Global, regional and national prevalence of overweight and obesity in children and adults 1980-2013: A systematic analysis

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Abstract

Background—In 2010, overweight and obesity were estimated to cause 3.4 million deaths, 3.9% of years of life lost, and 3.8% of DALYs globally. The rise in obesity has led to widespread calls for regular monitoring of changes in overweight and obesity prevalence in all populations. Comparative, up-to-date information on levels and trends is essential both to quantify population health effects and to prompt decision-makers to prioritize action.

Methods—We systematically identified surveys, reports, and published studies (n = 1,769) that included information on height and weight, both through physical measurements and self-reports. Mixed effects linear regression was used to correct for the bias in self-reports. Age-sex-country-year observations (n = 19,244) on prevalence of obesity and overweight were synthesized using a spatio-temporal Gaussian Process Regression model to estimate prevalence with 95% uncertainty intervals.

Findings—Globally, the proportion of adults with a body mass index (BMI) of 25 or greater increased from 28.8% (95% UI: 28.4-29.3) in 1980 to 36.9% (36.3-37.4) in 2013 for men and from 29.8% (29.3-30.2) to 38.0% (37.5-38.5) for women. Increases were observed in both developed and developing countries. There have been substantial increases in prevalence among children and adolescents in developed countries, with 23.8% (22.9-24.7) of boys and 22.6% (21.7-23.6) of girls being either overweight or obese in 2013. The prevalence of overweight and obesity is also rising among children and adolescents in developing countries as well, rising from 8.1% (7.7-8.6) to 12.9% (12.3-13.5) in 2013 for boys and from 8.4% (8.1-8.8) to 13.4% (13.0-13.9) in girls. Among adults, estimated prevalence of obesity exceeds 50% among men in Tonga and women in Kuwait, Kiribati, Federated States of Micronesia, Libya, Qatar, Tonga, and Samoa. Since 2006, the increase in adult obesity in developed countries has stabilized.

Interpretation—Because of the established health risks and substantial increases in prevalence, obesity has become a major global health challenge. Contrary to other major global risks, there is little evidence of successful population-level intervention strategies to reduce exposure. Not only is obesity increasing, but there are no national success stories over the past 33 years. Urgent global action and leadership is required to assist countries to more effectively intervene.

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Introduction

The rising prevalence of overweight and obesity in a number of countries[1–5] has been described as a global pandemic.[6–8] In 2010, overweight and obesity already were estimated to cause 3.4 million deaths, 3.9% of years of life lost and 3.8% of disability adjusted life years (DALYs) globally.[9] Studies in the USA have suggested that, unabated, the rise in obesity could well lead to future declines in life expectancy.[10] Concern about the health risks associated with rising obesity has become nearly universal; Member States of the World Health Organization adopted a voluntary target of halting the rise in obesity by 2025.[11] There have been widespread calls for regular monitoring of changes in overweight and obesity prevalence in all populations.[12–15]

Monitoring of trends in the prevalence of overweight and obesity depends on household surveys. Many health interview surveys include questions on self-reported weight and height that have been used to monitor trends overtime;[16–18] however, estimates of BMI from self-reported data have been shown to be biased downwards.[19–21] Examination surveys provide direct measurements of weight and height but many fewer countries conduct repeated national examination surveys, and estimates from them may be biased because of low participation rates.[19] Despite the lack of complete and unbiased information on overweight and obesity, various systematic analyses have tried to capture levels and trends. Finucane et al.[2] used data from 369 national surveys and 591 sub-national surveys to estimate country trends in mean BMI between 1980 and 2008. De Onis et al.[3] examined 450 national surveys to estimate trends in childhood obesity and overweight from 1990 to 2020. Mean BMI estimates have been used to predict levels of overweight and obesity over the period 1980-2008.[1] These analyses suggest widespread increases in overweight and obesity have been occurring over the past few decades although recent country-specific analyses suggest that trends may have stabilized in some populations.[22–24]

Up to date information on levels and trends in overweight and obesity is essential both to quantify their health effects and to prompt decision-makers to prioritize action and evaluate where progress is, or is not, being made. As an integral component of the risk factor work for the Global Burden of Disease 2013 Study (GBD), we have analyzed trends by country in overweight and obesity from 1980 to 2013. In this paper, we report on the results of the systematic analysis carried out for the GBD 2013.

Methods

Definitions and data

Following convention, prevalence of overweight and obesity is defined based on body-mass index (BMI) calculated by mass as measured in kilograms divided by the square of height measured in meters (kg/m^2) For adults (individuals above the age of 18 years), overweight is defined as having a BMI greater than or equal to 25 and lower than 30; obesity is defined as having a BMI greater than or equal to 30. For children and adolescents (individuals under the age of 18 years), classification of overweight and obesity is based on the International Obesity Task Force (IOTF) definition (see Webappendix for more details). We report estimates for 188 countries, 21 regions, and development status (developed or developing)

as defined in the Global Burden of Disease Study (GBD).[25] Estimates of the prevalence of overweight and obesity are reported for men and women separately and for 17 age groups, starting at ages 2-4 years, and ending with the age group 80+ years.

We used several strategies to identify the data sources used in the analysis. First, we included all major multi-country survey programs which include information on height and weight, such as the Demographic and Health Surveys (DHS),[26] the WHO STEPwise approach to Surveillance (STEPS) program,[27] the Eurobarometer Surveys,[28] the Multiple Indicator Cluster Surveys (MICS),[29] the World Health Surveys (WHS),[30] the Reproductive Health Surveys (RHS),[31] the Survey of Healthy Ageing and Retirement in Europe (SHARE),[32] and the International Social Survey Programmed (ISSP).[33] Second, we searched three large databases (the WHO Global Infobase,[34] the International Association for the Study of Obesity Data Portal,[35] and the Global Health Data Exchange (GHDx),[36] as well as national health ministry websites to identify national multi-year surveys, such as national health surveys and national longitudinal studies. Amongst 2,100 sources identified, 331 were excluded due to limitations in the representativeness of the sample. More details on the surveys included and excluded from the current study are presented in Webappendix.

Third, we conducted a systematic literature review, using similar search criteria as those applied by Finucane et al.[2] We identified all articles reporting on prevalence of overweight and obesity based on BMI from 1980 to 2012. Studies were included if the design involved a representative random sample of the population. Both self-report and measured data were considered (see Webappendix for details). Data identified in the systematic literature review were compared against the survey/report database. All duplicated data were dropped with preference given to survey microdata. Studies reporting on prevalence of overweight and obesity based on alternative measurements, such as waist-circumference and hip-waist ratio, were excluded from this study due to the lack of reliable data for converting prevalence based on these alternative measurements to an equivalent prevalence estimate based on BMI'. Further information on the specific search terms as well as inclusion and exclusion criteria for the systematic review are presented in the Webappendix.

In total, these sources provided 1,769 country-years of data and 19,244 country-year-age-sex data points from 183 countries. There were 5 countries with no data (Antigua and Barbuda, Brunei, Grenada, Saint Vincent and the Grenadines, Venezuela). A complete list of all the sources included in the analysis is shown in Webtable 6.

Data processing

Cross-walking different definitions—Self-reported weights for women in some countries tend to be under-reported and self-reported heights for men over-reported.[19–21] Self-reported weights and heights, however, are a major source of information. We examined the relationship between self-report and measured BMI using 671 country-years with both types of measurements available. We used a mixed effects linear regression to estimate bias correction factors for each GBD super-region, age, and sex. The uncertainty introduced from this adjustment was incorporated as the data variance and propagated into the Gaussian process regression described below. We have also conducted a sensitivity

analysis excluding all self-reported data from the analysis. More details on this analysis are shown in the Webappendix.

Several published reports presented data in broader age groups than those selected for this analysis and occasionally, for both sexes combined. We disaggregated these data into the required age and sex groups by applying an age-sex splitting model previously used in the GBD,[37] which uses all surveys that provide information on multiple age-sex groupings as the reference standard to redistribute aggregated prevalence estimates into specific five-year age and sex groups of interest. More details are available in the Webappendix.

Model

In many cases, we had multiple sources of data for the same year implying different levels of prevalence. In other cases, there were gaps in the data sequence. To deal with both issues and generate a complete time series based on all the available data, we use a spatial-temporal regression model (ST) and Gaussian process regression (GPR) to synthesize the data. ST-GPR has been used extensively to synthesize time series cross-sectional data.[38–42] ST-GPR serves as a powerful tool for interpolating and extrapolating non-linear trends. Specifically, it allows the borrowing of strength across space and time. In addition, rather than treating every data point with equal weight, the relative uncertainty of data is taken into account in the estimation procedure with less uncertain data given a higher weight. The Webappendix provides details of each step of the estimation process. In brief, we assume that the trend of overweight and obesity prevalence follows a Gaussian process, which is defined by a mean function $m(\cdot)$ and a covariance function $Cov(\cdot)$. To estimate the mean function, we apply a two-stage procedure. First, a linear model was fitted separately for each sex. Specifically for prevalence of overweight the following model is applied:

$$logit\left(p_{c,a,t}^{ow}\right) = \beta_0 + \beta_1 \log\left(Kcal_{pc,t}\right) + \beta_2 Lat + \beta_3 Urban + \sum_{k=4}^{k+16} \beta_k I_{age} + \sum_{k=21}^{k+21} \beta_k I_{region}$$

where $p_{c,a,t}^{ow}$ is the prevalence of overweight and obesity; the covariate is total kilocalories consumed per year per capita ($Kcal_{pc,t}$) obtained from the Food and Agriculture Organization food balance sheets.[43] Total kilocalories consumed per year per capita is used as a covariate given the association between food consumption and overweight and obesity.[44] In addition, latitude (*Lat*) and urbanicity (*Urban*) as measured by the proportion of a countries land area having a population density of 1000 people/km^2 or greater, were also included to measure the inter- and intra-country variation in overweight and obesity. Finally, a set of dummy indicators I_{age} and I_{region} were included to capture the age pattern and regional variation respectively. To estimate the prevalence of obesity $\left(p_{c,a,t}^{ob}\right)$, a similar model is applied:

$$logit\left(\frac{p_{c,a,t}^{ob}}{p_{c,a,t}^{ow}}\right) = \beta_0 + \beta_1 \log\left(Kcal_{c,t}\right) + \beta_2 Lat + \beta_3 Urban + \sum_{k=4}^{k+16} \beta_k I_{age} + \sum_{k=21}^{k+21} \beta_k I_{region}$$

We model the prevalence of obesity as a fraction of the joint category of overweight and obesity. The rationale for using this strategy is to ensure that the prevalence of obesity does not exceed the joint category of overweight and obesity, which is bound between 0 and 1. We explored the use of other covariates to predict prevalence, including average income per capita and various measures of diet composition. Our results were not sensitive to the choice of these covariates and we present estimates based on the most parsimonious model. Details on the various model specifications considered are presented in Webtable 4.

While the linear component captures the general trend in prevalence, some of the data variability is still not adequately accounted for. To do so, a smoothing function which allows for borrowing strength across time, age, and space patterns was applied to the residuals from the linear model, as has been done repeatedly in the GBD analytical framework. Details are presented in the Webappendix.

In addition to defining the mean function, another key component in GPR is the covariance function, which defines the shape and distribution of trends. In this study, we applied the Matern covariance function, which offers flexibility to model a wide spectrum of trends with varying degrees of smoothness. Details are presented in the Webappendix.

Based on the mean and covariance function, estimates of overweight and obesity prevalence, p_{c,a,t_*}^{ow} and p_{c,a,t_*}^{ob}, were derived for country c, age a, and sex s for time t_*. The analysis was implemented though PyMC package in Python. Random draws of 1,000 samples were obtained from the marginal distributions of predicted prevalence of overweight and obesity for every country, age, and sex group. The final estimated prevalence for each country, age, and sex group was the mean of the draws. In addition, uncertainty intervals were obtained by taking the 2.5 and 97.5 percentiles of the distributions. These uncertainty intervals reflect multiple sources of uncertainty, including the unexplained variance in the GPR mean function, sampling uncertainty, and uncertainty arising from the empirical adjustment of self-report data.

We conduct repeated cross-validation and estimate the root-mean squared error for the data held out in each cross-validation run and the percentage of the time that the 95% uncertainty interval for the data prediction includes the data held-out. The Webappendix provides the detailed results of the cross-validation which demonstrates that the modeling strategy has reasonable error and 95% uncertainty intervals that include close to 95% of the data held out.

Age-standardized prevalence rates for the population aged 20 years and older and for ages 2-19 years were computed using the standard population distribution based on the average country-level population distribution by age from the World Population Prospects 2012 revision.[45]

Results

Globally, prevalence of overweight and obesity combined has risen by 27.5% for adults and 47.1% for children between 1980 and 2013. The number of overweight and obese

individuals has increased from 921 million in 1980 to 2.1 billion in 2013. Figures 1a and 1b show the trend in the age-standardized global prevalence of adult overweight and obesity together (1a) and obesity only (1b) as well as for developing and developed countries between 1980 and 2013. Globally, the proportion of adults with a BMI of 25 or greater increased from 28.8% (28.4-29.3) in 1980 to 36.9% (36.3-37.4) in 2013 for men and from 29.8% (29.3-30.2) to 38.0% (37.5-38.5) for women. Increases were observed in developed and developing countries, but with different sex patterns. In developed countries, men have higher rates of overweight and obesity, while in developing countries, women exhibit higher rates and this relationship persists over time. Looking at rates of obesity only, Figure 1B shows increasing trends in both developed and developing regions. The prevalence of obesity is higher in women in developed and developing countries alike. The rate of increase of overweight and obesity appears to have been greatest between 1992 and 2002, but has slowed down over the last decade, particularly in developed countries.

Figures 2a and 2b show the trend in the age-standardized prevalence of overweight and obesity in children and adolescents (ages 2-19 years) for developing and developed countries. Developed countries show remarkable increases in prevalence at these ages since 1980, with 23.8% (22.9-24.7) of boys and 22.6% (21.7-23.6) of girls being either overweight or obese in 2013 compared to 16.9% (16.1-17.7) of boys and 16.2% (15.5-17.1) of girls in 1980. The prevalence of overweight and obesity is also rising among children and adolescents in developing countries, increasing from 8.1% (7.7-8.6) in 1980 to 12.9% (12.3-13.5) in 2013 for boys and 8.4% (8.1-8.8) to 13.4% (13.0-13.9) in girls. In both developed and developing countries, gender differences in the levels and trends of overweight and obesity are small.

Figure 3 demonstrates the age pattern of overweight and obesity in 2013. At all ages, prevalence is higher in developed than developing countries. Age patterns differ in men and women and between developing and developed countries. In developed countries, men above age 15 show higher rates of overweight and obesity than women; in developing countries, women have higher rates than men above age 25 years. Overweight and obesity peak in developed country men around age 55 years, with two out of three men overweight and one in four obese. For developed country women, the peak age is closer to 60 years with 31.3% (28.9-33.8) obese and 64.5% (62.5-66.5) overweight or obese. In developing countries, the age pattern of overweight and obesity is similar to that in developed countries, but the levels are much lower, with the highest level of obesity seen around age 55 years for women with a rate of 14.4% (13.5-15.5) and around 45 years for men with a rate of 8.1% (7.5-8.8).

Trends in adult age-standardized obesity prevalence over successive cohorts in developed and developing regions (Figure 4) reveal that successive cohorts appear to be gaining weight at all ages, including childhood and adolescence, with more rapid gains between ages 20-40 years. In developed countries, peak prevalence is moving to earlier ages over time. Of note, among developed country women, the 1965 birth cohort appears to have lower prevalence at the same age than the 1960 birth cohort and the 1970 birth cohort also crosses the 1965 cohort. Given uncertainty in the estimates (shown in Webtable 11), however, this cohort cross-over should not be over-interpreted. Prevalence in men and women decline as cohorts

age, possibly due to selective mortality effects or to higher rates of chronic disease at older age and associated weight loss.

