The Global Burden of Anemia

GBD 2013 Anemia Collaborators and Nicholas J Kassebaum

Key words

Anemia, iron-deficiency anemia, burden of disease, hemoglobinopathies, nutrition, hemoglobin, global health

Key points

1. Anemia burden is high, affecting 27 percent of the world's population—1.93 billion people—in 2013. Developing countries account for more than 89 percent of the burden.
2. Preschool children and women of reproductive age are particularly affected by anemia.
3. Iron-deficiency anemia (IDA) is the dominant cause ($\geq 60\%$) of anemia globally and in most populations, though there are important contributions from multiple other causes.
4. Other important causes of anemia include hemoglobinopathies, infections, chronic kidney diseases, gastrointestinal and gynecologic conditions. Patterns vary with respect to age, sex, and geography.
5. Individual and population-level interventions aimed at reducing burden should take into account the context-specific epidemiology of anemia to maximize effectiveness and avoid potential harm.

Synopsis

Anemia is an important cause of health loss throughout the world. In this analysis we estimated levels and trends of non-fatal anemia burden for 23 distinct etiologies in each of 188 countries, 20 age groups, and both sexes from 1990 to 2013. All available population-level anemia data was collected and standardized. We estimated mean hemoglobin, prevalence of anemia by severity, quantitative disability due to anemia, and underlying etiology for each population using the systematic approach of the Global Burden of Diseases, Injuries and Risk Factors 2013 Study. Anemia burden is high, affecting 27 percent of the world's population—1.93 billion people—in 2013. Developing countries account for 89 percent of all

disability due to anemia. The burden is highest in Central and Western sub-Saharan Africa. South Asia, Southeast Asia, and East Asia made the most progress since 1990. Age-standardized anemia prevalence is at least 14% in all high-income countries. Preschool children and women of reproductive age are particularly affected by anemia. Iron-deficiency anemia (IDA) remains the dominant cause of anemia globally ($\geq 60\%$) and in most populations. Reduced IDA burden drove much of the improvement in anemia since 1990, though this was partially offset by increases in anemia due to chronic kidney disease, sickle cell, and thalassemias. The specific contribution of each cause varies widely with respect to age, sex, and geography. Individual and population-level interventions aimed at reducing burden should take into account the context-specific epidemiology of anemia to maximize effectiveness and avoid potential harm.

Introduction

The primary role of hemoglobin is delivering oxygen to tissues and returning carbon dioxide to the lungs for elimination from the body. Any condition that leads to a shortage of functional hemoglobin or decreased red blood cell (RBC) mass may cause anemia. The pathophysiology of anemia is thus diverse and often multifactorial. Causes can include genetic mutations in hemoglobin genes, acute and chronic blood loss, inadequate nutritional intake, altered red blood cell morphology leading to shortened RBC life span, infectious processes, or alterations in iron and RBC metabolism secondary to chronic inflammation. A shortage of iron—the core of each hemoglobin molecule—is a common manifestation of many conditions that cause anemia.

Anemia has been associated with increased morbidity and mortality. Symptoms likely result from impaired tissue oxygen delivery and may include weakness, fatigue, concentration difficulty, or poor work productivity^{1,2}. Children may have issues with mental and motor development if they^{3–5} or their mothers⁶ are anemic. Anemia has been correlated with increased risk of preterm labor, low birth

weight^{7, 8}, child and maternal mortality^{9, 10}, and may predispose to infection¹¹ and heart failure¹². Though many studies have focused on iron-deficiency anemia (IDA), the findings have suggested risk in IDA exceeds that in non-anemic iron deficiency, supporting a primary role for anemia as a risk factor for poor outcomes. Even in high-income settings, anemia has been identified as related to decreased quality of life and physical functioning^{13, 14}. It has also been shown to be an independent risk factor for fatality in patients undergoing surgical procedures¹⁵ and is associated with increased all-cause mortality in the general population¹⁶.

Attention to the burden of anemia throughout the world has been growing. Many early enquiries appropriately focused on populations felt to be at highest risk—pregnant women and children in low income countries—because they were believed to be those with the biggest problems with inadequate nutrition, high infectious disease burden, and poor access to routine health care. Subsequent studies have found the prevalence of anemia is non-trivial even in high-income countries^{17, 18}, in non-pregnant women¹⁹ and older adults^{20, 21}. Additionally, anemia is a common manifestation of conditions such as chronic kidney diseases, malignancies, and autoimmune disorders.

This analysis, building on the one previously completed by our group, is intended to serve as a framework for understanding the population-specific epidemiology and pathophysiology of anemia throughout the world. We took advantage of the systematic approach of the Global Burden of Diseases, Injuries and Risk Factors 2013 Study to elucidate levels and trends of anemia-related disability. This includes estimates of prevalence and years lived with disability (YLD) for mild, moderate, severe and total anemia—by underlying cause—in 188 countries, 21 GBD regions, 20 age groups, and both sexes from 1990 to 2013.

Methods

Anemia burden estimation methods were largely unchanged since GBD 2010. The details of that analysis have been described in detail previously²², but will be summarized here with emphasis on the updates since that time.

