (1.9-2.1)	0.8 (0.7-0.8)	1.2 (1.1-1.2)	0 (0.0-0.0)	1.8 (1.8-1.9)	1.4 (1.3-1.5)	0.3 (0.3-0.3)	27 (25-30)	61	33 (31-36)
Mongolia	62 (41-84)	30 (17-43)	28 (20-36)	4 (3.0-5.2)	90 (86-93)	663 (606-725)	208 (180-239)	437 (407-469)	18 (15-21)	597 (561-635)	483 (452-520)	113 (104-123)	26 (24-28)	62	37 (34-39)
Myanmar	694 (553-856)	307 (246-377)	325 (258-402)	62 (49-77)	91 (89-92)	6,659 (6,261-7,105)	2,513 (2,377-2,669)	3,901 (3,638-4,179)	244 (205-290)	8,797 (8,436-9,262)	7,744 (7,387-8,196)	1,051 (998-1,111)	20 (18-22)	61	41 (39-44)
New Caledonia	2.8 (2.2-3.4)	1.1 (0.9-1.3)	1.3 (1.1-1.7)	0.4 (0.3-0.4)	100 (100-100)	46 (44-48)	9.5 (8.9-10)	32 (30-33)	5.4 (5.0-5.8)	10 (9.2-11)	10 (9.2-11)	0 (0.0-0.0)	52 (50-54)	69	17 (15-20)
New Zealand	702 (626-778)	246 (217-276)	323 (290-357)	132 (119-145)	100 (100-100)	17,600 (17,063-18,143)	2,207 (2,102-2,317)	11,282 (10,952-11,604)	4,113 (3,908-4,318)	2,273 (2,051-2,506)	2,273 (2,051-2,506)	0 (0.0-0.0)	63 (60-66)	73	10 (7-13)
North Korea	957 (852-1,072)	342 (305-383)	484 (431-543)	130 (116-146)	87 (86-89)	10,391 (9,845-10,982)	2,503 (2,418-2,600)	7,312 (6,917-7,705)	578 (478-696)	15,784 (15,274-16,353)	12,879 (12,280-13,548)	2,900 (2,778-3,026)	22 (19-25)	65	43 (40-45)
Papua New Guinea	15 (11-18)	8.2 (6.3-10)	5.8 (4.3-7.2)	0.8 (0.6-0.9)	89 (86-91)	134 (125-144)	63 (58-67)	69 (64-74)	2.4 (2.0-2.9)	153 (145-160)	130 (122-137)	23 (22-25)	18 (16-20)	59	41 (39-43)
Philippines	1,434 (1,116-1,774)	708 (554-872)	620 (480-770)	106 (82-132)	90 (87-92)	15,710 (14,752-16,654)	5,918 (5,601-6,283)	9,271 (8,662-9,840)	518 (435-603)	14,565 (13,841-15,346)	11,841 (11,132-12,605)	2,720 (2,584-2,852)	22 (20-25)	64	41 (39-44)
Samoa	2.1 (1.6-2.6)	1.2 (1.0-1.5)	0.8 (0.5-1.0)	0.1 (0.1-0.2)	91 (89-93)	26 (25-28)	10 (9.2-10)	16 (15-16)	1.2 (1.0-1.4)	12 (12-13)	8.3 (7.8-8.9)	3.9 (3.8-4.1)	36 (33-38)	65	30 (27-32)
Singapore	279 (246-313)	66 (58-75)	157 (139-176)	55 (49-62)	100 (100-100)	5,947 (5,810-6,089)	552 (531-572)	4,024 (3,944-4,106)	1,371 (1,310-1,430)	637 (564-718)	637 (564-718)	0 (0.0-0.0)	64 (61-68)	74	10 (7-14)
Solomon Islands	1.1 (0.8-1.4)	0.7 (0.5-0.8)	0.4 (0.3-0.5)	0 (0.0-0.0)	87 (83-89)	12 (11-13)	5.5 (5.2-5.8)	6.4 (6.0-6.8)	0.2 (0.2-0.3)	9 (8.6-9.5)	6.8 (6.5-7.3)	2.1 (2.0-2.3)	23 (20-26)	65	42 (39-45)
Taiwan	836 (759-924)	207 (193-223)	456 (410-509)	174 (157-193)	100 (100-100)	21,461 (20,885-22,048)	2,031 (1,991-2,076)	14,799 (14,514-15,101)	4,623 (4,323-4,915)	8,313 (7,867-8,775)	8,313 (7,867-8,775)	0 (0.0-0.0)	52 (49-55)	72	20 (17-22)
Thailand	771 (671-873)	238 (211-266)	399 (344-455)	134 (116-152)	94 (94-95)	10,906 (10,509-11,316)	2,171 (2,108-2,236)	7,076 (6,831-7,331)	1,657 (1,525-1,792)	4,879 (4,627-5,149)	3,737 (3,479-4,004)	1,142 (1,105-1,181)	39 (37-42)	69	29 (27-32)
Timor L'Este	18 (14-22)	11 (8.4-13)	6.5 (5.1-8.1)	1 (0.8-1.2)	89 (86-90)	188 (177-198)	83 (79-88)	100 (94-106)	3.9 (3.2-4.6)	155 (148-162)	121 (115-128)	33 (32-35)	24 (22-27)	64	39 (37-42)
Tonga	1.1 (0.9-1.3)	0.6 (0.5-0.8)	0.4 (0.4-0.5)	0 (0.0-0.1)	88 (86-90)	14 (13-14)	5.2 (4.9-5.5)	7.8 (7.5-8.2)	0.6 (0.5-0.7)	7.6 (7.2-8.0)	5.6 (5.2-6.0)	2 (1.9-2.1)	29 (25-38)	63	34 (25-38)
US Virgin Islands	14 (7.5-24)	4.9 (2.6-8.3)	5.8 (3.1-10)	3.4 (1.8-5.8)	100 (100-100)	289 (256-324)	49 (42-57)	158 (141-177)	81 (72-91)	57 (49-64)	57 (49-64)	0 (0.0-0.0)	60 (57-63)	72	12 (9-15)
Vanuatu	3.3 (2.5-4.1)	1.9 (1.5-2.4)	1.2 (0.9-1.5)	0.2 (0.1-0.2)	89 (86-91)	37 (35-39)	15 (14-16)	21 (20-22)	0.7 (0.6-0.8)	25 (24-26)	18 (17-19)	6.6 (6.3-6.9)	27 (24-30)	63	36 (34-39)
Viet Nam	1,208 (948-1,506)	480 (380-596)	602 (470-753)	126 (98-158)	92 (90-93)	14,190 (13,369-15,058)	3,904 (3,697-4,138)	9,520 (8,983-10,088)	765 (654-887)	14,011 (13,394-14,749)	11,782 (11,176-12,534)	2,231 (2,131-2,338)	26 (23-28)	68	42 (39-45)

