The Global Burden

Diabetes and Impaired Glucose Tolerance

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KEY MESSAGE

It is now recognized that it is the low- and middle-income countries that presently face the greatest burden of diabetes. However, many governments and public health planners still remain largely unaware of the current magnitude, or, more importantly, the future potential for increases in diabetes and its serious complications in their own countries.

Diabetes is now one of the most common non-communicable diseases globally. It is the fourth or fifth leading cause of death in most high-income countries and there is substantial evidence that it is epidemic in many low- and middle-income countries. Complications from diabetes, such as coronary artery and peripheral vascular disease, stroke, diabetic neuropathy, amputations, renal failure and blindness are resulting in increasing disability, reduced life expectancy and enormous health costs for virtually every society. Diabetes is certain to be one of the most challenging health problems in the 21st century.

The number of studies describing the epidemiology of diabetes over the last 20 years has been extraordinary. It is now recognized that it is the developing countries that presently face the greatest burden of diabetes. However, many governments and public health planners still remain largely unaware of the current magnitude, or, more importantly, the future potential for increases in diabetes and its serious complications in their own countries.

In addition to diabetes, the condition of impaired glucose tolerance (IGT) also constitutes a major public health problem, both because of its association with diabetes incidence and its own association with an increased risk of the development of cardiovascular disease.

The data presented in this report should be cautiously interpreted as general indicators of diabetes frequency, and the estimates will need to be revised as new and better epidemiological information becomes available. When reporting data in this form, various assumptions need to be made that give rise to a number of limitations. Caution should be used when interpreting data and their limitations will be discussed further throughout the text.

Comparison of country, regional, and even global rates from one report to the next can be misleading and should be performed with extreme caution. Large changes in the prevalence or numbers of people with diabetes from one edition of the *Diabetes Atlas* to another are usually due to the use of a more recent study rather than a genuine change in the profile of diabetes within that country. Thus, the inclusion of recent, and more reliable research brings us closer to the actual rates of diabetes, but also brings with it dangers in comparing global reports and estimates over time. These limitations need to always be considered, and the reader must realize that the key purpose of reports such as these is to stimulate action in the form of preventive and management programmes, as well as further research.

1.1 Prevalence and Projections

KEY MESSAGE

This report should act as a stimulus for intervention. Perhaps the most essential aspect of research is the action taken as a result of findings. Diabetes requires culturally appropriate intervention in order to reduce the enormous personal suffering and economic burden that *grows with this epidemic.*

At a glance

	2010	**2030**
Total world population (billions)	7.0	8.4
Adult population (age 20-79, billions)	4.3	5.6
World Diabetes and IGT (20-79 age group)		
Diabetes		
Comparative prevalence (%)	6.4	7.7
Number of people with diabetes (millions)	285	439
IGT		
Comparative prevalence (%)	7.8	8.4
Number of people with IGT (millions)	344	472

Introduction

Diabetes mellitus and lesser forms of glucose intolerance, particularly impaired glucose tolerance, can now be found in almost every population in the world and epidemiological evidence suggests that, without effective prevention and control programmes, diabetes will likely continue to increase globally [1].

Diabetes is recognized as a group of heterogeneous disorders with the common elements of hyperglycaemia and glucose intolerance, due to insulin deficiency, impaired effectiveness of insulin action, or both. Diabetes mellitus is classified on the basis of aetiology and clinical presentation of the disorder into four types: type 1 diabetes, type 2 diabetes, gestational diabetes, and other specific types.

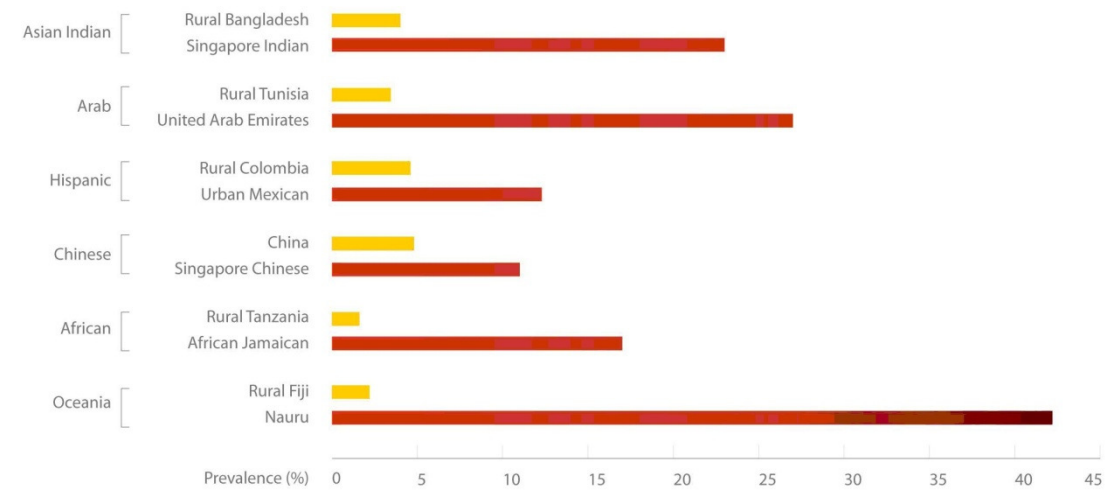
Type 1 diabetes usually accounts for only a minority of the total burden of diabetes in a population; it is the predominant form of the disease in younger age groups in most high-income countries. Type 1 diabetes is increasing in incidence in both rich and poor countries, and there is an indication of a shift towards type 1 diabetes developing in children at earlier ages (see Diabetes in the Young: a Global Perspective).

Type 2 diabetes constitutes about 85 to 95% of all diabetes in high-income countries [1] and accounts for an even higher percentage in low- and middle-income countries. Type 2 diabetes is now a common and serious global health problem, which, for most countries, has evolved in association with rapid cultural and social changes, ageing populations, increasing urbanization, dietary changes, reduced physical activity and other unhealthy lifestyle and behavioural patterns [1].

Figure 1 highlights the large range of type 2 diabetes prevalences even within the same or similar ethnic groups, when living under different conditions. Clearly, many of the differences between these rates reflect underlying behavioural, environmental and social risk factors, such as diet, level of obesity and physical activity.

FIGURE 1

Differences in the prevalence of type 2 diabetes among selected ethnic groups, 2007



Prevalence rates are age standardized to Segi's World Population for ages 30-64 year

Within ethnic groups, high rates of type 2 diabetes are usually found in migrant or urbanized populations that may have experienced a greater degree of lifestyle change. The lowest rates are generally found in rural communities where people have lifestyles incorporating high levels of physical activity.

The incidence and prevalence of type 2 diabetes is also reported to be increasing in children. Studies from America and Japan have demonstrated an increasing incidence [2,3] while other ethnic groups with high adult diabetes prevalence such as the Pima Indians [4] are also reporting increasing adolescent prevalences. The importance of this problem and the need for further research are emphasized by the authors of this report.

In addition to estimating the prevalence of diabetes for the years 2010 and 2030, data on case numbers and national prevalence of impaired glucose tolerance are presented for both years. Impaired glucose tolerance is an asymptomatic condition defined by elevated (though not diabetic) levels of blood glucose two hours after a 75g oral glucose challenge. Along with impaired fasting glucose (IFG), it is now recognized as being a stage in the transition from normality to diabetes. Thus, individuals with IGT are at high risk of progressing to type 2 diabetes, although such progression is not inevitable, and probably over 30% of individuals with IGT will return to normal glucose tolerance over a period of several years.

The decision to include data on IGT was based on two major factors associated with its presence: it greatly increases the risk of developing diabetes [5], and it is associated with the development of cardiovascular disease [6,7].

Classification criteria and reporting standards

Standardization of methods and reporting in diabetes epidemiology promotes comparison between studies and may permit the pooling of results from different studies [8,9]. However, there have been a number of different recommendations about diagnostic criteria over the last few decades, with the most important change being a reduction in the the diagnostic value of the fasting plasma glucose concentration from 7.8 to 7.0 mmol/l in the late 1990s [10,11]. Such differences in diagnostic criteria appear in the various studies reported, and it is important to realize that these differences have an impact on the reported prevalence of diabetes. In this section, the criteria used will be reported when they are known.

Global estimates of diabetes

The global burden of diabetes has been estimated several times [12-15]. In 1994, the International Diabetes Federation (IDF) Directory [12] included type 1 and type 2 diabetes estimates supplied by member nations. Using these data, IDF estimated that over 100 million people worldwide had diabetes. Also in 1994, McCarty et al [13] used data from population-based epidemiological studies and estimated that the global burden of diabetes was 110 million in 1994 and that it would likely more than double to 239 million by 2010.

WHO [14] also produced a report using epidemiological information and estimated the global burden at 135 million in 1995, with the number reaching 299 million by the year 2025. In 1997, Amos et al [15] estimated the global burden of diabetes to be 124 million people, and projected that this would increase to 221 million people by the year 2010. In the 2006 3rd edition of the *Diabetes Atlas* the estimates were of 246 million people worldwide with diabetes for 2007, and an anticipated 380 million for 2025 [16]. This edition is an update of those 2006 estimates, based principally on the same studies, but with 34 more recent studies included. Despite using different methodologies, and at times showing large differences in country-specific estimates, these reports have arrived at remarkably similar global figures of diabetes.

Methodology

The details of the methodology are provided in the Appendix, where details of the rationale and process of obtaining age-specific prevalences for those countries with adequate data are given.

The principal aspects of the determination of prevalence were:

1. Identification of studies through a detailed literature search, and contact with IDF member organizations.
2. Employing the methodology indicated in Appendix to create smoothed curves for prevalence (with respect to age).
3. Applying the prevalence rates to the population distribution of that country, and also to those other countries of similar ethnicity and economic circumstances, for which no local data were available.
4. Calculating the prevalence of diabetes (but not IGT) separately for urban and rural populations within developing countries (i.e. all countries except those countries classified by WHO[14] as market economies, or former socialist economies), assuming an urban/rural prevalence ratio of 2:1 for diabetes. The urban proportion of the population was derived from UN estimates [17].
5. The data for diabetes rates include both type 1 and type 2 diabetes, with a separate chapter providing estimates on type 1 diabetes in children and adolescents (see Diabetes in the Young: a Global Perspective).
6. The prevalence of diabetes throughout the *Diabetes Atlas* includes both undiagnosed and previously diagnosed diabetes.

This section contains prevalence estimates of diabetes and IGT for the years 2010 and 2030, and although the Tables contain data listed to one decimal point, it should not be inferred that this indicates the degree of precision, but rather to facilitate calculations and comparisons. In general, no predictions of diabetes or IGT numbers should be taken as having reliability of more than one significant figure.

The consequence of applying current age- and gender-specific prevalence rates to estimate prevalences and number of cases for the year 2030 is that only changes in the age and urban/rural distribution of the population will affect the estimates. Since it is likely that the age-specific prevalence rates (the prevalence at any given age) will rise due to increasing obesity, the figures are probably underestimates. Indeed, a recent report from Australia illustrates this very clearly. Using a different method for estimating the future prevalence of diabetes than is used in the *Diabetes Atlas*, and analysing a slightly older age-group, Magliano et al estimated that if risks for diabetes remain stable, the prevalence of diabetes in Australia will be 11.4% in 2025 [18]. However, if risks continue to rise at a similar rate to that which has been observed in the last two to three decades (mainly as a result of an increasing prevalence of obesity), and mortality continues to fall, the prevalence of diabetes will be 17.0% in 2025.

Results

The main aim of this section is to estimate the prevalence of diabetes mellitus and IGT for each country for the years 2010 and 2030. Data are provided for 216 countries and territories, which have been allocated mostly on a geographical basis into one of the seven IDF regions: Africa (AFR), Middle East and North Africa (MENA), Europe (EUR), North America and Caribbean (NAC), South and Central America (SACA), South-East Asia (SEA), and the Western Pacific (WP).

The prevalence of diabetes and IGT, as reported in the various studies used, has been applied to each country's population in two ways:

1. The age and sex structure of each country has been used to provide an accurate estimate of the percentage of adults affected within each country.
2. The age and sex structure of the world population has been used to provide a prevalence estimate for each country that can readily be compared to other countries.

The data presented are for all diabetes combined, i.e. type 1 and 2 diabetes, and for IGT. Only adults aged from 20 to 79 years of age are considered because the majority of all people who have diabetes and IGT are adults. Type 1 diabetes in children and adolescents is addressed separately.

It should be noted that column numbers in the Tables may not always exactly be the sum of the components because of rounding effects.

Two sets of prevalence estimates

Prevalences have been calculated for each country and region in two ways:

1. National or regional prevalence
2. Comparative prevalence

National or regional prevalence

The national or regional prevalence indicates the percentage of each country's or region's population that has diabetes. It is ideal for assessing the burden of diabetes for each country or region. However, because the prevalence of diabetes increases with age, it cannot be used for comparing risk of diabetes between countries or regions which have different age structures. For example, the national prevalence of diabetes for 2010 is higher in Japan (7.3%) than in Samoa (6.7%), but we cannot tell if this is just because Japan has an older population or because Japanese are more prone to develop diabetes than are Samoans.

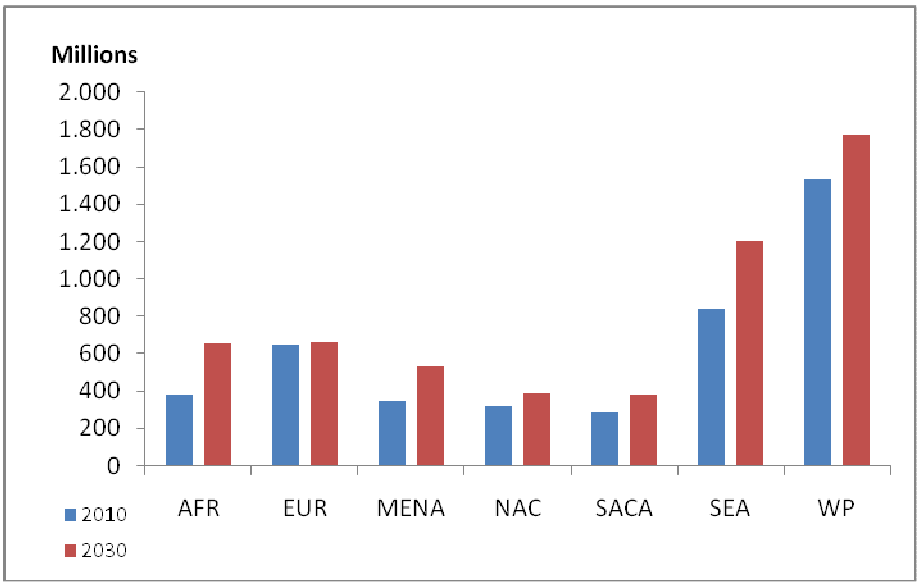
Comparative prevalence

The comparative prevalence has been calculated by assuming that every country and region has the same age profile (the age profile of the world population has been used). This removes the differences of age between countries and regions, and makes this figure ideal for making comparisons. For example, the comparative prevalence for 2010 shows that Samoans (7.7%) are in fact more prone to have diabetes than are Japanese (5.0%). The comparative prevalence should not be used for assessing the proportion of people within a country or region who have diabetes.

Demography

The total populations of the regions and the population aged from 20-79 years are shown in Figure 2. It is clear that the Western Pacific Region, which includes China, and the South-East Asian Region, which has India as a member, have the greatest numbers of people.

Figure 2 World population (20-79 age group) by region, 2010 and 2030



Diabetes

Table 1 Regional estimates for diabetes (20-79 age group), 2010 and 2030

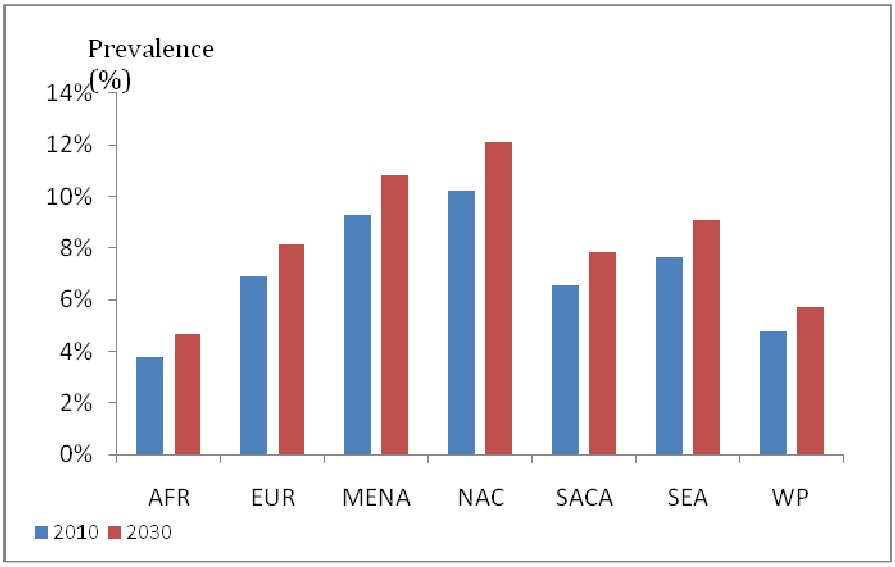
	2010			2030			2010/2030
	Population (20-79)	No. of people with diabetes	Comparative diabetes prevalence	Population (20-79)	No. of people with diabetes	Comparative diabetes prevalence	Increase in the no. of people with diabetes
Region	**millions**	**millions**	**%**	**millions**	**millions**	**%**	**%**
AFR	379	12.1	3.8	653	23.9	4.7	98.1%
EUR	646	55.4	6.9	659	66.5	8.1	20.0%
MENA	344	26.6	9.3	533	51.7	10.8	93.9%
NAC	320	37.4	10.2	390	53.2	12.1	42.4%
SACA	287	18.0	6.6	382	29.6	7.8	65.1%
SEA	838	58.7	7.6	1,200	101.0	9.1	72.1%
WP	1,531	76.7	4.7	1,772	112.8	5.7	47.0%
Total	**4,345**	**284.8**	**6.4**	**5,589**	**438.7**	**7.7**	**54.0%**

Prevalence

It is estimated that approximately 285 million people, or 6.4%, in the age group 20-79 will have diabetes worldwide in 2010. About 70% of these live in low-and middle-income countries. The worldwide estimate is expected to increase to some 438 million, or 7.7% of the adult population, by 2030 (see Table 1). The largest increases will take place in the regions dominated by developing economies.

The Western Pacific Region with 77 million and the South-East Asian Region with 59 million will have the largest number of people with diabetes in 2010. However the comparative prevalence rate (adjusted to the world population) of 4.7% for the Western Pacific Region is significantly lower than 9.3% for the Middle East and North African Region, and 10.2% in the North America and Caribbean Region (see Figure 3).

Figure 3 Prevalence of diabetes* (20- 79 age group) by region, 2010 and 2030



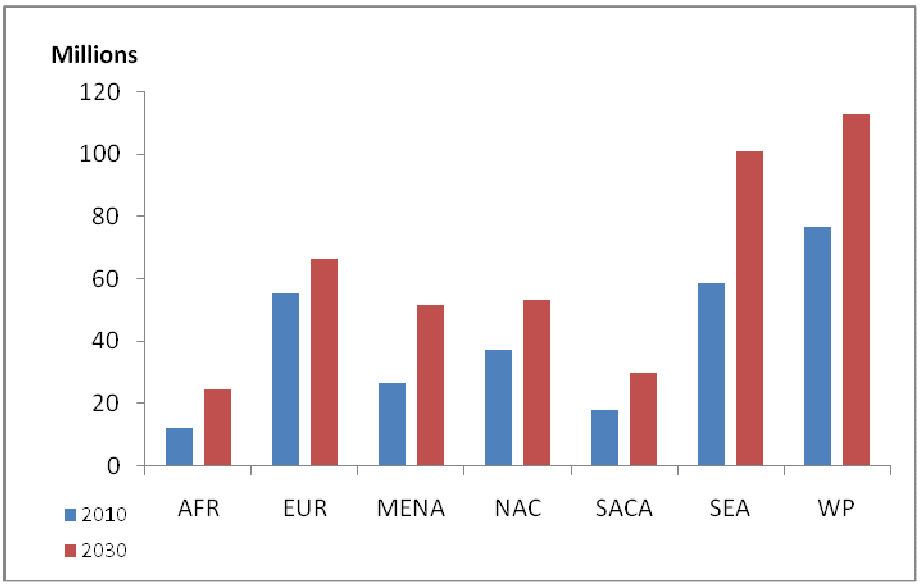
*Comparative prevalence

By 2030 the diabetes prevalences of all regions will have increased, with near doubling of numbers affected for Africa, and the Middle East and North Africa. The highest prevalences will continue to be in North America and Caribbean, the Middle East and North Africa, and South-East Asia.

The age structure of the population has a large effect on the relative prevalences. The European, and North America and Caribbean Regions have considerably older populations, so that without reference to an age-standardized population, the European Region has the second highest prevalence after North America and Caribbean for both years (see Tables 17 and 18). When adjusted to the same population structure, the European Region has the fourth highest prevalence for both 2010 and 2030 (see Table 1).

In 2030 the Western Pacific Region will still have the largest number of people with diabetes, some 113 million, representing an almost 50% increase from 2010 (see Figure 4).

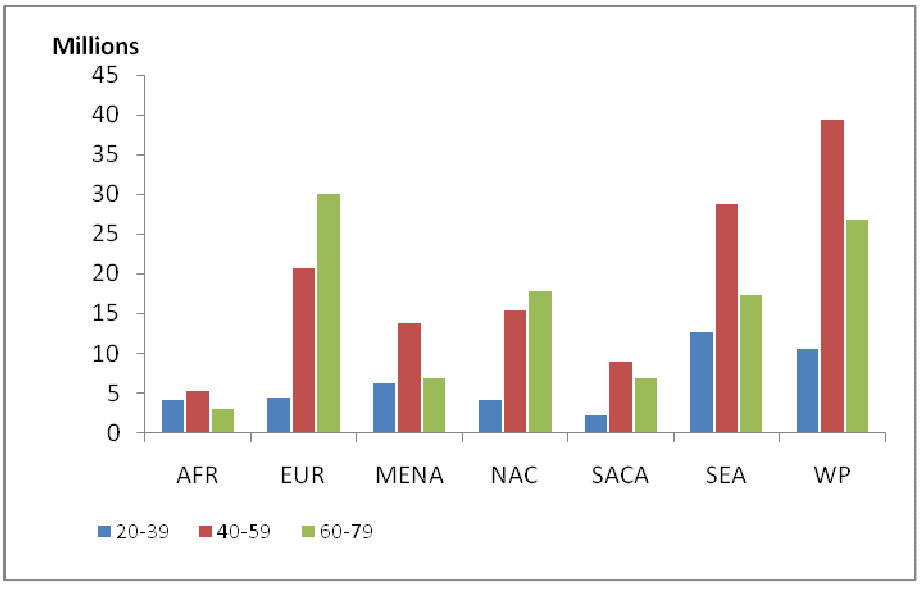
Figure 4 Number of people with diabetes (20-79 age group) by region, 2010 and 2030



Age distribution

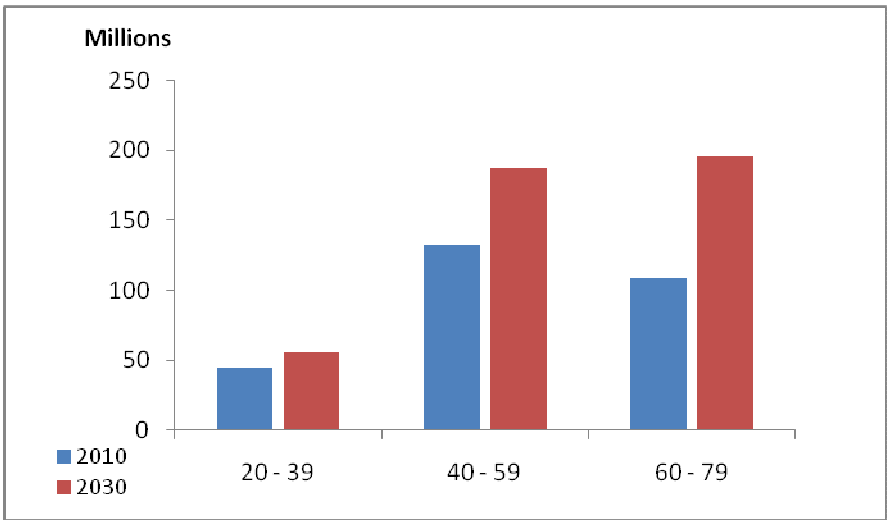
The 40-59 year age group currently has the greatest number of people with diabetes with some 132 million in 2010, of whom more than 75% live in low- and middle-income countries (see Figure 5).

Figure 5 Number of people with diabetes in age groups by region, 2010



By 2030, there will be 188 million people with diabetes aged 40-59, 83% of whom will be in newly developed or developing countries. There will be even more in the 60-79 age group, at approximately 196 million (see Figure 6).

Figure 6 Number of people with diabetes by age group, 2010 and 2030



Gender distribution

The estimates for both 2010 and 2030 showed little gender difference in the number of people with diabetes. For 2010 there are expected to be 1.1 million more women than men with diabetes (143 million women vs 142 million men). However this difference is expected to be almost six million by 2030 (222 million vs 216 million).

Urban/rural distribution

Separate estimates for urban and rural populations were undertaken for low and middle-income countries, and in 2010 the expected number of people with diabetes in urban areas will be 113 million, compared to 78 million in rural areas (including separate urban/rural classification for developing countries in the European Region). By 2030 it is expected that this discrepancy will increase to 228 million urban and 99 million rural people with diabetes.

Impaired Glucose Tolerance

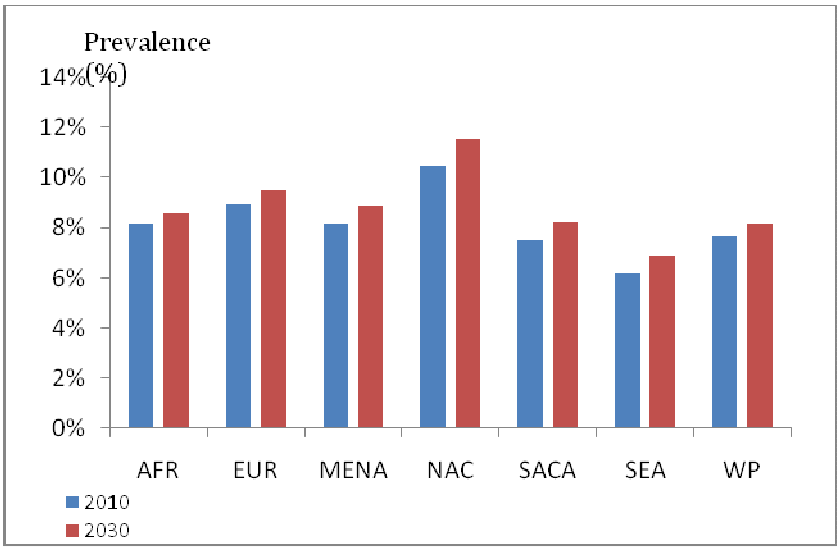
Table 2 Regional estimates for impaired glucose tolerance (IGT) (20-79 age group), 2010 and 2030

	2010			2030			2010/2030
	Population (20-79)	No. of people with IGT	Comparative IGT prevalence	Population (20-79)	No. of people with IGT	Comparative IGT prevalence	Increase in the no. of people with IGT
Region	millions	millions	%	millions	millions	%	%
AFR	379	26.9	8.1	653	47.3	8.6	75.7%
EUR	646	66.0	8.9	659	72.2	9.5	9.5%
MENA	344	24.4	8.2	533	43.1	8.9	76.8%
NAC	320	36.6	10.4	390	49.1	11.6	34.1%
SACA	287	21.2	7.5	382	31.3	8.2	47.9%
SEA	838	48.6	6.2	1,200	76.4	6.9	57.4%
WP	1,531	119.9	7.7	1,772	152.6	8.1	27.3%
Total	**4,345**	**343.5**	**7.8**	**5,589**	**472.2**	**8.4**	**37.4%**

Prevalence

It is estimated that approximately 344 million, or 7.8% in the age group 20 – 79, will have IGT in 2010, of whom the vast majority live in low- and middle-income countries. By 2030 the number of people with IGT is projected to increase to 472 million, or 8.4% of the adult population (see Table 2).