Table 1 and Webtables 9-10 provide age-standardized regional and national estimates of the prevalence of overweight and obesity together and obesity alone for males and females for 1980, 1990, 2000, and 2013 for 188 countries and 21 GBD regions. Figures 5A-D show maps of prevalence of obesity in 2013 for boys, girls, men, and women. Age-standardized prevalence of obesity in children and adolescents ranges from over 30% for girls in Kiribati, Samoa, and the Federated States of Micronesia to under 2% in Bangladesh, Brunei Darussalam, Burundi, Cambodia, Eritrea, Ethiopia, Laos, Nepal, North Korea, Tanzania, and Togo. There are distinct geographic patterns for child and adolescent obesity with high rates seen in many countries in the Middle-East and North Africa, particularly for girls, and in several Pacific Island and Caribbean nations for both girls and boys. Within Western Europe there is marked variation in rates of obesity from 12.5% (10.3-14.9) for boys in Malta to 4.1 % (3.4-5.0) in the Netherlands. In Latin America, Chile and Mexico stand out with the highest levels for boys, at 11.9% (9.6-14.3) and 10.5% (8.8-12.4) respectively, and Uruguay and Costa Rica for girls, at 18.1% (14.9-21.9) and 12.4% (10.0-15.1) respectively.

Among adults, estimated prevalence of obesity exceeds 50% among men in Tonga and women in Kuwait, Kiribati, the Federated States of Micronesia, Libya, Qatar, Tonga, and Samoa. In North America, the USA stands out for its high prevalence of obesity, with roughly one-third of both men (31.6% [30.0-33.4]) and women (33.9% [31.8-35.7]) being obese. Fourteen countries in Central and Latin America have female age-standardized prevalence rates greater than 20%. In sub-Saharan Africa, the highest prevalence of obesity is observed among South African women, at 42.0% (40.6-43.3) in 2013. Despite increasing trends over time (data not shown), China and India show relatively low rates of obesity in 2013, with 3.8% (3.5-4.3) of Chinese men and 5.0% (4.5-5.5) of women, and 3.7% (3.3-4.1) of Indian men and 4.2% (3.8-4.8) of Indian women being obese in 2013. More than 50% of the 693 million obese individuals in the world live in just 10 countries (listed in order of number of obese individuals): USA, China, India, Russia, Brazil, Mexico, Egypt, Pakistan, Indonesia, and Germany. The USA accounted for 13% of obese people worldwide in 2013, with China and India jointly accounting for another 15%. Although age-standardized rates are lower in developing than developed countries overall, 64% of the world's obese live in developing countries.

The correlation across countries between the level of obesity in 1980 and the change since then is 0.29 for women and 0.38 for men. This suggests that the long-term (three decades) increases in obesity have not been smaller for countries that already had higher rates of obesity in 1980. Over the 33-year period of this study, the largest increases in the rate of obesity were seen in Egypt, Saudi Arabia, Oman, Honduras, and Bahrain, for women, and for New Zealand, Bahrain, Kuwait, Saudi Arabia and the USA for men. The USA was among the top fifteen countries in terms of increases in obesity for both men and women. Other high-income countries with large gains during this time period include Australia and the United Kingdom.

Discussion

In our systematic analysis of global data on the prevalence of obesity and overweight, we find that the prevalence of overweight and obesity has risen significantly over the past three decades, with marked variations across countries in the levels and trends in overweight and obesity with distinct regional patterns. In developed countries, there is some indication that the increases in obesity that began in the 1980s have attenuated over the last eight years or so. Conversely, our findings suggest that there are likely to be continued increases in the developing world, where almost two in three of the world's obese live. Island nations in the Pacific and the Caribbean, and countries in the Middle-East and Central America, have already reached particularly high rates of overweight and obesity.

Attempts to explain the large increases in obesity over the past 33 years have focused on a number of potential contributors, including increases in calorie intake, changes in the composition of diet, declining levels of physical activity, and changes in the gut microbiome.[44,46–56] The relative contribution of changes in energy intake versus energy expenditure has been vigorously debated.[52–55] More recent experimental evidence on the importance of the microbiome for metabolism of energy[57,58] has led to alternative theories on the role of changing microbiome in the global obesity epidemic.[59,60] Our descriptive analysis does not attempt to measure the relative contribution of these, or other factors. It does, however, demonstrate that increases in the prevalence of overweight and obesity have been substantial, and widespread, and have occurred over a relatively short period of time. Theories of change need to encompass this temporal dimension and dispersion.

Our analysis has highlighted countries where the majority of the adult female population and over a third of the adult male population are obese. We have found no countries where there have been significant declines over the last 33 years. This raises the question as to whether many or most countries are on a trajectory to reach the high levels of obesity observed in countries such as Tonga or Kuwait. Evidence of a slowdown in the rate of increase of overweight and obesity in the developed world, and indications that obesity in more recent birth cohorts is lower than prior birth cohorts at the same age, provides some hope that the epidemic may have peaked in developed countries and that populations in other countries may not reach the very high rates of over 40% currently seen in some developing countries. Wide variation in rates of increase in obesity and overweight among countries starting at the same initial level also suggests that there is substantial scope to modulate weight gain in populations. Our analysis, however, does not indicate why some countries have seen slower rates of increase, only that smaller increases are possible.

The health effects of overweight and obesity have been extensively debated.[61–65] Large pooling studies used for the GBD 2013, however, show consistent risks as BMI rises above 23,[66–69] particularly for cardiovascular disease, cancer, diabetes, osteoarthritis, and chronic kidney disease. The majority of deaths attributable to overweight- and obesity are cardiovascular deaths.[9] Systematic reviews suggest that only 31% of the coronary heart disease risk and 8% of the stroke mortality risk associated with obesity is mediated through elevated blood pressure and cholesterol collectively.[70] Pharmacotherapy targeting blood pressure and cholesterol can thus be expected to attenuate some, but not the majority of the

cardiovascular risk attributable to overweight and obesity. Even with aggressive pharmacotherapy, we can therefore expect that rising overweight and obesity will have substantial health effects, driving up diabetes, osteoarthrisits, cancers, and major vascular disease.

This study has important limitations. First, we have chosen to include surveys that collect self-reported weights and heights. In our analysis (see Webappendix) we have found that there is systematic bias but this bias is greater in some regions such as high-income countries and the Middle-East than in low-income countries. We have corrected the self-reported data using the relationships observed in data from country-years with both self-report and measured weights and heights. The sensitivity analysis reported in the Webappendix shows that our overall global results are robust to the exclusion of these data (correlation coefficient = 0.96). Second, we have chosen to exclude sub-national studies from a limited number of sites. For example, MONICA data points were excluded because they pertained to a single city.[71] By examining national surveys with individual records and information on location we found that there is marked variation between urban and rural areas and heterogeneity across urban sites (data not shown). We were unable to generalize the bias for selected cities to national figures. Moreover, reporting national level rates of overweight and obesity undoubtedly obscures important subnational variations, particularly among ethnic groups, lower socioeconomic categories and important sub-populations (e.g. slums) in large cities. Third, there is substantial data sparseness particularly in the 1980s (see Webappendix). The estimation of prevalence for the earlier time period in this study is based on extrapolation from the model which is strongly influenced by the kcal per capita covariate. Kcal per capita are reported through food balance sheets of the Food and Agriculture Organization. To the extent that these are inaccurate, our trends will be biased. Of note, we did not include time as a covariate in our model because this inappropriately imposes a similar time trend on all countries. Nevertheless, we have attempted to capture temporal associations among data using spatio-temporal smoothing. Fourth, our uncertainty intervals may be under-estimated because we have not included uncertainty from the selection of GPR hyper parameters in our final results. However, our cross-validation analysis suggests that this is unlikely to be a major problem (see Webappendix). Fifth, definitions of childhood obesity vary between the International Obesity Task Force and WHO. We have chosen to apply a consistent definition of obesity and overweight across sources; for this reason, we have excluded a number of published studies from our analysis that were reported using non-standard definitions. Where we could, we estimated overweight and obesity rates from individual-level records in household surveys. Sixth, although BMI serves as a convenient measure for adiposity, it does not adequately take into account variations in body structure across ethnic groups.[72] Moreover, the use of the universal cutoff may underestimate the actual prevalence of overweight and obesity in certain countries.

Contrary to other major global risks such as tobacco[42] and childhood malnutrition[73,74] which are declining globally, obesity is not. As shown in this study, obesity is already a major public health challenge in many middle-income countries. Tracking this important risk to health with increased precision and disaggregation in both developing and developed countries is a key global health priority. Options for population level surveillance of the

epidemic need to take into account more complex measurement strategies than required for other major hazards, such as tobacco. In particular, countries will need to carefully weigh the choice between fielding physical examination surveys that are more costly but can provide robust measurements, and using more routine survey platforms to collect self-reported weights and heights. A combination of both approaches which allow for periodic assessment of self-report bias, such as used in the United States, United Kingdom, and Japan, may provide a reasonable approach.

Strengthened surveillance is not only good public health practice, but can be expected to increase public, including government awareness of the extent of the problem in countries. There is some evidence that this is already happening.[75] Member States of WHO in 2013 adopted a target of halting the rise in obesity by 2025.[11] While this resolution is commendable evidence that the global public health community is taking the rise in obesity seriously, there are no countries with well documented downward trends in the last three decades. Our analysis, moreover, suggests that this target is extremely ambitious and unlikely to be attained without concerted action and further research to evaluate the impact of population wide interventions, and how to effectively translate that knowledge into national obesity control programs.

To counter the impending health effects on populations, particularly in the developing world, urgent global leadership is required to assist countries to more effectively intervene against major determinants such as excessive caloric intake, physical inactivity and active promotion of food consumption by industry, all of which exacerbate an already problematic obesogenic environment.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

1. Stevens GA, Singh GM, Lu Y, et al. National, regional, and global trends in adult overweight and obesity prevalences. Popul Health Metr. 2012; 10:22. [PubMed: 23167948]

2. Finucane MM, Stevens GA, Cowan MJ, et al. National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9·1 million participants. The Lancet. 2011; 377:557–67.

3. De Onis M, Blössner M, Borghi E. Global prevalence and trends of overweight and obesity among preschool children. Am J Clin Nutr. 2010; 92:1257–64. [PubMed: 20861173]

4. Wang Y, Beydoun MA. The Obesity Epidemic in the United States—Gender, Age, Socioeconomic, Racial/Ethnic, and Geographic Characteristics: A Systematic Review and Meta-Regression Analysis. Epidemiol Rev. 2007; 29:6–28. [PubMed: 17510091]

5. Rennie KL, Jebb SA. Prevalence of obesity in Great Britain. Obes Rev. 2005; 6:11–2. [PubMed: 15655034]

6. Roth J, Qiang X, Marbán SL, Redelt H, Lowell BC. The Obesity Pandemic: Where Have We Been and Where Are We Going? Obes Res. 2004; 12:88S–101S. [PubMed: 15601956]

7. Popkin BM, Adair LS, Ng SW. Global nutrition transition and the pandemic of obesity in developing countries. Nutr Rev. 2012; 70:3–21. [PubMed: 22221213]

8. Swinburn BA, Sacks G, Hall KD, et al. The global obesity pandemic: shaped by global drivers and local environments. The Lancet. 2011; 378:804–14.

9. Lim SS, Vos T, Flaxman AD, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. The Lancet. 2012; 380:2224–60.

10. Olshansky SJ, Passaro DJ, Hershow RC, et al. A Potential Decline in Life Expectancy in the United States in the 21st Century. N Engl J Med. 2005; 352:1138–45. [PubMed: 15784668]

11. Follow-up to the Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-Communicable Diseases; Geneva, Switzerland: World Health Assembly; 2013. http://apps.who.int/gb/ebwha/pdf_files/WHA66/A66_R10-en.pdf

12. Gortmaker SL, Swinburn BA, Levy D, et al. Changing the future of obesity: science, policy, and action. The Lancet. 2011; 378:838–47.

13. Obesity: preventing and managing the global epidemic. Report of a WHO consultation. World Health Organ Tech Rep Ser. 2000; 894:i–xii. 1–253. [PubMed: 11234459]

14. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. BMJ. 2000; 320:1240. [PubMed: 10797032]

15. Swinburn BA. Obesity prevention: the role of policies, laws and regulations. Aust N Z Health Policy. 2008; 5:12.

16. Sassi, F.; Devaux, M.; Cecchini, M.; Rusticelli, E. The Obesity Epidemic: Analysis of Past and Projected Future Trends in Selected OECD Countries. OECD Publishing; 2009. http://ideas.repec.org/p/oec/elsaad/45-en.html [accessed 27 Jan2014]

17. Gigante DP, Moura de EC, Sardinha LMV. Prevalence of overweight and obesity and associated factors, Brazil, 2006. Rev Saúde Pública. 2009; 43:83–9. [PubMed: 19936502]

18. Mokdad AH, Ford ES, Bowman BA, et al. Prevalence of obesity, diabetes, and obesity-related health risk factors, 2001. JAMA. 2003; 289:76–9. [PubMed: 12503980]

19. Gorber SC, Tremblay M, Moher D, Gorber B. A comparison of direct vs. self-report measures for assessing height, weight and body mass index: a systematic review. Obes Rev. 2007; 8:307–26. [PubMed: 17578381]

20. Krul AJ, Daanen HAM, Choi H. Self-reported and measured weight, height and body mass index (BMI) in Italy, the Netherlands and North America. Eur J Public Health. 2011; 21:414–9. [PubMed: 20089678]

21. Ezzati M, Martin H, Skjold S, Hoorn SV, Murray CJL. Trends in national and state-level obesity in the USA after correction for self-report bias: analysis of health surveys. J R Soc Med. 2006; 99:250–7. [PubMed: 16672759]

22. Flegal KM, Carroll MD, Ogden CL, Curtin LR. Prevalence and trends in obesity among us adults, 1999-2008. JAMA. 2010; 303:235–41. [PubMed: 20071471]

23. Rokholm B, Baker JL, Sørensen TIA. The levelling off of the obesity epidemic since the year 1999 – a review of evidence and perspectives. Obes Rev. 2010; 11:835–46. [PubMed: 20973911]

24. Stamatakis E, Wardle J, Cole TJ. Childhood obesity and overweight prevalence trends in England: evidence for growing socioeconomic disparities. Int J Obes. 2009; 34:41–7.

25. Murray CJ, Ezzati M, Flaxman AD, et al. GBD 2010: design, definitions, and metrics. The Lancet. 2012; 380:2063–6.

26. Measure, DHS. [accessed 27 Jan2014] Demographic and Health Surveys. http://www.measuredhs.com/

27. WHO. STEPwise approach to surveillance (STEPS). WHO; http://www.who.int/chp/steps/en/ [accessed 27 Jan2014]

28. Eurobarometer surveys. [accessed 27 Jan2014] Eur. Comm. Public Opin. http://ec.europa.eu/public_opinion/index_en.htm

29. Multiple Indicator Cluster Survey (MICS). [accessed 27 Jan2014] UNICEF Stat. Monit. http://www.unicef.org/statistics/index_24302.html

30. WHO World Health Survey. WHO; http://www.who.int/healthinfo/survey/en/ [accessed 27 Jan2014]

31. Reproductive Health Surveys. [accessed 27 Jan2014] Cent. Dis. Control Prev. http://www.cdc.gov/reproductivehealth/Global/surveys.htm

32. The Survey of Health, Ageing and Retirement in Europe (SHARE). SHARE; http://www.share-project.org/ [accessed 27 Jan2014]

33. International Social Survey Programme. ISSP; http://www.issp.org/ [accessed 27 Jan2014]

34. WHO Global InfoBase. [accessed 27 Jan2014] https://apps.who.int/infobase/

35. IASO Obesity data portal. [accessed 27 Jan2014] Int. Assoc. Study Obes. http://www.iaso.org/resources/obesity-data-portal/

36. Global Health Data Exchange. IHME GHDx; http://ghdx.healthmetricsandevaluation.org/ [accessed 27 Jan2014]

37. Lozano R, Naghavi M, Foreman K, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. The Lancet. 2012; 380:2095–128.

