

Leonor Guariguata <sup>1</sup>, David R. Whiting <sup>2</sup>, Ute Linnenkamp <sup>1</sup>, Jessica Beagley <sup>1</sup>, Jonathan Shaw <sup>3</sup>

<sup>1</sup> International Diabetes Federation, Brussels, Belgium  
<sup>2</sup> Directorate of Public Health, Medway Council, Chatham, United Kingdom  
<sup>3</sup> Baker IDI Heart and Diabetes Institute, Melbourne, Australia

## Background

Diabetes is a serious and increasing global health burden. Impaired glucose tolerance (IGT) is an asymptomatic condition defined by elevated (though not diabetic) levels of blood glucose two hours after a 75g oral glucose challenge. IGT puts people at high risk of developing diabetes and is linked with the development of cardiovascular diseases.<sup>1-3</sup>

## Aims and Objectives

The International Diabetes Federation (IDF) has produced estimates of the prevalence of IGT since the year 2003.<sup>2-6</sup> Previous estimates of the prevalence of IGT have demonstrated a large and increasing burden, with significant regional variability. The current estimates provide the latest figures based on the most recent and highest quality data on IGT prevalence for 219 countries and territories.

## Methods

We conducted a literature search of studies reporting the age-specific prevalence for IGT and used the Analytic Hierarchy Process (AHP) to systematically select studies to generate estimates for 219 countries and territories. Data sources included country-level data sources from peer-reviewed studies, national health statistics reports, commissioned studies on diabetes prevalence, and unpublished data obtained through personal communication. Estimates for countries without available source data were modelled from countries with similar ethnicity, geography, and income group. Logistic regression was applied to generate smoothed age-specific prevalence estimates for adults 20-79 years which were then applied to population estimates for 2013 and 2035. Logistic regression was used to generate estimates of the prevalence of IGT. The national\* prevalence and the age-adjusted\*\* prevalence was generated for each country and territory.

## Results

A total of 116 data sources were considered and 78 included, representing 63 countries. This study estimated that 316 million adults worldwide, 6.9% of adults, had IGT in 2013. This is in addition to the 382 million people, 8.3% of adults, worldwide estimated to have diabetes. In 2035 this study predicts that 471 million, 7.3% of adults, will have IGT, in addition to the 592 million, 10.1% of adults, who are predicted to have diabetes. Most people with IGT live in low- and middle-income countries and these will experience the greatest increase in cases of diabetes over the next 22 years. The majority of adults with IGT (153 million) are less than 50 years of age, with almost one third belonging to the age-group 20-39 years.