Estimation of overall anemia

Our estimation strategy again began with the calculation of an anemia envelope – a determination of mean hemoglobin as well as sum total of anemia prevalence by severity for each country, age group, and both sexes for each year from 1990 through 2013. The envelope approach avoided double counting while capturing potentially different disease profiles within each population group. We defined a population group as a specific country, sex, age-group, and year.

We used population-based surveys of hemoglobin concentration as the primary data input for envelope calculations. These data were not only the most reliable and comparable measures of anemia, coming from national and sub-national measurement surveys, but also spanned the most countries and time-periods. Tabulated data from published and unpublished studies, collated by the WHO Vitamin and Mineral Nutrition Information System (VMNIS), were used to supplement the dataset. Most used a HemoCue test, adjusted for altitude, and excluded those with terminal or acute medical conditions. Inclusion, exclusion and diagnostic criteria for other studies were similar and can be found in each study. A full list of relevant studies is contained in the Global Health Data Exchange and the IHME website (<http://www.healthdata.org>).

We predicted mean hemoglobin levels for all missing population groups using a mixed-effects linear regression with fixed effects on prevalence of severe underweight (<2SD below mean; same as the GBD 2010) and age group and nested random effects on super-region, region, and country/subnational site. For these regressions, we again separated each population into five groups: male and

female children under 5 years, pregnant females, non-pregnant females, and males over 5 years. The country-year specific prevalence of underweight children was obtained from the IHME causes of death database and had been previously calculated for every year between 1970 and 2011 by using spatial-temporal regression of data from national and subnational measurement surveys²³.

We adopted different thresholds for defining anemia by age than were used in the GBD 2010 as they do not reflect the hematologic realities of early life. GBD 2010 thresholds were matched to those used by the WHO in GBD 2000²⁴. Since the GBD 2000, likely in recognition of this same phenomenon, WHO recommendations have changed. The GBD 2010 and the GBD 2013 thresholds are shown in Table 1. Our current thresholds match those published by WHO with the exception of those under 1 month of age, where there is no internationally-recommended cutoff for diagnosing anemia²⁵.

In recognizing the limitations of predicting anemia prevalence—especially severe anemia—directly from mean hemoglobin using multiple steps, we instead pooled survey microdata for each population group separately and fitted the pooled data with Weibull distributions. We then performed ordinary least squares regression of the shape and scale parameters versus all predicted mean hemoglobin values predicted above. The prevalence of mild, moderate, severe, and total anemia was then calculated by determining the area under the Weibull curve for each population group using the hemoglobin thresholds in Table 1. After adjusting for estimated prevalence of pregnancy, we finalized the anemia envelope by calculating years lived with disability (YLD) for each population group. YLD are the product of prevalence times disability weight (DW) for each severity of anemia. DW range from 0 (no health loss) to 1 (equivalent to death) and were derived from population-representative surveys as described previously^{26, 27}.

Etiologic attribution of anemia cases

We performed cause-specific attribution on the anemia envelope using the same method as in the GBD 2010. Total “hemoglobin shift” was determined as the difference between the normal and

predicted mean hemoglobin levels for each population group. We denoted the normal hemoglobin level as the global 95th percentile of the distribution of mean-hemoglobin within each age group, sex, and year. We then determined a total shift for each country in the corresponding age-group, sex, and year by finding the difference between the global “normal” and the country-specific predicted mean hemoglobin. Our model of attribution followed that, because the shift is a disease state experienced by 100% of the population, then the sum of cause-specific hemoglobin shifts times the prevalence of each contributing cause should add up to the total. Cause-specific hemoglobin shifts were unchanged from GBD 2010.

We summed shift times prevalence estimates from all causes, compared to the total predicted hemoglobin shift, and proportionally assigned. We distributed the residual envelope among seven remaining causes. Of note, our iron-deficiency anemia (IDA) estimates include acute and chronic hemorrhagic states for which supplementation may be helpful, but poor nutritional intake is not the only underlying problem. A few causes in this category—hookworm, schistosomiasis, upper gastrointestinal bleeding, and gynecologic conditions—were considered separately from IDA because there was enough data from the GBD 2013 to do so. Distribution of anemia burden to IDA only after assignment to “known” causes avoided double counting of these cases. Most other causes of anemia not specifically considered were included in the “other” categories.

Two changes in the GBD 2013 analysis affected the etiology-specific anemia estimates. First, and most importantly, we identified an inconsistency in this cause-specific attribution method where the total number of cases of anemia due to a condition was not bounded to be less than the total number of cases of the condition itself. We have introduced a method in this analysis to ensure that bounds are included. Second, inherent in our method of determining “normal” hemoglobin is the fact that 5% of population groups will have zero, or negative, total shift. In these cases, or when the sum of all causes’ shift-times-prevalence estimates exceeded the total shift, we assigned the denominator to be equal to

the sum of the numerators. Subsequent review of findings from National Health and Nutrition Examination Survey (NHANES) III suggested that the implicit assumption of zero residual—and therefore zero IDA—in the GBD 2010 approach was implausible^{28, 29}. Based on the published rates of IDA seen in these analyses, we therefore introduced a minimum of 10% of all anemia to be assigned to residual causes in the GBD 2013.