38. Wang H, Dwyer-Lindgren L, Lofgren KT, et al. Age-specific and sex-specific mortality in 187 countries, 1970–2010: a systematic analysis for the Global Burden of Disease Study 2010. The Lancet. 2012; 380:2071–94.

39. Murray CJ, Rosenfeld LC, Lim SS, et al. Global malaria mortality between 1980 and 2010: a systematic analysis. The Lancet. 2012; 379:413–31.

40. Hogan MC, Foreman KJ, Naghavi M, et al. Maternal mortality for 181 countries, 1980–2008: a systematic analysis of progress towards Millennium Development Goal 5. The Lancet. 2010; 375:1609–23.

41. Rajaratnam JK, Marcus JR, Flaxman AD, et al. Neonatal, postneonatal, childhood, and under-5 mortality for 187 countries, 1970–2010: a systematic analysis of progress towards Millennium Development Goal 4. The Lancet. 2010; 375:1988–2008.

42. Ng M, Freeman MK, Fleming TD, et al. Smoking prevalence and cigarette consumption in 187 countries, 1980-2012. JAMA. 2014; 311:183–92. [PubMed: 24399557]

43. Food Balance Sheets. FAOSTAT; http://faostat.fao.org/site/354/default.aspx [accessed 27 Jan2014]

44. Bleich S, Cutler D, Murray C, Adams A. Why is the developed world obese? Annu Rev Public Health. 2008; 29:273–95. [PubMed: 18173389]

45. United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects: The 2010 Revision. Vol. Vol 1 & 2: Comprehensive Tables. United Nations; New York: 2011.

46. Astrup A, Brand-Miller J. Diet composition and obesity. The Lancet. 2012; 379:1100.

47. Drewnowski A, Popkin BM. The Nutrition Transition: New Trends in the Global Diet. Nutr Rev. 1997; 55:31–43. [PubMed: 9155216]

48. Briefel RR, Johnson CL. Secular Trends in Dietary Intake in the United States. Annu Rev Nutr. 2004; 24:401–31. [PubMed: 15189126]

49. Swinburn B, Sacks G, Ravussin E. Increased food energy supply is more than sufficient to explain the US epidemic of obesity. Am J Clin Nutr. 2009; 90:1453–6. [PubMed: 19828708]

50. Popkin BM. The Nutrition Transition and Obesity in the Developing World. J Nutr. 2001; 131:871S–873S. [PubMed: 11238777]

51. Church TS, Thomas DM, Tudor-Locke C, et al. Trends over 5 Decades in U.S. Occupation-Related Physical Activity and Their Associations with Obesity. PLoS ONE. 2011; 6:e19657. [PubMed: 21647427]

52. Luke A, Cooper RS. Physical activity does not influence obesity risk: time to clarify the public health message. Int J Epidemiol. 2013; 42:1831–6. [PubMed: 24415616]

53. Blair SN, Archer E, Hand GA. Commentary: Luke and Cooper are wrong: physical activity has a crucial role in weight management and determinants of obesity. Int J Epidemiol. 2013; 42:1836–8. [PubMed: 24415617]

54. Hill JO, Peters JC. Commentary: Physical activity and weight control. Int J Epidemiol. 2013; 42:1840–2. [PubMed: 24415619]

55. Swinburn B. Commentary: Physical activity as a minor player in the obesity epidemic: what are the deep implications? Int J Epidemiol. 2013; 42:1838–40. [PubMed: 24415618]

56. Prentice A, Jebb S. Energy Intake/Physical Activity Interactions in the Homeostasis of Body Weight Regulation. Nutr Rev. 2004; 62:S98–S104. [PubMed: 15387474]

57. Turnbaugh PJ, Hamady M, Yatsunenko T, et al. A core gut microbiome in obese and lean twins. Nature. 2009; 457:480–4. [PubMed: 19043404]

58. Greenblum S, Turnbaugh PJ, Borenstein E. Metagenomic systems biology of the human gut microbiome reveals topological shifts associated with obesity and inflammatory bowel disease. Proc Natl Acad Sci. 2012; 109:594–9. [PubMed: 22184244]

59. Tilg H, Kaser A. Gut microbiome, obesity, and metabolic dysfunction. J Clin Invest. 2011; 121:2126–32. [PubMed: 21633181]

60. Turnbaugh PJ, Ley RE, Mahowald MA, Magrini V, Mardis ER, Gordon JI. An obesity-associated gut microbiome with increased capacity for energy harvest. Nature. 2006; 444:1027–131. [PubMed: 17183312]

61. Flegal KM, Graubard BI, Williamson DF, Gail MH. Excess deaths associated with underweight, overweight, and obesity. JAMA. 2005; 293:1861–7. [PubMed: 15840860]

62. Campos P, Saguy A, Ernsberger P, Oliver E, Gaesser G. The epidemiology of overweight and obesity: public health crisis or moral panic? Int J Epidemiol. 2006; 35:55–60. [PubMed: 16339599]

63. Sims EAH. Are there persons who are obese, but metabolically healthy? Metabolism. 2001; 50:1499–504. [PubMed: 11735101]

64. Willett WC, Hu FB, Thun M. Overweight, obesity, and all-cause mortality. JAMA. 2013; 309:1681–2. [PubMed: 23613066]

65. Flegal KM, Kit BK, Orpana H, Graubard BI. Association of all-cause mortality with overweight and obesity using standard body mass index categories: A systematic review and meta-analysis. JAMA. 2013; 309:71–82. [PubMed: 23280227]

66. Prospective Studies Collaboration. Body-mass index and cause-specific mortality in 900 000 adults: collaborative analyses of 57 prospective studies. The Lancet. 2009; 373:1083–96.

67. Asia Pacific Cohort Studies Collaboration. Body mass index and cardiovascular disease in the Asia-Pacific Region: an overview of 33 cohorts involving 310 000 participants. Int J Epidemiol. 2004; 33:751–8. [PubMed: 15105409]

68. Emerging Risk Factors Collaboration. Wormser D, Kaptoge S, et al. Separate and combined associations of body-mass index and abdominal adiposity with cardiovascular disease: collaborative analysis of 58 prospective studies. Lancet. 2011; 377:1085–95. [PubMed: 21397319]

69. Renehan AG, Tyson M, Egger M, Heller RF, Zwahlen M. Body-mass index and incidence of cancer: a systematic review and meta-analysis of prospective observational studies. The Lancet. 2008; 371:569–78.

70. The Global Burden of Metabolic Risk Factors for Chronic Diseases Collaboration. Metabolic mediators of the effects of body-mass index, overweight, and obesity on coronary heart disease and stroke: a pooled analysis of 97 prospective cohorts with 1·8 million participants. The Lancet. 2013 doi:10.1016/S0140-6736(13)61836-X.

71. The WHO MONICA project. WHO MONICA; http://www.thl.fi/monica/ [accessed 6 Mar2014]

72. WHO Expert Consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet. 2004; 363:157–63. [PubMed: 14726171]

73. De Onis M, Blössner M, Borghi E, Morris R, Frongillo EA. Methodology for estimating regional and global trends of child malnutrition. Int J Epidemiol. 2004; 33:1260–70. [PubMed: 15542535]

74. Stevens GA, Finucane MM, Paciorek CJ, et al. Trends in mild, moderate, and severe stunting and underweight, and progress towards MDG 1 in 141 developing countries: a systematic analysis of population representative data. The Lancet. 2012; 380:824–34.

75. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the united states, 2011-2012. JAMA. 2014; 311:806–14. [PubMed: 24570244]
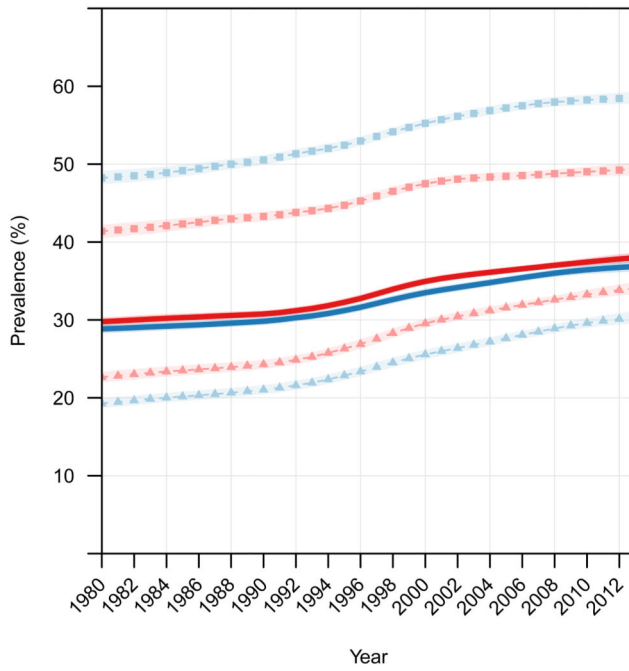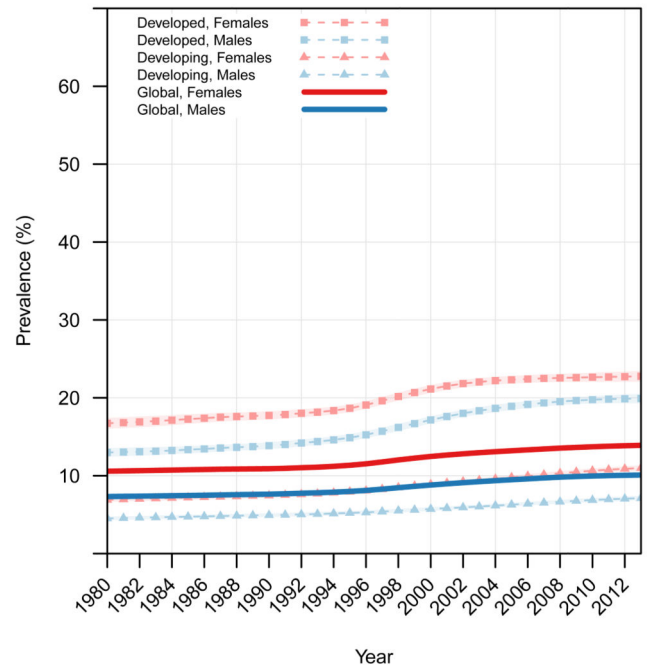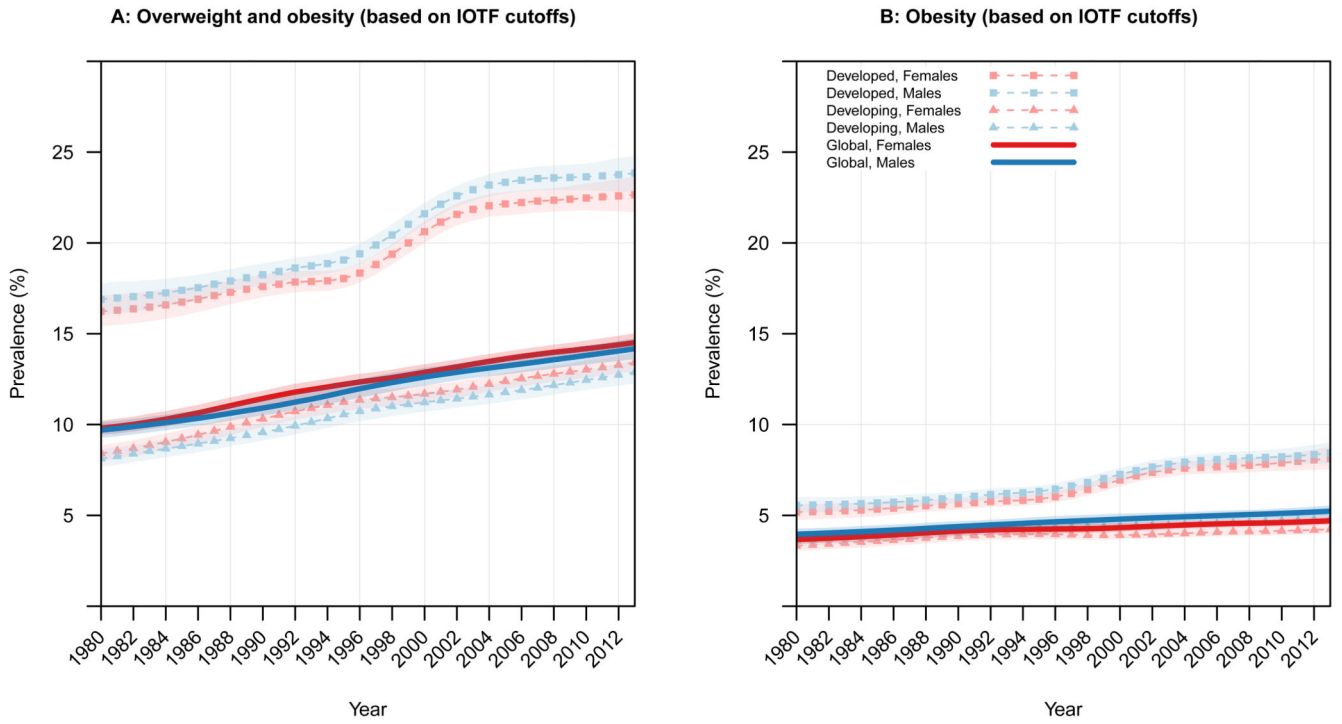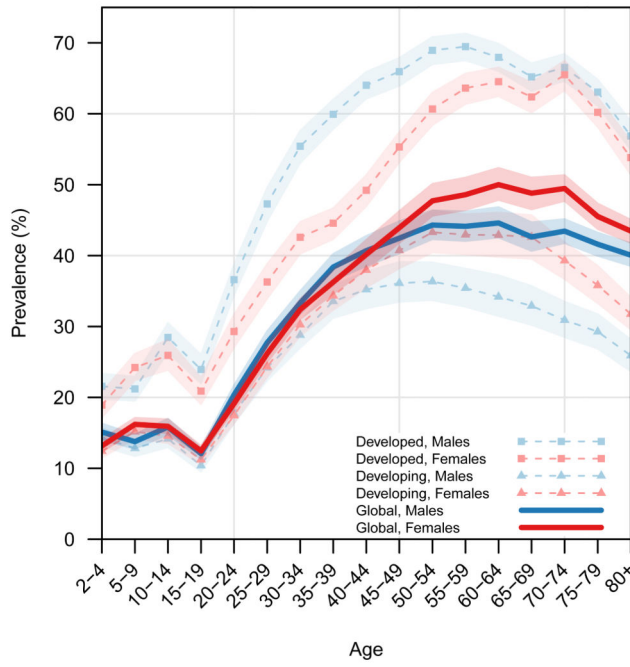
Figure 1.
Age–standardized prevalence of overweight and obesity (BMI>=25) and obesity
(BMI>=30), ages 20+ years, by sex, 1980–2013

A: Overweight and obesity (based on IOTF cutoffs)
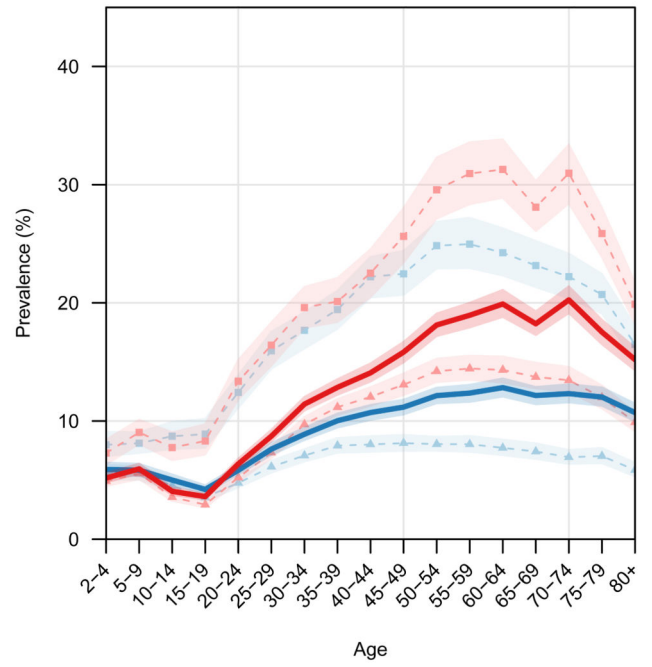
B: Obesity (based on IOTF cutoffs)