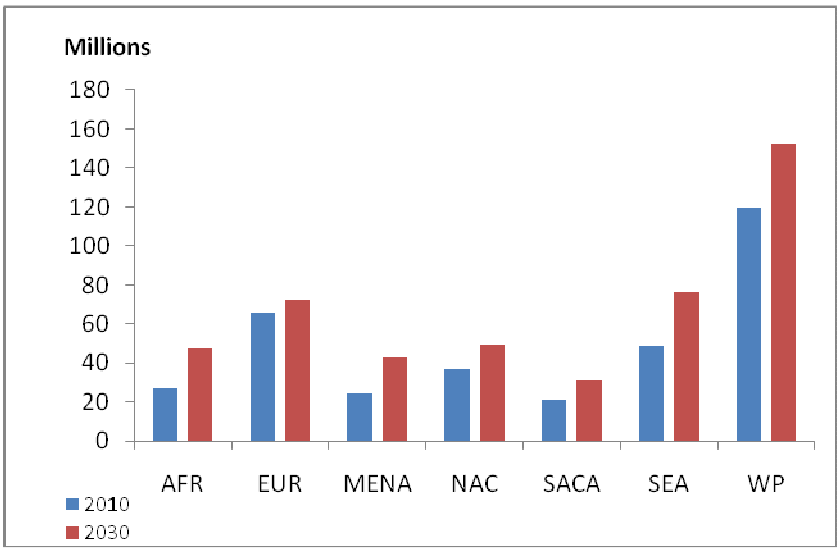
Figure 7 Prevalence of impaired glucose tolerance* (20-79 age group) by region, 2010 and 2030



*Comparative prevalence

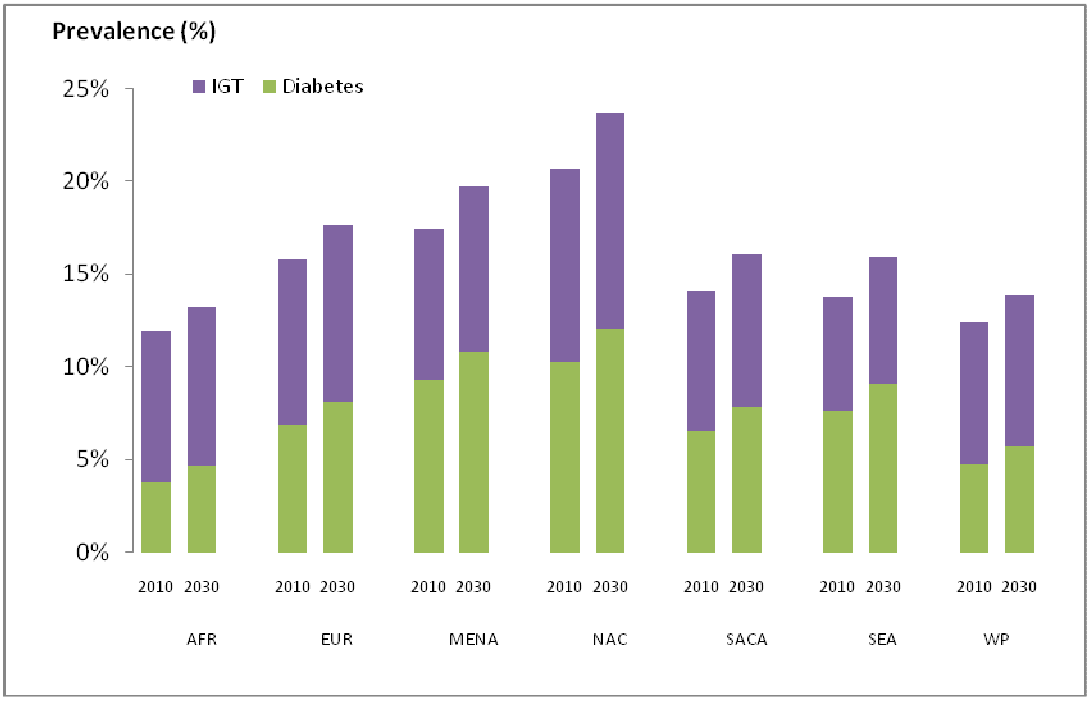
The Western Pacific Region is expected to have the greatest number of people with IGT in 2010 with some 120 million, although the North America and Caribbean Region has the highest prevalence rate with 10.4% of the adult population affected by IGT (see Figure 7). By 2030, the absolute number of people with IGT is likely to increase by 30-100% in most regions, with the greatest increases in Africa, and the Middle East and North Africa (see Figure 8).

Figure 8 Number of people with impaired glucose tolerance (20-79 age group) by region, 2010 and 2030



The prevalence of IGT is generally similar to that of diabetes, but somewhat higher for the African and Western Pacific Regions, and slightly lower in the North America and Caribbean Region (see Figure 9).

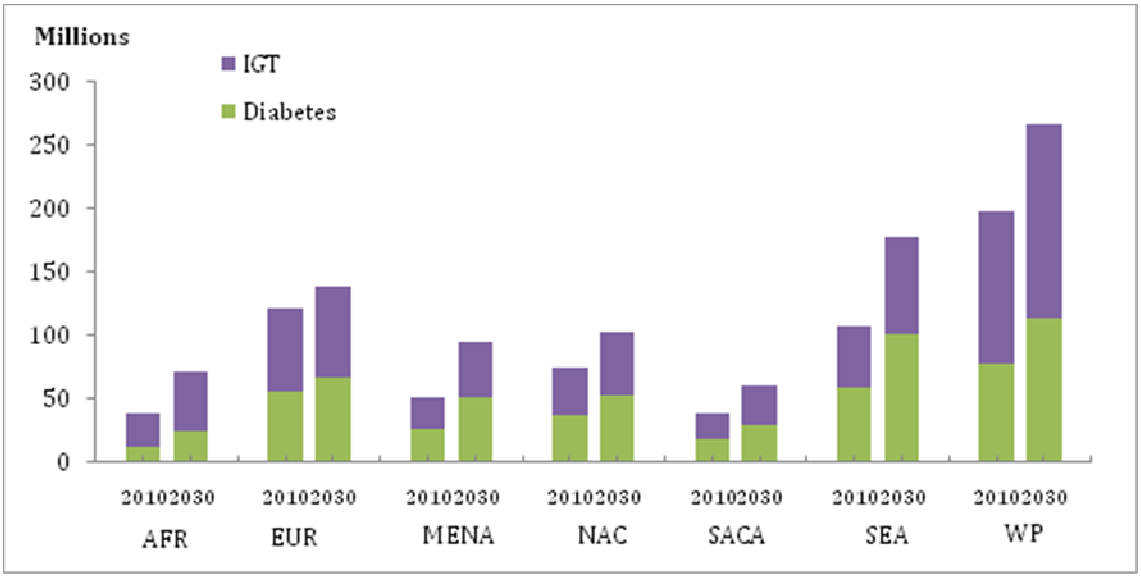
Figure 9 Prevalence of diabetes and impaired glucose tolerance* (20-79 age group) by region, 2010 and 2030



*Comparative prevalence

Figure 10 highlights the large increases in absolute numbers of both diabetes and IGT over the 20-year period.

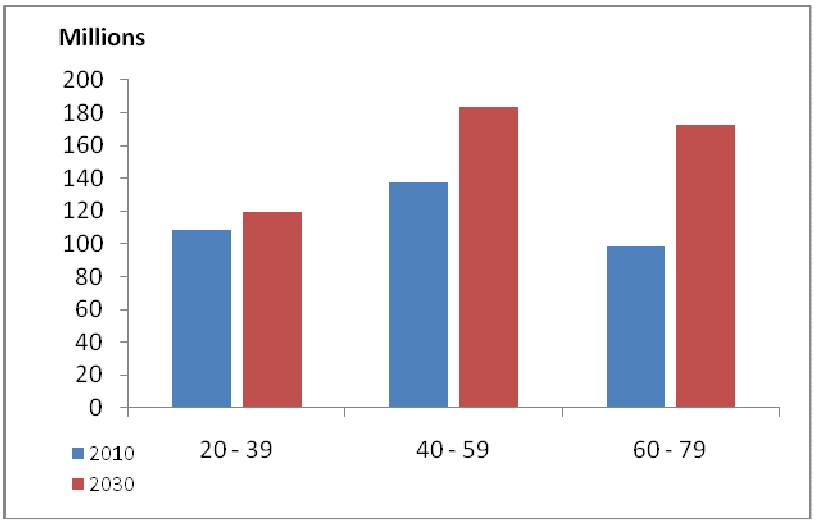
Figure 10 Number of people with diabetes and impaired glucose tolerance (20-79 age group) by region, 2010 and 2030



Age distribution

As with diabetes, the 40-59 year age group is expected to have the greatest number of people with IGT for 2010 with 138 million, and this will remain true in 2030 with 186 million as shown in Figure 11. It is also of note that nearly one-third of all those who will have IGT for 2010 are in the 20-39 year age group.

Figure 11 Number of people with impaired glucose tolerance by age group, 2010 and 2030



REGIONAL OVERVIEW

AFRICA

At a glance

	2010	2030
Total population (millions)	825	1,249
Adult population (millions) (20-79 years)	379	653
Diabetes and IGT (20-79 age group)		
Diabetes		
Regional prevalence (%)	3.2	3.7
Comparative prevalence (%)	3.8	4.7
Number of people with diabetes (millions)	12.1	23.9
IGT		
Regional prevalence (%)	7.1	7.2
Comparative prevalence (%)	8.1	8.6
Number of people with IGT (millions)	26.9	47.3

The landscape of sub-Saharan Africa is dominated by the twin disasters of poverty and HIV infection. While HIV infection and consequent AIDS so dominate the health needs for sub-Saharan Africa, there is only a small proportion of the population reaching ages at which type 2 diabetes becomes a major health concern. In 2010 only 9.8% of the population will be 50 years of age or older, and this is expected to increase to only 11.5% by 2030. Thus the effects of HIV and malnutrition combine to greatly reduce the size of groups most at risk for type 2 diabetes.

Diabetes and IGT prevalence

It is estimated that there will be 12.1 million people with diabetes, or 3.2% of the adult population, in the African Region in 2010 (see Table 7). There are marked discrepancies between the rates of diabetes prevalence among different communities in sub-Saharan Africa. The highest prevalences are among the ethnic Indian population of Tanzania [19] and South Africa [20]. The studies from Tanzania [21,22] (urban:rural ratio of 5:1) and Cameroon[23] (ratio of 2:1) both confirm the marked urban/rural discrepancy in diabetes prevalence, with the consequent likely increases in numbers with diabetes as more people move to urban areas.

The availability of prevalence data for sub-Saharan Africa is very limited, and nearly all the data here were derived from studies from South Africa [24-27], Tanzania [21,22], Ghana [28], Cameroon [23,29] and Sudan [30]. This meant that data from these studies were applied to populations living up to several thousand kilometres from where the study was undertaken. In the three years since the last edition of the *Diabetes Atlas (2006)*, only two further published studies [27,31] have been made available for this report.

The use of the Réunion data [31] hardly changed the estimates for and for the Seychelles,which had previously both been based on old data from Mauritius [32]. The new South African report [27] has not changed prevalence estimates as it represents publication of data previously made available to us.

That the data should need to be extrapolated to such distant and probably dissimilar countries and populations indicates the great need for further epidemiological investigation in the region. Such a need can also be linked with the high proportion of diabetes that has not been previously detected, but found only at the time of surveying. Undiagnosed diabetes accounted for 85% of those with diabetes in the Motala report from South Africa [27], 80% of those with the condition in Cameroon [29], 70% in Ghana [28] and over 80% of the Tanzania survey [22] (See section on Known and Newly Diagnosed Diabetes).

The impact of type 2 diabetes is bound to continue if nothing is done to curb the rising prevalence of impaired glucose tolerance, which now varies between 0.9% and 14.7% of the local population (see Table 9).

EUROPE

At a glance

	2010	2030
Total population (millions)	891	897
Adult population (millions) (20-79 years)	646	659
Diabetes and IGT (20-79 age group)		
Diabetes		
Regional prevalence (%)	8.5	10.0
Comparative prevalence (%)	6.9	8.1
Number of people with diabetes (millions)	55.4	66.5
IGT		
Regional prevalence (%)	10.2	11.0
Comparative prevalence (%)	8.9	9.5
Number of people with IGT (millions)	66.0	72.2

There exists a great diversity of populations and affluence among the 54 countries and territories in the European Region, with gross domestic product (GDP) varying from over USD85,000 per capita for Luxembourg to less than USD2,000 for several of the former socialist republics [33].

Diabetes and IGT prevalence

The number of people with diabetes in this vast region is expected to reach 55.2 million, or 8.5% of the adult population in 2010. National prevalence rates for diabetes show a wide variation from 2.1% in Iceland to 12.0% in Germany (see Table 12). Abnormal glucose tolerance in this region shows little association with affluence, and there was no evidence that any difference in urban/rural prevalence existed except in Turkey [34], and Uzbekistan [35,36] (with the data from Uzbekistan being extrapolated to the neighbouring countries of Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan).

The lack of data from several of the former socialist republics required that data for many countries be extrapolated from two studies from Poland - urban Krakow [37], and the urban and rural areas near Lublin [38], as well as more recent reports from Bulgaria [39], Croatia [40], Slovakia [41] and Slovenia [42]. These data suggested high levels of diabetes currently, and such high levels of IGT that the diabetes prevalence will almost certainly increase by 2030 to levels above those indicated in Table 13, as these took no account of the higher incidence of diabetes among those with IGT.

Surprisingly there is a paucity of good data from many of the more affluent western countries of the region. Only one country within the region (Turkey) has data available from a nationally-representative study [34]. Much of the data for Europe is based on surveys establishing the prevalence of 'known diabetes'. This applied to reports from Finland [43], France [44],Germany [45], Israel [46], Italy [47], Netherlands [48], Norway [49], Slovenia [42,50] and United Kingdom [51- 54]. The prevalence rates of these reports were generally multiplied by a factor of 1.5 to estimate total diabetes, based on other European data [55-58], but with the United Kingdom rates multiplied only by 1.5, based on local advice and no adjustment was made for one German report [45] based on other data by that author [59].

In comparison with the third edition of the *Diabetes Atlas*, national data from several countries - Bulgaria, Croatia, Portugal, Slovakia and Slovenia – have been used, which has reduced the need to extrapolate from other countries. Nonetheless, there remains a marked lack of data for eastern Europe.

To a large degree the high prevalence of abnormal glucose tolerance is a consequence of the relatively elderly population of the European Region, such that in 2010 a third of the population is predicted to be over 50 years of age, and this is expected to increase to over 40% by 2030. Thus the number of people with diabetes and IGT will increase, although the total regional population will have decreased. This will place an increasing financial burden on the declining working-age population to provide resources for the health consequences of rising diabetes prevalence in the older population. The region has the resources to be at the forefront of efforts to amend lifestyle factors contributing to the prevalence of diabetes.

MIDDLE EAST AND NORTH AFRICA

At a glance

	2010	2030
Total population (millions)	617	848
Adult population (millions) (20-79 years)	344	533
Diabetes and IGT (20-79 age group)		
Diabetes		
Regional prevalence (%)	7.7	9.7
Comparative prevalence (%)	9.3	10.8
Number of people with diabetes (millions)	26.6	51.7
IGT		
Regional prevalence (%)	7.1	8.1
Comparative prevalence (%)	8.2	8.9
Number of people with IGT (millions)	24.4	43.1

Studies performed in six countries of the Middle East and North African Region — Bahrain [60], Egypt [61,62], Kuwait [63], Oman [64], Saudi Arabia [65,66] and United Arab Emirates [67,68] — have shown their current diabetes prevalence to be among the world's 10 highest, and a similar situation applies for the IGT prevalences of some of these countries (see Tables 17 and 19). The ageing of populations, together with socio-economic changes and westernization, has resulted in the dramatic increase in the diabetes prevalence.

Over the past three decades, major social and economic changes have occurred in the majority of these nations. These include progressive urbanization, decreasing infant mortality and increasing life expectancy. Rapid economic development, especially among the more wealthy oil-producing countries, has been associated with tremendous changes in lifestyle towards the westernized pattern reflected by changes in nutrition, less physical activity, tendency to increased obesity and more smoking [69,70].

Diabetes and IGT prevalence

The explosion of diabetes in the MENA Region is mainly due to type 2 diabetes. As with many other countries with high diabetes prevalence, the onset of type 2 diabetes tends to occur at a relatively young age. An estimated 26.6 million people, or 7.7% of the adult population, will have diabetes in 2010 (see Table 17), with the number of those with diabetes expected to nearly double by 2030. Similarly, the number of people with IGT is also expected to rise markedly by 2030, increasing the likelihood of further increases in the prevalence of diabetes as the century proceeds.

The comparative prevalences for diabetes for 2030, when applied to a world standard population distribution rather than the young population distribution common in the region, are over 20% in the United Arab Emirates [67], 19% in Saudi Arabia [71-73], nearly as high for the Gulf countries, but even in much less affluent Pakistan the prevalence is 10.5% [74-76].

IN CONTRAST TO AFRICA, THERE IS A LARGE NUMBER OF STUDIES REPORTING DIABETES PREVALENCE, SO THAT OF THE 22 COUNTRIES OF THE REGION, 18 HAVE DATA AVAILABLE, FROM WHICH NATIONAL PREVALENCE ESTIMATES COULD BE DERIVED (SEE TABLE 21). SINCE THE THIRD EDITION OF THE DIABETES ATLAS, ADDITIONAL DATA HAVE BEEN INCLUDED FOR TUNISIA [77] AND THE UNITED ARAB EMIRATES [68].

NORTH AMERICA AND CARIBBEAN

At a glance

	2010	2030
Total population (millions)	477	555
Adult population (millions) (20-79 years)	320	390
Diabetes and IGT (20-79 age group)		
Diabetes		
Regional prevalence (%)	11.7	13.6
Comparative prevalence (%)	10.2	12.1
Number of people with diabetes (millions)	37.4	53.2
IGT		
Regional prevalence (%)	11.4	12.6
Comparative prevalence (%)	10.4	11.6
Number of people with IGT (millions)	36.6	49.1

The North America and Caribbean Region has the highest comparative prevalence of diabetes among the IDF regions with 10.2%, or 37.4 million people with diabetes in the adult population for 2010 (see Table 22). The region is expected to continue to have the highest prevalence in 2030 when 12.1% of adults are anticipated to have diabetes.

Although the region comprises 26 countries and territories, 68% of the adult population currently resides in the United States of America (USA), with a further 21% living in Mexico and 8% in Canada, so that only 3% of the region's adult population resides in the other 23 smaller nations.

Diabetes and IGT prevalence

The high prevalence of abnormal glucose tolerance for Canada and the USA are very much a consequence of their older age distribution, such that in 2010, 32% of their population will be over 50 years of age, and this is expected to rise to 36% by 2030[78]. This is in contrast to 18% of the Mexican population and 16% of the Caribbean population being over 50 years of age, increasing to 24% and 19%, respectively, by 2030.

There has been a marked increase in the estimate of the number of people with IGT for this region. The prevalences here for USA and Canada are based on the most recent USA data (NHANES 2005-2006) [79] which were derived from a relatively small sample (2806 people), hence with large confidence intervals. This survey provided estimates of IGT as well as impaired fasting glucose (IFG), rather than just IFG; the IFG estimates were considerably higher than IGT but were based on the new cut-off of 5.6 mmol/l [80].

As all the Caribbean islands other than Barbados, Guadeloupe, Haiti and Martinique had their estimates extrapolated from Jamaican data [81], the differences in prevalence between these countries are a consequence only of their different age distributions.

There were new studies of diabetes prevalence used for the USA [79], Canada [82,83] and Haiti [84], which increased the USA and Canadian prevalence estimates, but decreased that for Haiti.

SOUTH AND CENTRAL AMERICA

At a glance

	2010	2030
Total population (millions)	465	563
Adult population (millions) (20-79 years)	287	382
Diabetes and IGT (20-79 age group)		
Diabetes		
Regional prevalence (%)	6.3	7.8
Comparative prevalence (%)	6.6	7.8
Number of people with diabetes (millions)	18.0	29.6
IGT		
Regional prevalence (%)	7.4	8.2
Comparative prevalence (%)	7.5	8.2
Number of people with IGT (millions)	21.2	31.3

The South and Central American Region encompasses 20 countries and territories, most of which are still developing economically. It is estimated that 18 million people, or 6.3% of the adult population, will have diabetes in 2010 (see Table 27). In the following 20 years, the number of people with diabetes is expected to rise dramatically to almost 30 million.

Diabetes and IGT prevalence

Considerable extrapolation was required in this region as only seven countries have any epidemiological data from which prevalence estimates could be derived. The only new data for estimating prevalences for countries of this region was from Nicaragua [148].

South America and Central America have similar age distribution profiles to each other. For 2010 about 20% of the population will be older than 50 years, with this figure likely to increase to 28% by 2030. Thus the region has a markedly younger age distribution than most of North America (which has 32% 50 years or older for 2010). The likelihood is that diabetes will become a more major health priority for the region given the decreasing difference in age distribution between this region and North America, and with the continuing momentum for urbanization.

SOUTH-EAST ASIA

At a glance

	2010	2030
Total population (millions)	1,439	1,788
Adult population (millions) (20-79 years)	838	1,200
Diabetes and IGT (20-79 age group)		
Diabetes		
Regional prevalence (%)	7.0	8.4
Comparative prevalence (%)	7.6	9.1
Number of people with diabetes (millions)	58.7	101.0
IGT		
Regional prevalence (%)	5.8	6.4
Comparative prevalence (%)	6.2	6.9
Number of people with IGT (millions)	48.6	76.4

The South-East Asian Region comprises only seven countries. The adult population of India in 2010 will account for 85% of that of the region. Mauritius has the highest per capita GDP at USD12,400, while the other countries all have per capita GDPs of less than USD5,000, although India which has had an annual growth of 7.3% was experiencing economic development at a faster pace than almost anywhere in the world, except its neighbour, China [33].

Diabetes and IGT prevalence

There will be an estimated 58.7 million people, or 7.0% of the adult population, with diabetes in the region in 2010 (see Table 32). Economic progress is inevitably associated with increasing urbanization, and it appears that features of urban life tend to increase the prevalence of diabetes among people of Indian ethnic background to a greater extent than for other populations [85].

The second edition of the *Diabetes Atlas* used data from a single report [86], based on a population-based survey from the six largest Indian cities, and extrapolated these results nationwide, applying a 4:1 urban:rural ratio from these findings for diabetes prevalence (the majority of the Indian population is classified as rural). For this report, as with the third edition, two additional reports of population data collected on a nationwide basis [87,88] were used, which suggest that diabetes prevalence in smaller urban centres (100,000 – 1,000,000 inhabitants) tends to be about half of the larger cities, but still twice that of rural areas (less than 100,000 people).

The anticipated increase in regional diabetes prevalence from 7.0% for 2010 to 8.4% in 2030 is very much a consequence of the increasing life expectancy in India (the proportion of the population over 50 years is expected to increase from 16% to 23% between 2010 and 2030 [78]), and of the urbanization of the population (the proportion living in urban settings will increase from 33% to 46% [17] - see Table 33). Evidence suggests that in more affluent parts of the country, the rural prevalence is higher than in less affluent rural areas [89], indicating that increasing economic growth will increase diabetes prevalence in India even more than these possibly conservative estimates have indicated.

With regard to IGT, the same pattern as for diabetes emerged, with large cities having twice the prevalence of smaller cities, for which the prevalence is twice that of rural areas.

Mauritius, the second smallest country of the region, highlights the extent to which people of Indian ethnicity appear predisposed to diabetes, when exposed to more affluent economic circumstances. This island has one of the world's highest diabetes prevalences (of countries with representative prevalence data); currently 16% and expected to be 20% by 2030, and a high IGT prevalence of 13.5% for 2010.

The use of more recent data for Mauritius [90] and new rural data for Bangladesh [91] increased the prevalence estimates for both countries.

WESTERN PACIFIC

At a glance

	2010	2030
Total population (millions)	2,237	2,444
Adult population (millions) (20-79 years)	1,531	1,772
Diabetes and IGT (20-79 age group)		
Diabetes		
Regional prevalence (%)	5.0	6.4
Comparative prevalence (%)	4.7	5.7
Number of people with diabetes (millions)	76.7	112.8
IGT		
Regional prevalence (%)	7.8	8.6
Comparative prevalence	7.7	8.1
Number of people with IGT (millions)	119.9	152.6

The world's most populous region contains 39 disparate countries and territories with predicted populations for 2010 ranging from 1.4 billion for China to less than 5,000 in the smallest Pacific island nations of Niue and Tokelau. Similarly the economic profile varies from per capita GDPs of over USD35,000 for Australia, Hong Kong, Japan and Singapore to less than USD3,000 in one-third of the other countries [33].

The less economically advanced countries struggle with the double burden of managing infectious diseases and the diabetes epidemic with limited resources. Many also face a lack of government awareness of the seriousness of the diabetes threat to their populations.

Diabetes and IGT prevalence

Not surprisingly there is a great diversity in the prevalence of diabetes, with the world's highest found in the Micronesian population of Nauru (31% of the adult population).

There have been new data for Indonesia [92], Malaysia [93] and New Zealand [94]. The Indonesian report, which replaces a report from 1983 [95] has led to much higher prevalence for that country and for Timor-Leste to which it has been extrapolated. The Malaysian data replace the use of data from Singapore [96] for Malaysia and for Brunei Darussalam (without markedly affecting the prevalence estimates for those countries), and the New Zealand data enabled blood glucose measurement surveying to replace estimates based only on self-reported diabetes [97].

The diabetes epidemic has the greatest potential to explode in China, simply because of its population size. Although the current national prevalence there of 4.2% is among the region's lowest, the high prevalence among Chinese populations in the more urbanized and affluent cities of Hong Kong and Singapore indicate what may develop as China rapidly urbanizes and expands economically. The data indicated for 2030 in Table 38 are likely to represent an underestimate of China's diabetes problem if it continues to develop economically faster than almost any other country in the world.

Discussion

In order to make national, regional and global predictions for the prevalence of diabetes, a number of assumptions needed to be made, and therefore the results are subject to a number of limitations. In addition to those highlighted in the Methodology section in the Appendix, some of these are that:

- The studies included in this section often used differing screening techniques. The majority of studies used an oral glucose tolerance test (OGTT) to screen for diabetes. However, some studies used a fasting blood glucose (FBG), some a two-hour blood glucose (2BG), some a random blood glucose (RBG), and some based their data on self-report (SR). It is difficult to control for this unless, for example, only those studies that used an OGTT were included. This would also have the effect of excluding findings from countries lacking OGTT data, which would result in data for those countries being extrapolated from another country. The other consequence of incorporating studies that had no OGTT data is that impaired fasting glucose (IFG) rather than IGT represented the non-diabetic, but abnormal, glucose metabolism.

- There were inconsistencies in the diagnostic criteria adopted, resulting from the updating of the diagnostic criteria in 1997 [10]. The use of a lower fasting diagnostic criterion for diabetes will tend to result in a higher prevalence of diabetes and lower prevalence of IGT. The diagnostic criteria used for each study are indicated in the Tables on data sources.

- Studies from several countries (Canada, France, Italy, Netherlands, Norway, Slovenia, United Kingdom) only provided data on self-reported diabetes. To account for undiagnosed diabetes, the prevalences of diabetes for the United Kingdom and Canada were multiplied by a factor of 1.5, in accordance with local recommendation (UK) and USA data (Canada) [79], and for the other countries doubled, based on data from a number of nearby countries [55-58].

- If a country lacked data, it was assumed that their age- and sex-specific prevalence rates of diabetes mellitus were the same as those rates in another socio-economically, ethnically and geographically similar country.

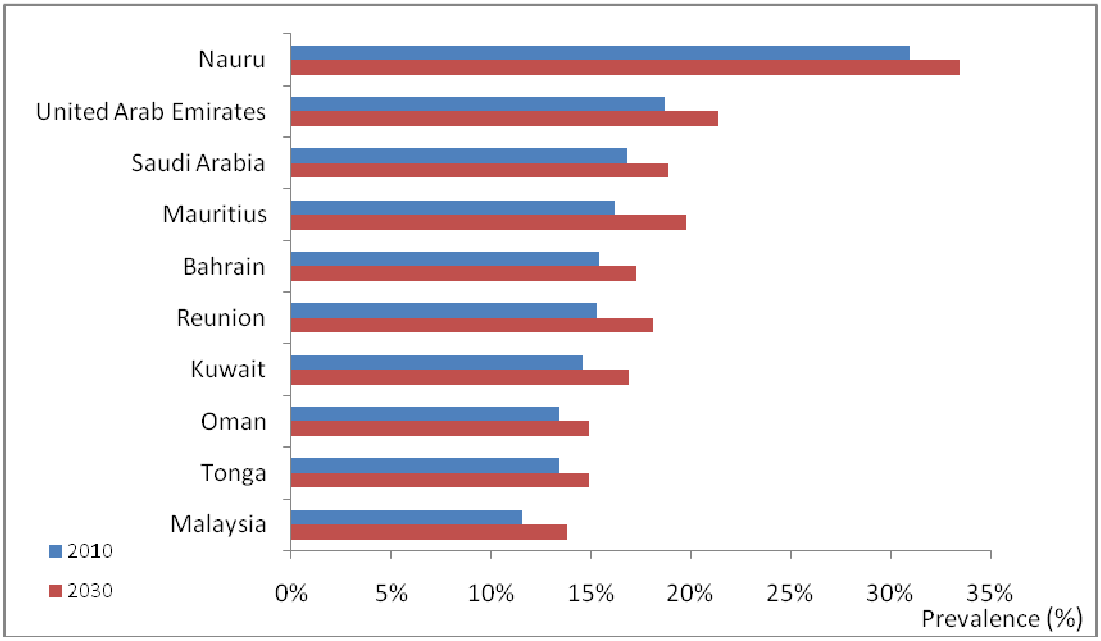
- Some of the studies were performed more than a decade ago, and thus may not reflect current prevalence rates. The prevalences and numbers of people predicted based on such studies are likely to be conservative estimates.

With the forces of globalization and industrialization proceeding at an increasing rate, the prevalence of diabetes is predicted to increase dramatically over the next few decades. The resulting burden of complications and premature mortality will continue to present itself as a major and growing public health problem for most countries.

It is hoped that this report will assist in monitoring the trends of diabetes prevalence over time, by adopting the same methodology for future reports. A report such as this should also be an indicator of a country's and region's 'database' of research. It should stimulate research in those countries lacking data, as well as encourage further and improved research in those countries where available data may not be representative of national rates.

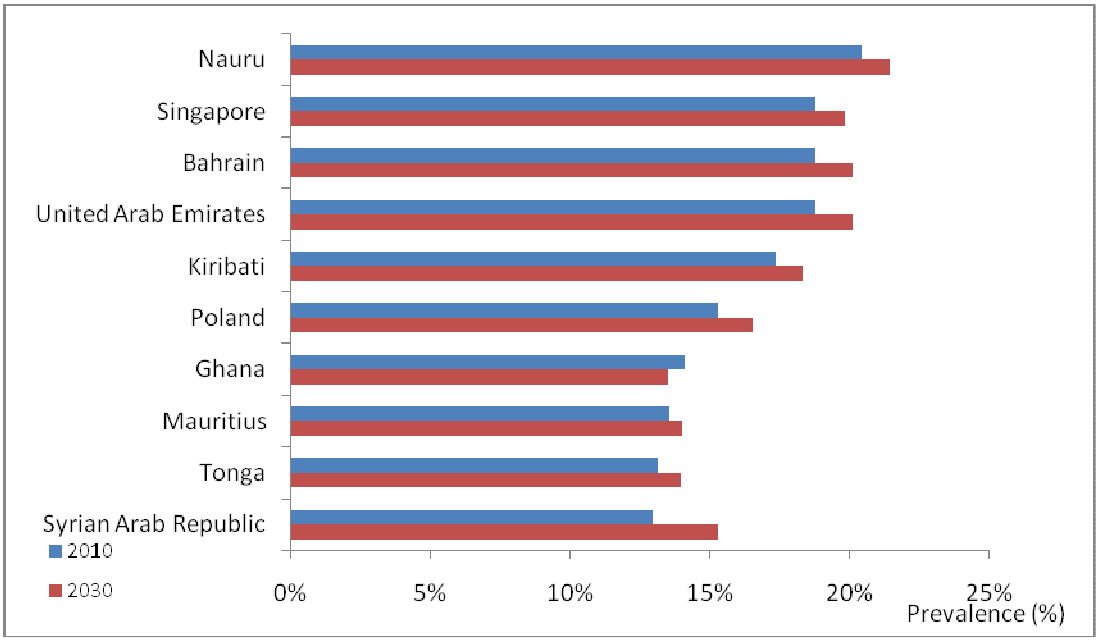
Finally, this report should act as a stimulus for intervention. Culturally appropriate interventions are required both for prevention and treatment of diabetes, in order to reduce the enormous personal suffering and economic burden that grows with this epidemic.