In order to disaggregate marginal estimates of anemia severity and etiology into a complete set of prevalence estimates for etiology/severity pairs, we developed a new method for the GBD 2013 that employed techniques from Bayesian contingency table modelling^{30, 31}. The model combined marginal estimates on the row sums (total etiology prevalence for each cause) and column sums (total anemia prevalence by severity [mild, moderate, severe]) with priors on the mean hemoglobin shift for each etiology and priors on the rank order of variation of severity (i.e. anemia due to malaria is expected to vary most between cases of all etiologies, whereas anemia due to sickle cell disorders are expected to be some of the least variable in severity). We used nonlinear optimization to find the *maximum a posteriori* (MAP) point estimate for 50 samples from estimated posterior distributions on the marginal values (etiology and severity estimates) independently for each population group, and then scaled and shifted these estimates to ensure that updated marginal row sums were all non-zero and the updated column sums matched the original draws exactly.

Uncertainty and aggregation

The final result of our analysis was estimates of mild, moderate, and severe anemia by cause for each of 20 age groups, 188 countries, 21 GBD regions, and both sexes in 1990, 1995, 2000, 2005, 2010 and 2013. Uncertainty was propagated using Monte Carlo simulation techniques by taking 1000 draws of each quantity calculated for each population group. Aggregations by geography, age, cause, and sex were made at the draw level assuming uncorrelated uncertainty. The uncertainty interval around each

quantity, at each level of aggregation, is presented as the 2.5th and 97.5th centile of the draws, which can be interpreted as a 95% uncertainty interval (UI).

Results

Our dataset for estimating the anemia envelope covered 996 separate surveys from 161 countries and contained more than four times as many data points as it did in the GBD 2010 (9899 versus 2425) notably including data from Turkey and India as well as subnational data from the United Kingdom, China, and Mexico.

The global age-standardized prevalence of anemia was 27.0% in 2013, down from 33.3% in 1990, a drop of approximately 21% (Figure 1). Largely due to population growth, the total number of cases worldwide actually increased somewhat over this time period. There were a total of 1.93 billion people with anemia in 2013 (compared to 1.83 billion in 1990), including 950 million cases of mild anemia, 906 million cases of moderate anemia, and 75.6 million cases of severe anemia. The total global number of YLDs also changed very little, decreasing from 62,023,831 (95% UI: 41,591,487 - 89,266,761) to 61,525,570 (95% UI: 41,020,763 - 88,730,696) for both sexes combined.

Geographic differences in anemia burden are readily apparent (Figure 2). The age-standardized prevalence rates of anemia in 2013 were highest in central and western sub-Saharan Africa at 45.1% and 43.2% respectively, though the largest number of cases was in South Asia. Four countries with highest prevalence were Afghanistan, Chad, Mali, and Yemen all of which had anemia age-standardized prevalence rates in excess of 50% in 2013, though this is an improvement from 1990 when more than 20 countries had anemia prevalence rates higher than 50%. Anemia was non-trivial in all countries. Chile, Venezuela, Canada, and Ukraine, were the lowest globally, though in each case the age-standardized anemia prevalence was still greater than 14%. Country-specific anemia prevalence and YLDs for 2013 is shown in Table 2.

Analysis of YLD rates shows that anemia burden is even more concentrated in many of the highest prevalence countries, especially in western and central sub-Saharan Africa (Figure 3 – top panel), as cases in those locations tend to be more severe, likely reflecting the wide variety of anemia-causing conditions that are highly prevalent there. Analyzing changes in age-standardized YLD rates from 1990 to 2013, a metric to disentangle changes in disease severity from those in total anemia prevalence, further demonstrates geographic heterogeneity (Figure 3 – bottom panel). Global change in absolute YLD rates was -24.0%. The biggest gains were seen in the GBD regions of South Asia, East Asia, Southeast Asia, and Eastern sub-Saharan Africa where absolute YLD rates changed by -50.5%, -44.8%, -31.7% and -21.1%, respectively. High-income had a collective YLD rate change of only -3.0%, though burden was already lower in those locations. Alarming, relatively little progress was seen in much of western and central sub-Saharan Africa, the same regions with the highest burden. Eight countries—Somalia, Burundi, Djibouti, Liberia, Zimbabwe, Yemen, Czech Republic and Moldova—all had age-standardized anemia prevalence in 2013 that were at least 1% higher than in 1990. In all of them, YLD rates increased even more than prevalence rates, indicating a relative worsening of anemia burden.

Age and gender patterns in global anemia prevalence and burden were striking (Figure 4). Young children, especially under the age of 10, had the highest prevalence of anemia and levels were generally similar between males and females. Throughout much of adulthood, anemia prevalence was consistently higher in females than males. Improvement between 1990 and 2013 was also greater for males than females in these age groups, a phenomenon largely driven at the global level by larger improvements amongst males in South Asia. Convergence between the sexes occurred in older ages, roughly equilibrating around age 60 in 1990 and 75 in 2013. Age patterns were largely consistent between countries, though the magnitude varies substantially by country.