Figure 2.
Age–standardized prevalence of overweight and obesity, and obesity alone (based on IOTF cutoffs), ages 2–19 years, by sex, 1980–2013
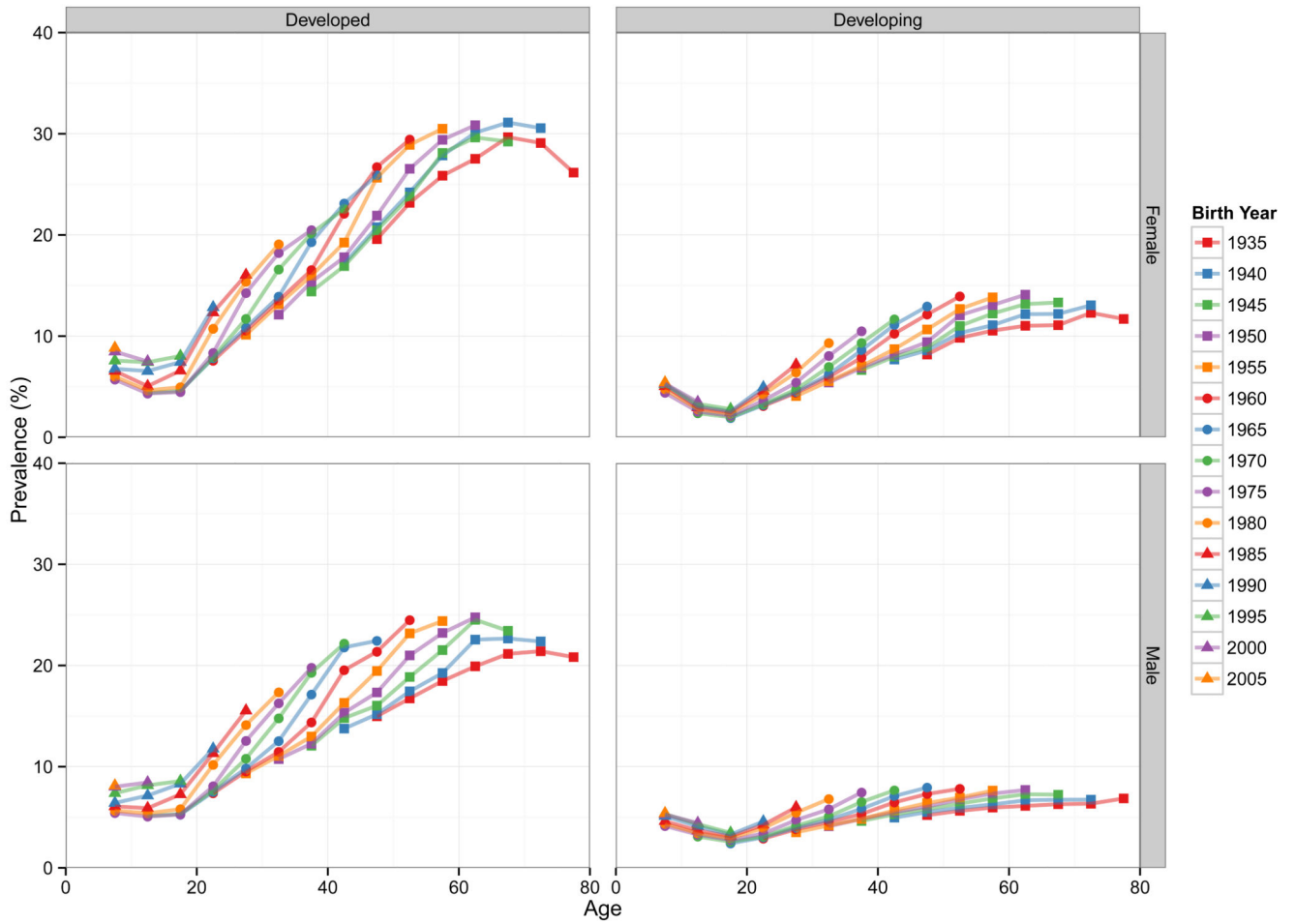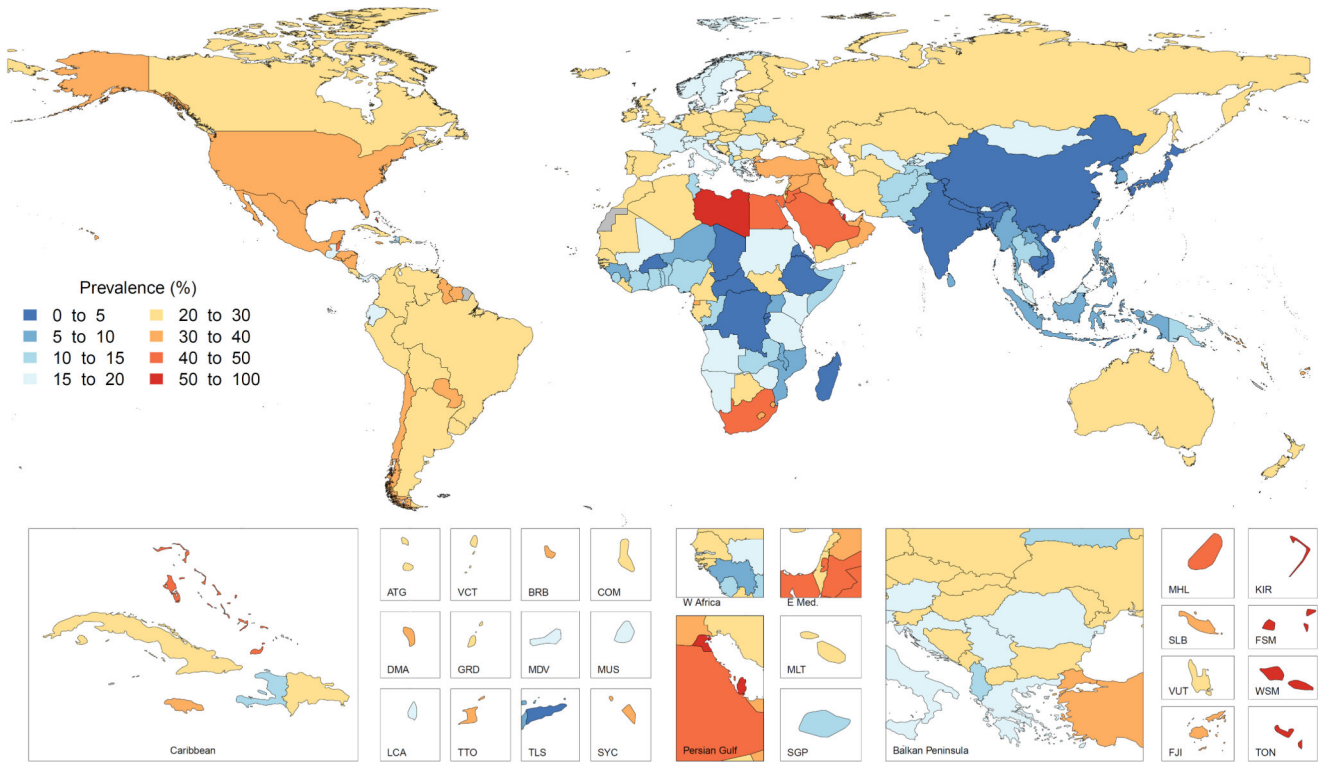
Figure 3.
Prevalence of overweight and obesity (BMI>=25) and obesity (BMI>=30), by age and sex,
2013
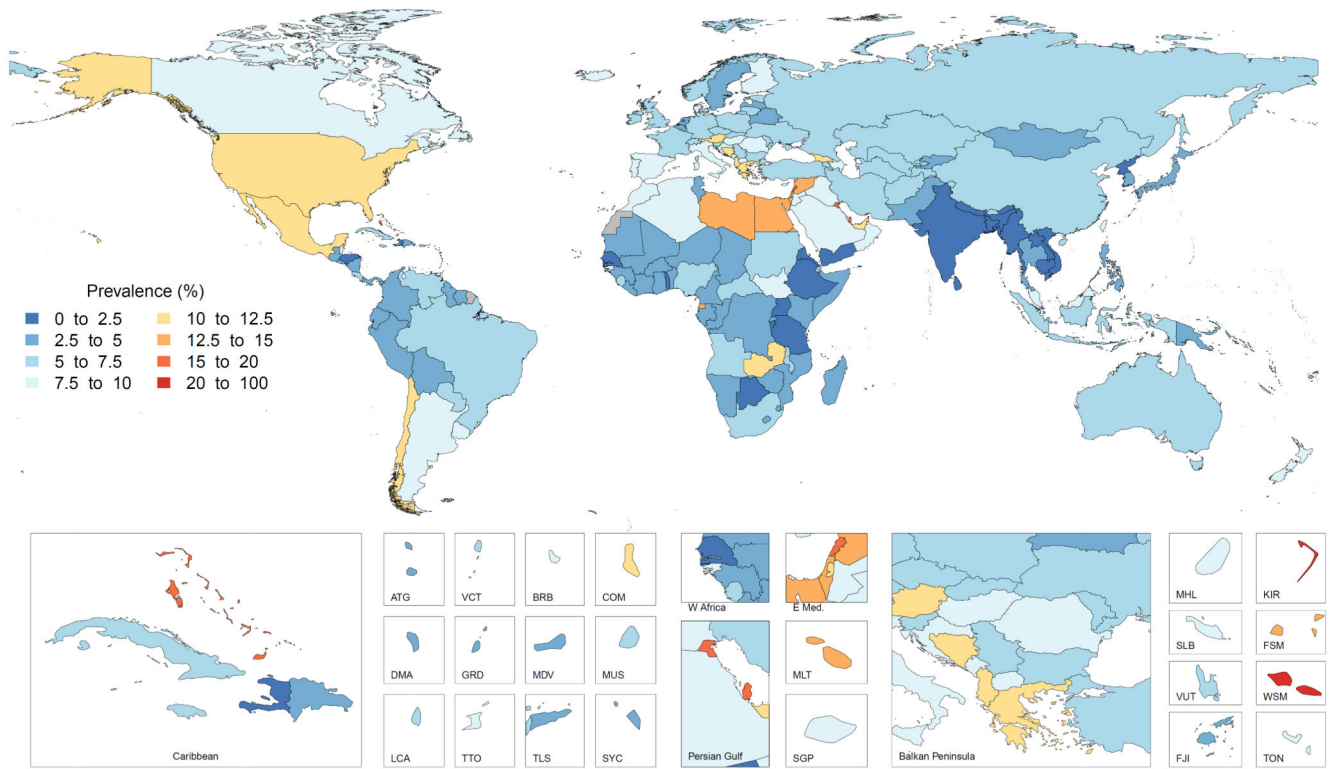
Figure 4.
Prevalence of obesity (BMI>=30) by age across birth cohorts for males and females in developed and developing countries
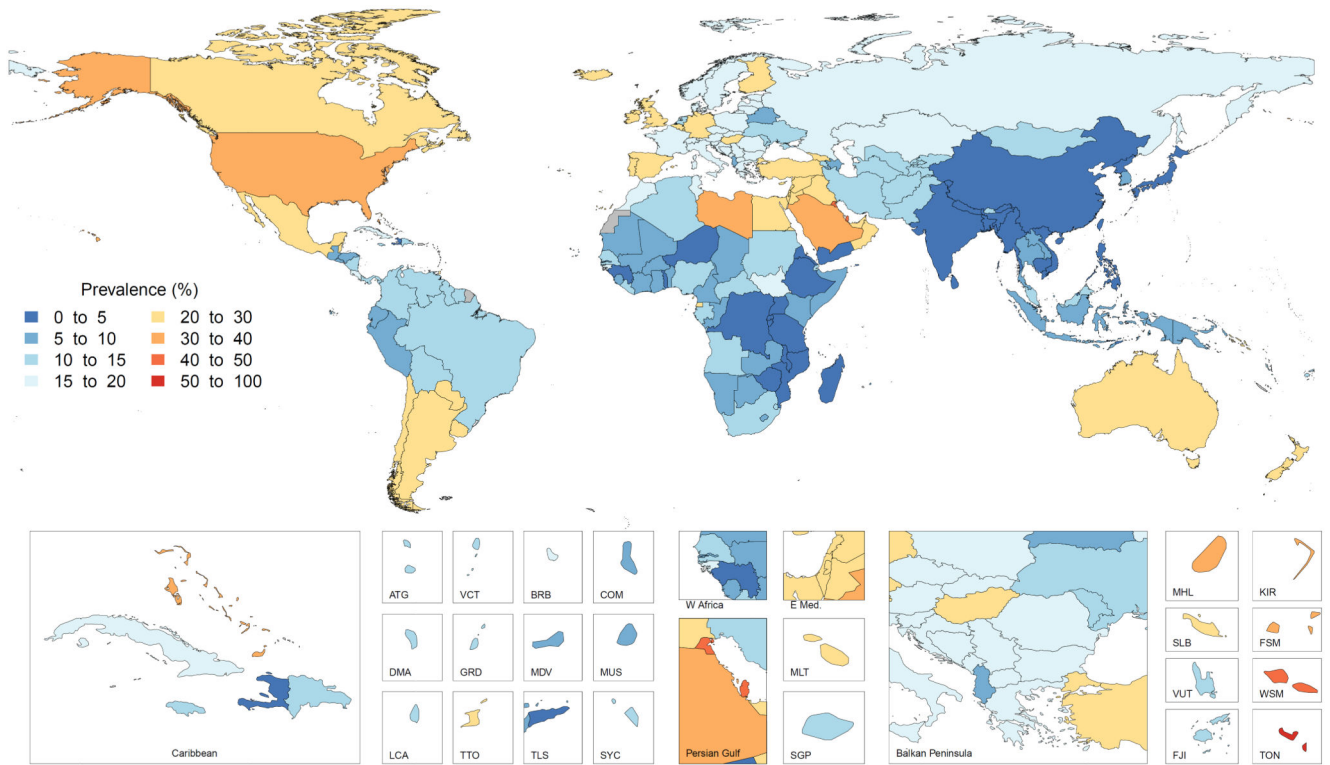
Figure 5A.
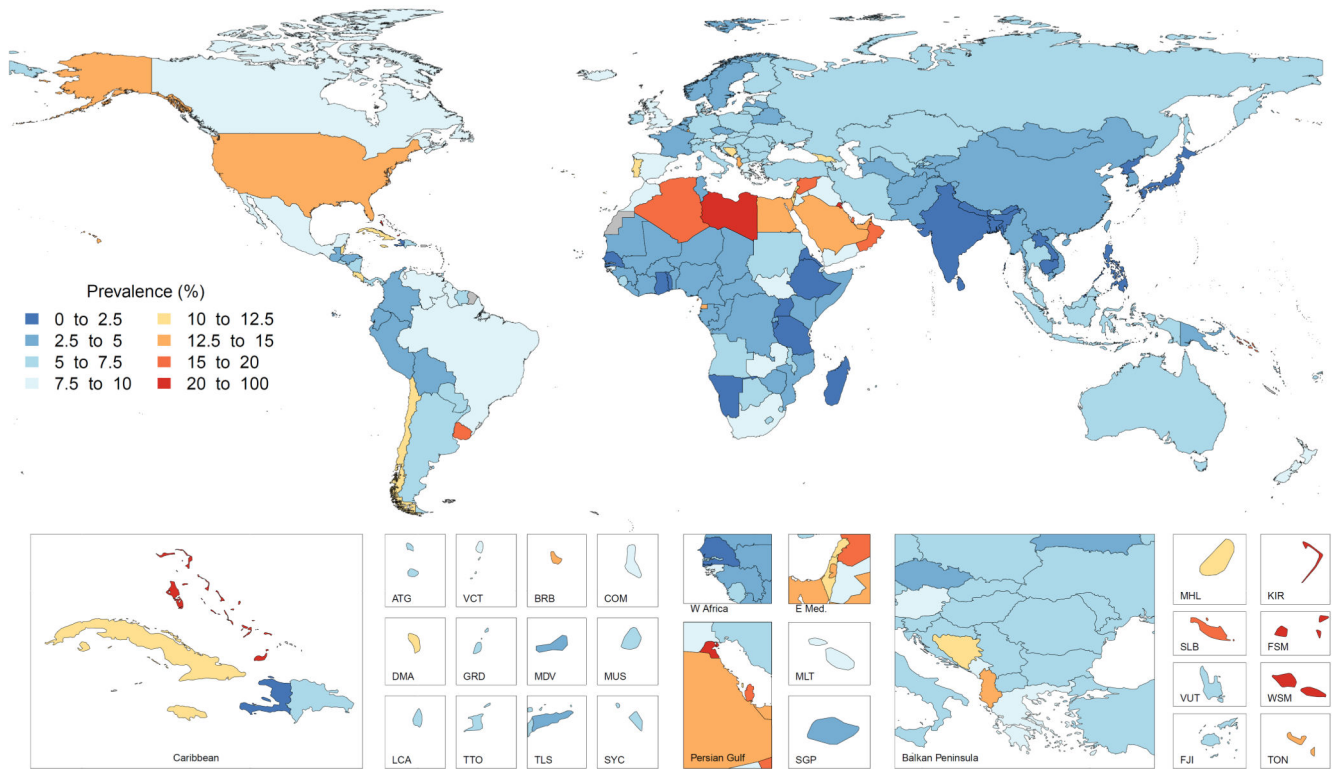Age–standardized prevalence of obesity (BMI>=30), ages 20+ years, males, 2013