Figure 12 Top 10: Prevalence of diabetes* (20-79 age group) in 2010 (with 2030 prevalence)



* Comparative prevalence
Includes only countries where surveys with glucose testing were undertaken for that country

Figure 13 Top 10: Prevalence of impaired glucose tolerance* (20-79 age group) in 2010 (with 2030 prevalence)



* Comparative prevalence
Includes only countries where surveys with glucose testing were undertaken for that country

Table 3 Top 10: Prevalence of diabetes* (20-79 age group), 2010 and 2030

	COUNTRY	2010 PREVALENCE (%)
1	Nauru	30.9%
2	United Arab Emirates	18.7%
3	Saudi Arabia	16.8%
4	Mauritius	16.2%
5	Bahrain	15.4%
6	Réunion	15.3%
7	Kuwait	14.6%
8	Oman	13.4%
9	Tonga	13.4%
10	Malaysia	11.6%

	COUNTRY	2030 PREVALENCE (%)
1	Nauru	33.4%
2	United Arab Emirates	21.4%
3	Mauritius	19.8%
4	Saudi Arabia	18.9%
5	Réunion	18.1%
6	Bahrain	17.3%
7	Kuwait	16.9%
8	Tonga	15.7%
9	Oman	14.9%
10	Malaysia	13.8%

* Comparative prevalence
Includes only countries where surveys with glucose testing were undertaken for that country

Table 4 Top 10: Number of people with diabetes (20-79 age group), 2010 and 2030

	COUNTRY	2010 PERSONS (MILLIONS)
1	India	50.8
2	China	43.2
3	United States of America	26.8
4	Russian Federation	9.6
5	Brazil	7.6
6	Germany	7.5
7	Pakistan	7.1
8	Japan	7.1
9	Indonesia	7.0
10	Mexico	6.8

	COUNTRY	2030 PERSONS (MILLIONS)
1	India	87.0
2	China	62.6
3	United States of America	36.0
4	Pakistan	13.8
5	Brazil	12.7
6	Indonesia	12.0
7	Mexico	11.9
8	Bangladesh	10.4
9	Russian Federation	10.3
10	Egypt	8.6

Table 5 Top 10: Prevalence of impaired glucose tolerance* (20-79 age group), 2010 and 2030

	COUNTRY	2010 PREVALENCE (%)
1	Nauru	20.4%
2	Singapore	18.8%
3	Bahrain	18.8%
4	United Arab Emirates	18.8%
5	Kiribati	17.3%
6	Poland	15.3%
7	Ghana	14.1%
8	Mauritius	13.5%
9	Tonga	13.1%
10	Syrian Arab Republic	13.0%

	COUNTRY	2030 PREVALENCE (%)
1	Nauru	21.5%
2	Bahrain	20.1%
3	United Arab Emirates	20.1%
4	Singapore	19.8%
5	Kiribati	18.3%
6	Poland	16.5%
7	Syrian Arab Republic	15.3%
8	Mauritius	14.0%
9	Tonga	14.0%
10	Denmark	13.8%

* Comparative prevalence
Includes only countries where surveys with glucose testing were undertaken for that country

Table 6 Top 10: Number of people with impaired glucose tolerance (20-79 age group), 2010 and 2030

	2010			2030	
	COUNTRY	PERSONS (MILLIONS)		COUNTRY	PERSONS (MILLIONS)
1	China	67.0	1	China	81.7
2	India	39.5	2	India	64.1
3	United States of America	27.3	3	United States of America	35.2
4	Russian Federation	17.9	4	Indonesia	23.4
5	Indonesia	16.3	5	Russian Federation	17.6
6	Japan	13.0	6	Brazil	13.3
7	Brazil	9.0	7	Pakistan	12.6
8	Pakistan	7.2	8	Japan	12.1
9	Bangladesh	6.7	9	Bangladesh	9.1
10	Ukraine	6.0	10	Philippines	8.7

Table 7

Prevalence estimates of diabetes mellitus (DM), 2010 - African Region

	Population (20-79)	DM prevalence		Number of people with DM (000's) in the 20-79 age-group							
Country /Territory	000's	National	Comparative*	Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Angola	7,942	2.8%	3.5%	39.1	184.6	118.5	105.1	79.6	101.3	42.8	**223.7**
Benin	4,527	3.9%	4.6%	58.7	115.8	94.0	80.6	66.2	71.5	36.8	**174.5**
Botswana	1,073	4.1%	5.4%	4.9	39.1	15.9	28.1	7.5	22.1	14.4	**44.0**
Burkina Faso	6,923	3.0%	3.8%	127.5	81.7	108.3	100.9	90.5	78.0	40.8	**209.3**
Burundi	4,263	1.4%	1.8%	30.5	29.6	31.5	28.6	21.8	24.9	13.4	**60.1**
Cameroon	9,493	4.4%	3.9%	117.0	298.4	216.4	198.9	190.1	138.7	86.5	**415.3**
Cape Verde	289	4.3%	5.3%	2.1	10.4	6.0	6.4	4.8	5.1	2.5	**12.4**
Central African Republic	2,146	3.8%	4.5%	29.9	52.2	42.0	40.2	30.2	31.3	20.6	**82.2**
Chad	5,043	2.8%	3.7%	78.1	61.1	54.4	84.9	17.2	77.8	44.2	**139.3**
Comoros	438	2.8%	3.4%	2.2	10.0	6.7	5.6	4.3	5.5	2.4	**12.3**
Congo, Democratic Republic of	28,699	2.6%	3.2%	155.2	588.2	395.9	347.5	266.1	320.3	157.0	**743.4**
Congo, Republic of	1,902	4.3%	5.1%	15.7	66.8	43.6	38.9	31.7	32.1	18.7	**82.6**
Côte d'Ivoire	9,857	4.0%	4.7%	121.8	272.1	221.6	172.3	146.0	153.9	93.9	**393.9**
Djibouti	462	4.1%	5.3%	1.5	17.4	7.5	11.4	2.3	10.6	5.9	**18.9**
Equatorial Guinea	256	4.3%	4.8%	2.9	8.1	5.9	5.2	3.7	4.5	2.9	**11.1**
Eritrea	2,468	1.8%	2.5%	14.8	30.5	23.2	22.1	19.6	16.3	9.5	**45.4**
Ethiopia	40,895	2.0%	2.5%	275.5	550.5	448.9	377.1	277.0	354.2	194.8	**826.0**
Gabon	761	4.4%	5.0%	7.6	26.2	18.4	15.4	11.6	14.0	8.2	**33.8**
Gambia	906	3.8%	4.3%	15.2	19.6	18.8	15.9	11.5	14.4	8.8	**34.7**
Ghana	12,870	3.6%	4.3%	175.9	282.5	259.8	198.5	125.0	207.2	126.1	**458.3**
Guinea	4,656	3.7%	4.3%	74.6	98.0	93.2	79.3	61.7	70.6	40.2	**172.5**
Guinea-Bissau	763	3.3%	3.9%	14.0	11.3	13.3	12.0	9.6	9.9	5.9	**25.4**
Kenya	18,795	2.8%	3.5%	90.0	429.1	278.4	240.7	196.0	227.7	95.5	**519.1**
Lesotho	979	3.8%	3.9%	21.2	16.2	13.6	23.9	8.5	16.3	12.6	**37.4**
Liberia	1,803	3.8%	4.7%	20.6	48.2	36.8	32.0	28.1	27.5	13.2	**68.8**
Madagascar	9,881	2.7%	3.2%	56.2	213.6	146.6	123.2	88.1	123.5	58.2	**269.7**
Malawi	6,307	1.8%	2.3%	43.9	71.3	61.7	53.5	40.2	45.0	23.0	**115.3**

	Population (20-79)	DM prevalence		Number of people with DM (000's) in the 20-79 age-group							
Country /Territory	**000's**	**National**	**Comparative***	**Rural**	**Urban**	**Male**	**Female**	**20-39**	**40-59**	**60-79**	**Total**
Mali	5,496	3.3%	4.2%	85.1	98.9	90.0	94.0	77.5	65.7	40.8	**184.0**
Mauritania	1,685	3.7%	4.8%	12.5	49.3	24.0	37.9	7.6	36.3	17.9	**61.8**
Mozambique	10,044	3.3%	4.0%	45.9	283.1	167.1	161.9	110.4	144.9	73.7	**329.0**
Namibia	1,110	3.9%	4.4%	19.2	23.9	17.2	25.9	9.4	21.2	12.5	**43.1**
Niger	6,525	3.4%	3.9%	131.3	92.7	127.2	96.8	77.0	95.3	51.7	**224.0**
Nigeria	72,060	3.9%	4.7%	889.2	1,929.9	1,504.9	1,314.2	1,069.1	1,125.5	624.5	**2,819.1**
Réunion[a]	543	16.1%	15.3%	12.1	75.1	35.8	51.4	10.3	47.0	29.9	**87.2**
Rwanda	4,836	1.1%	1.6%	34.7	19.7	28.4	26.1	21.1	21.1	12.3	**54.4**
Sao Tome and Principe[b]	79	3.9%	4.7%	0.9	2.1	1.6	1.5	1.2	1.1	0.7	**3.0**
Senegal	6,324	4.0%	4.7%	77.4	178.2	135.7	119.9	93.8	95.5	66.3	**255.6**
Seychelles[a,b]	51	14.4%	14.4%	1.6	5.8	3.1	4.3	1.0	3.7	2.7	**7.4**
Sierra Leone	2,881	3.9%	4.4%	43.9	67.5	58.7	52.7	38.1	46.3	27.0	**111.4**
Somalia	4,333	2.5%	3.0%	25.0	83.9	58.7	50.2	37.5	49.8	21.6	**108.9**
South Africa	28,550	4.5%	4.5%	505.4	778.0	501.2	782.2	228.2	649.6	405.6	**1,283.4**
Swaziland	569	3.7%	4.2%	10.4	10.4	8.0	12.9	4.8	9.8	6.3	**20.8**
Togo	3,339	3.6%	4.3%	52.3	67.7	63.5	56.6	45.6	47.5	27.0	**120.0**
Uganda	13,486	1.7%	2.2%	90.4	133.7	122.2	101.9	85.9	86.5	51.7	**224.1**
Tanzania, United Republic of	19,592	2.6%	3.2%	110.2	394.0	270.2	234.0	176.6	213.8	113.7	**504.2**
Western Sahara	330	4.1%	5.7%	0.2	13.4	6.4	7.1	1.9	9.0	2.7	**13.5**
Zambia	5,447	3.1%	4.0%	23.5	145.5	89.8	79.3	63.8	67.9	37.3	**169.0**
Zimbabwe	6,875	3.4%	4.1%	123.1	112.2	98.1	137.2	62.3	104.4	68.5	**235.3**
AFR Total	**378,550**	**3.2%**	**3.8%**	**3,891**	**8,198**	**6,193**	**5,896**	**4,062**	**5,146**	**2,873**	**12,089**

[a.] Réunion and the Seychelles were deemed as having the same ethnicity distribution as Mauritius
[b.] Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of world population from 2008 to 2010

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 8

Prevalence estimates of diabetes mellitus (DM), 2030 – African Region

Country/Territory	Population (20-79) 000's	DM prevalence National	DM prevalence Comparative*	Number of people with DM (000's) in the 20-79 age-group Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Angola	14,405	3.5%	4.7%	56.6	449.8	271.8	234.7	177.1	233.5	95.8	**506.5**
Benin	8,549	4.4%	5.5%	89.2	283.9	205.2	167.8	129.8	155.3	88.0	**373.1**
Botswana	1,442	4.8%	6.5%	5.1	63.5	27.3	41.4	10.0	34.7	24.0	**68.6**
Burkina Faso	13,285	3.5%	4.6%	215.8	253.8	254.0	215.6	179.1	196.1	94.4	**469.6**
Burundi	7,665	2.0%	2.7%	52.1	99.2	81.6	69.6	49.5	67.5	34.2	**151.2**
Cameroon	15,474	4.8%	4.8%	150.3	594.8	397.6	347.5	312.2	280.3	152.6	**745.1**
Cape Verde	494	5.2%	6.0%	3.1	22.8	13.6	12.2	7.3	11.5	7.0	**25.9**
Central African Republic	3,351	4.1%	5.4%	36.1	102.6	73.2	65.5	52.7	54.2	31.7	**138.7**
Chad	9,514	2.1%	4.2%	85.9	118.4	111.1	93.3	22.4	119.1	62.8	**204.3**
Comoros	773	3.8%	4.6%	3.5	26.1	16.2	13.4	8.5	14.7	6.4	**29.5**
Congo, Democratic Republic of	54,614	3.2%	4.4%	231.4	1,528.4	953.1	806.8	627.4	804.3	328.2	**1,759.9**
Congo, Republic of	3,260	4.7%	5.9%	21.2	132.6	83.6	70.3	54.4	64.7	34.8	**153.9**
Côte d'Ivoire	16,094	4.4%	5.5%	157.6	555.4	396.4	316.6	251.5	297.8	163.8	**713.1**
Djibouti	735	3.6%	5.7%	1.6	24.9	14.9	11.6	2.6	15.5	8.4	**26.5**
Equatorial Guinea	439	4.6%	5.7%	3.7	16.4	10.8	9.3	7.0	8.1	5.1	**20.1**
Eritrea	4,582	2.7%	3.5%	24.8	99.8	66.8	57.9	39.3	65.9	19.4	**124.6**
Ethiopia	73,689	2.8%	3.5%	432.2	1,598.3	1,109.0	921.5	652.5	920.7	457.4	**2,030.5**
Gabon	1,122	5.2%	5.8%	9.2	48.7	32.3	25.5	16.6	24.5	16.8	**57.9**
Gambia	1,571	4.3%	5.1%	21.3	46.4	37.0	30.7	21.7	27.1	19.0	**67.7**
Ghana	20,684	4.3%	5.2%	246.2	649.3	517.1	378.4	203.2	434.4	257.9	**895.5**
Guinea	8,603	4.2%	5.1%	111.3	246.0	195.7	161.7	122.9	145.9	88.5	**357.3**
Guinea-Bissau	1,460	3.5%	4.8%	21.3	30.4	27.5	24.2	20.9	20.0	10.8	**51.7**
Kenya	33,321	3.7%	4.7%	136.7	1,094.1	672.2	558.6	386.0	600.5	244.2	**1,230.8**
Lesotho	1,229	3.9%	5.1%	21.5	26.1	19.1	28.6	11.3	21.5	14.9	**47.7**
Liberia	3,436	4.1%	5.6%	30.1	110.6	76.3	64.4	57.0	56.8	27.0	**140.8**
Madagascar	18,080	3.5%	4.4%	86.1	553.6	344.8	294.9	198.2	294.6	146.9	**639.7**
Malawi	11,448	2.3%	3.3%	64.8	201.5	146.0	120.2	102.7	107.2	56.3	**266.3**

Country/Territory	Population (20-79) 000's	DM prevalence National	DM prevalence Comparative*	Number of people with DM (000's) in the 20-79 age-group Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Mali	10,915	3.7%	5.1%	136.7	271.9	208.5	200.2	164.7	162.4	81.6	**408.7**
Mauritania	2,942	3.2%	5.3%	13.8	80.7	54.8	39.7	9.0	55.3	30.2	**94.5**
Mozambique	15,863	3.7%	5.1%	53.6	531.1	311.5	273.1	220.2	245.5	118.9	**584.6**
Namibia	1,579	4.3%	5.5%	22.5	45.8	28.4	39.9	13.8	32.0	22.5	**68.3**
Niger	13,547	3.7%	4.7%	219.3	279.4	278.5	220.2	182.8	189.9	126.1	**498.7**
Nigeria	123,202	4.3%	5.5%	1,185.9	4,130.2	2,897.4	2,418.7	1,957.9	2,169.2	1,188.9	**5,316.1**
Réunion[a]	696	19.5%	18.1%	13.9	121.6	54.0	81.5	12.5	54.9	68.2	**135.5**
Rwanda	8,534	1.6%	2.2%	62.7	72.4	71.5	63.6	43.6	61.0	30.5	**135.1**
Sao Tome and Principe[b]	138	4.5%	5.5%	1.4	4.9	3.3	2.9	2.1	2.7	1.4	**6.2**
Senegal	11,154	4.5%	5.6%	108.6	394.4	265.6	237.4	168.6	212.3	122.0	**502.9**
Seychelles[a,b]	64	17.3%	17.3%	1.7	9.5	4.7	6.5	1.2	5.1	4.9	**11.2**
Sierra Leone	4,716	4.1%	5.3%	55.2	140.3	103.7	91.8	69.7	79.6	46.3	195.6
Somalia	7,805	3.3%	4.2%	38.3	219.6	139.6	118.3	80.4	122.1	55.5	**257.9**
South Africa	33,457	4.9%	5.6%	472.8	1,171.4	655.4	988.8	252.9	737.3	654.0	**1,644.3**
Swaziland	686	3.6%	5.3%	9.7	15.0	10.2	14.5	6.5	10.4	7.7	**24.7**
Togo	6,121	4.1%	5.1%	79.6	173.8	136.2	117.3	87.2	105.6	60.6	**253.4**
Uganda	27,905	2.2%	3.1%	158.6	458.7	341.3	276.0	234.3	268.9	114.1	**617.3**
Tanzania, United Repubic of	34,865	3.3%	4.3%	159.1	995.8	630.9	524.1	385.9	531.6	237.6	**1,155.0**
Western Sahara	557	4.3%	6.0%	0.2	23.5	16.6	7.1	2.0	14.7	7.1	**23.8**
Zambia	8,972	3.6%	5.1%	28.9	298.4	181.4	145.8	127.9	144.3	55.0	**327.2**
Zimbabwe	9,653	4.0%	5.3%	155.9	233.3	170.5	218.8	86.0	198.5	104.8	**389.3**
AFR Total	**652,689**	**3.7%**	**4.7%**	**5,297**	**18,649**	**12,718**	**11,228**	**7,833**	**10,479**	**5,634**	**23,947**

[a.] Réunion and the Seychelles were deemed as having the same ethnicity distribution as Mauritius
[b.] Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of world population from 2008 to 2030

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 9

Prevalence estimates of impaired glucose tolerance (IGT), 2010 - African Region

	Population (20-79)	IGT prevalence		Number of people with IGT (000's) in the 20-79 age-group					
Country/Territory	000's	National	Comparative*	Male	Female	20-39	40-59	60-79	Total
Angola	7,942	7.4%	8.6%	247.8	337.1	274.3	204.2	106.4	**584.9**
Benin	4,527	6.7%	7.6%	144.3	158.5	141.4	102.3	59.0	**302.8**
Botswana	1,073	6.9%	8.7%	46.5	27.2	28.3	23.7	21.8	**73.7**
Burkina Faso	6,923	6.5%	7.6%	208.6	240.9	231.9	136.9	80.7	**449.5**
Burundi	4,263	7.3%	8.6%	128.6	182.7	148.5	108.5	54.4	**311.3**
Cameroon	9,493	0.9%	1.1%	37.2	50.6	34.0	33.2	20.6	**87.8**
Cape Verde	289	6.7%	7.6%	8.3	11.1	9.0	6.6	3.8	**19.4**
Central African Republic	2,146	6.9%	7.6%	66.5	80.7	66.4	46.4	34.3	**147.1**
Chad	5,043	2.6%	2.9%	40.8	90.9	33.3	59.6	38.7	**131.6**
Comoros	438	7.4%	8.6%	14.1	18.4	15.0	11.3	6.2	**32.5**
Congo , Democratic Republic of	28,699	7.4%	8.6%	905.9	1,218.5	996.7	708.9	418.7	**2,124.4**
Congo, Republic of	1,902	6.7%	7.6%	59.9	68.2	60.0	41.3	26.8	**128.1**
Côte d'Ivoire	9,857	6.7%	7.6%	331.2	333.6	307.7	213.2	144.0	**664.9**
Djibouti	462	2.6%	2.9%	3.9	8.4	2.9	5.7	3.5	**12.2**
Equatorial Guinea	256	7.0%	7.6%	8.4	9.6	7.5	6.1	4.4	**18.0**
Eritrea	2,468	7.1%	8.6%	71.9	104.2	94.8	50.1	31.2	**176.1**
Ethiopia	40,895	7.5%	8.6%	1,334.8	1,750.1	1,373.5	1,075.7	635.7	**3,084.8**
Gabon	761	7.0%	7.6%	25.4	27.6	22.5	18.4	12.1	**52.9**
Gambia	906	7.0%	7.6%	30.2	33.3	26.2	22.3	15.0	**63.6**
Ghana	12,870	12.7%	14.1%	799.0	839.2	742.2	531.9	364.1	**1,638.2**
Guinea	4,656	6.8%	7.6%	151.8	166.4	141.0	108.4	68.7	**318.2**
Guinea-Bissau	763	6.7%	7.6%	24.0	27.5	23.9	16.6	10.9	**51.5**
Kenya	18,795	7.2%	8.6%	587.5	773.6	669.5	453.5	238.1	**1,361.1**
Lesotho	979	7.2%	8.7%	40.5	30.0	24.4	17.9	28.3	**70.5**
Liberia	1,803	6.5%	7.6%	56.0	61.4	58.6	38.5	20.3	**117.4**
Madagascar	9,881	7.6%	8.6%	326.7	426.3	326.8	271.1	155.1	**753.0**
Malawi	6,307	7.5%	8.6%	202.7	268.9	217.3	150.2	104.2	**471.7**
Mali	5,496	6.6%	7.6%	159.3	203.6	182.6	106.0	74.3	**362.9**
Mauritania	1,685	2.7%	2.9%	14.1	30.6	10.7	21.5	12.5	**44.7**
Mozambique	10,044	7.6%	8.6%	313.4	454.0	338.8	259.6	169.0	**767.4**
Namibia	1,110	7.0%	8.7%	48.5	28.7	28.4	24.3	24.6	**77.3**
Niger	6,525	6.9%	7.6%	222.9	225.8	194.0	158.8	95.9	**448.7**
Nigeria	72,060	6.7%	7.6%	2,284.9	2,545.6	2,255.8	1,595.8	979.0	**4,830.5**
Réunion[a]	543	14.7%	13.7%	30.1	49.8	27.2	35.9	16.8	**79.9**
Rwanda	4,836	7.1%	8.6%	139.6	204.5	174.0	115.0	55.1	**344.0**
Sao Tome and Principe[b]	79	6.8%	7.6%	2.5	2.9	2.7	1.5	1.2	**5.4**

	Population (20-79)	IGT prevalence		Number of people with IGT (000's) in the 20-79 age-group					
Country/Territory	**000's**	**National**	**Comparative***	**Male**	**Female**	**20-39**	**40-59**	**60-79**	**Total**
Senegal	6,324	6.9%	7.6%	203.9	229.9	195.8	134.7	103.3	**433.8**
Seychelles[a,b]	51	13.3%	13.7%	2.8	4.0	2.8	2.7	1.3	**6.8**
Sierra Leone	2,881	6.9%	7.6%	92.3	107.1	84.7	69.8	44.9	**199.4**
Somalia	4,333	7.5%	8.6%	139.2	186.3	147.1	118.2	60.1	**325.5**
South Africa	28,550	7.6%	8.7%	1,345.3	818.5	668.1	743.2	752.5	**2,163.8**
Swaziland	569	6.8%	8.7%	23.4	15.0	14.7	10.8	12.9	**38.4**
Togo	3,339	6.7%	7.6%	105.2	119.5	104.6	73.6	46.5	**224.7**
Uganda	13,486	7.2%	8.6%	424.1	548.7	485.9	301.9	185.0	**972.8**
Tanzania, United Republic of	19,592	7.5%	8.6%	630.3	834.2	673.8	482.2	308.5	**1,464.5**
Western Sahara	330	2.5%	2.9%	3.2	5.1	2.1	4.7	1.6	**8.3**
Zambia	5,447	7.3%	8.6%	172.1	226.2	194.4	118.7	85.2	**398.3**
Zimbabwe	6,875	6.7%	8.7%	289.8	170.8	191.0	123.5	146.1	**460.6**
AFR Total	**378,550**	**7.1%**	**8.1%**	**12,549**	**14,356**	**12,057**	**8,965**	**5,883**	**26,905**

[a.] Réunion and the Seychelles were deemed as having the same ethnicity distribution as Mauritius
[b.] Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of world population from 2008 to 2010
* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 10

Prevalence estimates of impaired glucose tolerance (IGT), 2030 - African Region

	Population (20-79)	IGT prevalence		Number of people with IGT (000's) in the 20-79 age-group					
Country/Territory	000's	National	Comparative*	Male	Female	20-39	40-59	60-79	Total
Angola	14,405	7.4%	9.3%	459.1	612.6	492.9	375.9	202.9	**1,071.7**
Benin	8,549	6.9%	8.2%	285.4	304.4	254.4	205.5	129.9	**589.8**
Botswana	1,442	7.7%	10.0%	72.9	38.4	34.0	40.4	37.0	**111.4**
Burkina Faso	13,285	6.7%	8.2%	423.6	462.7	415.3	306.5	164.6	**886.4**
Burundi	7,665	7.5%	9.3%	247.2	330.6	252.1	211.2	114.6	**577.8**
Cameroon	15,474	1.0%	0.4%	65.0	84.5	53.2	62.3	34.0	**149.5**
Cape Verde	494	7.3%	8.2%	16.5	19.8	12.9	13.9	9.5	**36.2**
Central African Republic	3,351	6.8%	8.2%	105.9	121.5	105.1	73.5	48.8	**227.4**
Chad	9,514	2.6%	3.3%	77.2	167.4	63.0	112.8	68.9	**244.7**
Comoros	773	7.9%	9.3%	26.7	34.6	23.7	24.0	13.6	**61.3**
Congo, Democratic Republic of	54,614	7.3%	9.3%	1,739.0	2,268.1	1,889.6	1,385.3	732.2	**4,007.1**
Congo, Republic of	3,260	6.9%	8.2%	106.7	117.1	97.9	78.7	47.3	**223.8**
Côte d'Ivoire	16,094	6.9%	8.2%	542.0	566.3	481.8	388.1	238.4	**1,108.3**
Djibouti	735	2.9%	3.3%	7.2	14.4	4.1	10.6	6.9	**21.6**
Equatorial Guinea	439	7.0%	8.2%	14.5	16.1	13.1	10.3	7.2	**30.6**
Eritrea	4,582	7.5%	9.3%	144.5	199.3	146.7	145.3	51.8	**343.7**
Ethiopia	73,689	7.7%	9.3%	2,476.2	3,211.2	2,412.1	2,049.1	1,226.2	**5,687.4**
Gabon	1,122	7.4%	8.2%	40.5	42.7	29.8	30.2	23.3	**83.3**
Gambia	1,571	7.2%	8.2%	54.1	58.7	44.9	38.1	29.8	**112.8**
Ghana	20,684	13.4%	6.6%	1,359.5	1,413.6	1,064.9	1,020.0	688.2	**2,773.1**
Guinea	8,603	7.0%	8.2%	288.4	310.1	255.1	204.6	138.7	**598.4**
Guinea-Bissau	1,460	6.6%	8.2%	45.4	50.6	47.4	30.4	18.2	**96.0**
Kenya	33,321	7.6%	9.3%	1,109.1	1,435.2	1,071.1	954.6	518.6	**2,544.3**
Lesotho	1,229	7.2%	10.0%	53.2	34.9	31.7	26.3	30.0	**88.1**
Liberia	3,436	6.5%	8.2%	107.9	115.9	111.1	73.8	38.9	**223.8**
Madagascar	18,080	7.9%	9.3%	613.9	808.0	580.8	510.8	330.3	**1,421.9**
Malawi	11,448	7.2%	9.3%	365.5	463.6	412.7	254.3	162.1	**829.1**
Mali	10,915	6.6%	8.2%	326.7	394.1	351.2	236.0	133.5	**720.7**
Mauritania	2,942	2.9%	3.3%	28.5	56.7	16.6	40.3	28.3	**85.2**
Mozambique	15,863	7.3%	9.3%	501.5	663.1	564.3	356.7	243.5	**1,164.6**
Namibia	1,579	7.6%	10.0%	76.7	42.7	39.6	39.0	40.9	**119.5**

	Population (20-79)	IGT prevalence		Number of people with IGT (000's) in the 20-79 age-group					
Country/Territory	**000's**	**National**	**Comparative***	**Male**	**Female**	**20-39**	**40-59**	**60-79**	**Total**
Niger	13,547	6.8%	8.2%	457.4	467.5	419.6	292.7	212.5	**924.9**
Nigeria	123,202	6.8%	8.2%	4,025.0	4,340.9	3,784.8	2,845.0	1,736.1	**8,365.9**
Réunion[a]	696	14.8%	14.1%	40.1	63.0	30.9	38.0	34.1	**103.1**
Rwanda	8,534	7.6%	9.3%	267.0	377.8	275.3	250.9	118.5	**644.7**
Sao Tome and Principe[b]	138	3.9%	8.2%	2.5	2.9	2.7	1.5	1.2	**5.4**
Senegal	11,154	7.0%	8.2%	361.6	420.0	323.4	279.5	178.7	**781.6**
Seychelles[a, b]	64	10.6%	14.1%	2.8	4.0	2.8	2.7	1.3	**6.8**
Sierra Leone	4,716	6.9%	8.2%	150.8	172.4	142.3	110.0	70.9	**323.2**
Somalia	7,805	7.7%	9.3%	260.9	342.2	251.6	222.9	128.6	**603.1**
South Africa	33,457	8.4%	10.0%	1,743.0	1,065.0	764.6	886.0	1,157.3	**2,807.9**
Swaziland	686	6.9%	10.0%	29.4	17.6	19.3	13.3	14.4	**47.0**
Togo	6,121	7.0%	8.2%	200.6	225.1	180.8	149.1	95.7	**425.6**
Uganda	27,905	7.2%	9.3%	885.1	1,121.1	994.3	678.7	333.2	**2,006.2**
Tanzania, United Republic of	34,865	7.6%	9.3%	1,152.5	1,480.5	1,164.2	926.9	541.9	**2,633.0**
Western Sahara	557	3.4%	3.3%	7.0	11.8	2.4	9.6	6.8	**18.8**
Zambia	8,972	7.2%	9.3%	285.8	355.8	324.8	206.4	110.4	**641.6**
Zimbabwe	9,653	7.2%	10.0%	457.9	240.4	243.7	246.1	208.5	**698.3**
AFR Total	**652,689**	**7.2%**	**8.6%**	**22,110**	**25,167**	**20,301**	**16,468**	**10,508**	**47,277**