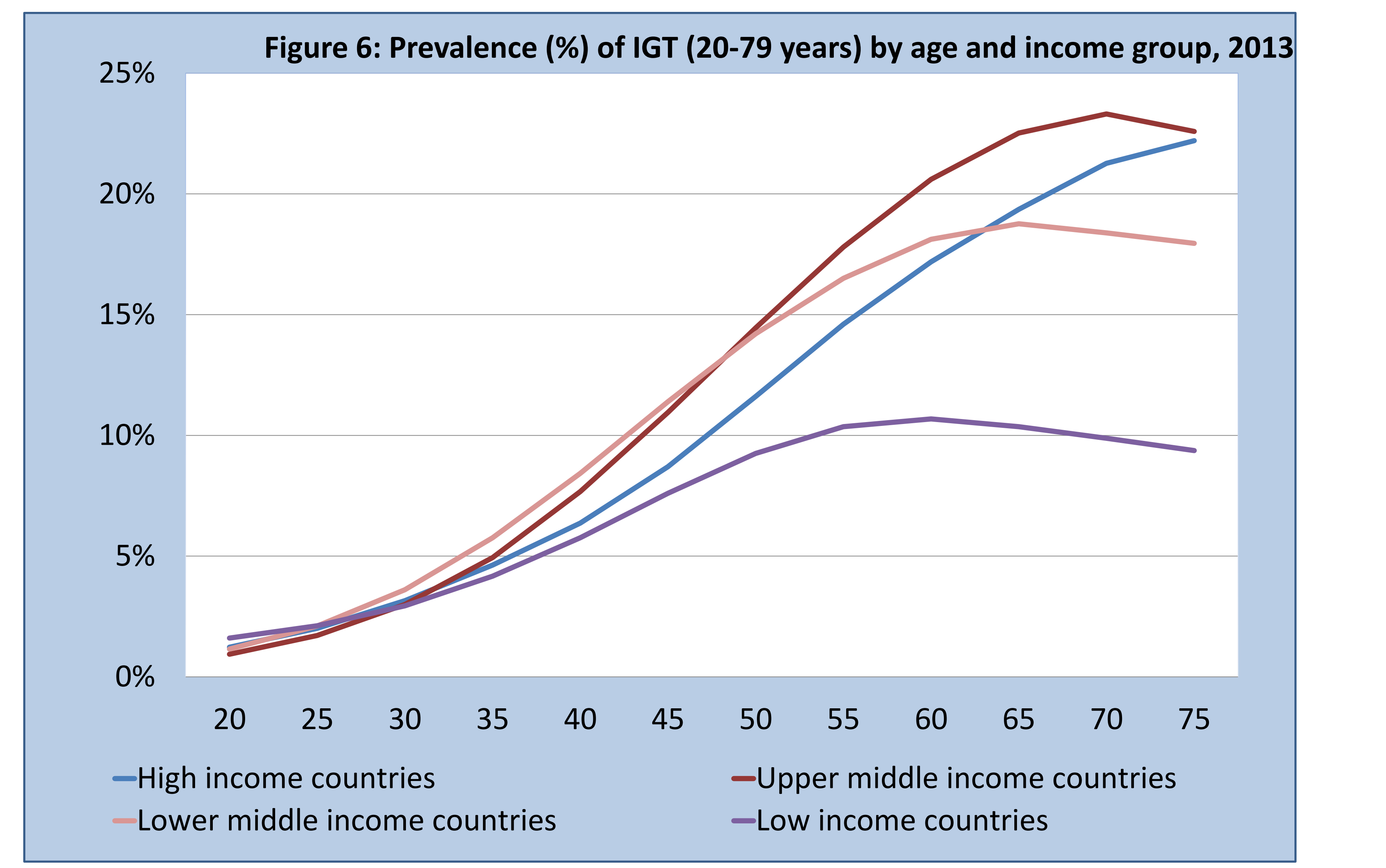
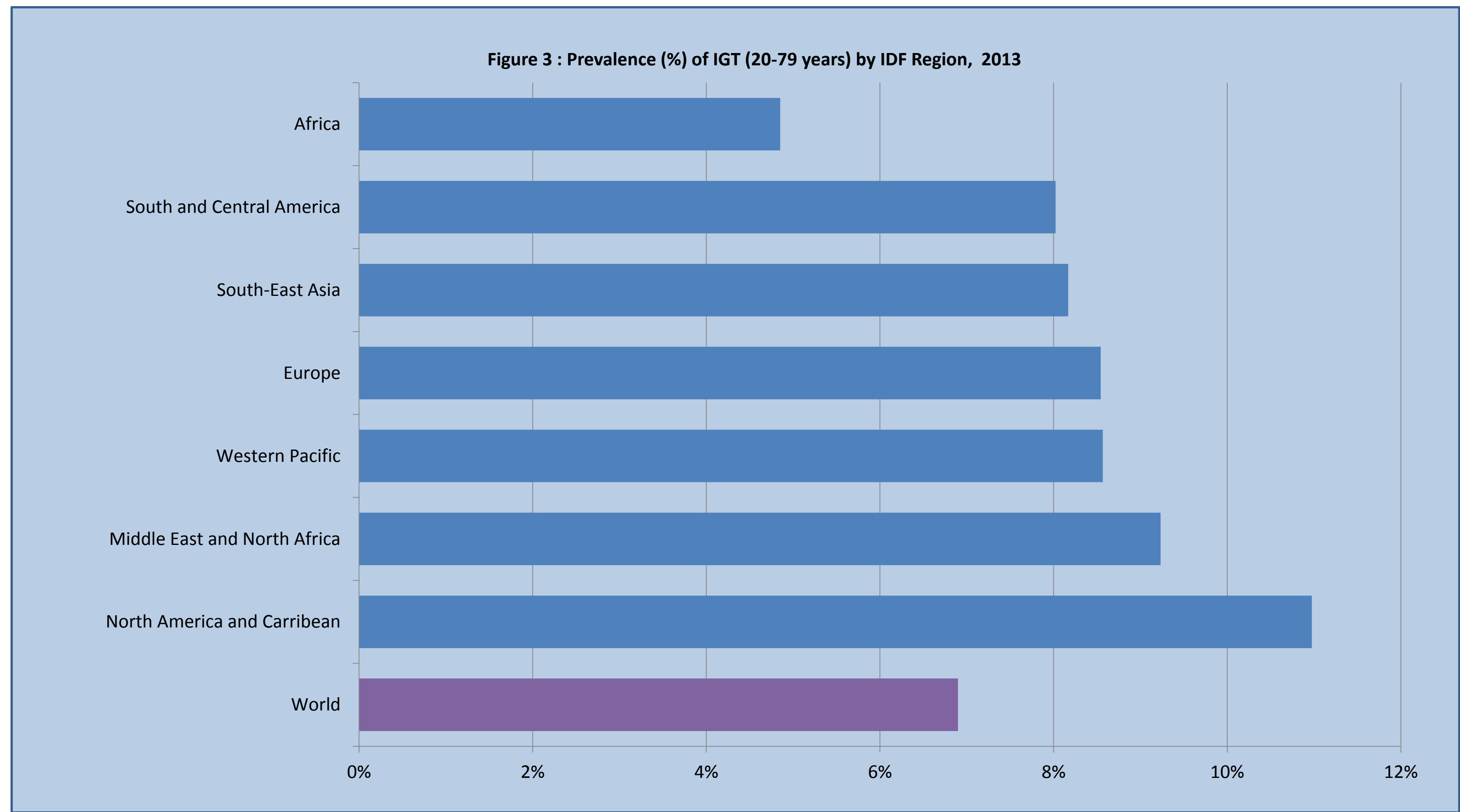