Figure 5B.
Age–standardized prevalence of obesity (BMI>=30), ages 20+ years, females, 2013

Figure 5C.
Age–standardized prevalence of obesity (based on IOTF cutoffs), ages 2–19 years, males,
2013

Figure 5D.
Age–standardized prevalence of obesity (based on IOTF cutoffs), ages 2–19 years, females, 2013

Country/Region	Males <20		Males, >20		Females, <20		Females, >20	
	Overweight	Obese	Overweight	Obese	Overweight	Obese	Overweight	Obese
Andean Latin America	16·7 (15·1-18·3)	3·7 (3·3-4·2)	45·0 (43·2-46·8)	8·5 (7·8-9·1)	27·2 (24·9-29·5)	4·4 (3·8-4·9)	66·7 (65·6-67·7)	23·4 (22·2-24·6)
Bolivia	20·5 (17·4-24·0)	4·6 (3·7-5·5)	51·9 (49·1-54·5)	10·2 (9·1-11·4)	28·2 (24·4-32·4)	4·7 (3·7-5·7)	62·0 (59·7-64·4)	24·5 (22·4-26·8)
Ecuador	13·7 (11·4-16·2)	3·1 (2·4-3·7)	40·2 (37·5-42·9)	6·9 (6·1-7·7)	29·6 (25·4-34·2)	4·6 (3·7-5·8)	69·8 (67·2-72·1)	19·8 (17·6-22·0)
Peru	16·6 (14·2-19·4)	3·8 (3·1-4·5)	45·4 (42·7-48·2)	8·8 (7·7-9·8)	25·6 (22·3-29·2)	4·1 (3·3-4·9)	66·5 (65·1-67·9)	24·9 (23·1-26·6)
Australasia	25·3 (22·7-28·2)	7·5 (6·5-8·6)	68·6 (66·3-70·6)	27·6 (25·5-29·6)	24·0 (21·3-26·9)	7·6 (6·4-9·0)	56·7 (54·4-59·1)	29·8 (27·7-32·0)
Australia	24·4 (21·4-28·0)	7·0 (5·8-8·2)	68·2 (65·6-70·5)	27·5 (25·2-29·8)	23·0 (19·9-26·5)	7·3 (5·9-8·9)	56·1 (53·4-58·9)	29·8 (27·3-32·4)
New Zealand	29·6 (26·0-33·3)	9·7 (8·4-11·4)	71·4 (69·6-73·3)	28·1 (26·3-29·9)	28·7 (25·3-32·6)	9·0 (7·6-10·6)	60·0 (57·8-62·2)	30·0 (28·1-31·9)
Caribbean	13·4 (12·3-14·6)	4·5 (4·1-4·9)	37·8 (36·4-39·1)	12·3 (11·5-13·1)	19·9 (18·4-21·5)	6·6 (5·9-7·3)	50·4 (49·1-51·8)	24·5 (23·4-25·9)
Antigua and Barbuda	11·2 (9·4-13·4)	4·5 (3·6-5·6)	35·5 (32·7-38·4)	10·1 (8·9-11·4)	20·5 (17·3-24·2)	6·7 (5·3-8·2)	49·1 (46·3-52·0)	20·5 (18·4-22·7)
Barbados	25·3 (21·6-29·1)	8·7 (7·0-10·5)	57·5 (54·7-60·1)	18·1 (16·4-20·0)	32·4 (27·9-37·3)	14·9 (12·0-17·9)	69·9 (67·2-72·4)	33·0 (30·6-35·8)
Belize	18·4 (15·7-21·4)	7·9 (6·4-9·5)	58·6 (55·9-61·4)	23·0 (20·9-25·3)	27·1 (23·1-31·5)	11·6 (9·3-14·2)	75·3 (72·9-77·5)	42·7 (39·5-45·8)
Cuba	15·7 (13·1-18·4)	7·4 (6·1-9·0)	37·5 (34·5-40·4)	16·0 (14·4-17·8)	23·9 (20·3-28·1)	10·7 (8·5-13·0)	51·4 (48·5-54·3)	29·7 (26·9-32·6)
Dominica	15·2 (12·7-18·0)	4·6 (3·7-5·7)	36·6 (33·8-39·1)	10·7 (9·7-11·9)	29·2 (24·5-33·6)	12·2 (9·9-14·9)	74·0 (71·5-76·4)	39·4 (36·8-42·1)
Dominican Republic	17·8 (14·8-20·9)	4·3 (3·5-5·3)	50·7 (47·9-53·7)	10·3 (9·1-11·7)	25·2 (21·5-29·5)	7·3 (5·9-9·1)	54·8 (51·7-57·9)	20·9 (18·8-23·4)
Grenada	11·6 (9·7-13·9)	4·7 (3·8-5·9)	36·5 (33·9-39·0)	10·5 (9·4-11·8)	21·2 (17·8-25·1)	7·0 (5·5-8·7)	50·2 (47·2-53·2)	21·3 (19·0-23·6)
Guyana	11·5 (9·8-13·3)	4·5 (3·6-5·4)	40·9 (38·6-43·2)	11·5 (10·4-12·7)	22·2 (18·8-25·8)	8·6 (7·0-10·5)	62·3 (60·2-64·5)	30·4 (28·0-32·7)
Haiti	7·7 (6·5-9·1)	2·1 (1·7-2·6)	16·6 (15·1-18·4)	5·0 (4·4-5·6)	9·5 (7·9-11·5)	2·0 (1·6-2·5)	30·8 (28·7-33·0)	12·2 (11·2-13·4)
Jamaica	13·4 (11·1-15·7)	5·3 (4·2-6·6)	37·1 (34·3-39·9)	10·6 (9·4-11·8)	31·0 (26·5-36·0)	10·9 (8·6-13·3)	62·7 (59·7-65·2)	32·0 (29·2-34·8)
Saint Lucia	15·8 (13·2-18·7)	6·2 (5·0-7·4)	46·9 (44·0-49·6)	14·4 (12·9-16·2)	17·0 (13·9-20·2)	6·0 (4·7-7·5)	44·2 (41·4-47·2)	19·2 (17·3-21·5)
Saint Vincent and the Grenadines	15·3 (12·7-17·9)	6·0 (4·9-7·4)	43·5 (40·8-46·3)	13·3 (11·8-14·8)	26·0 (22·1-30·7)	8·8 (7·0-10·9)	56·5 (53·2-59·7)	25·4 (23·0-28·0)
Suriname	11·8 (9·8-14·0)	4·2 (3·3-5·4)	49·7 (46·9-52·5)	12·5 (11·2-13·9)	22·6 (19·0-26·3)	7·4 (5·8-9·2)	64·7 (61·8-67·5)	33·8 (30·7-36·8)
The Bahamas	19·1 (16·3-22·3)	15·9 (12·9-18·9)	49·9 (47·1-52·8)	30·9 (28·3-33·6)	33·3 (28·7-38·3)	20·2 (16·6-24·2)	64·3 (61·4-67·2)	47·7 (44·5-51·2)
Trinidad and Tobago	19·2 (16·3-22·1)	7·8 (6·3-9·4)	55·5 (53·2-57·7)	20·9 (19·3-22·5)	21·3 (18·0-25·0)	7·2 (5·7-8·9)	66·1 (64·1-68·1)	36·2 (34·2-38·3)
Central Asia	19·9 (18·6-21·4)	6·8 (6·2-7·6)	50·8 (49·5-52·0)	12·6 (12·0-13·2)	20·6 (19·0-22·1)	5·9 (5·3-6·7)	53·2 (52·0-54·4)	22·0 (21·1-22·9)
Armenia	23·3 (20·1-27·1)	7·3 (5·8-8·9)	44·7 (42·1-47·3)	11·4 (10·0-12·8)	24·1 (20·7-28·2)	6·6 (5·2-8·2)	60·4 (58·0-62·7)	26·4 (24·1-28·8)
Azerbaijan	24·9 (21·2-28·6)	8·3 (6·5-10·4)	59·0 (56·6-61·4)	9·0 (8·0-10·0)	23·1 (19·5-26·9)	7·9 (6·2-9·9)	67·3 (65·1-69·5)	30·4 (28·2-32·8)
Georgia	26·3 (22·5-30·1)	10·7 (8·9-12·7)	58·7 (56·0-61·4)	21·2 (19·7-22·8)	29·9 (25·7-34·3)	12·1 (9·9-14·5)	59·7 (57·1-62·5)	28·1 (26·1-30·1)

Country/Region	Males, <20		Males, >20		Females, <20		Females, >20	
	Overweight	Obese	Overweight	Obese	Overweight	Obese	Overweight	Obese
Kazakhstan	20·5 (17·6-23·8)	7·4 (6·0-8·9)	52·7 (49·9-55·4)	15·4 (13·8-17·0)	21·9 (18·6-25·8)	5·7 (4·6-7·0)	55·9 (53·1-58·7)	27·3 (24·8-29·7)
Kyrgyzstan	19·7 (16·6-23·1)	4·6 (3·7-5·6)	50·9 (47·9-53·6)	10·3 (9·1-11·5)	19·1 (15·8-22·6)	4·5 (3·5-5·6)	50·0 (47·2-52·8)	19·7 (17·8-22·0)
Mongolia	15·5 (13·1-18·2)	4·7 (3·7-5·8)	44·3 (42·0-46·7)	12·1 (10·9-13·4)	18·9 (15·9-22·2)	4·5 (3·6-5·5)	53·8 (51·3-56·2)	18·3 (16·8-20·2)
Tajikistan	13·0 (11·0-15·3)	5·9 (4·8-7·1)	39·6 (37·1-42·4)	13·0 (11·5-14·4)	13·3 (10·8-15·7)	4·3 (3·4-5·5)	41·8 (39·5-44·2)	13·4 (12·0-14·8)
Turkmenistan	21·5 (18·2-25·1)	6·5 (5·3-8·1)	53·2 (50·4-56·0)	14·1 (12·6-15·8)	24·2 (20·4-28·4)	2·6 (2·1-3·3)	53·7 (50·7-56·7)	22·0 (19·9-24·1)
Uzbekistan	20·2 (17·3-23·5)	7·0 (5·5-8·5)	49·2 (46·6-51·9)	11·3 (10·0-12·6)	20·6 (17·1-24·3)	6·6 (5·1-8·4)	46·6 (43·8-49·2)	15·8 (14·1-17·7)
Central Europe	21·3 (20·0-22·7)	7·5 (6·9-8·1)	62·2 (61·1-63·3)	18·0 (17·2-18·8)	20·3 (18·9-21·6)	6·3 (5·8-6·9)	50·4 (49·2-51·5)	20·7 (19·8-21·7)
Albania	32·8 (28·5-37·3)	11·5 (9·2-13·9)	56·2 (53·6-58·7)	9·2 (8·2-10·2)	26·7 (22·9-30·5)	12·8 (10·3-15·8)	45·8 (43·3-48·5)	11·1 (9·9-12·4)
Bosnia and Herzegovina	17·2 (14·7-20·1)	10·1 (8·3-12·1)	57·3 (54·5-60·2)	15·4 (13·8-17·0)	22·7 (19·2-26·3)	11·6 (9·6-14·1)	51·9 (49·2-54·7)	20·4 (18·4-22·4)
Bulgaria	26·7 (22·9-30·8)	6·9 (5·6-8·5)	59·7 (56·9-62·2)	16·6 (14·9-18·5)	25·7 (21·9-29·9)	6·7 (5·3-8·3)	48·8 (46·1-51·7)	20·3 (18·3-22·5)
Croatia	29·5 (25·3-33·8)	7·6 (6·1-9·3)	65·5 (62·9-68·2)	19·9 (17·9-22·2)	19·7 (16·5-23·1)	5·6 (4·4-7·1)	51·0 (48·3-53·7)	19·6 (17·5-21·7)
Czech Republic	22·3 (19·1-26·3)	6·4 (5·2-7·7)	65·5 (62·9-68·2)	17·8 (16·0-19·6)	18·0 (15·0-21·0)	4·8 (3·8-6·1)	50·0 (47·2-52·7)	20·8 (18·8-22·9)
Hungary	30·2 (26·3-34·4)	7·9 (6·5-9·6)	65·6 (63·0-68·1)	21·7 (19·6-24·0)	24·9 (21·3-28·6)	6·1 (4·9-7·5)	54·8 (52·0-57·5)	24·7 (22·4-27·2)
Macedonia	23·7 (20·5-27·2)	8·6 (7·2-10·4)	57·0 (54·2-59·9)	16·8 (15·1-18·6)	22·3 (19·1-25·9)	5·4 (4·4-6·7)	51·7 (49·0-54·3)	21·6 (19·6-23·6)
Montenegro	26·3 (22·7-30·2)	9·4 (7·6-11·3)	60·1 (57·1-62·9)	19·5 (17·5-21·5)	27·3 (23·1-31·4)	8·3 (6·8-10·2)	57·0 (54·1-60·1)	24·1 (21·7-26·6)
Poland	21·9 (18·6-25·7)	6·9 (5·6-8·4)	64·0 (61·4-66·7)	18·3 (16·5-20·3)	17·8 (14·7-21·3)	6·0 (4·7-7·4)	49·4 (46·8-52·1)	20·9 (18·9-23·2)
Romania	11·0 (9·2-13·2)	8·6 (7·0-10·4)	60·4 (57·6-63·0)	18·7 (16·9-20·6)	20·3 (17·1-24·2)	5·7 (4·5-6·9)	50·3 (47·6-53·0)	19·8 (17·8-22·1)
Serbia	19·2 (16·5-22·5)	6·7 (5·5-8·1)	55·7 (53·5-58·2)	16·0 (14·5-17·4)	23·1 (19·8-26·7)	6·9 (5·6-8·4)	50·4 (47·8-52·8)	19·5 (17·7-21·3)
Slovakia	20·6 (17·5-23·8)	5·5 (4·5-6·7)	64·4 (61·8-66·9)	17·6 (15·7-19·5)	13·5 (11·0-16·4)	5·5 (4·3-6·9)	51·5 (48·9-54·1)	21·5 (19·3-23·7)
Slovenia	33·1 (29·4-36·9)	7·2 (5·9-8·6)	65·1 (62·3-67·6)	19·9 (17·9-22·0)	24·0 (20·7-27·3)	5·3 (4·3-6·4)	52·1 (49·1-54·8)	22·4 (20·2-24·9)
Central Latin America	21·7 (20·1-23·3)	7·4 (6·5-8·4)	57·1 (56·0-58·2)	16·7 (15·7-17·6)	25·5 (23·7-27·3)	7·5 (6·6-8·3)	65·2 (64·1-66·2)	28·4 (27·3-29·8)
Colombia	15·4 (13·1-18·0)	4·1 (3·4-4·8)	52·7 (50·4-54·9)	14·6 (13·5-15·8)	18·3 (15·4-21·6)	3·6 (2·9-4·3)	57·0 (54·9-59·2)	22·6 (21·0-24·3)
Costa Rica	20·8 (17·6-24·4)	6·7 (5·3-8·2)	55·2 (52·5-58·2)	15·4 (13·7-17·1)	37·7 (32·5-42·9)	12·4 (10·0-15·1)	66·5 (63·6-69·2)	28·8 (26·1-31·7)
El Salvador	11·2 (9·3-13·3)	2·7 (2·2-3·3)	35·7 (33·0-38·4)	6·2 (5·5-7·0)	25·4 (22·0-29·1)	6·3 (5·1-7·6)	71·0 (68·7-73·1)	33·0 (30·3-35·5)
Guatemala	13·6 (11·4-16·2)	3·4 (2·7-4·2)	41·4 (38·8-44·0)	9·4 (8·4-10·4)	19·4 (16·5-22·8)	3·8 (3·0-4·7)	54·5 (51·8-57·2)	19·1 (17·1-21·1)
Honduras	11·4 (9·5-13·5)	2·4 (2·0-3·0)	35·9 (33·3-38·6)	5·6 (4·9-6·3)	21·5 (18·2-24·8)	4·7 (3·8-5·7)	66·0 (64·0-67·9)	30·0 (27·9-32·0)
Mexico	28·4 (25·3-31·6)	10·5 (8·8-12·4)	66·8 (64·9-68·6)	20·6 (18·9-22·5)	29·3 (25·8-32·5)	9·8 (8·1-11·4)	71·4 (69·5-73·2)	32·7 (30·6-35·0)
Nicaragua	14·8 (12·4-17·5)	4·5 (3·7-5·5)	43·0 (40·3-45·8)	10·3 (9·2-11·6)	23·4 (19·9-27·1)	5·2 (4·1-6·5)	67·6 (65·3-69·9)	30·8 (28·3-33·4)