[a.] Réunion and the Seychelles were deemed as having the same ethnicity distribution as Mauritius
[b.] Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of world population growth from 2008 to 2030

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 11

Data sources: prevalence estimates of diabetes mellitus (DM) and impaired glucose tolerance (IGT) - African Region

Country/Territory	Data Used	Screening Method	Diagnostic Criteria	Sample Size	Age sample
Angola[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Benin[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Botswana[c,d]	South Africa[25,27,98,99]	OGTT	WHO - 1985, 1999	3,780	15+
Burkina Faso[b]	Cameroon Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Burundi[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Cameroon	Cameroon (Mbanya, 2006)[29]	OGTT	WHO - 1999	9,377	15+
Cape Verde[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Central African Republic[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Chad	Sudan[30]	2hBG	WHO - 1985	1,284	25-84
Comoros[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Congo, Democratic Republic of [a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Congo, Republic of[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Côte d'Ivoire[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Djibouti	Sudan	2hBG	WHO - 1985	1,284	25-84
Equatorial Guinea[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Eritrea[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Ethiopia[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Gabon[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Gambia[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Ghana	Ghana (Amoah et al, 2002)[28]	OGTT	WHO - 1999	14,110	15+
Guinea[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Guinea-Bissau[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Kenya[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Lesotho[c,d]	South Africa[25,27,98,99]	OGTT	WHO - 1985, 1999	3,780	15+
Liberia[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Madagascar[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Malawi[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Mali[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Mauritania	Sudan[30]	2hBG	WHO - 1985	1,284	25-84
Mozambique[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Namibia[c,d]	South Africa[25,27,98,99]	OGTT	WHO - 1985, 1999	3,780	15+

Niger[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Nigeria[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Réunion	Réunion (Favier et al, 2005)[31]	OGTT	WHO - 1999	3,600	30-69
Rwanda[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Sao Tome and Principe[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Senegal[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Seychelles	Réunion	OGTT	WHO - 1999	3,600	30-69
Sierra Leone[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Somalia[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
South Africa[c,d]	South Africa (Omar et al, 1993; Levitt et al 1993; Erasmus et al, 2001; Motala et al 2008)[25,27,98,99]	OGTT	WHO - 1985, 1999	3,780	15+
Swaziland[c,d]	South Africa[25,27,98,99]	OGTT	WHO - 1985, 1999	3,780	15+
Togo[b]	Cameroon[29] and Ghana[28]	OGTT	WHO - 1999	14,110	15+
Uganda[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Tanzania, United Republic of [a]	Tanzania (McLarty et al, 1989 and Aspray et al, 2000)[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Western Sahara	Sudan[30]	2hBG	WHO - 1985	1,284	25-84
Zambia[a]	Tanzania[21,22]	OGTT/FBG	WHO - 1985, 1999	7,781	15+
Zimbabwe[c,d]	South Africa[25,27,98,99]	OGTT	WHO - 1985, 1999	3,780	15+

[a.] The prevalence was calculated after the combination of the data of the two studies, notwithstanding the different criteria. IGT figures were calculated from the McLarty data, as the Aspray study only used FBG criteria
[b.] The prevalence was calculated as the average of the two studies as their sample sizes differed considerably
[c.] The prevalence was calculated after the combination of the data of the four studies
[d.] IGT figures were based only on the study of Omar et al

Table 12

Prevalence estimates of diabetes mellitus (DM), 2010 - European Region

Country/Territory	Population (20-79) 000's	DM prevalence National	DM prevalence Comparative*	Number of people with DM (000's) in the 20-79 age-group Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Albania	2,121	4.8%	4.5%			49.3	53.5	20.1	38.8	43.8	**102.8**
Andorra [a]	52	8.8%	6.6%			2.4	2.2	0.2	1.6	2.7	**4.6**
Austria	6,302	11.2%	8.9%			375.1	333.3	72.1	272.8	363.5	**708.4**
Azerbaijan	5,826	7.1%	7.5%	124.3	288.0	163.4	248.9	46.4	227.8	138.0	**412.3**
Belarus	7,251	9.1%	7.6%			303.1	358.0	64.5	263.5	333.1	**661.1**
Belgium	7,644	8.0%	5.3%			304.3	305.8	9.6	167.8	432.6	**610.0**
Bosnia and Herzegovina	2,990	9.1%	7.1%			112.6	158.5	20.9	109.3	140.9	**271.1**
Bulgaria	5,790	9.0%	6.5%	136.9	382.6	289.1	230.4	22.0	182.8	314.6	**519.5**
Channel Islands	113	4.1%	3.0%			2.3	2.3	0.2	1.7	2.7	**4.6**
Croatia	3,438	9.2%	6.9%			168.3	147.6	29.0	109.8	177.1	**315.9**
Cyprus	634	10.4%	9.1%			43.9	22.0	6.9	30.3	28.7	**65.9**
Czech Republic	7,824	8.7%	6.4%			309.6	367.7	44.5	190.7	442.1	**677.3**
Denmark	3,907	7.7%	5.6%			159.4	142.1	18.9	113.4	169.2	**301.5**
Estonia	994	9.9%	7.6%			44.0	53.9	8.5	33.9	55.6	**97.9**
Finland	3,863	8.3%	5.7%			180.0	139.8	15.6	100.4	203.8	**319.8**
France	44,091	9.4%	6.7%			2,437.1	1,727.1	208.6	1,210.2	2,745.4	**4,164.2**
Georgia	3,123	9.2%	7.5%	83.5	203.6	110.6	176.5	21.2	128.8	137.1	**287.1**
Germany	62,654	12.0%	8.9%			3,966.7	3,527.6	651.9	2,792.1	4,050.4	**7,494.3**
Greece	8,561	8.8%	6.0%			355.4	398.6	37.4	198.9	517.7	**754.0**
Hungary	7,515	8.8%	6.4%			280.4	378.5	42.7	188.1	428.1	**658.9**
Iceland	211	2.1%	1.6%			2.5	1.9	0.2	1.4	2.8	**4.4**
Ireland	3,171	5.7%	5.2%			93.0	87.3	34.5	68.0	77.8	**180.3**
Israel	4,496	7.1%	6.5%			179.9	138.9	42.1	127.1	149.5	**318.8**
Italy	44,510	8.8%	5.9%			2,018.9	1,907.3	121.3	1,223.5	2,581.3	**3,926.2**
Kazakhstan	10,436	5.6%	5.8%	138.1	446.1	307.8	276.3	40.6	331.9	211.7	**584.2**
Kyrgyzstan	3,294	4.3%	5.2%	63.4	77.4	81.1	59.7	10.4	83.3	47.1	**140.8**
Latvia	1,719	9.9%	7.6%			76.7	93.1	14.6	58.9	96.3	**169.7**
Liechtenstein[a]	25	11.0%	8.9%			1.4	1.3	0.3	1.0	1.4	**2.7**
Lithuania	2,484	9.7%	7.6%			110.1	129.6	20.9	86.6	132.3	**239.8**
Luxembourg	349	7.0%	5.3%			12.3	12.0	0.5	7.5	16.3	**24.3**
Macedonia, the Former Yugoslav Republic of	1,490	8.0%	6.9%			66.2	53.2	14.7	45.9	58.8	**119.3**

Country/Territory	Population (20-79) 000's	DM prevalence National	DM prevalence Comparative*	Number of people with DM (000's) in the 20-79 age-group Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Malta	307	9.8%	6.8%			12.6	17.3	0.3	9.0	20.6	**29.9**
Moldova	2,670	8.7%	7.6%			110.9	122.6	23.7	94.7	115.0	**233.5**
Monaco[a]	23	9.1%	6.7%			1.2	0.9	0.1	0.6	1.4	**2.1**
Montenegro	424	8.4%	6.9%			19.0	16.7	4.0	12.8	18.9	**35.7**
Netherlands	11,943	7.7%	5.3%			473.0	449.4	15.1	266.8	640.5	**922.4**
Norway	3,357	4.7%	3.6%			93.1	66.2	14.1	53.6	91.6	**159.3**
Poland	28,618	9.3%	7.6%			1,321.2	1,353.4	257.6	1,052.6	1,364.4	**2,674.6**
Portugal	8,034	12.4%	9.7%			578.0	419.7	95.6	374.3	527.7.4	**997.6**
Romania	16,129	8.4%	6.9%			720.3	631.2	157.8	474.7	718.9	**1,351.4**
Russian Federation	107,184	9.0%	7.6%			4,364.8	5,260.2	957.4	3,924.8	4,742.7	**9,624.9**
San Marino[a]	22	8.0%	5.9%			0.9	0.8	0.1	0.6	1.1	**1.7**
Serbia	7,166	8.6%	6.9%			336.4	277.0	67.6	221.7	324.1	**613.4**
Slovakia	4,075	7.7%	6.4%			138.2	175.8	25.6	103.0	185.4	**314.0**
Slovenia	1,546	9.9%	7.7%			87.5	65.4	10.3	70.3	72.4	**152.9**
Spain	33,944	8.7%	6.6%			1,547.5	1,391.8	160.9	1,008.8	1,769.6	**2,939.3**
Sweden	6,619	7.3%	5.2%			223.6	260.9	36.6	136.8	311.0	**484.4**
Switzerland	5,569	11.3%	8.9%			327.9	301.9	63.0	243.4	323.4	**629.9**
Tajikistan	3,618	3.6%	5.0%	124.3	288.0	77.4	52.6	10.2	78.1	41.8	**130.1**
Turkey	49,746	7.4%	8.0%	469.6	3,209.4	1,549.1	2,129.9	459.2	1,897.1	1,322.6	**3,679.0**
Turkmenistan	3,101	4.1%	5.3%	50.9	77.2	74.1	54.0	10.8	77.3	40.1	**128.1**
Ukraine	34,686	9.6%	7.6%			1,498.5	1,829.9	299.4	1,223.7	1,805.3	**3,328.4**
United Kingdom	44,056	4.9%	3.6%			1,225.7	913.9	149.2	684.4	1,306.0	**2,139.6**
Uzbekistan	16,650	4.0%	5.2%	286.4	387.4	399.9	273.9	56.0	405.7	212.2	**673.8**
EUR Total	**646,367**	**8.6%**	**6.9%**			**27,580**	**27,606**	**4,471**	**20,734**	**29,981**	**55,388**

a. Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of developed world population from 2008 to 2010

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 13

Prevalence estimates of diabetes mellitus (DM), 2030 – European Region

Country/Territory	Population (20-79) 000's	DM prevalence National	DM prevalence Comparative*	Number of people with DM (000's) in the 20-79 age-group Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Albania	2,476	5.6%	5.1%			62.5	75.1	20.8	42.9	74.0	**137.6**
Andorra[a]	61	10.3%	8.0%			3.2	3.1	0.2	1.9	4.2	**6.3**
Austria	6,424	13.1%	10.2%			446.0	393.1	64.3	252.1	522.7	**839.1**
Azerbaijan	6,938	9.8%	9.0%	151.4	526.8	258.2	420.0	51.4	285.1	341.7	**678.2**
Belarus	6,542	11.1%	9.0%			322.6	402.4	45.0	254.8	425.1	**724.9**
Belgium	7,822	9.6%	6.7%			378.0	371.6	9.1	155.1	585.4	**749.6**
Bosnia and Herzegovina	2,842	10.9%	8.6%			130.4	178.6	16.4	120.6	172.0	**309.0**
Bulgaria	4,822	10.6%	7.8%			284.7	225.3	13.4	177.9	318.7	**510.1**
Channel Islands	114	5.0%	3.6%			2.8	2.9	0.2	1.5	4.0	**5.7**
Croatia	3,135	10.5%	8.0%			179.5	149.9	22.1	98.9	208.2	**329.3**
Cyprus	771	11.7%	10.4%			58.8	31.4	8.0	37.6	44.6	**90.2**
Czech Republic	7,426	10.7%	7.8%			374.7	418.6	31.0	215.9	546.3	**793.3**
Denmark	3,978	8.2%	6.6%			169.4	158.3	19.2	102.2	206.3	**327.7**
Estonia	902	11.1%	9.0%			46.2	54.3	6.1	34.2	60.2	**100.5**
Finland	3,841	9.3%	6.9%			201.0	157.5	15.5	85.0	257.8	**358.4**
France	47,131	11.0%	8.3%			3,083.6	2,117.0	203.3	1,197.2	3,800.0	**5,200.5**
Georgia	2,902	11.2%	9.0%	65.4	258.3	122.2	201.5	18.0	123.0	182.7	**323.7**
Germany	59,214	13.5%	10.2%			4,226.8	3,786.9	559.9	2,207.4	5,246.5	**8,013.7**
Greece	8,452	10.3%	7.4%			426.6	447.9	27.5	221.4	625.6	**874.6**
Hungary	7,049	10.3%	7.8%			321.9	404.9	31.4	198.6	496.8	**726.8**
Iceland	244	2.7%	2.0%			3.6	2.9	0.2	1.5	4.8	**6.5**
Ireland	3,938	6.5%	5.9%			136.7	121.0	32.5	97.1	128.1	**257.7**
Israel	6,096	7.8%	7.6%			277.8	198.5	51.3	175.9	249.0	**476.3**
Italy	42,955	10.4%	7.2%			2,347.9	2,135.1	90.5	1,233.1	3,159.4	**4,483.0**
Kazakhstan	11,903	7.1%	7.0%	150.2	692.8	440.8	402.3	44.5	415.2	383.4	**843.1**
Kyrgyzstan	4,346	6.0%	6.5%	82.6	176.5	144.9	114.1	15.8	131.9	111.4	**259.0**
Latvia	1,517	11.5%	9.0%			81.5	92.7	9.8	59.1	105.4	**174.2**
Liechtenstein[a]	29	9.3%	10.2%			1.4	1.3	0.3	1.0	1.4	**2.7**
Lithuania	2,289	11.3%	9.0%			120.9	138.6	16.6	83.4	159.6	**259.5**
Luxembourg	434	8.0%	6.7%			17.5	17.2	0.6	8.5	25.6	**34.6**
Macedonia, the Former Yugoslav Republic of	1,509	9.7%	8.0%			81.6	64.1	11.9	49.2	84.6	**145.7**

	Population (20-79)	DM prevalence		Number of people with DM (000's) in the 20-79 age-group							
Country/Territory	**000's**	**National**	**Comparative***	**Rural**	**Urban**	**Male**	**Female**	**20-39**	**40-59**	**60-79**	**Total**
Malta	320	11.4%	8.6%			16.2	20.4	0.3	9.8	26.4	**36.6**
Moldova	2,532	10.3%	9.0%			124.8	136.1	20.3	90.9	149.8	**261.0**
Monaco[a]	28	10.9%	8.3%			1.8	1.3	0.1	0.7	2.2	**3.0**
Montenegro	436	9.3%	8.0%			21.8	18.7	3.6	13.2	23.7	**40.5**
Netherlands	12,344	9.5%	6.7%			599.4	578.3	14.7	234.1	928.9	**1,177.7**
Norway	3,806	5.4%	4.3%			119.8	86.4	15.3	55.3	135.6	**206.2**
Poland	27,182	11.6%	9.0%			1,524.1	1,628.8	181.3	1,062.0	1,909.6	**3,152.9**
Portugal	7,940	14.4%	11.2%			664.2	478.4	69.3	408.0	665.2	**1142.5**
Romania	14,672	10.0%	8.0%			791.9	677.3	98.3	516.1	854.8	**1,469.2**
Russian Federation	94,996	10.9%	9.0%			4,440.9	5,889.6	642.7	3,644.2	6,043.7	**10,330.5**
San Marino[a]	25	9.4%	7.2%			1.2	1.2	0.1	0.7	1.6	**2.3**
Serbia	7,212	9.5%	8.0%			379.8	307.0	57.6	229.8	399.4	**686.8**
Slovakia	4,047	10.2%	7.8%			186.7	225.7	17.5	113.8	281.1	**412.4**
Slovenia	1,461	8.9%	7.8%			99.7	73.0	7.1	66.7	98.9	**172.7**
Spain	34,870	11.1%	8.0%			2,062.0	1,804.2	105.0	1,224.0	2,537.1	**3,866.2**
Sweden	6,972	8.0%	6.2%			254.0	302.4	37.8	138.9	379.7	**556.3**
Switzerland	5,844	12.4%	10.2%			371.0	355.4	65.3	213.6	447.6	**726.5**
Tajikistan	5,879	4.8%	6.3%	105.8	175.3	159.7	121.4	22.2	142.5	116.4	**281.1**
Turkey	65,626	9.6%	9.4%	580.4	5,742.9	2,662.3	3,661.0	491.8	3,004.7	2,826.8	**6,323.3**
Turkmenistan	4,331	6.0%	6.6%	73.9	187.0	145.7	115.2	16.8	135.4	108.7	**260.9**
Ukraine	29,641	11.3%	9.0%			1,483.0	1,865.7	199.5	1,149.5	1,999.8	**3,348.8**
United Kingdom	46,886	5.4%	4.3%			1,461.7	1,087.0	151.3	687.7	1,709.7	**2,548.7**
Uzbekistan	24,125	5.8%	6.6%	423.5	983.7	806.3	600.9	93.4	729.2	584.6	**1,407.2**
EUR Total	**659,277**	**10.0%**	**8.1%**			**32,902**	**33,321**	**3,717**	**21,839**	**40,667**	**66,455**

a. Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of developed world population from 2008 to 2030

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 14

Prevalence estimates of impaired glucose tolerance (IGT), 2010 - European Region

Country/Territory	Population (20-79)	IGT prevalence		Number of people with IGT (000's) in the 20-79 age-group					
	000's	National	Comparative*	Male	Female	20-39	40-59	60-79	Total
Albania	2,121	2.6%	2.4%	17.3	37.3	11.6	18.8	24.2	**54.6**
Andorra[a]	52	7.5%	6.6%	2.0	1.8	0.8	1.6	1.5	**3.9**
Austria	6,302	6.0%	4.1%	181.3	196.4	0.6	93.1	284.1	**377.8**
Azerbaijan	5,826	6.0%	6.1%	120.7	228.3	86.3	173.6	89.1	**349.0**
Belarus	7,251	16.8%	15.3%	480.8	738.3	292.5	507.1	419.4	**1,219.1**
Belgium	7,644	6.5%	4.8%	246.0	248.5	51.7	151.6	291.2	**494.5**
Bosnia and Herzegovina	2,990	5.8%	5.8%	79.6	126.0	34.1	82.4	89.0	**205.5**
Bulgaria	5,790	6.0%	5.0%	172.2	172.5	45.7	162.6	136.5	**344.7**
Channel Islands	113	5.2%	4.7%	3.6	2.3	1.3	2.6	1.9	**5.8**
Croatia	3,438	7.2%	5.9%	95.8	151.4	36.1	100.1	111.0	**247.1**
Cyprus	634	6.7%	5.9%	19.8	23.0	7.3	16.9	18.6	**42.8**
Czech Republic	7,824	17.4%	15.3%	593.4	767.4	308.2	510.1	542.6	**1,360.9**
Denmark	3,907	15.2%	12.4%	273.0	321.4	101.6	194.9	299.9	**594.4**
Estonia	994	17.4%	15.3%	67.8	105.4	38.3	65.0	69.9	**173.2**
Finland	3,863	8.8%	5.9%	187.8	151.4	9.8	108.6	220.7	**339.2**
France	44,091	7.6%	6.6%	2,318.5	1,021.1	613.4	1,550.3	1,178.0	**3,339.6**
Georgia	3,123	7.2%	6.2%	78.4	146.5	38.8	96.9	89.2	**224.9**
Germany	62,654	6.6%	4.1%	2,006.6	2,125.9	4.7	979.6	3,148.2	**4,132.6**
Greece	8,561	7.4%	5.9%	292.5	342.0	93.1	225.6	315.8	**634.5**
Hungary	7,515	17.5%	15.3%	544.7	770.6	297.2	500.1	520.0	**1,315.3**
Iceland	211	7.3%	5.9%	8.9	6.6	0.7	5.7	9.1	**15.5**
Ireland	3,171	1.9%	1.7%	30.6	30.7	1.6	23.4	36.3	**61.3**
Israel	4,496	5.5%	5.1%	152.0	96.2	51.3	96.6	102.3	**248.2**
Italy	44,510	6.0%	4.7%	1,105.2	1,549.5	423.1	870.3	1,363.2	**2,654.7**
Kazakhstan	10,436	7.0%	7.1%	274.2	454.9	171.6	315.8	241.7	**729.1**
Kyrgyzstan	3,294	6.3%	7.1%	84.0	124.8	59.8	89.6	59.3	**208.8**
Latvia	1,719	17.4%	15.3%	118.3	181.4	67.7	113.2	120.9	**299.7**
Liechtenstein[a]	25	5.8%	4.0%	0.7	0.8	0.0	0.4	1.1	**1.4**
Lithuania	2,484	17.3%	15.3%	170.7	258.1	96.3	168.5	166.0	**428.9**
Luxembourg	349	5.9%	4.8%	10.5	9.9	2.6	6.9	10.9	**20.4**
Macedonia, the Former Yugoslav Republic of	1,490	6.5%	5.9%	38.5	58.6	18.2	41.9	37.0	**97.1**

Country/Territory	Population (20-79) 000's	IGT prevalence National	IGT prevalence Comparative*	Number of people with IGT (000's) in the 20-79 age-group Male	Female	20-39	40-59	60-79	Total
Malta	307	7.7%	6.1%	11.6	12.1	1.6	10.5	11.6	**23.8**
Moldova	2,670	16.3%	15.3%	176.6	259.3	112.8	179.9	145.2	**435.8**
Monaco[a]	23	7.4%	6.6%	1.2	0.5	0.3	0.8	0.6	**1.7**
Montenegro	424	6.8%	5.9%	10.9	17.8	7.1	11.7	11.9	**28.7**
Netherlands	11,943	6.3%	4.8%	381.2	366.8	81.6	242.4	426.0	**748.0**
Norway	3,357	8.6%	7.3%	94.7	192.4	54.1	89.6	143.4	**287.1**
Poland	28,618	16.9%	15.3%	2,050.3	2,793.0	1,156.4	1,967.7	1,719.2	**4,843.3**
Portugal	8,034	13.3%	4.7%	495.0	576.6	144.0	414.6	513.0	**1,071.6**
Romania	16,129	17.0%	15.3%	1,167.5	1,576.0	659.3	1,048.3	1,037.8	**2,743.4**
Russian Federation	107,184	16.7%	15.3%	6,966.3	10,930.5	4,384.5	7,522.8	5,991.5	**17,896.8**
San Marino[a]	22	5.6%	4.7%	0.5	0.7	0.2	0.4	0.6	**1.2**
Serbia	7,166	6.8%	5.9%	192.7	294.4	86.0	201.4	201.7	**487.1**
Slovakia	4,075	16.6%	15.3%	287.4	388.9	174.1	277.2	226.9	**676.2**
Slovenia	1,546	17.5%	15.3%	119.4	151.8	58.4	110.3	104.5	**271.2**
Spain	33,944	7.5%	6.6%	1,350.8	1,183.0	537.3	1,042.0	956.5	**2,533.8**
Sweden	6,619	9.0%	7.3%	196.2	401.5	102.9	166.9	327.8	**597.7**
Switzerland	5,569	6.1%	4.1%	159.9	179.3	0.5	85.9	252.8	**339.2**
Tajikistan	3,618	5.8%	7.1%	85.9	124.9	69.2	88.8	52.8	**210.8**
Turkey	49,746	6.3%	6.6%	1,124.4	2,013.3	860.3	1,411.3	866.0	**3,137.7**
Turkmenistan	3,101	6.1%	7.1%	75.5	113.4	57.8	82.6	48.5	**188.9**
Ukraine	34,686	17.2%	15.3%	2,331.6	3,644.4	1,355.1	2,352.5	2,270.4	**5,976.0**
United Kingdom	44,056	5.1%	4.7%	1,414.4	836.1	582.5	933.3	736.7	**2,250.5**
Uzbekistan	16,650	6.1%	7.1%	415.6	593.6	311.9	435.7	261.5	**1,009.1**
EUR Total	**646,367**	**10.2%**	**8.9%**	**28,885**	**37,099**	**13,764**	**25,950**	**26,305**	**65,984**

a. Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of developed world population from 2008 to 2010

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 15

Prevalence estimates of impaired glucose tolerance (IGT), 2030 - European Region

Country/Territory	Population (20-79)	IGT prevalence		Number of people with IGT (000's) in the 20-79 age-group					
	000's	National	Comparative*	Male	Female	20-39	40-59	60-79	Total
Albania	2,476	1.3%	2.7%	12.3	19.2	6.4	12.3	14.8	**31.5**
Andorra[a]	61	8.1%	7.2%	2.6	2.3	0.8	1.9	2.3	**4.9**
Austria	6,424	7.9%	5.3%	251.0	253.7	0.5	95.2	409.1	**504.8**
Azerbaijan	6,938	7.5%	7.0%	181.4	340.9	85.9	215.6	220.8	**522.2**
Belarus	6,542	18.7%	16.5%	482.9	739.1	192.6	495.0	534.5	**1,222.0**
Belgium	7,822	7.4%	5.7%	282.3	296.3	49.0	137.7	391.9	**578.6**
Bosnia and Herzegovina	2,842	7.9%	6.7%	89.2	136.7	26.9	88.7	110.3	**225.9**
Bulgaria	4,822	6.6%	5.4%	155.1	160.8	28.1	148.9	139.0	**316.0**
Channel Islands	114	5.4%	7.2%	3.8	2.4	1.2	2.2	2.7	**6.2**
Croatia	3,135	7.8%	6.5%	99.4	146.6	27.3	90.0	128.7	**246.1**
Cyprus	771	7.5%	6.7%	26.4	31.7	7.9	20.7	29.5	**58.1**
Czech Republic	7,426	19.1%	16.5%	634.3	782.4	206.9	569.1	640.7	**1,416.7**
Denmark	3,978	16.4%	13.8%	297.4	353.1	105.5	172.4	374.6	**650.5**
Estonia	902	18.6%	16.5%	68.6	99.7	26.7	66.1	75.4	**168.2**
Finland	3,841	9.0%	5.7%	154.9	190.3	2.5	34.0	310.7	**345.2**
France	47,131	7.8%	7.2%	2,544.2	1,146.2	597.3	1,527.2	1,568.0	**3,690.4**
Georgia	2,902	8.3%	7.1%	84.7	156.6	30.6	91.5	119.2	**241.2**
Germany	59,214	8.3%	5.3%	2,437.6	2,467.3	4.3	818.0	4,082.6	**4,905.0**
Greece	8,452	8.2%	6.7%	324.9	372.0	69.3	242.4	385.2	**696.9**
Hungary	7,049	18.8%	16.5%	566.3	759.8	215.6	527.0	585.5	**1,326.1**
Iceland	244	6.9%	5.7%	8.6	8.2	1.7	4.3	10.8	**16.8**
Ireland	3,938	2.4%	2.1%	47.1	47.8	1.5	34.4	59.1	**94.9**
Israel	6,096	6.0%	5.8%	229.4	135.8	62.7	133.2	171.2	**365.1**
Italy	42,955	6.5%	5.2%	1,211.8	1,598.0	342.4	815.9	1,653.5	**2,809.8**
Kazakhstan	11,903	8.1%	8.0%	376.9	591.1	158.0	380.3	429.7	**968.0**
Kyrgyzstan	4,346	7.5%	8.0%	133.4	193.0	66.4	131.5	128.5	**326.4**
Latvia	1,517	19.0%	16.5%	119.6	168.3	44.0	113.9	131.9	**287.8**
Liechtenstein[a]	29	7.2%	4.0%	1.0	1.1	0.0	0.4	1.7	**2.1**
Lithuania	2,289	18.8%	16.5%	178.0	252.8	71.7	161.0	200.2	**430.9**
Luxembourg	434	6.4%	5.7%	14.0	13.9	3.2	7.6	17.1	**27.9**
Macedonia, the Former Yugoslav Republic of	1,509	7.4%	6.5%	46.1	65.8	14.6	44.7	52.6	**111.9**

Country/Territory	Population (20-79) 000's	IGT prevalence National	IGT prevalence Comparative*	Number of people with IGT (000's) in the 20-79 age-group Male	Female	20-39	40-59	60-79	Total
Malta	320	8.6%	7.1%	13.8	13.8	1.4	11.8	14.3	**27.5**
Moldova	2,532	17.9%	16.5%	189.7	263.4	87.6	180.6	186.9	**453.1**
Monaco[a]	28	7.9%	7.2%	1.5	0.7	0.3	0.9	0.9	**2.2**
Montenegro	436	7.2%	6.5%	12.3	19.2	6.4	12.3	14.8	**31.5**
Netherlands	12,344	7.4%	5.7%	447.6	460.6	83.2	206.6	620.4	**908.2**
Norway	3,806	9.5%	8.1%	118.5	243.3	58.3	92.1	211.5	**361.9**
Poland	27,182	19.0%	16.5%	2,209.8	2,965.0	773.3	2,033.9	2,367.6	**5,174.8**
Portugal	7,940	14.9%	5.2%	559.2	625.6	109.5	430.9	644.5	**1,184.8**
Romania	14,672	18.9%	16.5%	1,198.7	1,567.1	408.6	1,128.1	1,231.2	**2,765.9**
Russian Federation	94,996	18.5%	16.5%	6,702.6	10,887.2	2,836.4	7,158.6	7,596.8	**17,589.8**
San Marino[a]	25	6.2%	5.2%	0.6	0.9	0.2	0.5	0.8	**1.5**
Serbia	7,212	7.3%	6.5%	213.9	313.1	73.0	209.0	247.0	**527.0**
Slovakia	4,047	18.8%	16.5%	329.2	430.6	120.6	308.9	332.3	**759.8**
Slovenia	1,461	19.5%	16.5%	128.0	156.8	40.6	103.9	142.3	**284.8**
Spain	34,870	8.4%	7.2%	1,616.9	1,321.4	380.2	1,183.8	1,374.2	**2,938.3**
Sweden	6,972	9.6%	8.1%	221.0	450.9	104.1	169.1	398.7	**671.9**
Switzerland	5,844	7.3%	5.3%	204.0	224.5	0.5	79.5	348.4	**428.4**
Tajikistan	5,879	6.7%	8.0%	158.7	234.0	105.5	153.5	133.8	**392.7**
Turkey	65,626	7.5%	7.5%	1,833.3	3,120.0	913.6	2,183.7	1,856.0	**4,953.3**
Turkmenistan	4,331	7.4%	8.0%	129.8	191.4	67.0	132.9	121.3	**321.2**
Ukraine	29,641	18.9%	16.5%	2,204.0	3,388.6	856.0	2,228.8	2,509.9	**5,592.6**
United Kingdom	46,886	5.2%	5.0%	1,546.4	910.9	588.9	920.2	950.3	**2,457.4**
Uzbekistan	24,125	7.3%	8.0%	734.6	1,025.4	382.1	719.7	658.3	**1,760.0**
EUR Total	**659,277**	**11.0%**	**9.5%**	**31,901**	**40,326**	**10,457**	**26,892**	**34,915**	**72,227**

a. Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of developed world population from 2008 to 2030