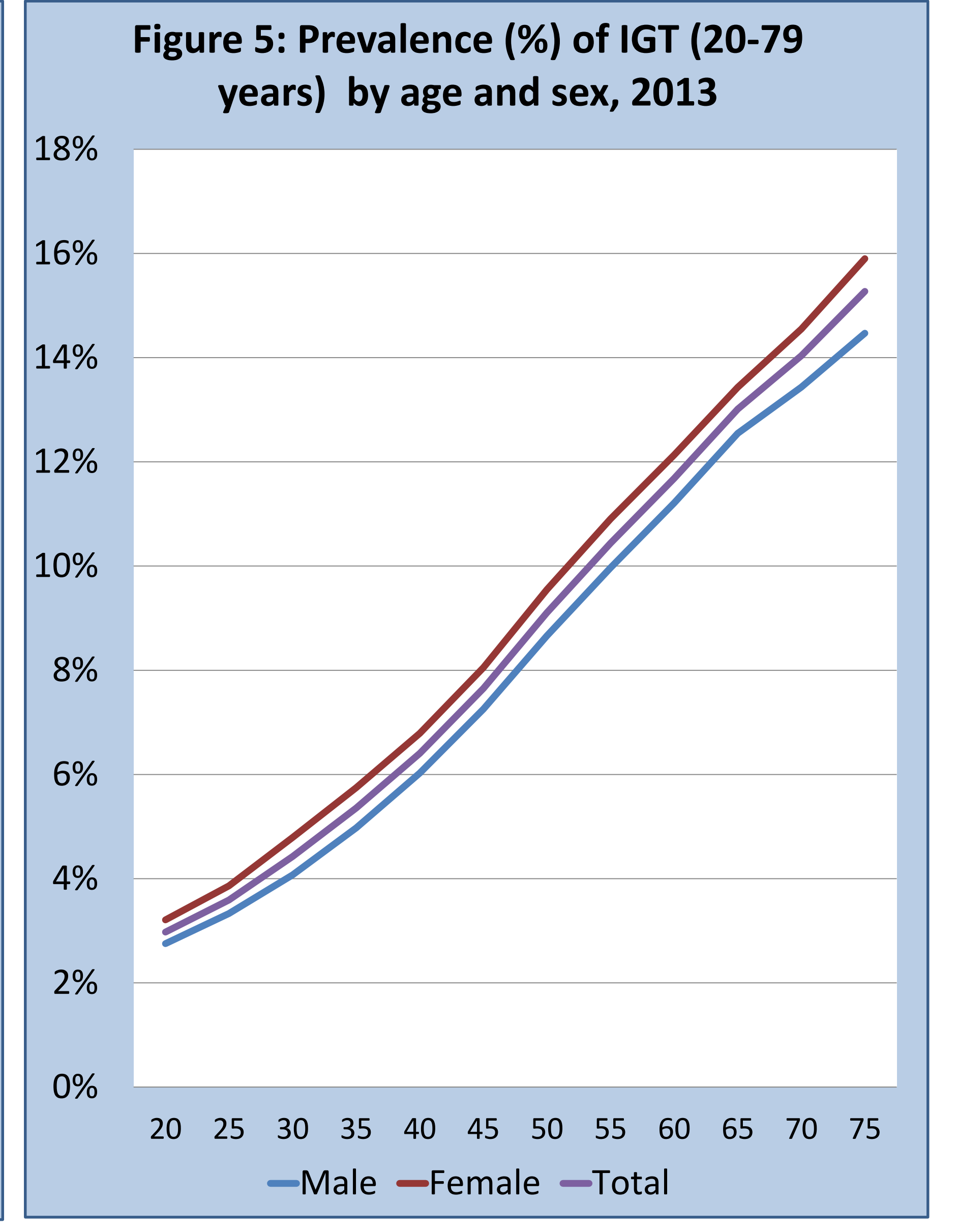