Iron deficiency was the single biggest cause of anemia globally in both 1990 and 2013. There were 552,500,091 (551,188,078 - 554,084,424) males and 655,860,048 (653,862,224 - 657,703,392)

females with IDA in 2013, collectively accounting for approximately 62.6% of the global total of anemia cases (Table 3). This was down from 66.2% in 1990. Iron-deficiency anemia (IDA) was also the biggest cause of anemia-related disability, though the proportion of total YLDs was only 59.5% in 2013, reflecting both the somewhat lower severity of IDA compared to other etiologies.

Despite the overall dominance of IDA, leading causes vary substantially by age, sex, and geography (Figure 5A). For example, in females the most common causes of anemia globally in 2013 were IDA (59.2% of total), hemoglobinopathies (11.6%), gastrointestinal losses (5.3%), gynecologic conditions (5.1%), and malaria (4.9%). For males, the order was IDA (67.1%), hemoglobinopathies (9.9%), gastrointestinal losses (4.6%), and other neglected tropical diseases (4.3%). In Western and Central sub-Saharan Africa—where the highest rates of anemia occur—IDA, malaria and hemoglobinopathies collectively explain nearly 80% of anemia cases. Schistosomiasis is also an important cause of anemia Eastern sub-Saharan Africa (8.1% of all anemia cases). Hookworm is a significant etiology in many countries of Oceania (12.2%), Tropical Latin America (8.6%), Southern sub-Saharan Africa (5.7%), and Southeast Asia (3.8%). Chronic kidney disease (CKD) emerges as an important contributor to overall anemia burden in high-income countries (7.4%), Tropical Latin America (17.4%), Central Europe (9.8%), and Eastern Europe (10.8%).

In those under 5 years of age, anemia is mostly due to IDA (Figure 5B). Hemoglobinopathies, “other” infectious diseases, and malaria (in endemic areas) are also important causes in preschool children. Throughout adulthood, the pathophysiology becomes progressively more complex. The contribution of hemoglobinopathies is relatively stable throughout adulthood in most locations. This is because heterozygous hemoglobin disorders such as sickle cell trait and thalassemia trait are the dominant component of anemia due to hemoglobinopathies in all but high-prevalence, high-mortality settings such as Central and Western sub-Saharan Africa. Malaria peaks in importance at ages 5-9, but remains an important contributor to anemia burden throughout adulthood in endemic locations.

Gynecologic causes, led by uterine fibroids, are important causes of anemia in females from menarche to menopause in all settings. CKD and gastrointestinal disorders increase sharply in older ages to become the most important causes of anemia in many locations.

Summary and Discussion

Anemia affected 1.93 billion people in 2013 collectively causing 61.5 (41.0 – 88.7) million YLDs. To put this number in perspective, it is helpful to compare against other findings from the GBD 2013 study²⁷. Anemia was responsible for roughly 8% of all non-fatal health loss for all diseases in 2013. While it is lower than the total disability caused by low back and neck pain (106 million YLDs), it is roughly equivalent to the amount of health loss caused by depressive disorders (61.6 million YLDs) and is greater than disability due to asthma, diabetes, and cardiovascular disease combined (61.3 million YLDs). It is also much more amenable to prevention and treatment than many of those conditions. The full health impact of anemia is likely even greater as these results do not include quantification of heart failure or early mortality due to anemia, the increased risk of cognitive deficiencies associated with chronic anemia, or the disability associated with many other sequelae of severe hemoglobinopathies such as repeated infections, often painful vaso-occlusive crises and strokes.

Levels and trends in anemia burden have been uneven with respect to age, sex, and geography. Globally, anemia burden has actually improved substantially since 1990 when 33.3% of the global population was affected and anemia caused 12.4% of all disability for all conditions combined. Children have consistently had the highest burden of anemia, but have also improved less in both absolute and relative terms than adults. This suggests at the very least that our efforts to prevent childhood anemia have been inconsistent. Improvement between 1990 and 2013 was greater for males than females, a phenomenon largely driven at the global level by larger improvements amongst males in South Asia. The biggest regional gains were seen in South Asia, East Asia, Southeast Asia, and Eastern sub-Saharan Africa

where many countries have national nutrition programs in place. In all of these regions YLD rates have dropped faster than prevalence rates which indicates that there has been an additional shift away from severe cases of anemia.

Our analysis shows that IDA is the dominant cause of anemia in most countries and populations. If we include those conditions such as hookworm, schistosomiasis, gastrointestinal and gynecological conditions that also manifest as IDA, its importance grows even more apparent. Despite its continued dominance, reduction in IDA has been the primary driver of reduced global anemia burden since 1990. The improvements have been partially offset, however, by increases in anemia due to chronic kidney diseases, hemoglobinopathies, malaria, and schistosomiasis. Most of the increase in these latter conditions is related to population aging (for CKD) and population growth in endemic areas.