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 16

Data sources: prevalence estimates of diabetes mellitus (DM) and impaired glucose tolerance (IGT) - European Region

Country/Territory	Data Used	Screening Method	Diagnostic Criteria	Sample Size	Age sample
Albania	Albania (Shapo et al, 2004)[100]	OGTT	WHO - 1985	1,120	25+
Andorra	Spain[111-114]				
Austria[a,b]	Germany[45,56,59]				
Azerbaijan Republic	Turkey[34]	2hBG	WHO - 1999	24,788	20+
Belarus[b]	Poland[37,38]	OGTT	WHO - 1985	6,842	35+
Belgium	The Netherlands[57]	OGTT	WHO - 1985	2,540	50-74
Bosnia and Herzegovina	Turkey[34]	2hBG	WHO - 1999	24,788	20+
Bulgaria	Bulgaria (Borissova et al, 2006)[39]	OGTT	WHO - 1999	2,403	20+
Channel Islands[b]	United Kingdom[116]	OGTT	WHO - 1985	2,529	25-75
Croatia[c]	Croatia (Metelko et al, 2008) [40]	FBG	WHO - 1999	1,653	18-65
Cyprus	Cyprus (Loizou et al, 2006)[101]	OGTT	WHO - 1999	1,200	20-79
Czech Republic[c,d]	Slovakia[41]	OGTT	WHO - 1999	1,517	18+
Denmark	Denmark (Glumer et al, 2003)[102]	OGTT	WHO - 1999	6,784	30-60
Estonia[b]	Poland[37,38]	OGTT	WHO - 1985	6,842	35+
Finland[b,e]	Finland (Saaristo et al, 2008)[103]	OGTT	WHO 1999	2,723	45-74
Finland	Finland (STAKES, Finnish Diabetes Association, 2006)[43]	SR	Known diabetes	Population	
France[b,f]	France (Kusnik-Joinville et al, 2008)[44]	Treated diabetes		Population	
France	France (Gourdy et al, 2001)[55]	SR and FBG	Known diabetes, ADA 1997	3,508	35-64
Georgia, Republic of	Turkey [34]	2hBG	WHO - 1999	24,788	20+
Germany[a,b]	Germany (Rathmann et al, 2003)[56]	OGTT	WHO - 1999	1,353	55-74
Germany	Germany (Hauner et al, 2007)[45]	SR	Known diabetes	310,000	
Germany	Germany (Hauner et al, 2008)[59]	FBG	WHO - 1999	35,869	18+
Greece[g]	Greece (Panagiotakos et al, 2005)[104]	FBG	ADA - 1997	3,032	20+
Hungary[c]	Slovakia[41]	OGTT	WHO - 1999	1,517	18+
Iceland[j]	Iceland (Vilbergsson et al, 1997)[105]	OGTT (50-100g)	WHO - 1985	18,887	30-79
Ireland, Republic of	Ireland (Smith et al, 2003)[106]	OGTT	WHO - 1999	3,821	40+
Israel [b]	Israel (Bar-on et al, 1992 Stern et al, 1999)[107,108]	OGTT	WHO - 1980/1985	6,918	25-64
Israel	Israel (Chodick et al, 2003)[46]	SR	Known diabetes	1.6 million	25+
Italy [h]	Italy (Cricelli et al, 2003)[191]	SR	Known diabetes	432,747	15+
Kazakhstan[b]	Uzbekistan[35,36]	2hBG	WHO - 1994, 1999	2,865	35+
Kyrgyzstan[b]	Uzbekistan[35,36]	2hBG	WHO - 1994, 1999	2,865	35+

Country/Territory	Data Used	Screening Method	Diagnostic Criteria	Sample Size	Age sample
Latvia[b]	Poland[37,38]	OGTT	WHO - 1985	6,842	35+
Liechtenstein	Germany[45,56,59]				
Lithuania[b]	Poland[37,38]	OGTT	WHO - 1985	6,842	35+
Luxembourg	The Netherlands (Ubink-Veltmaat et al, 2003)[48]	SR	Known diabetes	155,574	20+
Macedonia, the Former Yugoslav Republic of [d]	Croatia[40]	FBG	WHO - 1999	1,653	18-65
Malta	Malta (Schranz et al, 1989)[109]	OGTT	WHO - 1985	1,422	35+
Moldova [b]	Poland[37,38]	OGTT	WHO - 1985	6,842	35+
Monaco	France[55]	SR and FBG	Known diabetes, ADA 1997	3,508	35-64
Montenegro[c]	Croatia[40]	FBG	WHO - 1999	1,653	18-65
Netherlands[j]	The Netherlands (Ubink-Veltmaat et al, 2003)[48]	SR	Known diabetes	155,574	20+
Norway	Norway (Stene et al, 2004)[49]	SR	Known diabetes	combination	30+
Poland[b]	Poland (Szurkowska et al & Lopatynski et al, 2001)[37,38]	OGTT	WHO - 1985	6,842	35+
Portugal	Portugal (Gardete-Correia et al, 2009)[110]	OGTT	WHO - 1999	5,147	20-80
Romania[c]	Croatia[40]	FBG	WHO - 1999	1,653	18-65
Russia[b]	Poland [37,38]	OGTT	WHO - 1985	6,842	35+
San Marino	Italy[191]	SR	Known diabetes	432,747	15+
Serbia and Montenegro[d]	Croatia[40]	FBG	WHO - 1999	1,653	18-65
Slovakia[c]	Slovakia (Mokan et al, 2008)[41]	OGTT	WHO - 1999	1,517	18+
Slovenia[b,c]	Slovenia (Slovenian Health Inteview Survey, 2007)[50]	SR	Known diabetes	3,030	20 - 79
Slovenia[d]	Slovenia (Zaletel-Kragelj et al, 2004)[42]	SR	Known diabetes	9,043	25-64
Spain[b,k]	Spain (Arteagoita et al, 2003)[111]	SR	Known diabetes	65,651	24+
Spain	Spain (Castell et al, 1999)[112]	OGTT	WHO - 1985	3,839	30-79
Spain	Spain (Masia et al, 2004)[113]	FBG	ADA - 1997	3,000	25-74
Spain	Spain (Valverde et al, 2006)[114]	FBG	ADA - 1997	2,562	20+
Sweden	Sweden (Eliasson et al, 2002)[115]	OGTT	WHO - 1999	6,952	25-74
Switzerland[a,b]	Germany[45,56,59]				
Tajikistan[b]	Uzbekistan[35,36]	2hBG	WHO - 1994, 1999	2,865	35+
Turkey	Turkey (Satman et al, 2002)[34]	2hBG	WHO - 1999	24,788	20+
Turkmenistan[b]	Uzbekistan[35,36]	2hBG	WHO - 1994, 1999	2,865	35+
Ukraine[b]	Poland[37,38]	OGTT	WHO - 1985	6,842	35+
United Kingdom[b, m]	England (National Health Survey for England, 2004)[54]	SR	Known diabetes	12,546	16+
United Kingdom	England (Gill et al, 2003)[51]	SR	Known diabetes	177,000	20+
United Kingdom	Wales (Harvey et al, 2002)[52]	SR	Known diabetes	418,000	15+
United Kingdom	Scotland (Wild, 2009)[53]	SR	Known diabetes	Population	
United Kingdom	England (Forouhi et al, 2006)[116]	OGTT	WHO - 1985	2,529	25-75
Uzbekistan[b]	Uzbekistan (King et al, 1998 and 2002)[35,36]	2hBG	WHO - 1994, 1999	2,865	35+

[a.] IGT prevalences were derived from the data of Rathmann et al
[b.] The prevalences for the studies were obtained by combining the data from the two (or more) studies respectively
[c.] Because of the absence of data for IGT in the study used for diabetes, IGT figures were calculated from Turkish data
[d.] Because of the absence of data for IGT in the study used for diabetes, IGT figures were calculated from Polish data
[e.] IGT prevalence for Finland was derived only from the data in Saaristo et al
[f.] IFG prevalence for France was derived from the data in Gourdy et al and Lecomte et al [117]
[g.] Because of the absence of data for IGT in the study used for diabetes, IGT figures were calculated from Cyprus data
[h] IGT prevalence for Italy were derived from other reports: Garancini et al, 1995 [118], Verillo et al [119]
[j.] Because of the absence of data for IGT in the study used for diabetes, IGT figures were calculated from the Netherlands (Mooy et al)
[k.] IGT prevalence for Spain was calculated from the reports of Castell et al, Masia et al and Valverde et al
[m.] IGT prevalence for United Kingdom was calculated from the reports of Unwin et al [120] and Yudkin et al [121]

Table 17

Prevalence estimates of diabetes mellitus (DM), 2010 - Middle East and North African Region

	Population (20-79)	DM prevalence		Number of people with DM (000's) in the 20-79 age-group							
Country/Territory	**000's**	**National**	**Comparative***	**Rural**	**Urban**	**Male**	**Female**	**20-39**	**40-59**	**60-79**	**Total**
Afghanistan	12,911	6.6%	8.6%	558.6	297.9	466.0	390.5	219.0	455.6	181.8	**856.5**
Algeria	22,061	7.4%	8.5%	568.0	1,064.2	810.0	822.1	515.6	740.4	376.1	**1,632.1**
Armenia	2,108	8.7%	7.8%	38.3	145.6	66.5	117.5	13.9	95.8	74.2	**183.9**
Bahrain	535	14.4%	15.4%	2.2	74.6	47.2	29.6	15.2	50.1	11.6	**76.9**
Egypt	45,935	10.4%	11.4%	1,492.9	3,294.2	2,099.0	2,688.2	1,181.4	2,313.0	1,292.7	**4,787.1**
Iran, Islamic Republic of	46,960	6.1%	8.0%	576.7	2,294.8	1,213.7	1,657.8	376.0	1,500.2	995.3	**2,871.5**
Iraq	14,995	7.8%	10.2%	128.2	1,047.7	578.6	597.2	186.9	678.4	310.5	**1,175.9**
Jordan	3,566	7.5%	10.1%	32.6	236.1	138.2	130.5	47.3	148.3	73.0	**268.6**
Kuwait	2,130	10.8%	14.6%	2.3	228.1	147.3	83.1	64.3	123.5	42.7	**230.4**
Lebanon	2,670	7.7%	7.8%	8.4	196.0	99.4	104.9	8.5	93.6	102.2	**204.4**
Libyan Arab Jamahiriya	3,979	7.5%	9.0%	16.2	281.4	124.3	173.2	100.3	112.6	84.7	**297.6**
Morocco	19,869	7.6%	8.3%	359.7	1,153.1	728.9	783.9	329.1	800.1	383.6	**1,512.8**
Occupied Palestinian Territory[a]	1,952	6.4%	8.6%	13.8	111.8	53.9	71.8	11.0	77.3	37.3	**125.6**
Oman	1,623	11.1%	13.4%	8.1	172.2	110.7	69.6	62.2	88.0	30.0	**180.2**
Pakistan	93,644	7.6%	9.1%	3,416.3	3,730.1	3,870.8	3,275.6	1,591.8	3,902.3	1,652.3	**7,146.4**
Qatar	640	13.3%	15.4%	2.7	82.3	62.9	22.1	22.2	55.5	7.3	**85.0**
Saudi Arabia	15,187	13.6%	16.8%	146.0	1,919.3	1,182.5	882.8	587.3	1,114.8	363.2	**2,065.3**
Sudan	20,603	3.3%	4.2%	256.4	418.9	271.5	403.7	79.5	367.8	227.9	**675.3**
Syrian Arab Republic	11,744	8.3%	10.8%	247.5	726.1	488.0	485.6	333.9	361.0	278.8	**973.6**
Tunisia	7,079	8.5%	9.3%	96.3	505.5	271.0	330.8	103.4	326.5	171.9	**601.8**
United Arab Emirates	3,493	12.2%	18.7%	27.0	398.0	296.2	128.9	162.9	224.8	37.4	**425.0**
Yemen	10,785	2.5%	3.0%	99.9	170.1	133.4	136.6	115.0	112.9	42.2	**270.0**
MENA Total	**344,469**	**7.7%**	**9.3%**	**8,098**	**18,548**	**13,260**	**13,386**	**6,127**	**13,742**	**6,777**	**26,646**

[a] Occupied Palestinian Territory assigned urban/rural distribution of Jordan

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 18

Prevalence estimates of diabetes mellitus (DM), 2030 - Middle East and North African Region

Country/Territory	Population (20-79) 000's	DM prevalence National	DM prevalence Comparative*	Number of people with DM (000's) in the 20-79 age-group Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Afghanistan	24,565	7.0%	9.9%	880.4	846.0	938.3	788.1	456.3	929.3	340.8	**1,726.4**
Algeria	30,673	9.3%	9.4%	753.5	2096.4	1422.9	1426.9	529.5	1394.3	926.0	**2,849.9**
Armenia	2,141	10.8%	9.3%	36.4	195.8	81.0	151.2	14.0	93.6	124.5	**232.2**
Bahrain	766	17.5%	17.3%	2.9	131.1	75.3	58.7	17.1	71.0	45.9	**134.0**
Egypt	67,331	12.8%	13.7%	1,903.8	6,710.9	3,674.6	4,940.1	1,643.2	4,202.8	2,768.8	**8,614.7**
Iran, Islamic Republic of	64,205	9.3%	9.8%	869.3	5,111.8	2,547.6	3,433.6	451.1	3,122.3	2,407.7	**5,981.2**
Iraq	27,896	9.3%	12.0%	211.7	2,393.3	1,280.6	1,324.4	348.0	1,453.0	803.9	**2,605.0**
Jordan	5,587	10.5%	11.9%	52.8	534.4	298.9	288.3	61.4	332.7	193.1	**587.3**
Kuwait	3,175	16.6%	16.9%	4.1	522.7	326.9	199.9	61.4	260.5	205.0	**526.8**
Lebanon	3,443	9.7%	9.6%	10.6	323.4	156.1	177.9	10.2	137.1	186.7	**334.0**
Libyan Arab Jamahiriya	5,787	9.5%	10.3%	22.8	524.9	221.7	325.9	105.5	237.1	205.1	**547.6**
Morocco	26,700	9.7%	9.8%	440.5	2,148.6	1,217.2	1,371.9	393.0	1,318.7	877.4	**2,589.1**
Occupied Palestinian Territory[a]	3,995	7.2%	10.1%	24.0	262.2	125.7	160.5	22.5	166.9	96.8	**286.2**
Oman	2,544	13.9%	14.9%	11.0	342.8	200.0	153.8	78.8	181.1	93.9	**353.8**
Pakistan	149,190	9.3%	10.5%	4,963.4	8,869.6	7,482.0	6,351.0	2,682.2	7,593.7	3,557.1	**13,833.0**
Qatar	880	16.7%	17.2%	3.6	143.5	95.7	51.4	22.5	91.4	33.2	**147.1**
Saudi Arabia	24,550	17.0%	18.9%	226.4	3,957.0	2,242.6	1,940.9	799.5	2,155.8	1,228.1	**4,183.4**
Sudan	34,535	4.0%	5.2%	367.1	1,000.3	563.4	804.0	143.2	763.7	460.6	**1,367.5**
Syrian Arab Republic	19,028	11.0%	13.2%	383.3	1,716.0	1,043.2	1,056.0	445.2	885.4	768.6	**2,099.3**
Tunisia	9,021	11.7%	11.0%	116.8	935.0	470.0	581.7	104.4	547.3	400.1	**1,051.7**
United Arab Emirates	5,225	19.2%	21.4%	48.6	956.3	654.9	349.9	153.6	645.5	205.8	**1,004.9**
Yemen	21,485	2.9%	3.5%	164.9	457.4	308.9	313.4	240.9	278.3	103.1	**622.3**
MENA Total	**532,719**	**9.7%**	**10.8%**	**11,498**	**40,180**	**25,428**	**26,249**	**8,784**	**26,862**	**16,032**	**51,677**

a. Occupied Palestinian Territory assigned urban/rural distribution of Jordan

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 19

Prevalence estimates of impaired glucose tolerance (IGT), 2010 - Middle East and North African Region

Country/Territory	Population (20-79) 000's	IGT prevalence National	IGT prevalence Comparative*	Number of people with IGT (000's) in the 20-79 age-group Male	Female	20-39	40-59	60-79	Total
Afghanistan	12,911	7.2%	8.7%	307.4	623.5	390.7	362.6	177.8	**931.0**
Algeria	22,061	5.8%	6.5%	429.1	860.4	487.7	586.4	215.4	**1,289.5**
Armenia	2,108	7.3%	6.7%	46.6	108.3	32.4	73.0	49.4	**154.9**
Bahrain	535	17.0%	18.8%	46.7	44.3	35.4	43.3	12.3	**91.0**
Egypt	45,935	4.8%	5.1%	1,059.6	1,136.9	777.2	814.1	605.3	**2,196.5**
Iran, Islamic Republic of	46,960	9.7%	11.4%	1,939.2	2,601.3	1,475.0	2,120.0	945.4	**4,540.5**
Iraq	14,995	7.3%	8.7%	544.9	553.7	349.8	551.7	197.0	**1,098.6**
Jordan	3,566	7.3%	8.7%	133.7	125.3	87.5	124.6	46.9	**259.0**
Kuwait	2,130	15.9%	18.8%	184.4	154.2	161.6	141.2	35.8	**338.6**
Lebanon	2,670	4.0%	4.1%	46.1	61.2	13.6	49.8	44.0	**107.3**
Libyan Arab Jamahiriya	3,979	5.7%	6.5%	82.0	146.4	91.5	99.6	37.3	**228.4**
Morocco	19,869	6.2%	6.5%	388.1	836.5	416.0	577.7	230.9	**1,224.6**
Occupied Palestinian Territory	1,952	7.2%	8.7%	70.6	69.8	45.6	69.3	25.4	**140.3**
Oman	1,623	9.3%	10.9%	72.8	77.4	66.6	65.6	18.0	**150.2**
Pakistan	93,644	7.6%	8.7%	2,432.6	4,726.9	2,643.7	2,907.9	1,607.9	**7,159.5**
Qatar	640	15.5%	18.8%	63.6	35.7	45.2	46.3	7.8	**99.3**
Saudi Arabia	15,187	11.8%	12.5%	1,070.1	724.8	907.2	716.7	171.0	**1,794.9**
Sudan	20,603	2.3%	2.8%	177.4	300.6	117.4	223.3	137.4	**478.0**
Syrian Arab Republic	11,744	9.3%	13.0%	484.4	605.3	256.4	470.5	362.7	**1,089.7**
Tunisia	7,079	3.2%	3.4%	106.4	121.6	85.6	88.9	53.5	**228.0**
United Arab Emirates	3,493	14.3%	18.8%	321.4	179.7	292.6	180.2	28.3	**501.1**
Yemen	10,785	2.8%	4.0%	147.1	155.7	62.5	146.6	93.7	**302.8**
MENA Total	**344,469**	**7.1%**	**8.2%**	**10,154**	**14,250**	**8,841**	**10,459**	**5,103**	**24,404**

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 20

Prevalence estimates of impaired glucose tolerance (IGT), 2030 - Middle East and North African Region

Country/Territory	Population (20-79) 000s	IGT prevalence National	IGT prevalence Comparative*	Number of people with IGT (000's) in the 20-79 age-group Male	Female	20-39	40-59	60-79	Total
Afghanistan	24,565	7.2%	9.5%	585.6	1193.1	748.5	704.6	325.7	**1,778.7**
Algeria	30,673	6.9%	6.9%	710.0	1412.3	498.1	1095.9	528.2	**2,122.3**
Armenia	2,141	8.4%	7.4%	55.4	124.5	26.4	72.4	81.1	**179.9**
Bahrain	766	19.8%	20.1%	76.2	75.7	40.6	60.6	50.7	**151.9**
Egypt	67,331	5.3%	5.6%	1,701.4	1,849.6	963.8	1,367.7	1,219.6	**3,551.1**
Iran, Islamic Republic of	64,205	12.4%	12.4%	3,516.0	4,423.8	1,504.6	4,255.9	2,179.3	**7,939.8**
Iraq	27,896	8.1%	9.5%	1,118.0	1,137.9	617.9	1,140.4	497.7	**2,256.0**
Jordan	5,587	8.8%	9.5%	249.4	240.4	110.0	259.3	120.6	**489.9**
Kuwait	3,175	19.4%	20.1%	326.4	288.0	162.5	281.3	170.6	**614.4**
Lebanon	3,443	4.9%	4.8%	69.8	97.5	15.3	70.9	81.1	**167.4**
Libya	5,787	6.7%	6.9%	132.7	257.7	94.6	205.6	90.1	**390.3**
Morocco	26,700	7.0%	6.9%	578.1	1,283.4	449.4	909.8	502.3	**1,861.5**
Occupied Palestinian Territory	3,995	7.6%	9.5%	154.0	149.6	91.2	146.4	65.9	**303.5**
Oman	2,544	11.0%	11.5%	127.9	153.1	84.5	140.1	56.4	**281.0**
Pakistan	149,190	8.5%	9.5%	4,527.9	8,108.0	3,795.4	5,448.8	3,391.6	**12,635.9**
Qatar	880	18.1%	20.1%	92.8	66.7	48.0	75.3	36.3	**159.6**
Saudi Arabia	24,550	12.1%	12.4%	1,640.5	1,326.1	1,157.7	1,257.2	551.7	**2,966.5**
Sudan	34,535	2.5%	3.2%	327.7	541.9	189.7	424.1	255.8	**869.6**
Syria	19,028	12.5%	15.3%	1,073.0	1,296.2	329.9	1,094.7	944.6	**2,369.2**
Tunisia	9,021	5.2%	5.1%	219.3	251.0	108.7	197.2	164.5	**470.4**
United Arab Emirates	5,225	17.6%	20.1%	552.4	369.6	280.3	488.4	153.2	**921.9**
Yemen	21,485	3.1%	4.7%	325.8	341.7	126.4	328.3	212.8	**667.5**
MENA Total	**532,719**	**8.1%**	**8.9%**	**18,160**	**24,988**	**11,443**	**20,025**	**11,680**	**43,148**

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 21

Data sources: prevalence estimates of diabetes mellitus (DM) and impaired glucose tolerance (IGT) - Middle East and North African Region

Country/Territory	Data Used	Screening Method	Diagnostic Criteria	Sample Size	Age sample
Afghanistan[a]	Pakistan	OGTT	WHO - 1985	6,441	25+
Algeria	Algeria (Malek et al, 2001)[123]	OGTT	WHO - 1985	1,457	30-64
Armenia	Turkey[34]	2hBG	WHO - 1999	24,788	20+
Bahrain[b]	Bahrain (Al-Mahroos et al, 1998)[60]	OGTT	WHO - 1985	2,128	40-69
Egypt[c]	Egypt (Herman et al, 1995 and Arab, 1997)[61,124]	OGTT/Post prandial GT	WHO - 1985	5,251	20+
Iran, Islamic Republic of	Iran (Azizi et al, 2003)[125]	OGTT	WHO - 1999	10,368	20+
Iraq	Jordan[126]	OGTT	WHO - 1985	2,776	25-79
Jordan	Jordan (Ajlouni et al, 1998)[126]	OGTT	WHO - 1985	2,776	25-79
Kuwait[b]	Kuwait (Abdella et al, 1998)[63]	OGTT	WHO - 1985	3,003	20+
Lebanon	Lebanon (Salti et al, 1997)[127]	OGTT	WHO - 1985	2,518	30+
Libya	Libya (Kadiki et al, 1999)[128]	Registration	N/A	15,912	20+
Morocco[d]	Morocco (Tazi et al, 2003)[129]	FBG/ SR	WHO - 1980	1,802	20+
Occupied Palestinian Territory[e]	Palestine (Abdul-Rahim et al, 2001; Husseini et al, 2000)[130,131]	OGTT	WHO - 1985	992	30-65
Oman[f]	Oman (Al-Lawati et al, 2002)[64]	OGTT	WHO - 1999	5,731	20-79
Pakistan[a]	Pakistan (Shera et al, 1995, 1999a, 1999b) [74-76]	OGTT	WHO - 1985	3,409	25+
Pakistan[a]	Pakistan (Basit et al, 2002)[122]	FBG	ADA - 1997	2,032	25+
Qatar[b]	Bahrain[60]	OGTT	WHO - 1985	2,128	40-69
Saudi Arabia[a,b]	Saudi Arabia (El Hazmi et al, 1998; Al-Nozha et al 2004; Al-Nuaim 1997)[71-73]	OGTT	WHO - 1985, ADA 1997,	47,573	14+
Sudan	Sudan (Elbagir et al, 1996)[30]	2hBG	WHO - 1985	1,284	25-84
Syria	Syria (Albache, 2006)[132]	OGTT	WHO - 1999	1,700	20+
Tunisia[e]	Tunisia (Bougerra et al, 2007)[77]	FBG	ADA - 1997	3,729	20+
United Arab Emirates	UAE (Malik et al, 2005)[67]	OGTT	WHO - 1999	6,612	19+
United Arab Emirates	UAE (Saadi et al, 2007)[68]	OGTT	WHO - 1999	2,396	19+
Yemen	Yemen (Al-Habori, 2004)[133]	OGTT	WHO - 1999	498	20-69

[a.] The prevalence was obtained by combining the data from the four studies
[b.] Because of the absence of data for IGT in the study used for diabetes, IGT figures were calculated from UAE data
[c.] The prevalences were calculated as the average of the two cited studies as their sample sizes differed considerably
[d.] Because of the absence of data for IGT in the studies used for diabetes, IGT figures were calculated from Libyan data
[e.] Because of the absence of data for IGT in the studies used for diabetes, IGT figures were calculated from Jordanian data
[f.] Because of the absence of data for IGT in the studies used for diabetes, IGT figures were calculated from other Oman data (Asfour et al, 1995) [134]

Table 22

Prevalence estimates of diabetes mellitus (DM), 2010 - North America and Caribbean Region

Country/Territory	Population (20-79) 000's	DM prevalence National	DM prevalence Comparative*	Number of people with DM (000's) in the 20-79 age-group Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Anguilla[a]	9	5.9%	5.9%	0.4	0.1	0.2	0.3	0.1	0.3	0.2	**0.5**
Antigua and Barbuda[a]	44	7.1%	7.1%	1.4	1.7	1.4	1.7	0.3	1.5	1.2	**3.1**
Aruba[a]	73	12.8%	10.2%			3.8	5.5	0.7	5.0	3.7	**9.3**
Bahamas	222	10.2%	10.4%			9.5	13.0	2.5	11.6	8.5	**22.5**
Barbados	219	9.2%	8.0%	5.7	14.4	8.4	11.7	1.7	10.8	7.6	**20.1**
Belize	164	7.9%	9.8%	4.4	8.4	5.0	7.8	2.5	7.2	3.1	**12.9**
Bermuda[a]	42	10.2%	10.2%			1.9	2.4	0.5	2.1	1.7	**4.2**
British Virgin Islands[a]	15	10.2%	10.2%			0.7	0.9	0.2	0.8	0.6	**1.6**
Canada	24,736	11.6%	9.2%			1496.8	1369.3	247.2	1121.6	1497.3	**2,866.1**
Cayman Islands[a]	31	10.2%	10.2%			1.4	1.8	0.3	1.6	1.3	**3.2**
Dominica[a]	45	11.5%	11.5%	0.8	4.4	2.0	3.2	0.7	2.9	1.6	**5.2**
Grenada[a]	60	8.5%	9.5%	2.0	3.1	1.8	3.3	0.7	2.9	1.5	**5.1**
Guadeloupe	304	10.7%	8.9%	0.0	32.5	13.4	19.1	2.7	16.9	12.9	**32.5**
Guyana	439	10.2%	9.5%	17.0	27.6	20.6	24.0	5.3	26.9	12.4	**44.6**
Haiti	5,303	5.9%	7.2%	129.5	183.4	117.5	195.5	58.3	153.1	101.5	**313.0**
Jamaica	1,601	10.2%	10.6%	39.6	124.0	59.8	103.8	22.8	92.0	48.8	**163.6**
Martinique	278	11.0%	8.8%	0.6	29.9	12.4	18.1	2.1	15.5	12.9	**30.5**
Mexico	67,317	10.1%	10.8%	901.9	5924.8	2752.4	4074.4	1120.9	3142.2	2563.7	**6,826.8**
Netherlands Antilles	142	14.0%	11.5%	3.0	16.9	7.3	12.6	2.6	11.6	5.8	**19.9**
St Kitts and Nevis[a]	25	9.0%	9.0%	1.0	1.2	0.8	1.4	0.3	1.2	0.7	**2.2**
St Lucia	107	8.6%	9.3%	3.9	5.4	3.4	5.9	1.4	5.2	2.7	**9.3**
St Vincent and the Grenadines[a]	76	7.3%	8.4%	1.2	4.3	2.4	3.1	0.7	2.6	2.2	**5.5**
Suriname	289	10.3%	10.5%	7.9	21.8	11.9	17.8	5.4	16.5	7.8	**29.7**
Trinidad and Tobago	943	11.4%	11.7%	13.4	94.3	39.3	68.4	14.6	62.1	31.0	**107.7**
United States of America	217,335	12.3%	10.3%			12800.6	14013.0	2667.2	10712.2	13434.3	**26,813.6**
US Virgin Islands	75	12.7%	9.9%	3.1	6.4	3.2	6.4	0.7	4.7	4.2	**9.5**
NAC Total	**319,893**	**11.7%**	**10.2%**	**1,137**	**6,505**	**17,378**	**19,984**	**4,162**	**15,431**	**17,769**	**37,362**

a. Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of the world population from 2008 to 2010

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 23

Prevalence estimates of diabetes mellitus (DM), 2030 - North America and Caribbean Region