Country/Region	Males <20		Males, >20		Females, <20		Females, >20	
	Overweight	Obese	Overweight	Obese	Overweight	Obese	Overweight	Obese
Panama	10·6 (8·9-12·6)	4·9 (3·9-6·0)	21·4 (19·5-23·5)	10·9 (9·7-12·2)	9·9 (8·1-12·0)	6·2 (5·0-7·6)	30·9 (28·4-33·5)	19·4 (17·4-21·4)
Venezuela	18·4 (15·5-21·6)	6·1 (4·9-7·4)	48·7 (45·7-51·5)	13·4 (12·0-14·9)	27·7 (23·7-31·9)	7·7 (6·2-9·5)	58·4 (55·6-61·4)	23·0 (20·8-25·4)
Central Sub-Saharan Africa	10·3 (9·2-11·6)	5·1 (4·4-5·9)	24·8 (23·7-26·1)	7·0 (6·6-7·5)	14·6 (12·9-16·3)	4·7 (3·9-5·5)	25·7 (24·4-27·1)	8·5 (8·0-9·1)
Angola	15·5 (13·0-18·3)	5·7 (4·6-7·0)	42·9 (40·1-45·7)	12·0 (10·7-13·4)	20·9 (17·5-24·6)	6·0 (4·7-7·5)	49·1 (46·1-52·0)	18·7 (16·7-20·9)
Central African Republic	10·2 (8·5-12·0)	6·2 (5·0-7·6)	33·7 (31·2-36·3)	13·2 (11·8-14·7)	11·2 (9·1-13·6)	3·1 (2·4-4·0)	10·1 (9·0-11·3)	3·3 (2·9-3·8)
Congo	8·9 (7·4-10·7)	2·9 (2·4-3·6)	29·2 (27·0-31·6)	6·5 (5·7-7·4)	11·2 (9·3-13·2)	2·9 (2·3-3·7)	37·9 (35·7-40·2)	14·3 (13·0-15·8)
Democratic Republic of the Congo	8·5 (7·0-10·2)	4·9 (4·0-6·0)	17·5 (15·9-19·2)	4·7 (4·1-5·3)	12·6 (10·5-15·0)	4·4 (3·4-5·5)	17·7 (16·1-19·5)	4·5 (4·0-5·2)
Equatorial Guinea	27·2 (23·3-31·3)	12·9 (10·6-15·6)	59·6 (56·8-62·4)	24·8 (22·4-27·1)	33·2 (28·9-38·0)	13·5 (10·9-16·6)	63·4 (60·6-66·2)	35·4 (32·3-38·3)
Gabon	13·3 (11·4-15·4)	3·3 (2·6-4·0)	42·1 (39·8-44·5)	11·6 (10·4-13·0)	20·1 (17·1-23·4)	3·9 (3·1-4·8)	59·6 (57·5-61·7)	27·9 (25·7-30·1)
East Asia	22·6 (19·8-25·6)	6·8 (5·6-8·1)	28·0 (26·2-29·7)	3·8 (3·5-4·2)	13·7 (11·8-15·8)	2·8 (2·2-3·4)	27·1 (25·5-28·7)	4·9 (4·5-5·4)
China	23·0 (20·1-26·1)	6·9 (5·7-8·2)	28·3 (26·4-30·0)	3·8 (3·5-4·3)	14·0 (12·0-16·1)	2·8 (2·2-3·4)	27·4 (25·8-29·0)	5·0 (4·5-5·5)
North Korea	1·0 (0·8-1·3)	1·0 (0·8-1·3)	4·1 (3·7-4·6)	2·1 (1·9-2·4)	1·0 (0·8-1·2)	0·9 (0·7-1·1)	4·7 (4·2-5·2)	2·8 (2·5-3·2)
Taiwan	25·9 (22·3-29·9)	7·7 (6·2-9·4)	33·8 (31·3-36·4)	4·3 (3·7-4·8)	17·4 (14·5-20·7)	4·2 (3·3-5·3)	30·9 (28·4-33·4)	6·4 (5·6-7·2)
Eastern Europe	19·0 (16·7-21·4)	7·1 (6·0-8·4)	55·0 (52·8-56·9)	14·8 (13·7-16·0)	18·8 (16·5-21·2)	6·4 (5·4-7·6)	57·8 (55·9-59·7)	27·0 (25·3-28·7)
Belarus	15·4 (12·9-18·5)	3·8 (3·0-4·7)	44·1 (41·2-46·8)	8·8 (7·8-9·9)	17·4 (14·4-20·5)	4·2 (3·4-5·2)	44·7 (41·9-47·6)	14·2 (12·5-16·0)
Estonia	24·0 (20·2-27·8)	7·3 (5·9-9·0)	59·3 (56·5-62·0)	19·0 (17·2-21·0)	21·4 (18·0-25·2)	7·6 (6·1-9·4)	54·3 (51·5-57·2)	25·6 (23·2-28·1)
Latvia	19·9 (16·8-23·2)	4·8 (3·9-5·8)	56·3 (53·6-59·1)	17·4 (15·7-19·1)	15·2 (12·6-18·1)	3·4 (2·8-4·3)	55·8 (53·2-58·6)	25·7 (23·3-28·2)
Lithuania	24·3 (20·8-28·1)	6·3 (5·1-7·8)	63·9 (61·1-66·6)	18·3 (16·4-20·2)	21·1 (17·8-24·6)	5·2 (4·2-6·5)	56·2 (53·3-59·0)	24·4 (22·2-26·9)
Moldova	15·8 (13·2-18·6)	5·6 (4·5-6·8)	44·7 (41·9-47·5)	12·7 (11·3-14·1)	15·2 (12·7-18·1)	5·3 (4·1-6·8)	58·8 (56·4-61·1)	28·8 (26·3-31·3)
Russia	21·7 (18·5-25·0)	7·3 (5·8-9·2)	54·3 (51·5-57·1)	15·3 (13·8-17·0)	18·6 (15·5-21·9)	6·6 (5·2-8·3)	58·9 (56·3-61·4)	28·5 (26·1-30·9)
Ukraine	10·6 (8·8-12·6)	7·3 (5·9-8·9)	59·1 (56·3-61·8)	14·6 (13·0-16·2)	20·1 (16·8-23·8)	6·5 (5·1-8·0)	57·4 (54·3-60·2)	25·2 (22·8-27·9)
Eastern Sub-Saharan Africa	8·4 (7·9-8·9)	3·3 (3·1-3·5)	14·9 (14·4-15·4)	4·4 (4·2-4·6)	12·0 (11·3-12·7)	2·9 (2·7-3·1)	23·7 (23·2-24·3)	8·8 (8·4-9·1)
Burundi	7·0 (5·9-8·3)	1·8 (1·5-2·2)	23·0 (20·9-25·1)	3·7 (3·3-4·2)	9·3 (7·7-10·9)	1·4 (1·1-1·8)	10·3 (9·3-11·3)	2·4 (2·2-2·8)
Comoros	19·0 (16·2-22·2)	10·1 (8·1-12·4)	25·6 (23·5-27·9)	5·5 (5·0-5·9)	23·9 (20·4-27·9)	7·9 (6·1-9·9)	48·5 (45·9-51·1)	20·8 (19·1-22·4)
Djibouti	9·2 (7·6-10·9)	7·1 (5·8-8·7)	16·3 (14·7-17·8)	11·8 (10·4-13·1)	23·5 (20·0-27·4)	8·6 (6·9-10·7)	53·0 (50·0-55·9)	17·0 (15·1-19·0)
Eritrea	4·1 (3·4-5·1)	1·8 (1·4-2·2)	12·2 (11·0-13·6)	2·7 (2·4-3·1)	6·2 (5·0-7·5)	1·6 (1·2-2·0)	16·4 (14·8-18·1)	4·7 (4·1-5·4)
Ethiopia	4·6 (3·8-5·5)	1·9 (1·5-2·4)	4·0 (3·6-4·4)	4·0 (3·6-4·6)	6·3 (5·2-7·7)	1·9 (1·5-2·3)	8·0 (7·2-8·9)	1·8 (1·6-2·0)
Kenya	9·4 (7·8-11·3)	3·0 (2·4-3·6)	30·0 (27·5-32·5)	6·3 (5·6-7·2)	13·2 (11·0-15·8)	2·6 (2·0-3·2)	34·1 (31·6-36·7)	15·2 (13·7-16·8)

Country/Region	Males <20		Males, >20		Females, <20		Females, >20	
	Overweight	Obese	Overweight	Obese	Overweight	Obese	Overweight	Obese
Madagascar	6·3 (5·2-7·6)	3·4 (2·7-4·3)	9·3 (8·4-10·4)	1·9 (1·6-2·1)	5·6 (4·5-7·0)	2·1 (1·6-2·7)	12·6 (11·4-14·0)	4·0 (3·5-4·6)
Malawi	12·7 (10·9-14·7)	6·3 (5·2-7·7)	15·6 (14·3-16·9)	2·0 (1·8-2·3)	24·3 (20·9-27·9)	6·1 (4·8-7·9)	25·7 (24·0-27·4)	7·2 (6·4-8·0)
Mozambique	12·3 (10·4-14·4)	3·5 (2·9-4·3)	14·1 (12·7-15·6)	3·5 (3·0-3·9)	14·4 (12·3-16·9)	3·0 (2·4-3·7)	26·5 (24·6-28·3)	9·2 (8·3-10·3)
Rwanda	11·3 (9·5-13·3)	4·2 (3·4-5·1)	5·4 (4·9-6·0)	2·4 (2·1-2·9)	18·4 (15·5-21·6)	3·4 (2·6-4·2)	19·3 (17·8-21·0)	3·4 (3·0-3·8)
Somalia	7·6 (6·2-9·1)	3·5 (2·8-4·3)	24·9 (22·8-27·1)	7·4 (6·6-8·3)	10·0 (8·0-12·2)	3·9 (3·1-5·0)	28·7 (26·3-31·2)	12·4 (11·0-13·9)
South Sudan	14·7 (12·3-17·4)	8·2 (6·7-10·1)	40·4 (37·7-43·4)	16·1 (14·3-18·0)	21·6 (18·0-25·6)	9·8 (7·8-12·1)	48·5 (45·4-51·4)	26·7 (24·2-29·6)
Tanzania	8·9 (7·4-10·5)	2·4 (1·9-3·0)	20·4 (18·7-22·1)	4·0 (3·6-4·5)	12·0 (10·0-14·2)	1·9 (1·5-2·3)	38·5 (36·5-40·5)	16·4 (15·1-17·8)
Uganda	5·7 (4·6-6·9)	2·4 (1·9-3·0)	6·9 (6·3-7·6)	1·7 (1·5-2·0)	14·6 (12·1-17·1)	2·1 (1·6-2·6)	24·6 (22·7-26·6)	6·8 (6·0-7·6)
Zambia	20·9 (18·1-24·1)	10·6 (8·9-12·5)	20·1 (18·4-22·2)	5·1 (4·5-5·7)	20·5 (17·4-23·8)	7·6 (6·0-9·5)	39·5 (37·1-41·7)	13·9 (12·5-15·5)
High-income Asia Pacific	17·2 (15·6-19·0)	4·0 (3·4-4·5)	31·7 (30·4-33·0)	5·3 (4·9-5·7)	12·6 (11·2-14·3)	2·7 (2·3-3·1)	20·6 (19·7-21·6)	4·2 (3·9-4·5)
Brunei	6·7 (5·5-8·0)	1·6 (1·3-2·0)	23·3 (21·2-25·2)	3·6 (3·1-4·0)	5·6 (4·5-6·8)	1·1 (0·8-1·4)	17·9 (16·2-19·8)	3·5 (3·1-4·1)
Japan	15·3 (13·2-17·6)	3·4 (2·8-4·0)	28·9 (27·1-30·7)	4·5 (4·0-5·0)	12·4 (10·2-14·6)	2·4 (2·0-3·0)	17·6 (16·5-18·9)	3·3 (3·0-3·7)
Singapore	20·9 (17·5-24·3)	7·7 (6·3-9·4)	44·3 (41·4-47·1)	12·0 (10·7-13·4)	13·3 (10·9-16·0)	3·9 (3·1-5·0)	32·5 (30·0-35·1)	10·8 (9·6-12·0)
South Korea	21·2 (17·9-24·5)	4·8 (3·9-5·9)	36·9 (35·1-38·8)	6·8 (6·0-7·7)	13·2 (10·9-15·7)	3·1 (2·4-3·9)	27·2 (25·6-28·9)	5·8 (5·2-6·5)
High-income North America	28·5 (26·2-30·9)	12·1 (10·7-13·6)	70·3 (68·7-71·7)	30·6 (29·1-32·2)	29·1 (26·7-31·5)	13·0 (11·5-14·8)	60·5 (58·6-62·2)	32·5 (30·7-34·2)
Canada	25·5 (22·4-28·7)	10·0 (8·4-11·6)	64·5 (62·0-67·0)	21·9 (20·0-23·9)	22·0 (19·1-25·5)	8·8 (7·2-10·7)	48·5 (45·9-51·1)	20·5 (18·7-22·5)
United States	28·8 (26·4-31·4)	12·4 (10·8-14·0)	70·9 (69·2-72·5)	31·7 (30·0-33·4)	29·7 (27·2-32·5)	13·4 (11·7-15·3)	61·9 (59·8-63·8)	33·9 (31·8-35·7)
North Africa and Middle East	22·2 (21·0-23·3)	8·4 (7·9-8·9)	58·5 (57·8-59·2)	20·3 (19·9-20·8)	27·9 (26·6-29·2)	10·2 (9·5-10·8)	65·5 (64·7-66·2)	33·9 (33·2-34·7)
Afghanistan	18·5 (15·6-21·6)	6·8 (5·4-8·3)	49·2 (46·5-52·0)	14·8 (13·2-16·6)	19·5 (16·4-22·8)	4·4 (3·5-5·5)	42·6 (40·5-44·8)	13·8 (12·5-15·3)
Algeria	21·7 (18·5-25·2)	7·7 (6·2-9·4)	42·0 (39·0-44·8)	11·1 (9·8-12·3)	30·0 (25·5-34·5)	15·3 (12·5-18·6)	57·8 (55·1-60·9)	24·9 (22·6-27·4)
Bahrain	22·4 (19·2-26·0)	9·3 (7·3-11·4)	67·7 (65·3-70·2)	31·0 (28·4-33·7)	26·7 (22·5-30·8)	10·7 (8·5-13·4)	75·2 (72·8-77·5)	42·9 (40·0-45·9)
Egypt	31·5 (27·5-35·7)	12·7 (10·7-15·2)	71·2 (68·9-73·7)	26·4 (25·0-27·8)	39·5 (34·7-44·3)	14·4 (11·9-17·6)	79·4 (77·6-81·3)	48·4 (46·1-50·9)
Iran	21·6 (18·6-25·4)	5·9 (4·8-7·2)	49·4 (47·2-51·6)	13·6 (12·5-14·8)	26·2 (22·3-30·4)	7·2 (5·7-8·9)	63·3 (61·0-65·4)	29·3 (27·2-31·6)
Iraq	19·5 (16·5-22·8)	8·2 (6·8-9·8)	62·4 (59·7-65·3)	25·7 (23·3-28·1)	25·0 (21·3-28·9)	8·2 (6·6-10·0)	68·1 (65·1-70·9)	37·5 (34·4-40·6)
Jordan	24·1 (20·6-28·0)	8·0 (6·4-9·9)	71·6 (69·3-74·1)	27·5 (25·3-29·7)	25·4 (21·8-29·3)	8·0 (6·2-10·0)	75·6 (74·0-77·3)	45·6 (43·4-47·9)
Kuwait	24·6 (21·1-28·5)	16·7 (13·9-20·1)	74·5 (72·4-76·6)	43·4 (40·9-46·1)	45·5 (40·1-50·9)	23·3 (19·5-27·8)	84·3 (82·6-86·1)	58·6 (55·7-61·4)
Lebanon	33·1 (28·9-37·9)	15·9 (13·0-19·1)	71·1 (68·9-73·4)	26·3 (24·2-28·4)	29·8 (25·6-34·0)	12·5 (10·2-15·4)	62·3 (59·9-64·8)	29·3 (27·0-31·7)
Libya	32·5 (28·5-36·9)	14·5 (12·0-17·0)	70·6 (68·1-73·1)	30·2 (27·6-32·9)	41·7 (36·3-46·8)	22·1 (18·1-26·4)	77·0 (74·6-79·3)	57·2 (54·0-60·4)