Iron-deficiency anemia (IDA) in high-risk, high-prevalence populations is likely due to inadequate vitamin intake or absorption^{32, 33}. Addressing IDA by only increasing micronutrient supplementation would not be a panacea for ending anemia, however, because IDA is a final common pathway of a heterogeneous group of conditions that also includes acute or chronic hemorrhagic events and disorders of iron metabolism that may happen as a result of chronic illness or malabsorption. WHO guidelines take some of this into account³⁴, with recommendation that nutrition be optimized, including targeted supplementation of iron, Vitamin A, and other micronutrients in high risk or high prevalence groups such as pregnant women and young children. The guidelines further recommend administration of anti-helminthic medications in endemic regions.

These recommendations still fall short of addressing the complexity of anemia epidemiology, however, and others have called for a more comprehensive approach to reducing anemia burden³⁵. For starters, many infectious and inflammatory conditions will limit iron absorption³⁶ so the underlying drivers of inflammation must be addressed. Some components of local diet such as teas (tannins) and

whole grain cereals (phytates) may also retard iron uptake, so their role in the local diet should be considered and/or mitigated with agents that promote uptake such as ascorbic acid³⁷. Second, our analysis shows that hemoglobinopathies are among the top five causes of anemia in many populations. Some subtypes may present with laboratory findings similar to IDA, but the anemia due to these conditions will not be reversed by typical interventions for IDA³⁸. Furthermore, routine supplementation for those with homozygous disease may be inappropriate as iron overload is a common complication of treatment. Third, malaria remains a crucial public health challenge in many countries of the world, especially in sub-Saharan Africa. Trials of iron supplementation in malaria endemic areas is controversial as in isolation it has been associated with increased parasitemia rate³⁹, malarial fever⁴⁰, and all cause mortality⁴¹. These findings support at the very least implementation of malaria control and chemoprophylaxis programs to combat anemia⁴². Fourth, folic acid administration should also be considered, especially in pregnant women, to reduce anemia and prevent neural tube defects in their offspring⁴³. Finally, as we see from the age pattern of anemia etiology, prevention and treatment of chronic kidney disease and gastrointestinal conditions in older persons should be a part of anemia control programs for those populations, a strategy that should focus on appropriate use of non-steroidal anti-inflammatory drugs^{44, 45}.

Unfortunately, eight countries—Somalia, Burundi, Djibouti, Liberia, Zimbabwe, Yemen, Czech Republic and Moldova—all had age-standardized anemia prevalence in 2013 that were at least 1% higher than in 1990. In all of them, YLD rates increased even more than prevalence rates, indicating a relative intensification of anemia burden. Except for the latter two, all are low income countries that already had a high burden of anemia in 1990, have experienced internal conflict over the interim, and have received comparatively little development assistance for health for maternal, child, and newborn health, and non-communicable diseases⁴⁶. Addressing the anemia burden in the countries that are

falling behind, and accelerating progress in other countries, will require a comprehensive program of prevention, screening and treatment that is based on the context-specific epidemiology of anemia.

Bangladesh is an example of a country that has been especially successful in reducing anemia burden. Anemia burden remains high there, but absolute prevalence rates changed by -43.3% and all ages YLD rates by -59.8% between 1990 and 2013. The government of Bangladesh, in cooperation with the World Bank, started a national nutrition program in 1995 called the Bangladesh Integrated Nutrition Programme (BINP) which implemented a comprehensive set of nutrition and non-nutrition-based interventions. The objective of BINP was to reduce underweight and stunting rates by 50% in 5 years, an objective that was not met, but the collective benefit of its interventions are consistent with those that would be expected to be effectively reduce anemia burden. Efforts at the individual level aimed to educate mothers, encourage routine and preventive healthcare utilization, and provide multiple micronutrient supplements⁴⁷. Parallel efforts aimed to address the high burden of diarrheal disease, expand access to safe water and sanitation, and improve food security. Such a comprehensive approach, guided by the local epidemiology, should serve as a model to all countries seeking to reduce anemia burden.

Despite broad agreements in total case numbers and YLDs between this and our previous analysis, increased data availability and enhanced analytic methods have allowed us to improve our country-specific anemia estimates. Interestingly, additional data from Turkey had little effect on the predicted magnitude of anemia burden. In contrast, our current estimates of anemia prevalence in the United Kingdom are nearly 25% higher than in GBD 2010 and they are now lower for 2013—especially in males—in both India and China. Incorporation of an increasing number of subnational locations into future GBD analyses and will be instrumental to honing our understanding of population-specific anemia epidemiology. Identification of new, existing data sources and continued inclusion of anemia surveillance in population health surveys will be crucial to this collaborative endeavor.