	Population (20-79)	DM prevalence		Number of people with DM (000's) in the 20-79 age-group							
Country/Territory	**000's**	**National**	**Comparative***	**Rural**	**Urban**	**Male**	**Female**	**20-39**	**40-59**	**60-79**	**Total**
Anguilla[a]	11	7.5%	7.5%	0.5	0.3	0.3	0.4	0.1	0.3	0.4	**0.8**
Antigua and Barbuda[a]	55	9.1%	9.1%	1.5	3.4	2.2	2.8	0.4	2.2	2.4	**5.0**
Aruba[a]	80	14.8%	11.9%			4.7	7.1	0.7	3.9	7.3	**11.8**
Bahamas	291	12.7%	12.1%			15.4	21.5	2.8	15.9	18.3	**37.0**
Barbados	231	12.9%	9.9%	6.1	23.6	12.5	17.1	1.4	10.6	17.6	**29.7**
Belize	268	10.4%	11.8%	7.0	20.8	10.4	17.4	4.0	15.3	8.5	**27.8**
Bermuda[a]	52	11.9%	11.9%			2.7	3.5	0.5	2.7	2.9	**6.2**
British Virgin Islands[a]	18	11.9%	11.9%			0.9	1.2	0.2	0.9	1.0	**2.1**
Canada	28,620	13.9%	10.9%			2,091.4	1,889.2	264.4	1,124.1	2,592.1	**3,980.6**
Cayman Islands[a]	35	11.9%	11.9%			1.8	2.4	0.4	1.8	2.0	**4.2**
Dominica[a]	55	13.3%	13.3%	0.8	6.5	2.7	4.6	0.8	3.7	2.8	**7.3**
Grenada[a]	71	10.9%	11.6%	2.2	5.6	2.9	4.9	1.1	3.7	3.0	**7.8**
Guadeloupe	345	12.5%	10.3%	0.0	43.2	17.7	25.5	2.6	16.6	24.1	**43.2**
Guyana	465	11.6%	11.6%	14.7	39.2	21.3	32.6	6.0	22.4	25.5	**53.9**
Haiti	7,944	7.4%	8.9%	174.4	412.3	222.4	364.4	91.7	294.3	200.8	**586.8**
Jamaica	1,919	12.3%	12.6%	41.0	194.1	81.0	154.2	27.9	111.0	96.3	**235.2**
Martinique	291	13.2%	10.1%	0.6	37.9	15.7	22.8	1.9	13.4	23.1	**38.5**
Mexico	89,731	13.3%	12.9%	1,185.1	10,724.8	4,657.9	7,252.0	1,233.2	5,028.6	5,648.1	**11,909.9**
Netherlands Antilles	157	16.8%	13.2%	2.9	23.5	9.4	17.0	1.9	13.0	11.5	**26.4**
St Kitts and Nevis[a]	31	11.0%	11.0%	1.2	2.2	1.3	2.1	0.4	1.7	1.3	**3.4**
St Lucia	139	11.5%	11.3%	4.9	11.1	5.7	10.3	1.7	8.5	5.8	**16.0**
St Vincent and the Grenadines[a]	86	10.9%	10.4%	1.4	8.0	4.2	5.2	0.7	4.4	4.4	**9.4**
Suriname	336	12.9%	12.3%	8.2	35.1	17.3	26.1	5.5	21.1	16.8	**43.4**
Trinidad and Tobago	1,010	15.2%	13.5%	14.2	139.5	54.8	98.9	12.1	80.1	61.4	**153.7**
United States of America	257,606	14.0%	12.0%			17,263.0	18,695.2	3,038.5	10,708.3	22,211.4	**35,958.2**
US Virgin Islands	69	13.5%	12.0%	2.2	7.1	2.8	6.5	0.8	3.4	5.0	**9.3**
NAC Total	**389,914**	**13.6%**	**12.1%**	**1,469**	**11,738**	**24,523**	**28,685**	**4,702**	**17,512**	**30,994**	**53,207**

a. Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of the world population from 2008 to 2030

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 24

Prevalence estimates of impaired glucose tolerance (IGT), 2010 - North America and Caribbean Region

Country/Territory	Population (20-79)	IGT prevalence		Number of people with IGT (000's) in the 20-79 age-group					
	000's	National	Comparative*	Male	Female	20-39	40-59	60-79	Total
Anguilla[a]	9	11.5%	11.5%	0.4	0.6	0.3	0.4	0.3	**1.1**
Antigua and Barbuda[a]	44	11.5%	11.5%	2.1	3.0	1.3	2.1	1.6	**5.0**
Aruba[a]	73	13.3%	11.5%	3.9	5.8	1.7	4.8	3.3	**9.7**
Bahamas	222	11.5%	11.5%	10.0	15.6	6.8	11.2	7.6	**25.6**
Barbados	219	12.5%	11.5%	11.1	16.3	5.5	13.3	8.6	**27.4**
Belize	164	10.0%	11.5%	6.4	10.0	5.9	6.5	3.9	**16.3**
Bermuda[a]	42	11.5%	11.5%	2.0	2.8	1.2	2.0	1.5	**4.8**
British Virgin Islands[a]	15	11.5%	11.5%	0.7	1.0	0.5	0.7	0.6	**1.8**
Canada[b]	24,736	12.9%	11.2%	1,650.3	1,538.3	580.1	1,323.5	1,285.1	**3,188.6**
Cayman Islands[a]	31	11.5%	11.5%	1.5	2.1	0.9	1.5	1.1	**3.6**
Dominica[a]	45	11.5%	11.5%	2.1	3.1	1.3	2.2	1.7	**5.2**
Grenada[a]	60	10.7%	11.5%	2.4	4.0	1.8	2.7	1.9	**6.4**
Guadeloupe	304	13.0%	11.5%	16.0	23.6	7.6	17.9	14.2	**39.7**
Guyana	439	12.0%	11.5%	25.8	27.0	11.5	25.0	16.3	**52.8**
Haiti	5,303	6.7%	7.5%	164.4	192.0	141.0	131.6	83.8	**356.4**
Jamaica	1,601	11.4%	11.5%	71.8	110.0	49.1	76.6	56.1	**181.8**
Martinique	278	13.5%	11.5%	15.2	22.3	6.1	16.8	14.6	**37.5**
Mexico	67,317	7.7%	8.0%	2,117.1	3,089.6	1,466.8	2,015.7	1,724.1	**5,206.6**
Netherlands Antilles	142	8.7%	7.6%	3.6	8.8	2.9	6.5	3.1	**12.4**
Saint Kitts and Nevis[a]	25	11.5%	11.5%	1.2	1.7	0.7	1.2	0.9	**2.9**
Saint Lucia	107	11.0%	11.5%	4.6	7.2	3.5	5.0	3.4	**11.8**
Saint Vincent and the Grenadines[a]	76	10.6%	11.5%	3.2	4.9	2.5	3.1	2.4	**8.0**
Suriname	289	7.6%	7.6%	7.3	14.6	7.4	9.9	4.6	**21.9**
Trinidad and Tobago	943	11.2%	11.5%	41.0	64.5	28.7	46.4	30.4	**105.5**
United States of America	217,335	12.6%	11.2%	13,889.3	13,390.0	5,383.4	11,289.8	10,606.2	**27,279.4**
US Virgin Islands	75	14.1%	11.5%	4.4	6.2	1.6	4.1	4.9	**10.5**
NAC Total	**319,893**	**11.4%**	**10.4%**	**18,058**	**18,565**	**7,720**	**15,020**	**13,882**	**36,623**

a. Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of world population from 2008 to 2010
b. Because of the absence of data for IGT in the study used for diabetes, IGT figures were calculated from USA data.

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 25

Prevalence estimates of impaired glucose tolerance (IGT), 2030 - North America and Caribbean Region

Country/Territory	Population (20-79) 000's	IGT prevalence National	IGT prevalence Comparative*	Number of people with IGT (000's) in the 20-79 age-group Male	Female	20-39	40-59	60-79	Total
Anguilla[a]	11	12.8%	12.8%	0.6	0.8	0.3	0.5	0.5	**1.3**
Antigua and Barbuda[a]	55	12.8%	12.8%	3.0	4.0	1.4	2.7	2.8	**7.0**
Aruba[a]	80	14.9%	12.8%	5.1	6.8	1.8	3.6	6.5	**11.9**
Bahamas	291	13.4%	12.8%	16.3	22.6	7.4	15.1	16.4	**39.0**
Barbados	231	15.5%	12.8%	16.2	19.4	4.3	12.0	19.3	**35.6**
Belize	268	11.4%	12.8%	12.4	18.2	8.2	12.8	9.6	**30.6**
Bermuda[a]	52	12.8%	12.8%	2.9	3.8	1.4	2.6	2.7	**6.6**
British Virgin Islands[a]	18	12.8%	12.8%	1.0	1.3	0.5	0.9	0.9	**2.3**
Canada[b]	28,620	14.5%	12.4%	2,144.6	1,991.2	603.8	1,327.0	2,205.0	**4,135.8**
Cayman Islands[a]	35	12.8%	12.8%	1.9	2.6	0.9	1.8	1.8	**4.5**
Dominica[a]	55	10.7%	12.8%	2.5	3.3	1.2	2.3	2.4	**5.9**
Grenada[a]	71	12.0%	12.8%	3.5	5.1	2.1	3.2	3.2	**8.5**
Guadeloupe	345	14.9%	12.8%	22.1	29.3	7.3	17.3	26.8	**51.4**
Guyana	465	13.7%	12.8%	30.8	32.6	12.6	19.1	31.7	**63.5**
Haiti	7,944	9.0%	10.3%	302.8	412.7	218.6	295.3	201.6	**715.5**
Jamaica	1,919	12.5%	12.8%	98.3	142.0	53.6	86.7	100.0	**240.3**
Martinique	291	15.6%	12.8%	19.9	25.6	5.4	14.2	25.9	**45.5**
Mexico	89,731	9.3%	9.1%	3,604.0	4,705.7	1,531.0	3,089.2	3,689.6	**8,309.7**
Netherlands Antilles	157	14.6%	10.7%	8.9	13.9	0.9	9.4	12.5	**22.8**
Saint Kitts and Nevis[a]	31	12.8%	12.8%	1.7	2.2	0.8	1.5	1.6	**4.0**
Saint Lucia	139	12.7%	12.8%	7.3	10.4	3.6	7.4	6.7	**17.7**
Saint Vincent and the Grenadines[a]	86	13.2%	12.8%	5.0	6.4	2.0	4.8	4.5	**11.4**
Suriname	336	8.3%	8.1%	9.6	18.2	6.8	11.8	9.2	**27.8**
Trinidad and Tobago	1,010	13.8%	12.8%	59.3	79.7	21.2	58.3	59.5	**139.0**
United States of America	257,606	13.7%	12.4%	17,976.7	17,188.9	6,149.7	11,388.0	17,628.9	**35,165.6**
US Virgin Islands	69	14.6%	12.8%	4.1	5.9	1.6	2.8	5.7	**10.0**
NAC Total	**389,914**	**12.6%**	**11.6%**	**24,361**	**24,753**	**8,648**	**16,390**	**24,075**	**49,113**

a. Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of world population from 2008 to 2030
b. Because of the absence of data for IGT in the study used for diabetes, IGT figures were calculated from USA data
* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 26

Data sources: prevalence estimates of diabetes mellitus (DM) and impaired glucose tolerance (IGT) - North America and Caribbean Region

Country/Territory	Data Used	Screening Method	Diagnostic Criteria	Sample Size	Age sample
Anguilla[a]	Barbados[135]	SR or HBA1c> 10%	Known diabetes	4,104	40-79
Antigua and Barbuda[a]	Barbados[135]	SR or HBA1c> 10%	Known diabetes	4,104	40-79
Aruba[a]	Barbados[135]	SR or HBA1c> 10%	Known diabetes	4,104	40-79
Bahamas	Barbados[135]	SR or HBA1c> 10%	Known diabetes	4,104	40-79
Barbados[a]	Barbados (Hennis et al, 2002)[135]	SR or HBA1c> 10%	Known diabetes	4,104	40-79
Belize	Jamaica[81]	OGTT	WHO - 1980	1,303	25-74
Bermuda[a]	Barbados[135]	SR or HBA1c> 10%	Known diabetes	4,104	40-79
British Virgin Islands[a]	Barbados[135]	SR or HBA1c> 10%	Known diabetes	4,104	40-79
Canada[b]	Canada (Lipscombe et al, 2007; NDSS, 2008)[82,136]	Registry	Known diabetes	Population	20+
Cayman Islands[a]	Barbados[135]	SR or HBA1c> 10%	Known diabetes	4,104	40-79
Dominica	Jamaica[81]	OGTT	WHO - 1980	1,303	25-74
Grenada	Jamaica[81]	OGTT	WHO - 1980	1,303	25-74
Guadeloupe[a]	Guadeloupe (Costagliola et al, 1991)[137]	SR or FPG > 8.0	WHO - 1980	1,036	18+
Guyana	Jamaica	OGTT	WHO - 1980	1,303	25-74
Haiti	Haiti (Jean Baptiste et al, 2006)[84]	OGTT	Expert Commtee - 2003	1,113	20+
Jamaica	Jamaica (Wilks et al, 1999)[81]	OGTT	WHO - 1980	1,303	25-74
Martinique[a]	Guadeloupe	SR or FPG > 8.0	WHO - 1980	1,036	18+
Mexico[b]	Mexico (Aguilar-Salinas et al, 2003; Sanchez-Castillo et al, 2005)[138,139]	OGTT/FBG	ADA - 1997	84,054	20+
Netherlands Antilles	Suriname[140]	OGTT	WHO - 1980	1,218	30+
St Kitts and Nevis	Jamaica[81]	OGTT	WHO - 1980	1,303	25-74
St Lucia	Jamaica[81]	OGTT	WHO - 1980	1,303	25-74
St Vincent and the Grenadines[a]	Barbados[135]	SR or HBA1c> 10%	Known diabetes	4,104	40-79
Suriname	Suriname (Schaad et al, 1985)[140]	OGTT	WHO - 1980	1,218	30+
Trinidad and Tobago	Jamaica[81]	OGTT	WHO - 1980	1,303	25-74
United States of America	USA (Cowie et al, 2009)[79]	OGTT	ADA - 1997	2,806	20+
US Virgin Islands	Jamaica[81]	OGTT	WHO - 1980	1,303	25-74

[a] Because of the absence of data for IGT in the study used for diabetes, IGT figures were calculated from Jamaican data
b. Because of the absence of data for IGT in the study used for diabetes, IGT figures were calculated from USA data

Table 27

Prevalence estimates of diabetes mellitus (DM), 2010 - South and Central American Region

	Population (20-79)	DM prevalence		Number of people with DM (000's) in the 20-79 age-group							
Country/Territory	**000's**	**National**	**Comparative***	**Rural**	**Urban**	**Male**	**Female**	**20-39**	**40-59**	**60-79**	**Total**
Argentina	26,027	6.0%	5.7%	136.9	1,421.0	729.8	828.1	130.7	764.5	662.7	**1,557.9**
Bolivia	5,293	5.2%	6.0%	45.7	228.4	126.0	148.1	39.7	139.3	95.1	**274.1**
Brazil	126,326	6.0%	6.4%	608.2	7,024.3	3,423.3	4,209.2	971.4	3,579.7	3,081.4	**7,632.5**
Chile	11,473	6.1%	5.7%	75.2	623.6	336.8	362.0	80.9	379.1	238.7	**698.8**
Colombia	29,548	4.8%	5.2%	170.8	1,256.4	634.4	792.9	125.3	810.4	491.5	**1,427.3**
Costa Rica	2,963	8.8%	9.3%	70.6	191.1	130.8	130.9	36.2	151.0	74.6	**261.7**
Cuba	8,245	11.0%	9.5%	93.1	810.2	330.5	572.8	91.3	487.1	324.9	**903.3**
Dominican Republic	5,818	10.4%	11.2%	104.3	501.4	232.8	372.9	94.4	341.1	170.1	**605.7**
Ecuador	8,018	5.5%	5.9%	83.6	359.9	208.7	234.7	55.8	229.8	157.8	**443.4**
El Salvador	4,067	7.8%	9.0%	103.3	214.6	148.4	169.5	54.7	162.3	100.8	**317.9**
French Guiana	123	11.8%	12.0%	1.5	13.0	6.2	8.3	2.6	8.6	3.3	**14.5**
Guatemala	6,695	6.9%	8.6%	175.9	289.0	216.5	248.4	82.0	234.4	148.5	**464.9**
Honduras	3,817	7.1%	9.1%	83.5	189.2	132.9	139.8	50.7	145.5	76.5	**272.7**
Nicaragua	3,094	8.0%	10.0%	45.1	203.0	123.0	125.1	45.7	135.3	67.2	**248.1**
Panama	2,138	9.2%	9.6%	45.6	151.4	97.7	99.2	28.1	107.8	61.1	**196.9**
Paraguay	3,552	4.2%	4.9%	34.9	115.3	66.6	83.6	24.9	74.2	51.0	**150.1**
Peru	17,258	5.6%	6.2%	129.5	832.9	453.1	509.3	130.5	498.4	333.5	**962.4**
Puerto Rico	2,788	12.4%	10.6%	41.5	303.9	150.1	195.3	32.1	167.0	146.3	**345.4**
Uruguay	2,222	6.6%	5.7%	10.6	136.0	67.6	79.0	10.3	69.6	66.7	**146.6**
Venezuela	17,457	5.9%	6.5%	56.9	976.8	484.4	549.3	138.8	488.9	406.1	**1,033.7**
SACA Total	**286,922**	**6.3%**	**6.6%**	**2,117**	**15,842**	**8,100**	**9,858**	**2,226**	**8,974**	**6,758**	**17,958**

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 28

Prevalence estimates of diabetes mellitus (DM), 2030 - South and Central American Region

	Population (20-79)	Diabetes prevalence			Number of people with DM (000's) in the 20-79 age-group						
Country/Territory	**000's**	**National**	**Comparative***	**Rural**	**Urban**	**Male**	**Female**	**20-39**	**40-59**	**60-79**	**Total**
Argentina	32,538	6.6%	6.5%	145.4	2,012.4	1,025.4	1,132.5	151.0	1,073.4	933.5	**2,157.9**
Bolivia	8,206	6.0%	7.2%	59.3	436.2	229.8	265.7	62.0	248.8	184.8	**495.5**
Brazil	163,491	7.8%	7.7%	747.4	11,960.2	5,588.2	7,119.4	1,058.4	5,155.1	6,494.1	**12,707.6**
Chile	14,061	7.2%	6.5%	81.4	924.7	486.8	519.2	90.3	447.5	468.3	**1,006.0**
Colombia	39,979	6.3%	6.2%	222.6	2,282.9	1,134.3	1,371.3	156.5	1,171.2	1,177.9	**2,505.6**
Costa Rica	4,101	11.5%	11.3%	90.8	379.1	227.4	242.5	46.4	231.7	191.8	**469.9**
Cuba	8,464	13.5%	10.9%	87.4	1,055.1	401.6	740.9	72.0	492.8	577.7	**1,142.5**
Dominican Republic	8,081	12.4%	13.2%	124.9	878.1	368.4	634.5	122.0	514.8	366.2	**1,003.0**
Ecuador	11,086	6.8%	7.1%	102.1	650.8	348.4	404.6	74.0	350.4	328.6	**753.0**
El Salvador	5,846	10.2%	10.9%	139.9	456.2	274.4	321.7	70.5	325.2	200.5	**596.1**
French Guinea	204	13.7%	14.6%	4.0	23.8	11.2	16.7	5.0	13.0	9.9	**27.9**
Guatemala	12,288	8.0%	10.6%	266.4	716.8	445.4	537.9	171.5	522.2	289.6	**983.3**
Honduras	6,401	9.0%	11.0%	126.0	449.7	273.3	302.5	89.8	309.0	176.9	**575.8**
Nicaragua	4,729	10.4%	11.9%	65.2	427.9	233.3	259.8	66.8	265.6	160.7	**493.1**
Panama	3,014	11.4%	11.5%	57.3	286.8	163.8	180.3	35.9	171.9	136.4	**344.2**
Paraguay	5,415	5.1%	6.0%	46.1	231.1	116.8	160.4	39.2	128.9	109.1	**277.2**
Peru	23,841	7.0%	7.3%	165.3	1,500.7	771.0	894.9	166.9	823.8	675.2	**1,666.0**
Puerto Rico	3,065	13.7%	12.3%	37.4	381.8	185.4	233.8	34.0	194.0	191.2	**419.2**
Uruguay	2,505	7.1%	6.5%	10.0	167.0	83.6	93.4	11.1	81.1	84.8	**177.0**
Venezuela	24,855	7.4%	7.8%	76.4	1,763.3	840.9	998.8	177.8	754.4	907.5	**1,839.7**
SACA Total	**382,170**	**7.8%**	**7.8%**	**2,656**	**26,985**	**13,209**	**16,431**	**2,701**	**13,275**	**13,665**	**29,640**

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 29

Prevalence estimates of impaired glucose tolerance (IGT), 2010 - South and Central American Region

	Population (20-79)	IGT prevalence		Number of people with IGT (000's) in the 20-79 age-group					
Country/Territory	**000's**	**National**	**Comparative***	**Male**	**Female**	**20-39**	**40-59**	**60-79**	**Total**
Argentina	26,027	9.9%	9.7%	878.4	1,702.6	561.7	1,290.4	728.9	**2,581.0**
Bolivia	5,293	7.3%	8.0%	153.1	231.5	118.7	141.6	124.2	**384.6**
Brazil	126,326	7.1%	7.3%	3,684.6	5,315.5	2,672.8	3,828.9	2,498.4	**9,000.1**
Chile	11,473	10.2%	9.7%	407.0	762.2	232.6	651.9	284.7	**1,169.2**
Colombia	29,548	4.3%	4.5%	493.8	785.6	457.8	522.9	298.7	**1,279.4**
Costa Rica	2,963	7.0%	7.3%	89.6	117.0	62.2	90.2	54.2	**206.6**
Cuba	8,245	12.9%	11.5%	457.1	604.5	202.3	455.3	404.1	**1,061.7**
Dominican Republic	5,818	11.0%	11.5%	258.7	381.0	187.9	267.8	184.0	**639.7**
Ecuador	8,018	7.7%	8.0%	260.4	359.1	166.9	236.7	215.9	**619.5**
El Salvador	4,067	6.8%	7.3%	113.1	164.8	96.5	104.2	77.3	**278.0**
French Guiana	123	7.6%	7.6%	3.2	6.1	3.1	4.5	1.7	**9.3**
Guatemala	6,695	6.6%	7.3%	179.5	259.7	164.1	156.2	118.9	**439.2**
Honduras	3,817	6.4%	7.3%	103.4	140.3	94.3	91.2	58.3	**243.7**
Nicaragua	3,094	6.4%	7.3%	84.8	113.5	75.9	76.5	45.9	**198.2**
Panama	2,138	7.1%	7.3%	65.3	86.4	45.4	63.0	43.2	**151.7**
Paraguay	3,552	8.7%	9.7%	112.5	196.1	83.7	161.3	63.6	**308.6**
Peru	17,258	7.5%	8.0%	535.1	759.6	371.9	491.9	430.8	**1,294.6**
Puerto Rico	2,788	8.3%	7.3%	90.8	141.0	47.9	88.3	95.5	**231.7**
Uruguay	2,222	10.5%	9.7%	78.1	156.3	43.6	117.3	73.4	**234.4**
Venezuela	17,457	4.8%	5.0%	339.9	502.2	312.9	329.3	200.0	**842.2**
SACA Total	**286,922**	**7.4%**	**7.5%**	**8,388**	**12,785**	**6,002**	**9,169**	**6,002**	**21,173**

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 30

Prevalence estimates of impaired glucose tolerance (IGT), 2030 - South and Central American Region

	Population (20-79)	IGT prevalence		Number of people with IGT (000's) in the 20-79 age-group					
Country/Territory	**000's**	**National**	**Comparative***	**Male**	**Female**	**20-39**	**40-59**	**60-79**	**Total**
Argentina	32,538	10.6%	10.4%	1,190.4	2,264.0	630.7	1,804.4	1,019.3	**3,454.3**
Bolivia	8,206	7.9%	9.1%	268.9	375.3	169.1	241.4	233.7	**644.2**
Brazil	163,491	8.1%	8.0%	5,407.5	7,893.1	2,803.7	5,333.3	5,163.6	**13,300.6**
Chile	14,061	11.1%	10.4%	541.4	1,012.7	255.2	753.8	545.1	**1,554.1**
Colombia	39,979	5.0%	5.0%	746.1	1,270.0	537.0	743.7	735.3	**2,016.1**
Costa Rica	4,101	8.1%	8.0%	143.9	190.0	70.3	129.8	133.8	**333.9**
Cuba	8,464	15.3%	12.8%	602.8	694.6	157.3	443.9	696.2	**1,297.4**
Dominican Republic	8,081	12.2%	12.8%	413.3	573.4	230.2	384.9	371.5	**986.7**
Ecuador	11,086	8.8%	9.1%	433.2	545.8	202.2	343.1	433.7	**979.1**
El Salvador	5,846	7.6%	8.0%	179.3	264.6	113.8	187.9	142.2	**443.9**
French Guinea	204	7.8%	8.1%	5.5	10.4	5.2	6.1	4.7	**15.9**
Guatemala	12,288	6.7%	8.0%	330.3	495.6	290.3	321.9	213.8	**825.9**
Honduras	6,401	7.0%	8.0%	185.2	261.8	142.1	180.6	124.3	**447.1**
Nicaragua	4,729	7.3%	8.0%	142.9	203.5	97.8	143.5	105.1	**346.4**
Panama	3,014	8.0%	8.0%	102.1	137.9	54.4	93.5	92.1	**240.0**
Paraguay	5,415	9.6%	10.4%	184.2	333.9	122.8	269.6	125.7	**518.1**
Peru	23,841	8.6%	9.1%	895.1	1,160.3	431.0	780.9	843.4	**2,055.3**
Puerto Rico	3,065	8.9%	8.0%	108.2	163.4	46.9	98.7	126.1	**271.6**
Uruguay	2,505	10.9%	10.4%	93.4	179.8	46.1	134.6	92.5	**273.2**
Venezuela	24,855	5.3%	5.4%	510.0	809.7	379.3	497.1	443.3	**1,319.7**
SACA Total	**382,170**	**8.2%**	**8.2%**	**12,484**	**18,840**	**6,786**	**12,893**	**11,645**	**31,324**

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 31

Data sources: prevalence estimates of diabetes mellitus (DM) and impaired glucose tolerance (IGT) - South and Central American Region

Country/Territory	Data Used	Screening Method	Diagnostic Criteria	Sample Size	Age sample
Argentina[a,b]	Argentina (de Sereday et al,2004)[141]	OGTT	WHO - 1999	2,397	20-69
Bolivia	Bolivia (Barceló et al, 2001)[142]	2hBG	WHO - 1985	2,948	25+
Brazil	Brazil (Oliveira et al, 1996; Malerbi et al, 1992; Torquato et al, 2003)[143-145]	OGTT	WHO - 1985	25,371	30-69
Chile	Chile (Baechler et al, 2002)[146]	OGTT	WHO - 1999	1,315	20+
Colombia	Colombia (Aschner et al, 1993)[147]	2hBG	WHO - 1985	670	30-79
Costa Rica[c]	Nicaragua[148]	N/A	N/A	1,993	20+
Cuba	Jamaica[81]	OGTT	WHO - 1980	1,303	25-74
Dominican Republic	Jamaica[81]	OGTT	WHO - 1980	1,303	25-74
Ecuador	Bolivia[142]	2hBG	WHO - 1985	2,948	25+
El Salvador[c]	Nicaragua[148]	N/A	N/A	1,993	20+
French Guiana	Suriname[140]	OGTT	WHO - 1980	1,218	30+
Guatemala[c]	Mexico[138,139]	OGTT/FBG	ADA - 1997	84,054	20+
Honduras[c]	Nicaragua[148]	N/A	N/A	1,993	20+
Nicaragua[c]	Nicaragua (Medina, 2007)[148]	N/A	N/A	1,993	20+
Panama[c]	Nicaragua[148]	N/A	N/A	1,993	20+
Paraguay	Paraguay (Jimenez et al, 1998)[149]	OGTT	WHO - 1985	1,606	20-74
Peru	Bolivia[142]	2hBG	WHO - 1985	2,948	25+
Puerto Rico	Nicaragua[148]	N/A	N/A	1,993	20+
Uruguay	Argentina[141]	OGTT	WHO - 1999	2,397	20-69
Venezuela	Brazil[143-145]	OGTT	WHO - 1985	25,371	30-69

N/A Not available

[a.] People with previously diagnosed diabetes were excluded from the study, and obtained prevalence doubled
[b.] Because of the absence of data for IGT in the Argentinian study, IGT estimates were based on the Paraguay study
[c.] IGT prevalence was calculated from Brazilian data

Table 32

Prevalence estimates of diabetes mellitus (DM), 2010 – South-East Asian Region

	Population (20-79)	DM prevalence		Number of people with DM (000's) in the 20-79 age-group							
Country/Territory	000's	National	Comparative*	Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Bangladesh	93,862	6.1%	6.6%	3,105.3	2,575.8	2,734.8	2,946.2	2,052.0	2,634.8	994.3	**5,681.1**
Bhutan	413	2.9%	3.6%	9.0	2.9	5.9	6.0	2.3	5.8	3.8	**11.9**
India	713,498	7.1%	7.8%	29,135.9	21,632.3	27,852.8	22,915.4	10,168.6	25,021.1	15,578.7	**50,768.3**
Maldives	186	6.5%	7.4%	4.0	8.0	6.0	6.0	5.3	4.8	1.9	**12.0**
Mauritius	877	17.0%	16.2%	55.9	92.9	74.4	74.4	21.6	84.7	42.5	**148.8**
Nepal	15,556	3.3%	3.9%	330.1	180.6	214.8	295.9	94.9	260.7	155.1	**510.7**
Sri Lanka	13,339	11.5%	10.9%	871.2	657.9	731.5	797.7	232.4	806.9	489.8	**1,529.1**
SEA Total	**837,732**	**7.0%**	**7.6%**	**33,512**	**25,150**	**31,620**	**27,042**	**12,577**	**28,819**	**17,266**	**58,662**