APPENDIX 9: PROJECTIONS

To project the global T1D population between 2021 and 2040, we developed two scenarios.

The first ("conservative estimate") held incidence, mortality and diagnosis rates constant from 2020 onwards (**Table 1**).

Table 1 – Projected prevalent cases by region ('Conservative estimate')

Region	2020	2025	2030	2035	2040
GLOBAL	**8,111,875** (7,817,794-8,415,208)	**9,653,954** (9,219,544-10,092,235)	**11,078,273** (10,487,368-11,670,835)	**12,366,450** (11,626,516-13,118,048)	**13,511,327** (12,645,843-14,422,954)
North America	1,650,554 (1,601,479-1,705,753)	1,857,655 (1,786,020-1,932,182)	2,055,598 (1,959,672-2,155,903)	2,243,813 (2,127,162-2,372,009)	2,419,501 (2,286,189-2,563,470)
Latin America & Caribbean	835,821 (801,182-870,490)	995,033 (953,984-1,038,391)	1,141,985 (1,090,861-1,197,623)	1,275,283 (1,214,336-1,342,975)	1,394,073 (1,322,410-1,480,030)
Europe & Central Asia	2,839,353 (2,745,022-2,937,778)	3,267,307 (3,122,856-3,411,053)	3,645,330 (3,451,746-3,840,464)	3,970,088 (3,731,804-4,217,206)	4,243,102 (3,969,958-4,536,989)
Middle East & North Africa	799,607 (776,325-823,579)	1,074,360 (1,039,097-1,108,644)	1,346,502 (1,296,535-1,394,049)	1,605,072 (1,540,454-1,666,816)	1,844,357 (1,762,869-1,922,942)
Sub-Saharan Africa	334,642 (311,222-357,899)	448,659 (407,786-488,197)	564,115 (506,781-620,221)	683,309 (609,798-758,017)	807,250 (717,207-899,229)
South Asia	858,899 (822,100-895,820)	1,069,796 (1,008,833-1,131,717)	1,251,796 (1,161,232-1,336,766)	1,404,927 (1,283,682-1,510,641)	1,528,547 (1,386,224-1,665,415)
East Asia & Pacific	792,998 (760,463-823,888)	941,144 (900,970-982,051)	1,072,946 (1,020,541-1,125,809)	1,183,959 (1,119,280-1,250,384)	1,274,498 (1,200,986-1,354,879)

The second ("momentum estimate") continues to change these inputs at the same annual rate of change as for 2012-2021 (**Table 2**).

Table 2 – Projected prevalent cases by region ('Momentum estimate')

Region	2020	2025	2030	2035	2040
GLOBAL	8,111,875 (7,817,794-8,415,208)	9,793,431 (9,275,651-10,329,883)	11,834,127 (10,957,881-12,765,414)	14,331,880 (13,027,775-15,735,319)	17,427,901 (15,626,846-19,386,951)
North America	1,650,554 (1,601,479-1,705,753)	1,863,317 (1,783,900-1,951,385)	2,085,346 (1,965,582-2,225,345)	2,321,507 (2,153,565-2,511,093)	2,567,163 (2,353,388-2,804,864)
Latin America & Caribbean	835,821 (801,182-870,490)	1,021,553 (969,381-1,076,175)	1,295,791 (1,199,648-1,397,956)	1,697,520 (1,536,752-1,868,955)	2,287,193 (2,036,392-2,560,437)

Europe & Central Asia	2,839,353 (2,74,5022-2,937,778)	3,307,087 (3,146,741-3,469,120)	3,859,156 (3,610,243-4,120,665)	4,515,905 (4,162,731-4,893,289)	5,312,566 (4,845,012-5,823,021)
Middle East & North Africa	799,607 (776,325-823,579)	1,102,071 (1,050,726-1,155,572)	1,503,138 (1,399,008-1,615,673)	2,026,057 (1,853,088-2,214,660)	2,703,043 (2,440,831-2,989,694)
Sub-Saharan Africa	334,642 (311,222-357,899)	459,311 (408,453-512,629)	619,584 (530,725-718,662)	826,223 (693,030-977,204)	1,090,436 (905,387-1,303,072)
South Asia	858,899 (822,100-895,820)	1,088,143 (1,014,965-1,161,386)	1,343,882 (1,214,319-1,469,948)	1,627,160 (1,440,870-1,818,590)	1,943,702 (1,696,209-2,203,433)
East Asia & Pacific	792,998 (760,463-823,888)	951,948 (901,485-1,003,617)	1,127,230 (1,038,355-1,217,166)	1,317,509 (1,187,739-1,451,528)	1,523,798 (1,349,626-1,702,430)