This analysis has several limitations. First, our calculation of anemia burden is based on hemoglobin thresholds were initially adopted by the WHO in 1968⁴⁸. Although the thresholds have been updated over time, they remain based on statistical analysis of hemoglobin concentrations in “normal” individuals rather than a full evaluation of the risk of health loss associated with decreased hemoglobin. They also do not reflect ethnicity-specific diagnostic criteria that have been suggested by some researchers⁴⁹. Furthermore, there is no internationally accepted threshold for diagnosing anemia in infants under 6 months of age despite the commonly held belief that very young children are the most susceptible to the detrimental effects of anemia. Second, as mentioned above, we have not quantified the risk of poor growth, poor development, intellectual disability, or early mortality due to anemia. IDA was analyzed as a specific cause of death and risk factor in GBD 2013²³, but for other etiologies of anemia it was not possible in this framework to disentangle the role of anemia in early mortality. The full health loss associated with anemia is thus even higher than we have presented here. Third, in keeping with GBD cause of death analytic principles, we assigned each case of anemia to a single underlying cause. Due to paucity of data, etiology-specific hemoglobin shifts were used globally which limited our ability to account for differing treatment availability for chronic conditions. While this approach generates estimates that accurately reflect the complexity of anemia epidemiology at the population level, it limits the direct clinical applicability of our findings. Many cases of anemia—especially severe anemia—are multifactorial, a phenomenon that must be considered when treating individuals. Fifth, also in keeping with GBD 2013 analytic principles, our estimates of uncertainty at the regional and global level assumed the uncertainty for each cause was uncorrelated. This assumption is well-supported for burden of disease analysis overall, but could be challenged in the case of underlying anemia etiologies. Correlation of uncertainty would have led to wider uncertainty intervals at the regional and global level. Sixth, while we expended great effort to collect and analyze all available data to estimate anemia burden by etiology, not all specific causes could be disaggregated. Most were

assigned to our “other” categories, due either to rarity of the condition or insufficient data for separate modeling. Examples include anemia due to acute and chronic hemorrhage, HIV/AIDS, malignancy, and chemotherapy where population-specific information could be helpful in guiding anemia control efforts. Finally, due to exclusion of those with known chronic disease from many data sources, we suspect anemia of chronic inflammation (ACI) was underestimated in some locations, especially in older ages.

Targeted anemia surveillance and intervention should be a priority in high-risk, high-burden populations such as young children and females of reproductive age. Given that anemia burden is non-trivial in all populations, there should also be a renewed focus on anemia surveillance and treatment even in high-income settings and older persons. Treatment of individuals should be guided by consideration of population-specific anemia epidemiology, recognizing that each person may have multifactorial underpinnings to their anemia. Population-level interventions should similarly be based on context-specific factors, but also be comprehensive in nature, to maximize the likelihood of sustained success in reducing the global burden of anemia.

Acknowledgements

This research has been conducted as part of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD), led by the Institute for Health Metrics and Evaluation. The GBD was partially funded by the Bill & Melinda Gates Foundation; the funders had no role in the study design, data analysis, data interpretation, or writing of the report. We would like to thank all of the GBD 2013 researchers, staff, and collaborators who worked to make the project a success:

Tom D Fleming¹ (tomflem@uw.edu), Abraham Flaxman¹ (abie@uw.edu), David E Phillips¹ (davidp6@uw.edu), Caitlyn Steiner¹ (csteiner@uw.edu), Ryan M Barber¹ (rmbarber@uw.edu), Sarah Wulf Hanson¹ (swulf@uw.edu), Maziar Moradi-Lakeh¹ (mmoradi@uw.edu), Lucas E Coffeng¹ (l.coffeng@erasmusmc.nl), Juanita Haagsma¹ (jhaagsma@uw.edu), Hmwe H Kyu¹ (hmwekyu@uw.edu), Nicholas Graetz¹ (ngraetz@uw.edu), Stephen S Lim¹ (stevelim@uw.edu), Theo Vos¹ (tvos@uw.edu), Mohsen Naghavi¹ (naghavi@uw.edu), Christopher Murray¹ (cjlm@uw.edu), Naohiro Yonemoto³ (4-1-1, Ogawahigashi, Kodaira, Tokyo, 1878551, Japan; nyonemoto@gmail.com), Jasvinder Singh⁴ (2000 6th Ave S Fl 3, Birmingham, AL 35233; jasvinder.md@gmail.com), Jost B Jonas⁵ (Kutzerufer 1, Mannheim