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 33

Prevalence estimates of diabetes mellitus (DM), 2030 – South-East Asian Region

	Population (20-79)	DM prevalence		Number of people with DM (000's) in the 20-79 age-group							
Country/Territory	000's	National	Comparative*	Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Bangladesh	140,679	7.4%	7.9%	4,195.8	6,227.3	4,859.4	5,563.8	3,030.4	5,033.3	2,359.4	**10,423.2**
Bhutan	589	4.3%	4.6%	15.4	9.8	12.5	12.6	3.3	13.5	8.4	**25.2**
India	1,017,413	8.6%	9.3%	38,556.3	48,479.8	47,344.5	39,691.6	13,831.4	41,376.1	31,828.6	**87,036.1**
Maldives	285	9.0%	9.5%	5.8	19.8	12.8	12.8	7.7	12.3	5.6	**25.6**
Mauritius	1,035	21.7%	19.8%	60.4	163.8	110.4	113.8	23.8	101.7	98.6	**224.2**
Nepal	25,391	4.2%	5.2%	523.7	546.7	456.8	613.6	179.3	542.2	348.9	**1,070.4**
Sri Lanka	14,493	14.9%	13.5%	901.4	1,256.4	994.0	1,163.8	225.9	915.5	1,016.4	**2,157.8**
SEA Total	**1,199,885**	**8.4%**	**9.1%**	**44,259**	**56,704**	**53,790**	**47,172**	**17,302**	**47,995**	**35,666**	**100,962**

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 34

Prevalence estimates of impaired glucose tolerance (IGT), 2010 – South-East Asian Region

	Population (20-79)	IGT prevalence (%)		Number of people with IGT (000's) in the 20-79 age-group					
Country/Territory	**000's**	**National**	**Comparative***	**Male**	**Female**	**20-39**	**40-59**	**60-79**	**Total**
Bangladesh	93,862	7.1%	8.9%	2,734.8	3,969.2	3,949.1	2,909.5	1,167.3	**6,704.0**
Bhutan	413	2.9%	3.3%	6.5	5.6	5.2	3.6	3.3	**12.2**
India	713,498	5.5%	5.7%	20,173.9	19,297.8	17,536.1	14,406.2	7,529.5	**39,471.8**
Maldives	186	12.3%	12.7%	12.7	10.2	13.9	5.9	3.2	**22.9**
Mauritius	877	13.8%	13.5%	49.3	71.6	44.2	55.2	21.6	**120.9**
Nepal	15,556	3.8%	4.1%	209.7	381.7	267.1	167.3	156.9	**591.3**
Sri Lanka	13,339	12.3%	12.4%	843.5	795.5	691.9	571.9	375.1	**1,639.0**
SEA Total	**837,732**	**5.8%**	**6.2%**	**24,030**	**24,532**	**22,508**	**18,120**	**9,257**	**48,562**

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 35

Prevalence estimates of impaired glucose tolerance (IGT), 2030 - South-East Asian Region

	Population (20-79)	IGT prevalence (%)		Number of people with IGT (000's) in the 20-79 age-group					
Country/Territory	000's	National	Comparative*	Male	Female	20-39	40-59	60-79	Total
Bangladesh	140,679	6.4%	9.3%	2,734.8	6,331.0	5,100.9	4,860.8	2,591.9	**9,065.8**
Bhutan	589	3.5%	3.8%	10.8	9.7	5.9	8.1	6.4	**20.5**
India	1,017,413	6.3%	6.5%	32,655.6	31,424.7	23,962.9	24,528.7	15,588.6	**64,080.3**
Maldives	285	13.3%	14.1%	20.3	17.6	16.5	13.5	8.0	**37.9**
Mauritius	1,035	14.4%	14.0%	61.4	88.1	43.3	60.1	46.1	**149.5**
Nepal	25,391	4.0%	4.6%	357.6	646.7	392.9	299.2	312.2	**1,004.3**
Sri Lanka	14,493	14.2%	13.8%	1,017.5	1,039.7	627.0	647.0	783.2	**2,057.2**
SEA Total	**1,199,885**	**6.4%**	**6.9%**	**36,858**	**39,557**	**30,149**	**30,417**	**19,336**	**76,416**

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 36

Data sources: prevalence estimates of diabetes mellitus (DM) and impaired glucose tolerance (IGT) - South Asian Region

Country/Territory	Data Used	Screening Method	Diagnostic Criteria	Sample Size	Age sample
Bangladesh	Bangladesh (Hussain et al, 2005)[150]	OGTT	WHO - 1999	6,312	20+
Bangladesh	Bangladesh (Sayeed et al, 2003)[151]	FBG	ADA - 1997	4,923	20+
Bangladesh[a]	Bangladesh (Rahim et al, 2007)[91]	OGTT	WHO - 1999	3,981	20+
Bhutan	Nepal[152,153]				
India[b]	India (Ramachandran et al, 2001)[86]	OGTT	WHO - 1999	11,216	20+
India[b]	India (Sadikot et al, 2004)[87]	OGTT	WHO - 1999	18,363	25+
India[b]	India (Mohan et al, 2008)[88]	SR	Known Diabetes	39,429	15 - 64
Maldives	Sri Lanka[154]	OGTT	WHO - 1999	4,532	18+
Mauritius	Mauritius (Soderberg et al, 2005)[90]	OGTT	WHO - 1999	5,589	20+
Nepal	Nepal (Singh, Bhattarai, 2003)[152]	FBG	WHO - 1999	1,841	20+
Nepal	Nepal (Karki et al, 2000)[155]	OGTT	WHO - 1985	1,840	30+
Nepal	Nepal (Shestra et al, 2006)[153]	OGTT	WHO - 1999	1,012	40+
Sri Lanka	Sri Lanka (Katulanda et al, 2008)[154]	OGTT	WHO - 1999	4,532	18+

[a.] IGT prevalence was calculated only from the Hussein et al and Sayeed et al reports
[b.] IGT prevalence was calculated only from the Ramachandran et al and Sadikot et al reports

Table 37

Prevalence estimates of diabetes mellitus (DM), 2010 - Western Pacific Region

Country/Territory	Population (20-79)	Diabetes prevalence		Number of people with DM (000's) in the 20-79 age-group							
	000's	National	Comparative*	Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Australia	15,128	7.2%	5.7%			569.9	515.9	86.3	390.5	609.0	**1,085.8**
Brunei Darussalam	262	10.7%	12.6%	3.7	24.5	15.3	12.9	6.6	15.8	5.8	**28.2**
Cambodia	8,195	4.3%	5.2%	180.5	173.5	158.1	196.0	74.2	207.0	72.9	**354.0**
China	964,302	4.5%	4.2%	20,643.0	22,514.1	22,262.3	20,894.8	6,095.9	23,736.8	13,324.4	**43,157.2**
China, Hong Kong	5,732	10.2%	8.5%			252.3	334.3	51.7	271.1	263.8	**586.6**
China, Macau	383	9.2%	8.5%	0.0	0.0	15.5	19.6	3.4	18.9	12.9	**35.2**
Cook Islands[a]	14	5.7%	5.7%	0.1	0.6	0.3	0.5	0.2	0.4	0.2	**0.8**
Fiji	499	9.1%	9.4%	19.4	25.8	20.9	24.3	6.4	27.1	11.7	**45.2**
French Polynesia	177	13.5%	13.8%	5.9	18.0	10.8	13.1	4.2	14.3	5.4	**23.9**
Guam	112	7.1%	6.7%	2.4	5.6	4.1	3.9	1.3	4.4	2.2	**8.0**
Indonesia	152,828	4.6%	4.8%	2,392.9	4,570.6	2,932.0	4,031.5	1,337.0	3,614.6	2,011.9	**6,963.5**
Japan	96,666	7.3%	5.0%			3,648.1	3,441.1	373.8	2,358.3	4,357.1	**7,089.2**
Kiribati[a]	71	6.6%	6.6%	1.5	3.2	2.3	2.4	0.9	2.5	1.3	**4.7**
Korea, Democratic People's Republic of	16,581	5.7%	5.3%	188.1	754.7	514.1	428.8	141.7	454.2	346.9	**942.9**
Korea, Republic of	36,603	9.0%	7.9%			1,755.4	1,537.0	415.2	1,584.7	1,292.6	**3,292.4**
Lao People's Democratic Republic	3,175	4.5%	5.6%	78.0	65.3	72.6	70.7	37.6	70.8	34.8	**143.3**
Malaysia	16,920	10.9%	11.6%	410.7	1,435.3	930.3	915.7	351.7	1,006.9	487.4	**1,846.0**
Marshall Islands[a]	41	9.1%	9.1%	0.3	3.3	1.9	1.8	0.6	2.0	1.1	**3.7**
Micronesia, Federated States[a]	57	5.3%	6.2%	1.2	1.9	1.5	1.5	0.7	1.6	0.7	**3.0**
Mongolia	1,723	1.3%	1.6%	10.9	12.0	10.1	12.7	4.6	14.2	4.1	**22.9**
Myanmar	32,484	2.8%	3.2%	460.0	461.8	434.6	487.3	90.2	463.3	368.4	**921.8**
Nauru	9	30.9%	30.9%	0.0	2.7	1.4	1.4	0.6	1.6	0.6	**2.7**
New Caledonia[b]	164	5.5%	7.2%	1.7	7.4	1.4	7.7	1.9	3.6	3.6	**9.1**
New Zealand	2,952	6.5%	5.2%			92.9	98.9	12.6	72.3	107.1	**191.9**
Niue[a]	1	4.6%	4.6%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
Palau[a]	13	9.1%	9.1%	0.1	1.1	0.6	0.6	0.2	0.6	0.4	**1.2**
Papua New Guinea	3,377	2.1%	3.0%	31.1	40.4	28.4	43.1	6.9	38.5	26.1	**71.5**
Philippines	51,000	6.7%	7.7%	1,071.9	2,326.3	1,020.7	2,377.5	593.6	1,818.4	986.2	**3,398.2**
Samoa	95	6.7%	7.7%	4.2	2.3	3.0	3.4	0.6	3.6	2.2	**6.4**
Singapore	3,433	12.7%	10.2%			227.6	209.0	20.4	200.7	215.6	**436.6**
Solomon Islands	268	2.3%	3.3%	2.3	3.7	2.4	3.6	0.7	3.0	2.5	**6.1**

Country/Territory	Population (20-79) 000's	Diabetes prevalence National	Diabetes prevalence Comparative*	Number of people with DM (000's) in the 20-79 age-group Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Taiwan[a]	14,222	5.7%	7.5%			325.9	490.0	92.9	360.1	362.9	**815.9**
Thailand	45,924	7.7%	7.1%	2,369.2	1,168.8	1,586.7	1,951.3	485.7	1,820.7	1,231.5	**3,538.0**
Timor-Leste	564	2.9%	3.5%	13.8	2.5	7.0	9.3	3.7	8.4	4.2	**16.3**
Tokelau[a]	1	8.6%	8.6%	0.1	0.0	0.0	0.0	0.0	0.0	0.0	**0.1**
Tonga	52	11.6%	13.4%	1.8	4.3	2.6	3.5	1.2	3.0	1.9	**6.1**
Tuvalu[a]	8	13.9%	13.9%	0.3	0.8	0.5	0.6	0.2	0.6	0.3	**1.1**
Vanuatu	124	2.4%	3.2%	1.2	1.8	1.2	1.7	0.3	1.5	1.2	**3.0**
Viet Nam	56,662	2.9%	3.5%	1,134.8	511.8	797.2	849.4	199.7	739.9	707.0	**1,646.6**
WP Total	**1,530,822**	**5.0%**	**4.7%**	**29,031**	**34,144**	**37,712**	**38,997**	**10,505**	**39,336**	**26,868**	**76,709**

[a.] Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of world population from 2008 to 2010, except Taiwan (developed world population)
[b.] For New Caledonia, the Melanesian population was ascribed as having the national urban/rural population distribution, whereas the French population was deemed as having the diabetes prevalence of Metropolitan France, and assigned to the urban component, and each assigned 50% of the total population

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 38

Prevalence estimates of diabetes mellitus (DM), 2030 - Western Pacific Region

Country/Territory	Population (20-79) 000's	DM prevalence National	DM prevalence Comparative*	Number of people with DM (000's) in the 20-79 age-group Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Australia	17,869	8.4%	6.8%			784.5	718.7	92.9	429.4	980.9	**1,503.2**
Brunei Darussalam	398	13.4%	14.6%	5.1	48.4	27.0	26.5	8.8	26.3	18.4	**53.5**
Cambodia	12,914	5.6%	6.5%	268.4	455.8	350.6	373.6	143.9	397.7	182.7	**724.2**
China	1,077,302	5.8%	5.0%	21,493.6	41,059.4	31,147.1	31,405.9	5,350.7	27,992.2	29,210.0	**62,553.0**
China, Hong Kong	6,722	13.7%	10.1%			368.8	552.5	47.6	274.4	599.3	**921.3**
China, Macau	437	13.9%	10.1%			24.4	36.4	3.0	17.4	40.4	**60.8**
Cook Islands[a]	17	6.5%	6.5%	0.2	1.0	0.4	0.7	0.2	0.5	0.4	**1.1**
Fiji	608	10.2%	11.0%	19.3	42.8	28.8	33.3	7.5	33.6	21.0	**62.1**
French Polynesia	231	16.6%	16.1%	6.8	31.4	16.7	21.4	5.1	19.7	13.4	**38.2**
Guam	150	8.6%	8.5%	2.6	10.3	6.5	6.4	1.9	5.7	5.3	**12.9**
Indonesia	199,435	6.0%	5.9%	2,905.7	9,074.3	5,040.0	6,940.0	1,512.8	6,002.9	4,464.2	**11,980.0**
Japan	85,466	8.0%	5.9%			3,556.8	3,322.2	251.0	2,434.9	4,193.1	**6,878.9**
Kiribati[a]	82	8.3%	8.3%	1.5	5.3	3.4	3.4	1.0	3.3	2.5	**6.8**
Korea, Democratic People's Republic of	18,512	6.8%	6.2%	181.7	1,074.4	697.8	558.3	151.0	580.4	524.6	**1,256.1**
Korea, Republic of	38,069	11.4%	9.0%			2,164.2	2,159.0	316.6	1,641.9	2,364.8	**4,323.3**
Lao People's Democratic Republic	5,145	5.9%	7.0%	121.3	180.2	152.5	149.0	64.8	145.9	90.8	**301.5**
Malaysia	24,291	13.4%	13.8%	516.8	2,727.7	1,609.0	1,635.6	467.9	1,563.0	1,213.6	**3,244.5**
Marshall Islands[a]	47	10.6%	10.6%	0.3	4.6	2.5	2.5	0.7	2.4	1.9	**5.0**
Micronesia, Federated States[a]	80	6.4%	7.9%	1.4	3.8	2.6	2.5	1.2	2.4	1.5	**5.1**
Mongolia	2,284	2.0%	2.0%	15.9	30.2	19.9	26.1	5.3	28.0	12.7	**46.1**
Myanmar	40,746	4.3%	4.3%	639.4	1,115.5	821.6	933.3	102.3	759.1	893.5	**1,754.9**
Nauru	10	33.4%	33.4%	0.0	3.5	1.8	1.7	0.6	1.9	1.0	**3.5**
New Caledonia[b]	223	4.7%	4.8%	1.4	9.1	2.2	8.4	1.6	3.7	5.3	**10.6**
New Zealand	3,471	7.8%	6.3%			129.9	139.6	13.7	75.8	180.0	**269.5**
Niue[a]	1	5.5%	5.5%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.1**
Palau[a]	16	10.6%	10.6%	0.1	1.6	0.9	0.8	0.2	0.8	0.6	**1.7**
Papua New Guinea	5,520	3.1%	4.4%	54.6	117.3	62.0	109.9	16.2	84.2	71.6	**172.0**
Philippines	78,711	7.8%	8.9%	1,450.3	4,713.4	1,815.0	4,348.8	836.3	3,114.8	2,212.7	**6,163.8**
Samoa	134	8.2%	9.5%	5.7	5.2	5.1	5.9	0.8	5.1	5.0	**10.9**
Singapore	4,027	18.4%	12.4%			369.6	372.4	23.0	166.4	552.7	**742.0**
Solomon Islands	461	3.5%	4.8%	4.3	11.6	6.2	9.7	1.5	8.2	6.2	**15.9**

Country/Territory	Population (20-79) 000's	DM prevalence National	DM prevalence Comparative*	Number of people with DM (000's) in the 20-79 age-group Rural	Urban	Male	Female	20-39	40-59	60-79	Total
Taiwan[a]	18,186	8.5%	8.5%			472.2	759.9	106.6	477.2	648.3	**1,232.1**
Thailand	50,826	9.8%	8.4%	2,628.6	2,327.6	2,212.9	2,743.4	434.3	2,021.9	2,499.9	**4,956.2**
Timor-Leste	1,107	3.0%	4.2%	24.8	8.8	14.5	19.1	7.8	16.6	9.1	**33.5**
Tokelau[a]	1	9.5%	9.5%	0.1	0.0	0.0	0.1	0.0	0.1	0.0	**0.1**
Tonga	68	12.9%	15.7%	1.8	7.0	4.1	4.7	1.9	4.6	2.3	**8.8**
Tuvalu[a]	9	16.2%	16.2%	0.3	1.2	0.6	0.9	0.2	0.8	0.5	**1.5**
Vanuatu	216	3.6%	4.7%	2.2	5.5	2.9	4.8	0.7	3.6	3.4	**7.7**
Viet Nam	78,202	4.4%	4.4%	1,892.4	1,522.6	1,653.4	1,761.5	231.3	1,318.9	1,864.6	**3,414.9**
WP Total	**1,771,994**	**6.4%**	**5.7%**	**32,247**	**64,599**	**53,578**	**59,199**	**10,213**	**49,666**	**52,898**	**112,777**

[a.] Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of world population from 2008 to 2030, except Taiwan (developed world population)
[b.] For New Caledonia, the Melanesian population was ascribed as having the national urban/rural population distribution, whereas the French population was deemed as having the diabetes prevalence of Metropolitan France, and assigned to the urban component, and each assigned 50% of the total population
* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 39

Prevalence estimates of impaired glucose tolerance (IGT), 2010 - Western Pacific Region

Country/Territory	Population (20-79) 000's	IGT prevalence National	IGT prevalence Comparative*	Number of people with IGT (000's) in the 20-79 age-group Male	Female	20-39	40-59	60-79	Total
Australia	15,128	9.8%	8.3%	653.8	827.1	217.3	608.9	654.8	**1,481.0**
Brunei Darussalam	262	19.8%	17.9%	27.1	24.8	23.3	24.0	4.7	**51.9**
Cambodia	8,195	9.4%	10.6%	333.6	437.2	339.8	287.0	144.0	**770.8**
China	964,302	6.9%	6.8%	41,357.7	25,620.3	23,407.7	27,634.3	15,935.9	**66,977.9**
China, Hong Kong	5,732	12.7%	10.8%	310.0	418.9	112.0	356.7	260.2	**728.9**
China, Macau	383	11.9%	10.8%	19.1	26.5	7.6	25.0	13.0	**45.7**
Cook Islands[a]	14	10.2%	10.2%	0.6	0.8	0.3	0.6	0.5	**1.4**
Fiji	499	10.4%	10.8%	21.6	30.5	17.2	22.8	12.1	**52.1**
French Polynesia	177	13.0%	13.1%	10.9	12.2	5.6	13.5	4.0	**23.0**
Guam	112	17.9%	17.3%	9.3	10.8	5.8	10.0	4.3	**20.1**
Indonesia	152,828	10.7%	11.0%	6,877.7	9,449.5	6,203.2	6,608.9	3,515.1	**16,327.3**
Japan	96,666	13.4%	11.0%	5,758.3	7,221.2	2,202.8	4,642.9	6,133.8	**12,979.4**
Kiribati[a]	71	17.3%	17.3%	5.6	6.8	4.0	5.7	2.6	**12.4**
Korea, Democratic People's Republic of	16,581	8.9%	8.3%	740.4	741.8	257.7	665.6	558.9	**1,482.2**
Korea, Republic of	36,603	9.4%	8.3%	1,758.5	1,679.9	542.2	1,677.2	1,219.0	**3,438.4**
Lao People's Democratic Republic	3,175	7.6%	8.8%	104.4	136.9	98.4	97.3	45.6	**241.3**
Malaysia (IFG)	16,920	4.4%	4.4%	453.4	291.7	351.2	290.6	103.3	**745.1**
Marshall Islands[a]	41	17.3%	17.3%	3.2	3.9	2.3	3.3	1.5	**7.1**
Micronesia, Federated States	57	15.8%	17.3%	4.0	5.0	3.5	4.1	1.4	**9.0**
Mongolia	1,723	9.2%	10.3%	57.7	100.6	70.5	60.3	27.5	**158.3**
Myanmar	32,484	6.5%	6.9%	1,008.6	1,095.3	588.6	1,000.3	515.0	**2,103.9**
Nauru[a]	9	20.4%	20.4%	0.9	0.9	0.7	0.7	0.4	**1.8**
New Caledonia	164	5.0%	4.8%	3.3	4.9	1.8	4.1	2.3	**8.3**
New Zealand	2,952	6.7%	5.9%	95.8	101.2	40.2	71.5	85.2	**196.9**
Niue[a]	1	6.9%	6.9%	0.0	0.0	0.0	0.0	0.0	**0.1**
Palau[a]	13	17.3%	17.3%	1.0	1.3	0.8	1.1	0.5	**2.3**
Papua New Guinea	3,377	8.0%	9.4%	102.5	167.2	100.2	121.6	47.8	**269.7**
Philippines	51,000	9.6%	10.9%	1,400.4	3,490.3	1,217.5	2,383.8	1,289.4	**4,890.8**
Samoa	95	6.0%	6.5%	2.4	3.3	1.5	2.9	1.4	**5.7**
Singapore	3,433	17.5%	18.8%	301.0	298.5	116.8	350.4	132.4	**599.5**
Solomon Islands	268	8.0%	9.5%	8.3	13.0	8.5	8.6	4.3	**21.3**

Country/Territory	Population (20-79) 000's	IGT prevalence National	IGT prevalence Comparative*	Number of people with IGT (000's) in the 20-79 age-group Male	Female	20-39	40-59	60-79	Total
Taiwan[a]	14,222	3.9%	4.6%	249.6	302.0	131.7	230.5	189.4	**551.6**
Thailand	45,924	4.5%	4.2%	1,090.6	953.5	531.5	1,100.9	411.7	**2,044.1**
Timor-Leste	564	10.0%	11.0%	24.1	32.0	25.2	21.2	9.8	**56.2**
Tokelau[a]	1	13.1%	13.1%	0.1	0.1	0.0	0.1	0.0	**0.1**
Tonga[a]	52	11.4%	13.1%	2.5	3.4	1.7	2.8	1.4	**5.9**
Tuvalu[a]	8	13.1%	13.1%	0.5	0.6	0.2	0.6	0.2	**1.0**
Vanuatu	124	8.2%	9.5%	3.9	6.2	3.6	4.4	2.2	**10.1**
Viet Nam	56,662	6.3%	6.9%	1,746.4	1,820.3	1,019.7	1,696.5	850.5	**3,566.7**
WP Total	**1,530,822**	**7.8%**	**7.7%**	**64,549**	**55,341**	**37,663**	**50,040**	**32,186**	**119,889**

[a.] Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of world population from 2008 to 2010, except Taiwan (developed world population).
* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 40

Prevalence estimates of impaired glucose tolerance (IGT), 2030 - Western Pacific Region

Country/Territory	Population (20-79) 000's	IGT prevalence National	IGT prevalence Comparative*	Number of people with IGT (000's) in the 20-79 age-group Male	Female	20-39	40-59	60-79	Total
Australia	17,869	10.8%	9.3%	869.8	1,065.0	231.7	664.8	1,038.3	**1,934.8**
Brunei Darussalam	398	20.6%	18.9%	41.2	40.8	29.7	38.2	14.1	**82.0**
Cambodia	12,914	10.7%	11.9%	614.9	761.1	515.8	537.1	323.2	**1,376.0**
China	1,077,302	7.6%	7.0%	46,636.2	35,034.3	17,394.6	30,686.3	33,589.7	**81,670.5**
China, Hong Kong	6,722	15.3%	12.2%	454.7	572.7	100.2	354.1	573.2	**1,027.4**
China, Macau	437	15.6%	12.2%	30.1	38.0	6.4	22.8	38.9	**68.0**
Cook Islands[a]	17	11.5%	11.5%	0.9	1.1	0.3	0.8	0.8	**2.0**
Fiji	608	11.3%	11.8%	28.2	40.4	19.9	27.6	21.1	**68.5**
French Polynesia	231	14.3%	14.0%	15.3	17.6	6.2	17.4	9.3	**33.0**
Guam	150	18.4%	18.3%	13.0	14.7	7.6	11.3	8.8	**27.6**
Indonesia	199,435	11.7%	11.7%	9,846.1	13,552.9	6,359.6	9,849.4	7,189.9	**23,399.0**
Japan	85,466	14.2%	11.9%	5,465.0	6,628.7	1,541.3	4,647.7	5,904.7	**12,093.6**
Kiribati[a]	82	18.3%	18.3%	6.9	8.1	4.1	6.7	4.2	**15.0**
Korea, Democratic People's Republic of	18,512	10.1%	9.3%	946.7	918.1	260.3	807.4	797.1	**1,864.8**
Korea, Republic of	38,069	11.5%	9.3%	2,252.9	2,121.4	414.0	1,714.8	2,245.6	**4,374.3**
Lao People's Democratic Republic	5,145	9.3%	10.4%	206.2	270.7	168.6	194.4	113.9	**476.9**
Malaysia (IFG)	24,291	4.5%	4.5%	650.7	449.2	433.7	423.8	242.4	**1,099.9**
Marshall Islands[a]	47	18.3%	18.3%	4.0	4.6	2.3	3.8	2.4	**8.6**
Micronesia, Federated States	80	16.4%	18.3%	6.0	7.1	5.0	5.3	2.7	**13.1**
Mongolia	2,284	10.8%	11.2%	104.2	142.2	65.1	107.5	73.8	**246.5**
Myanmar	40,746	7.8%	7.7%	1,515.9	1,662.3	575.0	1,468.1	1,135.1	**3,178.2**
Nauru[a]	10	21.5%	21.5%	1.1	1.2	0.7	0.9	0.7	**2.2**
New Caledonia	223	5.6%	5.3%	5.8	6.7	2.1	5.7	4.6	**12.5**
New Zealand	3,471	7.5%	6.5%	127.1	134.2	43.3	74.5	143.4	**261.3**
Niue[a]	1	7.1%	7.5%	0.1	0.0	0.0	0.0	0.0	**0.1**
Palau[a]	16	18.3%	18.3%	1.4	1.6	0.8	1.3	0.8	**3.0**
Papua New Guinea	5,520	9.0%	10.7%	179.0	315.8	166.8	209.8	118.2	**494.8**
Philippines	78,711	11.0%	12.3%	2,478.2	6,214.3	1,694.8	4,082.4	2,915.3	**8,692.5**
Samoa	134	6.5%	7.2%	3.9	4.8	2.1	3.5	3.0	**8.7**
Singapore	4,027	17.8%	19.8%	373.7	341.4	126.5	281.4	307.2	**715.1**
Solomon Islands	461	9.1%	10.8%	16.2	26.0	13.7	18.9	9.5	**42.1**

Country/Territory	Population (20-79) 000's	IGT prevalence National	IGT prevalence Comparative*	Number of people with IGT (000's) in the 20-79 age-group Male	Female	20-39	40-59	60-79	Total
Taiwan[a]	18,186	4.3%	5.1%	362.6	428.2	148.3	302.9	339.5	**790.8**
Thailand	50,826	4.7%	4.4%	1,270.6	1,118.8	464.8	1,142.3	782.4	**2,389.4**
Timor-Leste	1,107	10.0%	11.7%	47.7	62.6	50.3	39.6	20.5	**110.3**
Tokelau[a]	1	14.0%	14.0%	0.1	0.1	0.0	0.1	0.0	**0.2**
Tonga[a]	68	12.2%	14.0%	3.9	4.4	2.4	4.2	1.7	**8.3**
Tuvalu[a]	9	14.0%	14.0%	0.6	0.7	0.3	0.7	0.3	**1.3**
Vanuatu	216	9.4%	10.8%	7.5	12.8	6.3	8.6	5.4	**20.3**
Viet Nam	78,202	7.7%	7.7%	2,961.6	3,075.1	1,132.1	2,724.6	2,180.0	**6,036.7**
WP Total	**1,771,994**	**8.6%**	**8.1%**	**77,550**	**75,100**	**31,997**	**60,491**	**60,162**	**152,649**

[a.] Population number as described in the *CIA World Factbook 2008* [33], with growth and age distribution adjustment to that of world population from 2008 to 2030, except Taiwan (developed world population)

* All comparisons between countries should be done using the comparative prevalence, which is adjusted to the world population

Table 41

Data sources: prevalence estimates of diabetes mellitus (DM) and impaired glucose tolerance (IGT) - Western Pacific Region

Country/Territory	Data Used	Screening Method	Diagnostic Criteria	Sample Size	Age sample
Australia	Australia (Dunstan et al, 2002)[156]	OGTT	WHO - 1999	11,247	25+
Australia	Australia (NDSS, 2009)[157]	SR	Known diabetes	Population	
Brunei Darussalam	Malaysia[168]	FBG	ADA - 1997	34,539	18+
Cambodia[a]	Cambodia (King et al, 2005)[158]	OGTT	WHO - 1999	2,246	25+
China, Hong Kong	Hong Kong (Lam et al 2000)[159]	OGTT	WHO - 1985	2,661	20-74
China, Macau	Hong Kong[159]	OGTT	WHO - 1985	2,661	20-74
China, People's Republic of	People's Republic of China (Gu et al, 2003)[160]	FBG	ADA - 1997	15,838	35-74
Cook Islands	Rarotonga (King et al, 1986)[161]	OGTT	WHO - 1985	1,127	20+
Fiji	Fiji (Zimmet et al, 1983)[162]	OGTT	WHO - 1980	2,638	20+
French Polynesia	Tonga[177]				
Guam	Kiribati[165]	OGTT	WHO - 1980	2,938	20+
Indonesia	Indonesia (Ministry of Health, 2008)[92]	OGTT	WHO - 1999	24,417	15+
Japan[b]	Japan (Ohmura et al, 1993 and Sekikawa et al, 2000)[163,164]	OGTT	WHO - 1985	5,211	40+
Kiribati	Kiribati (King et al, 1984)[165]	OGTT	WHO - 1980	2,938	20+
Korea, Democratic People's Republic of	Korea, Republic of (Park et al, 1995)[166]	OGTT	WHO - 1985	2,520	30+
Korea, Republic of	Korea, Republic of (Kim et al, 2006)[167]	FBG	ADA - 1997	5,844	20+
Lao People's Democratic Republic	Cambodia[158]	OGTT	WHO - 1999	2,246	25+
Malaysia[c]	Malaysia (3rd National Health Survey, 2006)[168]	FBG	ADA - 1997	34,539	18+
Marshall Islands	Kiribati[165]	OGTT	WHO - 1980	2,938	20+
Micronesia	Kiribati[165]	OGTT	WHO - 1980	2,938	20+
Mongolia	Mongolia (Suvd et al, 2002)[169]	OGTT	WHO - 1999	2,996	35+
Myanmar	Viet Nam[178]	FBG	WHO - 1999	9,057	30-64
Nauru	Nauru (Zimmet et al, 1984)[170]	OGTT	WHO - 1980	1,583	20+
New Caledonia	New Caledonia (Zimmet et al, 1982)[171]	OGTT	WHO - 1980	707	20+
New Zealand	New Zealand (Sundborn et al, 2007)[94]	OGTT	WHO - 1999	4,049	35-74
Niue	Niue (King et al, 1986)[161]	OGTT	WHO - 1985	1,149	20+
Palau	Kiribati[165]	OGTT	WHO - 1980	2,938	20+
Papua New Guinea	Fiji[162]	OGTT	WHO - 1980	2,638	20+
Philippines	Philippines (Baltazar et al, 2004)[172]	OGTT	WHO - 1999	7,044	20-65
Samoa	Samoa (Collins et al, 1994)[173]	OGTT	WHO - 1985	1,776	25-74

Country/Territory	Data Used	Screening Method	Diagnostic Criteria	Sample Size	Age sample
Singapore	Singapore (Ministry of Health Survey, 2004)[96]	OGTT	WHO - 1999	4,168	18-69
Solomon Islands	Fiji[162]	OGTT	WHO - 1980	2,638	20+
Taiwan[b]	Taiwan (Chou et al, 1992, 1994)[174,175]	OGTT	WHO - 1985	4,287	30-79
Thailand[a]	Thailand (Aekplakorn et al, 2003)[176]	FBG	ADA - 1997	5,350	35+
Tokelau	Tonga[177]	OGTT	WHO - 1999	1,024	15+
Timor-Leste	Indonesia[92]	OGTT	WHO - 1999	24,417	15+
Tonga	Tonga (Colaguiri et al, 2002)[177]	OGTT	WHO - 1999	1,024	15+
Tuvalu	Tonga[177]	OGTT	WHO - 1999	1,024	15+
Vanuatu	Fiji[162]	OGTT	WHO - 1980	2,638	20+
Viet Nam[c]	Viet Nam (Ministry of Health, 2006)[178]	FBG	WHO - 1999	9,057	30-64

[a.] Because of the absence of data for IGT in the study used for diabetes, IGT figures were calculated from Indonesian data
[b.] The prevalences for the studies based on the Japanese and Taiwanese studies were obtained by combining the data from the two studies respectively
[c.] IFG prevalence was calculated as only fasting specimens were used

1.2 Known and Newly Diagnosed Diabetes

KEY MESSAGE

Studies have shown that a substantial proportion of all people found to have diabetes had not been previously diagnosed.