Country/Region	Males, <20		Males, >20		Females, <20		Females, >20	
	Overweight	Obese	Overweight	Obese	Overweight	Obese	Overweight	Obese
Morocco	22·5 (19·3-26·1)	7·9 (6·4-9·6)	54·7 (51·7-57·5)	18·1 (16·3-20·0)	25·9 (22·1-30·2)	9·1 (7·3-11·3)	52·8 (50·0-55·5)	20·9 (18·8-23·1)
Oman	24·5 (20·5-28·5)	8·4 (6·7-10·2)	53·7 (50·9-56·7)	20·6 (18·5-22·7)	42·3 (37·4-47·5)	15·4 (12·4-18·5)	73·4 (71·0-75·7)	36·9 (33·9-40·1)
Palestine	27·9 (23·8-31·9)	11·9 (9·8-14·3)	70·0 (67·4-72·4)	29·8 (28·0-31·5)	30·6 (26·4-35·5)	12·5 (10·1-15·2)	77·0 (74·8-79·2)	42·4 (40·5-44·4)
Qatar	33·5 (29·3-38·0)	18·8 (15·8-21·9)	75·7 (73·8-77·4)	44·0 (41·8-46·4)	22·1 (18·6-25·7)	15·5 (12·6-18·6)	78·5 (77·0-80·1)	54·7 (52·1-57·0)
Saudi Arabia	23·5 (20·2-26·8)	9·4 (7·8-11·2)	69·0 (67·1-70·7)	30·0 (28·4-31·8)	37·4 (32·8-42·5)	14·8 (12·2-17·7)	74·2 (72·3-76·0)	44·4 (42·4-46·5)
Sudan	11·2 (9·2-13·4)	5·7 (4·6-6·9)	35·8 (33·2-38·4)	12·7 (11·3-14·2)	14·4 (12·0-17·6)	5·8 (4·5-7·1)	39·9 (37·3-42·7)	18·3 (16·4-20·4)
Syria	32·9 (28·6-37·5)	13·9 (11·5-16·5)	72·0 (69·5-74·2)	24·2 (21·8-26·6)	33·3 (28·8-38·3)	15·4 (12·5-18·6)	72·7 (69·9-75·1)	39·9 (36·8-43·0)
Tunisia	17·7 (15·0-20·8)	4·2 (3·4-5·2)	51·7 (48·8-54·4)	15·3 (13·7-16·9)	23·4 (19·6-27·5)	4·2 (3·3-5·2)	57·5 (54·4-60·3)	12·8 (11·3-14·3)
Turkey	20·4 (17·5-23·6)	7·1 (5·7-8·7)	63·8 (62·1-65·5)	20·1 (18·7-21·3)	19·8 (16·6-23·0)	5·7 (4·5-7·0)	65·8 (64·2-67·5)	34·1 (32·4-35·8)
United Arab Emirates	30·8 (26·5-35·1)	12·2 (9·8-14·7)	66·1 (63·6-68·8)	27·1 (24·5-30·0)	31·6 (27·1-36·2)	12·6 (10·0-15·7)	60·6 (57·4-63·4)	33·2 (30·2-36·3)
Yemen	8·4 (6·9-10·0)	1·7 (1·4-2·1)	29·0 (26·8-31·2)	4·1 (3·7-4·7)	26·9 (22·9-31·4)	8·3 (6·5-10·3)	57·9 (55·1-60·8)	24·7 (22·2-27·2)
Oceania	17·8 (15·6-20·0)	4·3 (3·8-4·8)	43·7 (41·7-45·7)	11·4 (10·8-12·1)	22·9 (20·5-25·6)	6·4 (5·7-7·2)	51·5 (49·2-53·8)	20·0 (19·1-21·2)
Federated States of Micronesia	29·7 (25·7-33·9)	14·5 (11·9-17·5)	65·7 (63·1-68·3)	31·3 (28·9-33·9)	61·4 (56·2-66·4)	32·4 (27·6-37·7)	84·2 (82·3-85·8)	57·9 (54·9-61·3)
Fiji	12·8 (10·6-15·3)	3·3 (2·7-4·1)	41·9 (39·0-44·8)	14·8 (13·3-16·5)	24·9 (20·6-29·3)	6·9 (5·6-8·7)	60·4 (57·4-63·4)	35·4 (32·6-38·8)
Kiribati	47·7 (42·3-52·9)	22·9 (19·1-26·9)	76·5 (74·1-78·6)	39·3 (36·3-42·3)	66·1 (60·9-70·9)	36·0 (30·7-41·4)	81·8 (79·9-83·6)	55·5 (52·4-58·6)
Marshall Islands	29·2 (25·0-33·3)	7·6 (6·0-9·4)	72·7 (70·5-75·1)	31·9 (29·4-34·4)	36·1 (31·1-40·9)	11·4 (9·1-13·9)	80·8 (78·8-82·6)	49·1 (45·9-52·0)
Papua New Guinea	16·0 (13·2-18·9)	2·9 (2·3-3·6)	39·6 (37·0-42·2)	7·0 (6·3-7·9)	18·3 (15·3-21·6)	3·9 (3·1-4·9)	45·8 (42·6-48·8)	12·4 (11·1-13·8)
Samoa	42·2 (37·4-47·2)	23·7 (20·1-27·5)	83·0 (81·1-85·0)	45·9 (42·9-49·1)	50·0 (45·1-55·0)	29·6 (24·9-34·5)	85·0 (83·0-86·9)	69·1 (66·2-72·0)
Solomon Islands	28·3 (24·5-32·5)	9·6 (7·9-11·7)	60·2 (57·5-62·8)	24·7 (22·4-27·0)	49·2 (43·9-54·3)	18·0 (14·7-21·9)	69·4 (66·9-71·9)	38·4 (35·2-41·6)
Tonga	34·5 (30·2-39·3)	8·3 (6·6-10·2)	83·5 (81·8-85·2)	52·4 (49·7-55·2)	52·6 (47·1-58·2)	14·0 (11·3-16·9)	88·3 (86·7-89·7)	67·2 (64·5-69·9)
Vanuatu	14·5 (12·1-17·2)	5·2 (4·3-6·4)	46·4 (44·4-48·6)	13·4 (12·3-14·5)	23·2 (19·4-27·1)	5·6 (4·4-7·0)	54·8 (52·7-57·0)	22·0 (20·4-23·6)
South Asia	5·7 (5·0-6·5)	2·5 (2·2-2·9)	20·2 (18·8-21·5)	4·8 (4·5-5·2)	6·2 (5·4-7·1)	2·6 (2·2-3·0)	22·5 (21·1-23·9)	5·2 (4·8-5·7)
Bangladesh	4·7 (3·8-5·8)	1·5 (1·2-1·8)	15·2 (13·8-16·5)	3·4 (3·1-3·8)	4·3 (3·6-5·3)	1·5 (1·1-1·9)	18·7 (17·3-20·3)	3·8 (3·4-4·2)
Bhutan	10·5 (8·8-12·3)	5·5 (4·5-6·8)	33·0 (30·5-35·6)	11·9 (10·6-13·4)	14·4 (11·9-17·0)	6·1 (4·9-7·6)	38·2 (35·3-41·2)	17·5 (15·7-19·5)
India	5·3 (4·3-6·4)	2·3 (1·8-2·8)	19·5 (17·8-21·2)	3·7 (3·3-4·1)	5·2 (4·2-6·4)	2·5 (1·9-3·1)	20·7 (18·9-22·5)	4·2 (3·8-4·8)
Nepal	4·6 (3·8-5·6)	1·7 (1·4-2·2)	13·1 (11·8-14·6)	2·2 (1·9-2·5)	4·0 (3·2-4·8)	1·8 (1·4-2·2)	13·0 (11·8-14·2)	2·7 (2·4-3·1)
Pakistan	6·2 (5·2-7·3)	4·1 (3·3-5·1)	27·9 (25·8-30·1)	14·4 (12·9-16·0)	10·4 (8·7-12·3)	3·8 (3·1-4·6)	38·4 (36·4-40·6)	14·3 (13·0-15·7)
Southeast Asia	6·8 (6·3-7·5)	4·6 (4·0-5·3)	22·1 (21·2-23·0)	4·8 (4·6-5·1)	9·0 (8·1-9·9)	4·3 (3·7-5·0)	28·3 (27·2-29·3)	7·6 (7·2-8·0)

Country/Region	Males <20		Males, >20		Females, <20		Females, >20	
	Overweight	Obese	Overweight	Obese	Overweight	Obese	Overweight	Obese
Cambodia	3·8 (3·1-4·5)	1·7 (1·4-2·1)	11·9 (11·1-12·7)	1·3 (1·1-1·4)	3·8 (3·1-4·7)	1·7 (1·3-2·1)	18·3 (17·0-19·7)	2·9 (2·6-3·2)
Indonesia	6·0 (5·0-7·3)	6·0 (5·3-8·2)	21·4 (19·5-23·3)	5·4 (4·9-6·1)	10·0 (8·3-12·1)	6·0 (4·8-7·6)	30·6 (28·4-33·1)	8·3 (7·4-9·4)
Laos	4·1 (3·4-4·9)	1·8 (1·4-2·2)	22·1 (20·3-23·8)	5·4 (4·7-6·1)	5·8 (4·7-7·1)	1·7 (1·4-2·2)	27·0 (25·0-29·1)	5·9 (5·2-6·7)
Malaysia	22·5 (19·1-26·1)	8·8 (7·1-10·7)	43·8 (41·1-46·5)	11·4 (10·2-12·8)	19·1 (16·1-22·6)	7·2 (5·8-9·0)	48·6 (45·6-51·5)	16·7 (15·0-18·6)
Maldives	7·9 (6·5-9·5)	3·8 (3·1-4·7)	26·8 (24·6-28·9)	8·1 (7·2-9·1)	18·0 (15·0-21·3)	4·2 (3·3-5·1)	54·0 (51·7-56·3)	17·0 (15·3-18·8)
Mauritius	22·9 (19·8-26·2)	5·4 (4·4-6·6)	39·4 (36·5-42·4)	7·4 (6·5-8·3)	21·9 (18·4-26·0)	6·6 (5·3-8·3)	49·3 (46·5-52·1)	18·4 (16·4-20·5)
Myanmar	4·6 (3·7-5·5)	1·9 (1·5-2·4)	13·8 (12·7-15·1)	4·5 (4·0-5·0)	7·4 (6·1-8·9)	2·8 (2·2-3·5)	22·1 (20·6-23·8)	8·4 (7·6-9·2)
Philippines	5·5 (4·5-6·6)	2·6 (2·1-3·2)	22·9 (21·0-24·8)	4·1 (3·6-4·7)	5·4 (4·4-6·6)	2·1 (1·6-2·7)	25·9 (23·8-28·2)	6·2 (5·5-7·0)
Seychelles	12·7 (10·5-15·2)	4·3 (3·5-5·4)	45·8 (43·0-48·7)	11·0 (9·7-12·3)	17·6 (14·6-21·0)	5·7 (4·6-7·2)	64·6 (62·0-67·0)	30·3 (27·6-32·8)
Sri Lanka	5·0 (4·1-6·0)	1·9 (1·5-2·4)	19·3 (17·5-21·1)	3·3 (2·9-3·8)	8·9 (7·4-10·8)	2·2 (1·8-2·7)	32·4 (29·9-35·1)	7·0 (6·2-7·8)
Thailand	13·3 (11·4-15·9)	4·9 (4·0-6·0)	32·1 (30·1-34·2)	6·5 (5·8-7·2)	15·4 (12·7-18·2)	5·6 (4·3-6·9)	39·7 (37·1-42·4)	11·2 (10·0-12·4)
Timor-Leste	7·0 (5·8-8·3)	3·8 (3·1-4·6)	3·2 (2·9-3·6)	3·2 (7·2-9·1)	5·7 (4·6-7·0)	3·8 (3·1-4·8)	6·6 (5·9-7·2)	1·5 (1·3-1·7)
Vietnam	5·2 (4·3-6·3)	2·5 (2·0-3·1)	13·6 (12·5-15·0)	1·5 (1·3-1·7)	6·1 (5·0-7·4)	2·5 (2·0-3·2)	12·3 (11·2-13·4)	1·7 (1·4-1·9)
Southern Latin America	31·3 (28·0-34·4)	10·1 (8·6-11·7)	60·0 (58·0-61·9)	21·6 (20·0-23·1)	26·4 (23·7-29·6)	8·8 (7·6-10·2)	53·0 (50·9-55·2)	23·6 (22·1-25·3)
Argentina	29·1 (24·9-33·1)	9·4 (7·5-11·6)	56·4 (53·5-59·2)	21·2 (19·1-23·3)	23·6 (19·8-27·8)	6·8 (5·3-8·5)	48·1 (45·0-51·1)	20·4 (18·3-22·6)
Chile	37·0 (32·6-41·6)	11·9 (9·6-14·3)	67·9 (65·5-70·3)	22·0 (20·1-24·1)	31·6 (27·3-36·3)	12·4 (10·0-15·1)	63·9 (61·3-66·4)	30·3 (27·9-32·9)
Uruguay	31·2 (26·7-35·8)	9·7 (7·8-11·8)	59·6 (56·7-62·4)	23·3 (21·1-25·6)	37·7 (32·8-43·1)	18·1 (14·9-21·9)	53·1 (49·9-56·1)	25·4 (23·0-27·9)
Southern Sub-Saharan Africa	14·9 (13·7-16·1)	5·6 (4·9-6·4)	34·2 (33·0-35·3)	11·7 (10·9-12·4)	23·1 (21·6-24·6)	7·4 (6·7-8·1)	63·7 (62·7-64·7)	37·0 (35·9-38·1)
Botswana	6·6 (5·5-7·9)	1·8 (1·4-2·2)	21·5 (19·7-23·5)	5·8 (5·2-6·4)	22·4 (18·8-26·4)	7·2 (5·8-8·9)	52·6 (50·0-55·1)	24·1 (22·0-26·3)
Lesotho	9·1 (7·5-11·0)	4·0 (3·2-4·9)	21·6 (19·9-23·3)	6·9 (6·2-7·6)	21·9 (18·8-25·8)	5·7 (4·6-7·0)	60·2 (57·9-62·5)	31·3 (29·7-32·8)
Namibia	6·0 (4·9-7·2)	2·6 (2·1-3·2)	21·2 (19·2-23·1)	6·0 (5·3-6·7)	8·8 (7·3-10·7)	2·3 (1·8-3·0)	42·4 (39·8-45·1)	19·8 (17·9-21·9)
South Africa	18·8 (17·0-20·6)	7·0 (6·0-8·2)	38·8 (37·4-40·3)	13·5 (12·6-14·5)	26·3 (24·3-28·5)	9·6 (8·5-10·7)	69·3 (68·1-70·4)	42·0 (40·6-43·3)
Swaziland	11·6 (9·9-13·9)	3·3 (2·7-4·1)	33·5 (31·1-35·9)	10·9 (9·8-12·2)	26·2 (22·6-30·4)	5·8 (4·7-7·2)	68·6 (66·2-71·0)	33·5 (31·0-35·9)
Zimbabwe	7·5 (6·2-9·0)	3·0 (2·4-3·7)	16·5 (15·2-17·8)	4·2 (3·7-4·7)	16·1 (13·6-18·9)	2·6 (2·0-3·2)	41·9 (39·7-44·1)	17·4 (15·8-19·2)
Tropical Latin America	22·0 (18·9-25·6)	6·8 (5·4-8·3)	52·7 (50·0-55·3)	11·9 (10·8-13·3)	24·3 (20·7-28·0)	7·5 (6·0-9·3)	58·8 (56·0-61·6)	20·9 (18·9-22·9)
Brazil	22·1 (18·8-25·8)	6·8 (5·4-8·4)	52·5 (49·6-55·2)	11·7 (10·4-13·0)	24·3 (20·6-28·1)	7·6 (6·1-9·4)	58·4 (55·6-61·3)	20·6 (18·6-22·8)
Paraguay	21·3 (18·1-24·5)	6·8 (5·4-8·3)	62·9 (60·0-65·7)	21·2 (19·2-23·3)	24·3 (20·6-28·5)	6·3 (4·9-7·9)	73·0 (70·6-75·3)	30·5 (28·2-33·2)
Western Europe	24·2 (23·1-25·2)	7·2 (6·7-7·6)	61·3 (60·5-62·2)	20·5 (19·9-21·1)	22·0 (21·0-23·0)	6·4 (6·0-6·8)	47·6 (46·8-48·4)	21·0 (20·4-21·7)