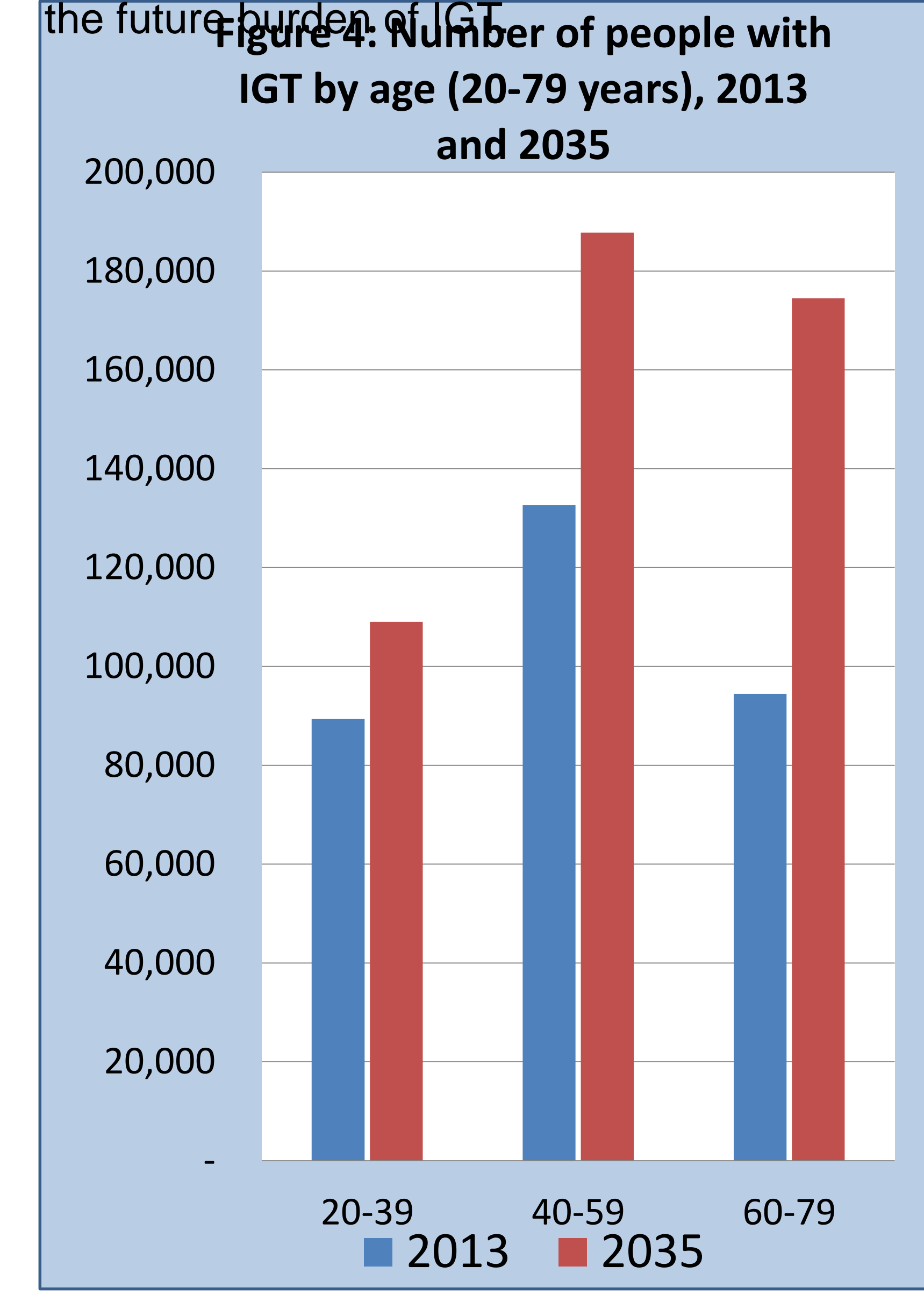
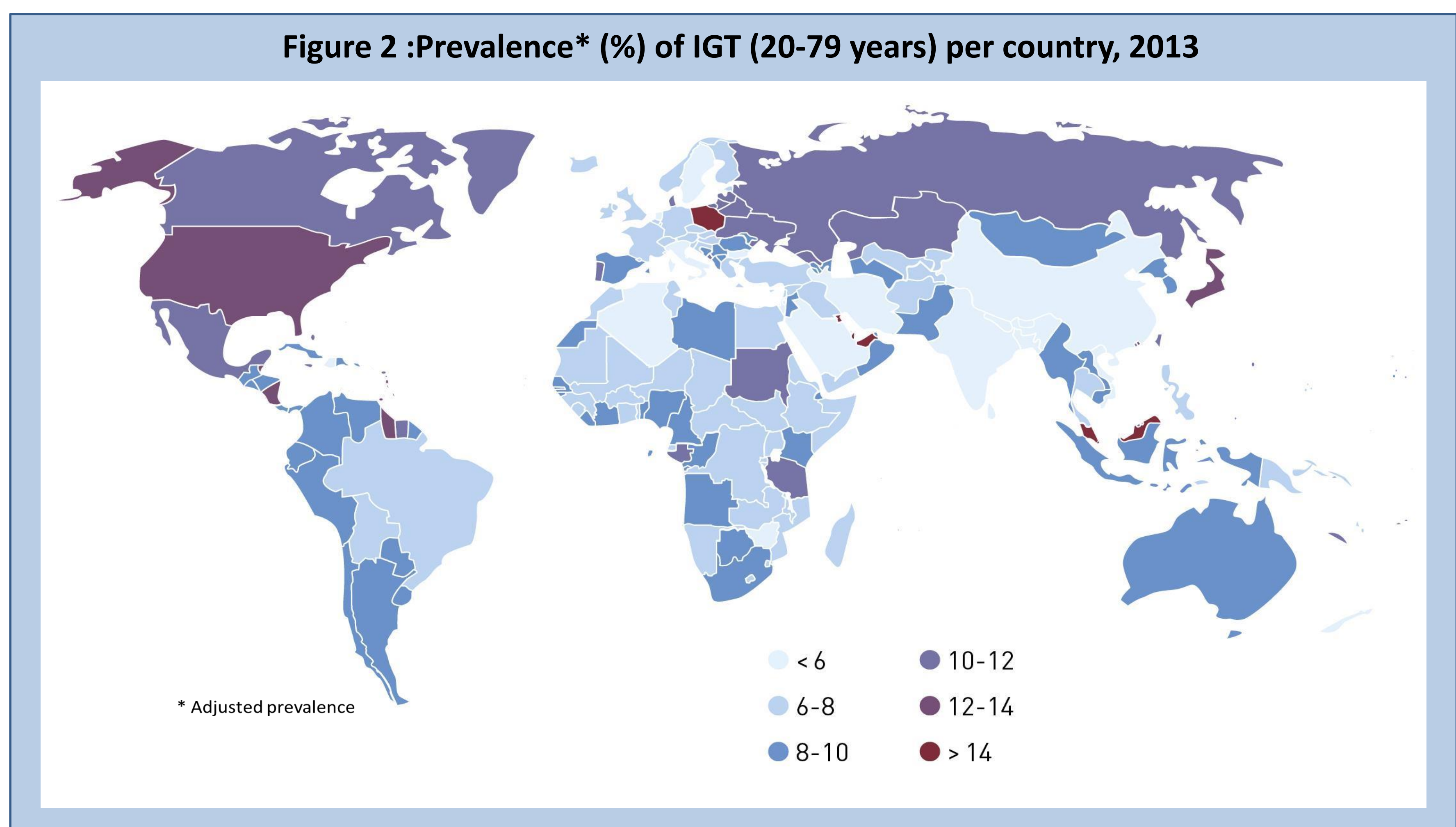