Introduction

It has been a consistent finding of population-based diabetes studies that a substantial proportion of all people found to have diabetes had not been previously diagnosed. Thus, diabetes surveys identify people with previously diagnosed, or known, diabetes (KDM), as well as those with newly diagnosed diabetes, whose diabetes is only found through blood tests undertaken in the survey.

The uncovering of new cases of diabetes when mass blood testing is undertaken is primarily because of the lack of symptoms associated with the early years of type 2 diabetes, meaning that those with diabetes may be unaware of their condition and therefore not seek medical attention for it. However, it should also be noted that since the clinical diagnosis of diabetes requires diagnostic blood glucose levels on two separate days, a proportion of those labelled as having undiagnosed diabetes in research studies may not in fact have diabetes if re-tested.

In any survey, the percentage of all people with diabetes, whose diabetes has been previously diagnosed, is often taken as a measure of how well the standard clinical services are managing to screen for and identify people with diabetes. A high percentage indicates successful screening, while a low number reflects an inability of medical services to screen for diabetes, and is often seen in developing countries where resources are limited.

Studies

Tables 42-48 show the numbers with KDM as a percentage of all those with diabetes in over 80 studies. In general, the lowest percentages were seen in studies from developing countries, and the highest from developed countries. In Tanzania, rural India, Nepal, Tonga and China only 20-25% of all people with diabetes had been previously diagnosed. Overall, across all the surveys, approximately 50% of all people with diabetes were undiagnosed.

It should be noted that in some studies that report a high percentage of previously diagnosed cases, there may have been some bias in study design, which resulted in this finding. For example, the study from Ireland [106] only undertook blood glucose testing on those individuals with symptoms or risk factors for diabetes. This is likely to have underestimated the numbers of individuals with newly diagnosed diabetes, as some of these individuals may not have had risk factors or symptoms.

Table 42

Proportion of known diabetes (KDM) in studies - African Region

Country/territory	Author	Journal	Total diabetes (n)	KDM (n)	KDM proportion of total diabetes (%)
Cameroon	Mbanya, 2006[29]	Unpublished	489	101	21
Ghana	Amoah et al, 2002[28]	Diabetes Research and Clinical Practice	300	91	30
Réunion	Favier et al, 2005[31]	Diabetes Research and Clinical Practice	584	379	65
South Africa	Erasmus et al, 2001[99]	South African Medical Journal	9	1	11
	Levitt et al, 1993[25]	Diabetes Care	46	24	52
	Omar et al, 1993[98]	South African Medical Journal	20	12	60
	Motala et al, 2008[28]	Diabetes Care	46	7	15
Tanzania, United Republic of	McLarty et al, 1989[21]	Lancet	53	7	13
				Mean	**33**
				Median	**26**

Table 43 Proportion of known diabetes (KDM) in studies – European Region

Country/ territory	Author	Journal	Total diabetes (n)	KDM (n)	KDM proportion of total diabetes (%)
Albania	Shapo et al, 2004[100]	Diabetic Medicine	70	38	54
Bulgaria	Borissova et a, 2006l[39]	Unpublished	201	120	60
Croatia	Metelko et al, 2008[40]	Diabetes Research and Clinical Practice	100	58	58
Cyprus	Loizou et al, 2006[101]	Diabetes Care	123	84	68
Denmark	Glumer et al, 2003[102]	Diabetes Care	404	139	34
Finland	Saaristo et al, 2008[103]	BMC Public Health	413	177	43
France	Gourdy et al, 2001[55]	Diabetes and Metabolism	238	129	53
	Lecomte et al, 2002[117]	Diabetes and Metabolism	1,675	993	59
Germany	Rathmann et al, 2003[56]	Diabetologia	253	128	51
	Hauner et al, 2008[59]	Exp Clin Endoncrinol Diab	4,697	4,360	93[b]
Greece	Panagiotakos et al, 2005[104]	Diabetic Medicine	210	154	73
Iceland	Vilbergsson et al, 1997[105]	Diabetic Medicine	467	282	60
Ireland	Smith et al, 2003[106]	Diabetic Medicine	353	270	76
Israel	Stern et al, 1988[179]	Diabetes	192	113	59
	Stern et al, 1999[108]	Acta Diabetologica	345	310	90
	Bar-On et al, 1992[107]	Nutrition, Metabolism and Cardiovasc Diseases	100	N/A	67[a]
Italy	Garancini et al, 1995[118]	Diabetologia	476	213	45
Netherlands	Mooy et al, 1995[57]	Diabetes Care	184	78	42
Poland	Lopatynski et al, 2001[38]	Polskie Archiwum Medycyny Wewnetrznej	586	204	35
	Szurkowska et al, 2001[37]	Polskie Archiwum Medycyny Wewnetrznej	321	161	50
Portugal	Gardete-Correia et al, 2009[110]	Unpublished	540	371	69[a]
Slovakia	Mokan et al, 2008[41]	Diabetes Research and Clinical Practice	106	80	75
Spain	Botas et al, 2003[180]	Diabetic Medicine	120	47	39
	Castell et al, 1999[112]	Diabetes Research and Clinical Practice	258	167	65
	Masia et al, 2004[113]	Rev Esp Cardiol	390	300	77
	Valverde et al, 2006[114]	Diabetes Research and Clinical Practice	158	112	71
Sweden	Eliasson et al, 2002[115]	Diabetic Medicine	214	N/A	50[a]
Turkey	Kelestimur et al, 1999[181]	Acta Diabetologica	99	58	59
	Satman et al, 2002[34]	Diabetes Care	1,792	578	32
United Kingdom	Forrest et al, 1986[182]	Diabetic Medicine	N/A	N/A	45[a]
Uzbekistan	King et al, 1998[35]	Diabetic Medicine	162	49	30
	King et al, 2002[36]	Diabetes Research and Clinical Practice	61	26	43
				Mean	**57**
				Median	**59**

[a.] These figures were quoted in the original papers as simple fractions (e.g. 1/2, 2/3), or provided only separate prevalences of new and known diabetes, so that ratio could be deduced

[b.] General practice survey of patients

N/A not available

Table 44

Proportion of known diabetes (KDM) in studies – Middle East and North African Region

Country/territory	Author	Journal	Total diabetes (n)	KDM (n)	KDM proportion of total diabetes (%)
Algeria	Malek et al, 2001[123]	Diabetes and Metabolism	120	54	45
Bahrain	al-Mahroos et al,1998[60]	Diabetes Care	604	393	65
Egypt	Herman et al, 1995[61]	Diabetic Medicine	N/A	N/A	57
Iran, Islamic Republic of	Azizi et al, 2003[192]	Eastern Mediterranean Health Journal	21,637	12,024	56
Jordan	Ajlouni et al, 1998[126]	Journal of Internal Medicine	379	N/A	67[a]
Kuwait	Abdella et al, 1998[63]	Diabetes Research and Clinical Practice	443	N/A	50[a]
Lebanon	Salti et al, 1997[127]	Eastern Mediterranean Health Journal	331	259	78
Occupied Palestinian Territory	Abdul-Rahim et al, 2001[130]	Eastern Mediterranean Health Journal	59	46	78
	Husseini et al, 2003[183]	Medical Science Monitor	49	35	71
Oman	Al-Lawati et al, 2002[64]	Diabetic Medicine	677	N/A	33[a]
Pakistan	Shera et al, 1995[75]	Diabetic Medicine	131	72	55
	Shera et al, 1999[74]	Diabetes Research and Clinical Practice	127	69	54
	Shera et al, 1999[76]	Journal of the Pakistan Medical Association	115	42	37
Saudi Arabia	Al-Nuiam, 1997[72]	Diabetic Medicine	41	21	51
	Al-Nozha et al, 2004[71]	Saudi Medical Journal	4,004	2,888	72
Sudan	Elbagir et al,1996[30]	Diabetes Care	44	16	36
Tunisia	Bouguerra et al, 2007[77]	Eur J Clin Nutr	360	90	25
United Arab Emirates	Malik et al, 2005[67]	Diabetes Research and Clinical Practice	505	299	59
	Saadi et al, 2007[68]	Diabetes Research and Clinical Practice	412	250	61
				Mean	**55**
				Median	**56**

[a] These figures were quoted in the original papers as simple fractions (e.g. 1/2, 2/3), or provided only separate prevalences of new and known diabetes, so that ratio could be deduced

N/A not available

Table 45

Proportion of known diabetes (KDM) in studies – North America and Caribbean Region

Country/ territory	Author	Journal	Total diabetes (n)	KDM (n)	KDM proportion of total diabetes (%)
Guadeloupe	Costagliola et al, 1991[137]	Diabetes Research and Clinical Practice	81	66	81
Haiti	Jean Baptiste et al, 2006[84]	Diabetes Metabolism	85	60	71[a]
Jamaica	Ragoobirsingh et al, 1995[184]	Diabetes Care	378	196	52
Mexico	Aguilar-Salinas et al, 2003[138]	Diabetes Care	3,597	2,878	80
United States of America	Cowie et al, 2009[79]	Diabetes Care	410	246	60[a]
				Mean	**69**
				Median	**71**

[a.] These figures were quoted in the original papers as simple fractions (e.g. 1/2, 2/3), or provided only separate prevalences of new and known diabetes, so that ratio could be deduced

Table 46

Proportion of known diabetes (KDM) in studies – South and Central American Region

Country/ territory	Author	Journal	Total diabetes (n)	KDM (n)	KDM proportion of total diabetes (%)
Bolivia	Barceló et al, 2001[142]	Revista Panamericana de Salud Pública	185	132	71
Brazil	Malerbi et al, 1992[144]	Diabetes Care	1,660	896	54
Chile	Baechler et al, 2002[146]	Revista Medica de Chile	115	63	55
Colombia	Aschner et al, 1993[147]	Diabetes Care	34	22	65
Nicaragua	Medina, 2007[148]	Unpublished	179	102	57
Paraguay	Jimenez et al, 1998[149]	Diabetic Medicine	99	44	45
				Mean	**58**
				Median	**56**

Table 47

Proportion of known diabetes (KDM) in studies – South-East Asian Region

Country/ territory	Author	Journal	Total diabetes (n)	KDM (n)	KDM proportion of total diabetes (%)
Bangladesh	Sayeed et al, 1997[185]	Diabetes Care	123	35	28
	Rahim et al, 2007[91]	Diabetes Research and Clinical Practice	270	27	10
India	Ramachandran et al (large cities), 2001[86]	Diabetologia	1,684	1,175	70
	Sadikot et al (urban), 2004[87]	Diabetes Research and Clinical Practice	624	199	32
	Sadikot et al (rural), 2004[87]	Diabetes Research and Clinical Practice	193	37	19
Mauritius	Dowse et al, 1990[32]	Diabetes	633	269	42
	Soderberg et al, 2005[90]	Diabetic Medicine	1,317	671	51
Nepal	Karki et al, 2000[155]	Southeast Asian Journal of Tropical Medicine and Public Health	116	30	25
				Mean	**35**
				Median	**30**

Table 48

Proportion of known diabetes (KDM) in studies – Western Pacific Region

Country/ territory	Author	Journal	Total diabetes (n)	KDM (n)	KDM proportion of total diabetes (%)
Australia	Dunstan et al, 2002[156]	Diabetes Care	943	475	50
Cambodia	King et al, 2005[158]	Lancet	185	66	36
China	Gu et al, 2003[160]	Diabetologia	N/A	N/A	24
China, Hong Kong	Cockram et al, 1993[186]	Diabetes Research and Clinical Practice	41	16	38
	Janus et al, 2000[187]	Diabetic Medicine	269	77	29
	Lam et al, 2000[159]	Diabetic Medicine	253	90	36
Indonesia	Ministry of Health Indonesia, 2008[92]	Government Report	1,392	444	32[a]
Japan	Sekikawa et al, 1993[188]	Diabetes Care	109	52	48
Korea, Republic of	Kim et al, 2006[167]	Diabetes Care	N/A	N/A	57[a]
Malaysia	Malaysia (Institute of Public Health, 2006)[93]	Government Report	3,934	2,374	60[a]
Mongolia	Suvd et al, 2002[169]	Diabetic Medicine	72	46	64
Nauru	Zimmet et al, 1984[170]	Diabetes Research	374	221	59
Philippines	Baltazar et al, 2004[172]	Diabetes Research and Clinical Practice	362	N/A	67[a]
Samoa	Collins et al, 1994[173]	Diabetes Care	203	101	50
Singapore	Ministry of Health,Singapore, 1999[189]	Government Report	N/A	N/A	38
Taiwan	Chou et al, 1992[174]	Diabetes Care	143	77	54
	Chou et al, 1994[175]	Diabetes Care	209	63	30
Thailand	Aekplakorn et al, 2003[176]	Diabetes Care	607	N/A	50[a]
Tonga	Colagiuri et al, 2002[177]	Diabetes Care	106	N/A	20[a]
Viet Nam	Duc Son et al, 2004[190]	Diabetic Medicine	194	118	61
Viet Nam	Ministry of Health Vietnam, 2006[178]	Government Report	662	302	46
			Mean		**44**
			Median		**47**

[a] These figures were quoted in the original papers as simple fractions (e.g. 1/2, 2/3), or provided only separate prevalences of new and known diabetes, so that ratio could be deduced

N/A not available

Appendix 1 Methodology

Data search

The search for data was limited to studies published after 1979. This cut-off was chosen as data collected prior to 1980 may no longer reflect the current prevalence of diabetes. Selection of articles was limited to those published pre-March 2009.

The Medline database and internet were used for the literature search. Systematic searches were conducted for each country using the following search formulae:

Country name (all the countries of the world were entered for separate searches) together with 'diabetes' or 'impaired glucose tolerance' and 'prevalence' or 'incidence'; and

'NIDDM' or 'IDDM' or 'non-insulin-dependent diabetes mellitus' or 'insulin-dependent diabetes mellitus' or 'Type 1 diabetes' or 'Type 2 diabetes', combined with 'prevalence' or 'incidence'.

Relevant citations from each article were also obtained. A number of other avenues were explored in the search for relevant data. Diabetes researchers in each major IDF geographical region were contacted and requested to provide information on the prevalence of diabetes for countries within their region. In addition, IDF member associations in each member country were asked about relevant data. In the absence of data for a country, the member association was further asked to comment on the use of data from another country (see section on Extrapolation below).

Data selection

The search obtained data in a variety of forms such as prevalence studies, registry reports, hospital statistics, government estimates, etc. Studies for a particular country were included based on their level of reliability. The following factors were taken into account when assessing a study's level of reliability:

- The year of the study—more recent studies were preferred.
- The screening method used—the oral glucose tolerance test (OGTT) was the preferred method of screening, followed by two-hour blood glucose (2hBG) alone, then the fasting blood glucose (FBG) alone, and then self-report (SR).
- Sample size—studies with larger sample sizes and higher response rates were preferred.

When more than one study was available for a country, and there was no clear superiority of one over the other, the results from the available studies were averaged, and then applied to the national population.

Extrapolation

If there were no data available for a particular country, prevalence rates from a published study from the socio-economically, ethnically, and geographically most similar country were applied to that country's age and sex-specific (and in the case of low/middle-income countries, urban/rural-specific) population distribution. Socio-economic comparisons were based on gross national product (GNP) per capita. Ethnic comparisons were based on ethnicity data from the CIA *World Factbook 2008*[33].

If a dataset did not provide sex-specific data, the data were disaggregated and assigned 50% to females and 50% to males.

Urban: rural prevalence

In countries with low or middle-income economies, differences between urban and rural populations in levels of physical exercise, diet, and socio-economic factors often result in significant differences in diabetes prevalence rates. Therefore, for low- and middle-income economies (except those of the former socialist economies in Europe), the urban and rural rates were calculated and numbers reported separately.

If the above conditions for different urban and rural diabetes prevalences applied, then for countries where available studies showed prevalences separately for urban and rural populations, these rates were applied to the national urban and rural populations.

For studies reporting on a mixed urban and rural population, but where no data were provided as to the urban/rural distribution of the survey population, the available age and gender specific data were assigned to the population so as to produce a 2:1 urban:rural ratio in diabetes prevalence.

For countries where only urban or only rural data were available, the 2:1 ratio was used to calculate the prevalence of diabetes in the other segment of the population. No urban:rural difference was used for IGT prevalence, unless the data for that country indicated a prevalence difference to be present.

Known diabetes

Studies from several countries—Canada, France, Italy, Netherlands, Norway, Slovenia, United Kingdom—only provided data on self-reported diabetes. To account for undiagnosed diabetes, the prevalences of diabetes for Canada and UK were multiplied by a factor of 1.5, in accordance with findings from the USA[79] (Canada) and local recommendations (UK) and for the other countries doubled, based on data from a number of countries [55-58,156].

Prevalence calculation

A list of the world's countries and 2010 and 2030 population distribution estimates was obtained from the United Nations Population Division [78]. The age- and sex-specific prevalence rates (obtained from the logistic regression—see below) were applied to the corresponding age and sex population distribution for the years 2010 and 2030 for each country. This method for estimating figures for 2030 only takes into account changes in age, sex and urban/rural population distributions, and not for the likely changes in lifestyle and obesity, which may tend to increase diabetes prevalence. Thus, the figures may be an underestimate.

The prevalence rate (PR) of diabetes and IGT for each country was then calculated using the formula:

PR (for those people 20-79 years) =

Total number of expected cases (20-79)

Total country population (20-79)

Where:

Total number of expected cases of diabetes, or IGT, in the 20-79 year range = the sum of each age and gender (and urban/rural) specific number, as derived according to the earlier description.

Following calculation of the PR, the expected number of people with diabetes and IGT within the country was reported separately for males and females, according to age

groups (20-39, 40-59, 60-79), and in those low- and middle-income economies (only for diabetes), according to residence in urban and rural areas.

For countries without available age and gender distribution descriptions i.e. those with populations of less than 100,000 for the year 2010, (and Taiwan), for which data are not provided [9], the total world population distribution was applied to the 2008 population as indicated in the CIA *World Factbook 2008* [33]. For Andorra, Liechtenstein, Monaco and San Marino, the total developed world population was applied. Populations for all these countries for 2010were obtained by applying the annual increase for one year, and for 2030, by assuming an unchanged proportion of the world (or developed world) from 2010 to 2030.

The countries/territories without UN population data that are included are: Andorra, Anguilla, Antigua and Barbuda, Aruba, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Grenada, Cook Islands, Kiribati, Liechtenstein, Marshall Islands, Monaco, Nauru, Niue, Palau, Saint Kitts and Nevis, San Marino, Seychelles, Taiwan, Tokelau, Tuvalu.

Prevalence reporting

In addition to calculating the national rates, a prevalence for each country and region, adjusted to the world population, was calculated by applying for each country that country's age- and sex-specific rates to a notional population of that country's population size, but with the world population age and gender distribution for 20–79 years (for 2010 and 2030). This was done to facilitate comparison of rates between countries and regions, and this adjustment to the world population noted whenever it was used.

For each region the prevalence adjusted to the world population was calculated by the summation of the number of persons for each member country with the condition, if each country's world population adjusted prevalence were applied to that country, and the sum divided by the total regional population (20-79 years).

Logistic Regression

For each country, data for both diabetes and IGT are presented for people in the 20-79 age group. Most of the datasets used did not contain data for all age groups in the 20-79 year age bracket. In order to fill in missing data and to ensure a smooth relationship between prevalence and age, logistic regression was performed on those datasets that contained four or more datapoints.

Observed data were entered into an SPSS spreadsheet under the following columns: age (mid-age of each age group), weight (number of people without or with diabetes, or IGT, for each age group), and diabetes or IGT (0 = no, 1 = yes). The age specific prevalence (or case numbers, when provided) was used to obtain the weighting in the following manner:

If 3.6% of 1,000 participants of a particular age group had the condition (diabetes or IGT), the weighting for having the condition would be 36, and for not having the condition, 964.

Following this, the variable age^2 (age x age) was calculated, to enable the model to contain a quadratic term, so that the end model could include the possibility of flattening or reducing prevalence for the oldest age groups. A binary logistic regression was then performed using diabetes or IGT as the dependent variable and age and age^2 as the covariates, to produce parameter estimates for the intercept, B and C. This provided the values for each of the 12 five-year groups (20-24, 25-29, …75-79) for the following equation:

$y = \text{Intercept} + (B \times \text{age}) + (C \times \text{age}^2)$

The age specific prevalence (for the five-year age group) was then calculated as $(e^y/(e^y+1))$.

The total numbers of persons with diabetes and IGT for each country were then calculated by applying the calculated age specific prevalence rates to the demographic data from the United Nations Population Prospects [77].

An upper limit of age was necessary for the logistic regression process, and 79 years was the limit chosen. When original datasets contained the age group 65+, the assumption was made that this age group was 65-74. If a dataset contained the age group 60+, the assumption was that this age group was 60-79, unless all previous age group data were in 10-year groups, in which case a 60-69 year limit was applied. No age groups with the youngest members being over 79 years were included, but persons over 80 years were included if part of an age group 75-84 years.

Where the data were available, five-year age bands were chosen instead of 10-year age bands as they provided 12 datapoints in the 60 years age range which gave a smoother relationship between age and diabetes prevalence.

The following figures illustrate how the published age specific data could be converted by using the described methodology into a smoothed curve with respect to age.

Examples of modelled and published diabetes prevalences

Figure A1.1 Jordanian males and females combined (urban)

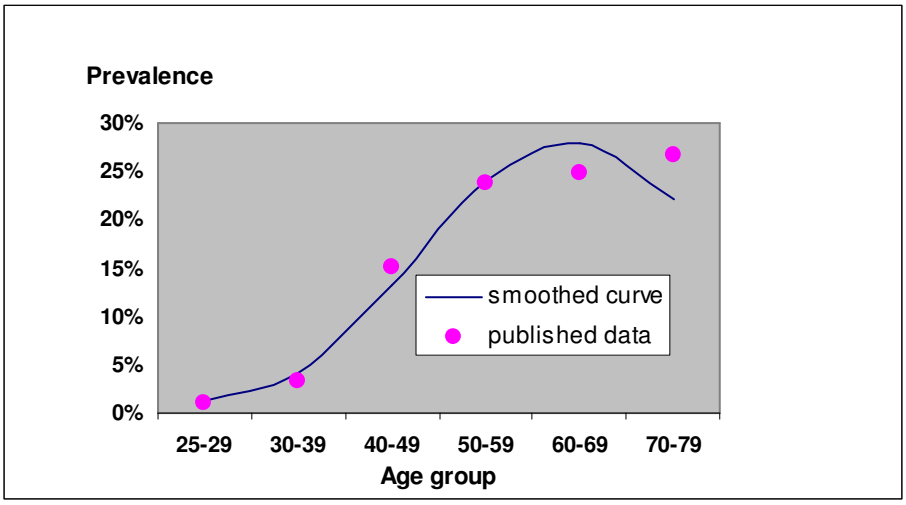


Figure A1.2 Chinese males

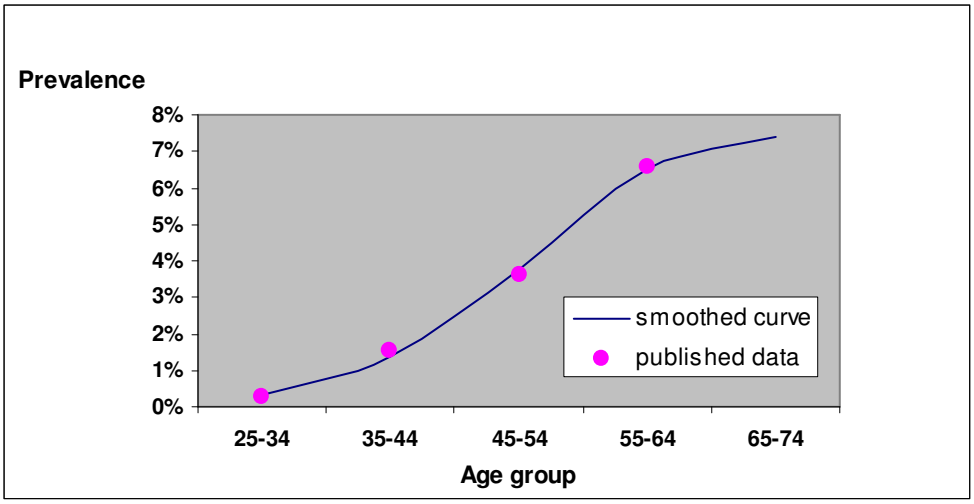


Figure A1.3 Bolivian females

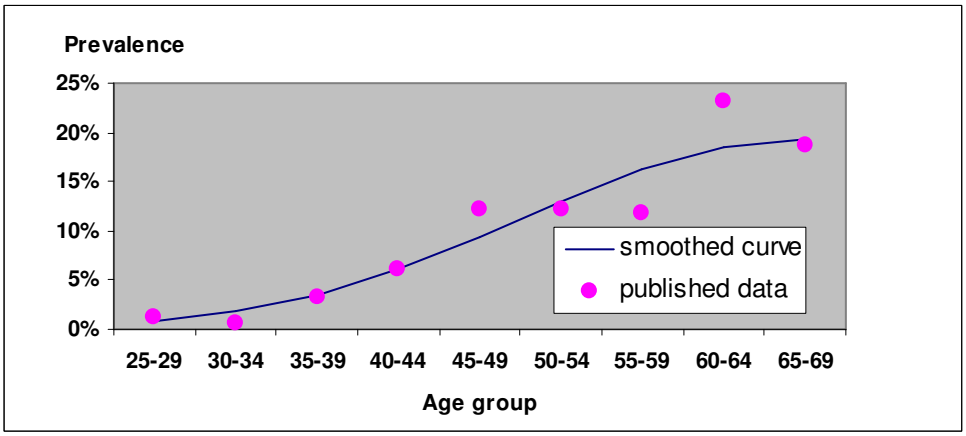
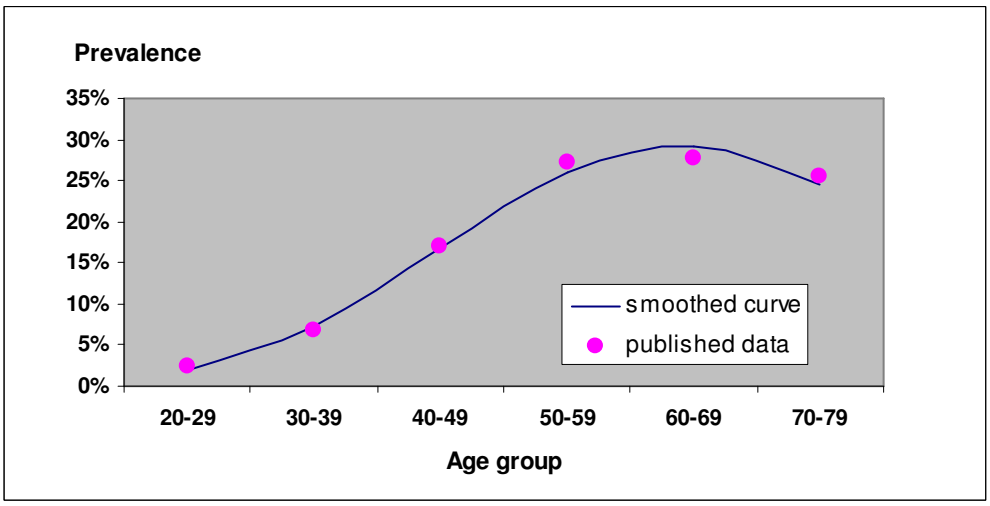


Figure A1.4 Indian females



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