68167, Germany; Jost.Jonas@medma.uni-heidelberg.de), Itamar S Santos⁶ (Cidade Universitária, Av. Lineu Prestes 2565, 05508-000 Sao Paulo Brazil; itamarss@usp.br), Isabela M Bensenor⁶ (Hospital Universitario, Av Lineu Prestes, 2565, 05508-000 Sao Paulo Brazil; isabensenor@gmail.com), Paulo A. Lotufo⁶ (University of São Paulo, Faculdade de Medicina / Hospital Universitario, Av Lineu Prestes, 2565, 05508-000 Sao Paulo Brazil; palotufo@usp.br), Saleem M Rana⁷ (54-A, HBFC Faisal Town, Lahore 54700, Pakistan; smrmep@gmail.com), Bradford D Gessner⁸ (21 bd. Pasteur, 75015 Paris, France; bgessner@aamp.org), Kingsley N Ukwaja⁹ (Dept of Internal Medicine, Federal Teaching Hospital, A 343 Abakaliki, Nigeria; ukwajakingsley@yahoo.co.uk), Frédéric B Piel¹⁰ (Department of Zoology, University of Oxford, The Tinbergen Building, South Parks Road, Oxford OX1 3PS, UK; fred.piel@zoo.ox.ac.uk), Yousef S Khader¹¹ (Ar Ramtha, Irbid 22110, Jordan; yaskhader@just.edu.jo), Neeraj Bhala^{12, 13} (Queen Elizabeth Medical Centre, Birmingham B15 2TH, UK; neeraj.bhala@uhb.nhs.uk), Carl A T Antonio¹⁴ (Lara Hall, 625 Pedro Gil Street, Ermita, Manila, 1000 Metro Manila, Philippines; ctantoniodm@gmail.com), Amanda G Thrift¹⁵ (Epidemiology & Prevention Unit Stroke and Ageing Research Ctr, Department of Medicine, Southern Clinical School, Monash University, Level 1/43–51, Kanooka Grove, Clayton, Victoria 3168, Australia; amanda.thrift@monash.edu), Walter Mendoza¹⁶ (Av. Guardia Civil 1231, Lima 27, Peru; mendoza@unfpa.org), Maysaa El Sayed Zaki¹⁷ (Rabaea street, Mansoura 35514, Egypt; may_s65@hotmail.com), Anders Larsson¹⁸ (Akademiska sjukhuset, Ing.40, 5 tr, 751 85 Uppsala, Sweden; anders.larsson@akademiska.se), Devina Nand¹⁹ (Dinem House, 88 Amy Street, Toorak, Suva, Fiji; dr.devinanand@gmail.com), Reza Malekzadeh^{20, 21} (Digestive Disease Research Inst, Shariati Hospital, Jamshidiyeh, Tehran, 14117-13135, Iran; malek@tums.ac.ir), Yongmei Li²² (Anolinx LLC, 428 E Winchester St, Salt Lake City, UT 84107; yongmeil@hotmail.com), Kim Yun Jin²³ (Southern University College, 81300 Skudai, Johor, Malaysia; yikim@sc.edu.my), Teresa Shamah Levy²⁴ (Av. Universidad # 655, Col. Sta. Ma. Ahuacatitlán, Cuernavaca, Morelos, Mexico 62100 C.P; tshamah@insp.mx).

Affiliations:

1. Institute for Health Metrics and Evaluation, University of Washington, Seattle, WA, USA
2. Seattle Children's Hospital, Department of Anesthesiology and Pain Medicine, Seattle, WA, USA
3. National Center of Neurology and Psychiatry, Kodira, Tokyo, Japan
4. University of Alabama at Birmingham, Birmingham, AL, USA
5. Department of Ophthalmology, Medical Faculty Mannheim, Ruprecht-Karls-University Heidelberg, Germany
6. University of Sao Paulo, Sao Paulo, Brazil
7. Department of Public Health, University of the Punjab, Lahore, Pakistan, Punjab, India
8. Agence de Medecine Preventive, Paris, France
9. Department of Internal Medicine Federal Teaching Hospital, Abakaliki, Ebonyi State, Nigeria
10. University of Oxford, Oxford, UK
11. Jordan University of Science and Technology, Irbid, Jordin
12. Queen Elizabeth Hospital Birmingham, Birmingham, UK
13. University of Otago Medical School, Wellington, New Zealand
14. Department of Health Policy and Administration, College of Public Health, University of the Philippines Manila
15. Department of Medicine, Monash University, Melbourne, VIC, Australia
16. United Nations Population Fund (UNFPA), Lima, Peru

17. Mansoura Faculty of Medicine, Mansoura, Egypt
18. Uppsala University, Uppsala, Sweden
19. Ministry of Health Fiji, Suva, Republic of Fiji
20. Digestive Diseases Research Center, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran
21. Shiraz University of Medical Sciences, Shiraz, Iran
22. Anolinx, LLC, Salt Lake City, UT, USA
23. Southern University College, Johor, Malaysia
24. National Public Health Institute, Cuernavaca, Morelos, Mexico

References

1. Haas JD., Fairchild MW. Summary and conclusions of the International Conference on Iron Deficiency and Behavioral Development, October 10-12, 1988. *Am J Clin Nutr* 1989;50(3):703–5.
2. Edgerton VR., Ohira Y., Hettiarachchi J., et al. Elevation of hemoglobin and work tolerance in iron-deficient subjects. *J Nutr Sci Vitaminol (Tokyo)* 1981;27(2):77–86.
3. Sachdev H., Gera T., Nestel P. Effect of iron supplementation on mental and motor development in children: systematic review of randomised controlled trials. *Public Health Nutr* 2005;8(2):117–32.
4. McCann JC., Ames BN. An overview of evidence for a causal relation between iron deficiency during development and deficits in cognitive or behavioral function. *Am J Clin Nutr* 2007;85(4):931–45.
5. Beard JL., Connor JR. Iron status and neural functioning. *Annu Rev Nutr* 2003;23:41–58. Doi: 10.1146/annurev.nutr.23.020102.075739.
6. Mireku MO., Davidson LL., Koura GK., et al. Prenatal Hemoglobin Levels and Early Cognitive and Motor Functions of One-Year-Old Children. *Pediatrics* 2015;136(1):e76–83. Doi: 10.1542/peds.2015-0491.
7. Schorr T., Hediger M. Anemia and iron-deficiency anemia: compilation of data on pregnancy outcome. *Am J Clin Nutr* 1994;59(Suppl):492S – 501S.
8. Rasmussen KM. Is There a Causal Relationship between Iron Deficiency or Iron-Deficiency Anemia and Weight at Birth, Length of Gestation and Perinatal Mortality? *J Nutr* 2001;131(2):590S – 603S.
9. Brabin BJ., Hakimi M., Pelletier D. An Analysis of Anemia and Pregnancy-Related Maternal Mortality. *J Nutr* 2001;131(2):604S – 615S.
10. Brabin BJ., Premji Z., Verhoeff F. An Analysis of Anemia and Child Mortality. *J Nutr* 2001;131(2):636S – 648S.
11. Hershko C., Karsai A., Eylon L., et al. The effect of chronic iron deficiency on some biochemical functions of the human hemopoietic tissue. *Blood* 1970;36(3):321–9.