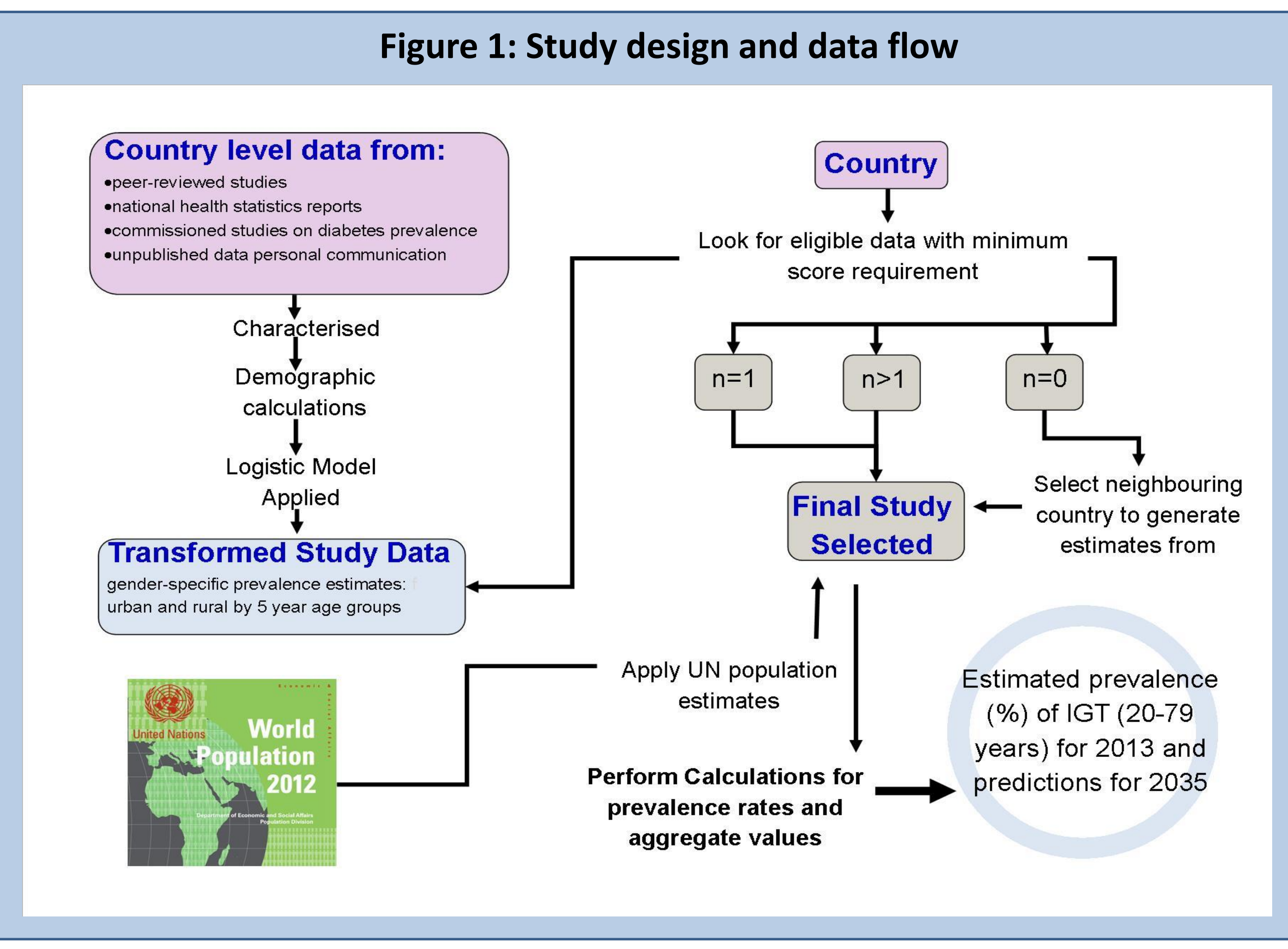
**Table 1 :Top 10 countries/ territories for prevalence \*(%) of IGT (20-79 years ) 2013 and 2035**