Country/Region	Males <20		Males, >20		Females, <20		Females, >20	
	Overweight	Obese	Overweight	Obese	Overweight	Obese	Overweight	Obese
Andorra	15·9 (13·3-19·0)	9·3 (7·5-11·4)	34·4 (32·0-37·1)	10·6 (9·6-11·9)	18·4 (14·9-21·8)	9·5 (7·3-12·0)	36·1 (33·5-38·7)	7·2 (6·3-8·1)
Austria	18·9 (15·9-22·1)	10·3 (8·4-12·5)	59·7 (57·0-62·3)	18·4 (16·6-20·3)	16·3 (13·5-19·4)	7·8 (6·3-9·7)	42·8 (40·1-45·4)	17·4 (15·6-19·4)
Belgium	20·5 (17·7-23·6)	4·6 (3·7-5·5)	58·0 (55·2-60·8)	20·1 (18·0-22·1)	18·8 (16·0-21·8)	4·2 (3·3-5·1)	47·1 (44·3-49·9)	21·7 (19·5-24·1)
Cyprus	25·7 (21·9-29·6)	8·0 (6·5-9·9)	67·8 (65·0-70·6)	24·0 (21·8-26·5)	22·5 (18·9-26·2)	7·4 (5·9-9·2)	52·1 (49·1-55·1)	24·1 (21·7-26·6)
Denmark	19·7 (16·8-23·1)	8·7 (7·1-10·7)	59·2 (56·5-61·9)	19·6 (17·7-21·9)	19·4 (15·8-23·2)	5·9 (4·7-7·5)	44·7 (41·7-47·7)	19·9 (17·7-22·0)
Finland	26·0 (22·3-29·8)	9·2 (7·5-11·2)	62·2 (59·5-64·9)	20·9 (18·9-23·2)	21·1 (17·7-25·0)	6·6 (5·2-8·1)	50·4 (47·5-53·2)	22·3 (20·3-24·6)
France	19·9 (16·8-23·3)	5·8 (4·7-7·0)	55·9 (53·2-58·7)	19·3 (17·4-21·4)	16·0 (13·3-18·7)	4·7 (3·8-5·9)	42·8 (40·0-45·7)	19·7 (17·7-21·7)
Germany	20·5 (17·4-23·8)	5·5 (4·5-6·7)	64·3 (61·9-66·8)	21·9 (20·2-23·8)	19·4 (16·3-22·5)	5·3 (4·2-6·5)	49·0 (46·5-51·4)	22·5 (20·5-24·7)
Greece	33·7 (29·6-37·7)	10·5 (8·7-12·3)	71·4 (68·9-73·7)	19·1 (17·4-21·1)	29·1 (25·3-33·1)	7·9 (6·5-9·6)	51·1 (48·2-54·0)	19·4 (17·6-21·4)
Iceland	26·4 (22·7-30·2)	9·6 (7·9-11·6)	73·6 (71·3-75·8)	26·9 (24·4-29·7)	23·0 (19·7-26·6)	7·6 (6·1-9·4)	60·9 (58·0-63·8)	28·8 (26·0-31·5)
Ireland	26·6 (23·2-30·8)	6·9 (5·7-8·3)	66·4 (63·9-68·8)	22·9 (20·8-25·0)	26·5 (22·9-30·5)	7·2 (5·8-8·8)	50·9 (48·3-53·6)	22·5 (20·4-24·7)
Israel	31·0 (27·0-35·6)	13·9 (11·4-16·7)	60·4 (57·6-63·2)	21·4 (19·4-23·5)	26·6 (22·6-31·1)	11·3 (9·1-13·8)	52·7 (49·6-55·6)	24·8 (22·5-27·0)
Italy	29·9 (26·4-33·9)	8·4 (7·0-10·0)	58·3 (55·5-61·1)	18·6 (16·9-20·4)	24·3 (21·0-27·9)	6·2 (5·0-7·6)	41·4 (38·9-44·2)	17·7 (15·9-19·5)
Luxembourg	29·3 (25·3-33·4)	11·1 (9·2-13·5)	58·0 (55·1-60·8)	23·7 (21·3-26·3)	17·7 (14·5-21·1)	13·5 (10·9-16·4)	44·4 (41·6-47·2)	26·0 (23·6-28·7)
Malta	33·6 (29·3-38·0)	12·5 (10·3-14·9)	74·0 (71·6-76·4)	29·0 (26·4-31·6)	25·3 (21·6-29·3)	7·9 (6·3-9·6)	57·8 (55·0-60·6)	27·5 (24·9-30·1)
Netherlands	18·3 (15·7-21·3)	4·1 (3·4-5·0)	53·2 (51·1-55·4)	12·7 (11·6-14·0)	16·1 (13·4-18·9)	3·8 (3·0-4·7)	44·9 (42·3-47·5)	15·9 (14·4-17·4)
Norway	20·1 (17·2-23·0)	5·1 (4·1-6·3)	58·4 (55·7-61·0)	19·1 (17·1-21·4)	16·0 (13·4-18·7)	4·0 (3·1-5·0)	47·3 (44·4-50·2)	18·0 (16·1-20·0)
Portugal	28·7 (24·9-32·8)	8·9 (7·4-10·9)	63·8 (61·2-66·4)	20·9 (19·0-23·1)	27·1 (23·4-31·4)	10·6 (8·5-12·9)	54·6 (51·7-57·6)	23·4 (21·0-25·9)
Spain	27·6 (23·9-31·2)	8·4 (6·7-10·2)	62·3 (60·0-64·9)	20·2 (18·5-22·1)	23·8 (20·2-27·4)	7·6 (6·0-9·3)	46·5 (43·7-48·9)	20·9 (19·0-23·1)
Sweden	20·4 (17·5-23·4)	4·3 (3·6-5·3)	58·2 (55·6-61·0)	18·9 (17·0-21·0)	19·3 (16·5-22·5)	4·0 (3·2-5·0)	45·8 (43·2-48·5)	19·8 (17·7-21·9)
Switzerland	20·7 (17·4-24·4)	6·6 (5·4-7·9)	56·6 (53·7-59·4)	18·4 (16·5-20·1)	16·2 (13·4-19·4)	5·5 (4·3-6·8)	39·9 (37·0-42·9)	17·0 (15·3-18·8)
United Kingdom	26·1 (23·8-28·5)	7·4 (6·5-8·5)	66·6 (65·3-68·0)	24·5 (23·4-25·7)	29·2 (26·8-31·9)	8·1 (7·0-9·3)	57·2 (55·7-58·6)	25·4 (24·2-26·6)
Western Sub-Saharan Africa	11·0 (9·9-12·1)	4·3 (3·8-5·0)	32·6 (31·1-34·0)	9·4 (8·8-10·1)	12·3 (11·3-13·5)	3·2 (2·8-3·6)	34·5 (33·3-35·6)	11·9 (11·3-12·5)
Benin	6·9 (5·6-8·4)	4·7 (3·8-5·8)	9·4 (8·4-10·4)	9·4 (9·0-11·4)	13·1 (10·7-15·7)	3·2 (2·5-4·1)	29·9 (27·6-32·4)	10·0 (8·9-11·2)
Burkina Faso	9·1 (7·6-10·9)	3·7 (2·9-4·5)	31·3 (28·8-33·8)	8·2 (7·3-9·2)	8·7 (7·3-10·6)	3·0 (2·4-3·8)	15·4 (14·1-16·9)	4·6 (4·1-5·2)
Cameroon	16·4 (14·1-19·0)	4·8 (3·9-5·8)	40·4 (37·8-43·1)	8·5 (7·5-9·5)	19·8 (16·8-23·1)	3·6 (2·9-4·5)	50·7 (48·4-53·0)	20·1 (18·2-22·0)
Cape Verde	11·5 (9·6-13·7)	3·3 (2·6-4·0)	31·8 (29·4-34·3)	7·0 (6·2-7·8)	18·3 (15·0-21·7)	5·2 (4·1-6·5)	44·0 (41·3-47·0)	15·4 (13·9-17·1)
Chad	8·3 (6·9-9·9)	2·9 (2·3-3·5)	28·2 (25·8-30·5)	6·4 (5·6-7·2)	8·3 (6·7-10·1)	2·6 (2·0-3·3)	12·4 (11·1-13·8)	2·8 (2·4-3·2)

Country/Region	Males <20		Males, >20		Females, <20		Females, >20	
	Overweight	Obese	Overweight	Obese	Overweight	Obese	Overweight	Obese
Cote d'Ivoire	8·8 (7·3-10·4)	2·7 (2·2-3·3)	26·6 (24·3-29·0)	6·2 (5·4-7·0)	13·3 (11·1-15·8)	2·8 (2·2-3·4)	35·4 (33·1-37·8)	11·4 (10·1-12·7)
Ghana	5·3 (4·4-6·4)	2·6 (2·1-3·2)	27·9 (25·7-30·1)	8·1 (7·2-9·2)	11·5 (9·6-13·8)	2·3 (1·9-2·9)	38·4 (36·0-41·1)	14·0 (12·6-15·7)
Guinea	8·2 (6·8-9·9)	2·8 (2·2-3·5)	15·4 (13·8-16·9)	2·5 (2·2-2·7)	11·7 (9·6-14·3)	3·5 (2·7-4·3)	29·1 (26·9-31·6)	9·8 (8·9-10·9)
Guinea-Bissau	15·8 (13·3-18·5)	8·1 (6·6-9·8)	44·0 (41·1-46·9)	16·8 (15·1-18·6)	20·4 (17·2-23·8)	8·3 (6·7-10·3)	47·8 (44·8-50·8)	24·2 (21·8-26·7)
Liberia	13·4 (11·1-16·0)	4·8 (3·9-5·9)	40·6 (37·9-43·4)	14·9 (13·7-16·1)	13·7 (11·3-16·5)	3·0 (2·4-3·8)	49·4 (46·8-52·1)	22·1 (20·0-24·0)
Mali	10·4 (8·6-12·3)	3·6 (2·9-4·5)	29·1 (26·8-31·6)	7·4 (6·6-8·4)	12·8 (10·7-15·4)	4·1 (3·2-5·1)	46·8 (44·4-49·2)	18·2 (16·5-20·0)
Mauritania	5·7 (4·7-6·8)	2·8 (2·3-3·5)	21·4 (19·5-23·4)	6·4 (5·7-7·3)	14·2 (11·5-17·1)	3·8 (3·0-4·7)	55·7 (52·9-58·8)	27·6 (25·3-30·4)
Niger	11·8 (9·8-14·2)	2·9 (2·3-3·5)	23·7 (21·5-25·8)	3·4 (3·0-3·9)	7·9 (6·4-9·5)	2·5 (2·0-3·1)	27·8 (25·8-29·7)	5·9 (5·3-6·5)
Nigeria	12·8 (10·7-15·1)	5·4 (4·4-6·7)	39·5 (36·7-42·3)	11·8 (10·5-13·3)	12·3 (10·1-14·7)	3·2 (2·4-4·2)	33·6 (31·3-35·9)	10·4 (9·3-11·6)
Sao Tome and Principe	12·3 (10·3-14·4)	4·4 (3·6-5·5)	30·6 (28·4-33·0)	7·1 (6·4-7·9)	18·9 (16·0-22·0)	5·8 (4·5-7·3)	45·7 (43·1-48·3)	17·6 (16·0-19·2)
Senegal	3·8 (3·1-4·6)	1·6 (1·3-1·9)	16·8 (15·5-18·2)	10·3 (9·4-11·3)	8·3 (6·8-10·0)	2·1 (1·6-2·6)	37·4 (35·3-39·6)	21·1 (19·7-22·6)
Sierra Leone	13·8 (11·8-15·8)	6·4 (5·3-7·7)	16·4 (15·1-17·8)	5·2 (4·7-5·9)	23·3 (19·7-26·7)	7·2 (5·9-8·7)	32·9 (30·7-35·2)	11·9 (10·8-13·1)
The Gambia	10·1 (8·3-12·1)	3·8 (3·0-4·6)	34·3 (31·7-36·9)	8·4 (7·6-9·3)	14·8 (12·2-17·9)	6·1 (4·9-7·6)	48·7 (45·9-51·6)	18·1 (16·8-19·5)
Togo	5·7 (4·7-6·7)	2·2 (1·8-2·8)	18·8 (17·3-20·3)	3·4 (3·0-3·8)	8·8 (7·3-10·6)	1·8 (1·4-2·2)	32·2 (30·1-34·5)	11·3 (10·0-12·5)