Country/ Territory	2013 (%)	Country/ Territory	2035 (%)
Kuwait	17.9	Poland	19.3
Qatar	17.1	Kuwait	18.1
United Arab Emirates	16.6	Qatar	17.4
Poland	16.5	United Arab Emirates	17.0
Bahrain	16.3	Bahrain	16.7
Malaysia	15.2	Malaysia	15.3
Hong Kong SAR	13.3	Hong Kong SAR	13.2
Nicaragua	12.9	Anguilla	13.0
Japan	12.6	Guadeloupe	13.0
Singapore	12.4	Macau SAR	12.9

\* Age-adjusted prevalence

## Discussion

The new estimates of IGT in adults quantifies the large burden of people at high risk of diabetes, especially in low and middle income countries. The prevalence of IGT is generally similar to that of diabetes, but somewhat higher than the diabetes prevalence in the European Region and lower than diabetes prevalence in the African and South-East Asia Regions. A recent study (9) found that the age-standardised prevalence of IGT in Mauritius to be 15.3% (13.5-17.1%). As this survey was not incorporated into the current IDF Atlas study, it was not included in Table 1 . However, this survey will be considered for inclusion in future updates, and it is likely that Mauritius will be found in the top ten countries for prevalence of IGT in the next update of the IDF Diabetes Atlas. As no other variables except from changes in the age and urban/rural distribution of the population have been considered in producing the estimates for 2035, and that it is likely that the age-specific prevalence will rise due to changes in lifestyle, the figures reported here may be underestimating the future burden of IGT.



**\*National or regional prevalence** is the percentage of each country's or region's adult population that has IGT. It is ideal for assessing the burden of IGT for each country or region. However, because the prevalence of IGT increases with age, it cannot be used for comparing risk of IGT between countries or regions which have different age structures.

**\*\*Adjusted prevalence** has been calculated by assuming that every country and region has the same age profile. This removes the differences of age between countries and regions, and makes this figure ideal for making comparisons.

## Conclusion

In 2013, 316 million adults worldwide (6.9% of adults aged 20-79) had IGT. This is in addition to the 382 million people, 8.3% of adults, worldwide estimated to have diabetes. In 2035, 471 million (7.3% of adults aged 20-79) are predicted to have IGT, in addition to the 592 million (10.1% of adults aged 20-79) who are predicted to have diabetes.

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