12. Anand IS. Anemia and Chronic Heart Failure Implications and Treatment Options. *J Am Coll Cardiol* 2008;52(7):501–11. Doi: 10.1016/j.jacc.2008.04.044.
13. Thein M., Ershler WB., Artz AS., et al. Diminished quality of life and physical function in community-dwelling elderly with anemia. *Medicine (Baltimore)* 2009;88(2):107–14. Doi: 10.1097/MD.0b013e31819d89d5.
14. Sabbatini P. The Relationship between Anemia and Quality of Life in Cancer Patients. *The Oncologist* 2000;5(Supplement 2):19–23. Doi: 10.1634/theoncologist.5-suppl_2-19.
15. Musallam KM., Tamim HM., Richards T., et al. Preoperative anaemia and postoperative outcomes in non-cardiac surgery: a retrospective cohort study. *The Lancet* 2011;378(9800):1396–407. Doi: 10.1016/S0140-6736(11)61381-0.
16. Martinsson A., Andersson C., Andell P., et al. Anemia in the general population: prevalence, clinical correlates and prognostic impact. *Eur J Epidemiol* 2014;29(7):489–98. Doi: 10.1007/s10654-014-9929-9.
17. Brotanek JM., Halterman JS., Auinger P., et al. Iron deficiency, prolonged bottle-feeding, and racial/ethnic disparities in young children. *Arch Pediatr Adolesc Med* 2005;159(11):1038–42. Doi: 10.1001/archpedi.159.11.1038.
18. Cusick SE., Mei Z., Freedman DS., et al. Unexplained decline in the prevalence of anemia among US children and women between 1988–1994 and 1999–2002. *Am J Clin Nutr* 2008;88(6):1611–7. Doi: 10.3945/ajcn.2008.25926.
19. Stevens GA., Finucane MM., De-Regil LM., et al. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995–2011: a systematic analysis of population-representative data. *Lancet Glob Health* 2013;1(1):e16–25. Doi: 10.1016/S2214-109X(13)70001-9.
20. Beghé C., Wilson A., Ershler WB. Prevalence and outcomes of anemia in geriatrics: a systematic review of the literature. *Am J Med* 2004;116 Suppl 7A:3S – 10S. Doi: 10.1016/j.amjmed.2003.12.009.
21. Guralnik JM., Eisenstaedt RS., Ferrucci L., et al. Prevalence of anemia in persons 65 years and older in the United States: evidence for a high rate of unexplained anemia. *Blood* 2004;104(8):2263–8. Doi: 10.1182/blood-2004-05-1812.
22. Kassebaum NJ., Jasrasaria R., Naghavi M., et al. A systematic analysis of global anemia burden from 1990 to 2010. *Blood* 2014;123(5):615–24. Doi: 10.1182/blood-2013-06-508325.
23. Global, regional, and national age–sex specific all-cause and cause-specific mortality for 240 causes of death, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet* 2015;385(9963):117–71. Doi: 10.1016/S0140-6736(14)61682-2.

24. Colin Mathers, Tanuja Rastogi WHO | Global burden of Iron Deficiency Anaemia in the year 2000 2002.
25. WHO | Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Geneva: World Health Organization; 2011.
26. Salomon JA., Vos T., Hogan DR., et al. Common values in assessing health outcomes from disease and injury: disability weights measurement study for the Global Burden of Disease Study 2010. *The Lancet* 2012;380(9859):2129–43. Doi: 10.1016/S0140-6736(12)61680-8.
27. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet* 2015. Doi: 10.1016/S0140-6736(15)60692-4.
28. Centers for Disease Control and Prevention (CDC) Iron deficiency--United States, 1999-2000. *MMWR Morb Mortal Wkly Rep* 2002;51(40):897–9.
29. Looker AC, Dallman PR, Carroll MD, et al. PRevalence of iron deficiency in the united states. *JAMA* 1997;277(12):973–6. Doi: 10.1001/jama.1997.03540360041028.
30. Pearson K. Mathematical Contributions to the Theory of Evolution. VII. On the Correlation of Characters not Quantitatively Measurable. *Philos Trans R Soc Math Phys Eng Sci* 1900;195(262-273):1–405. Doi: 10.1098/rsta.1900.0022.
31. Discrete Multivariate Analysis Theory and Practice. New York, NY: Springer New York; 2007.
32. Ahmed F. Anaemia in Bangladesh: a review of prevalence and aetiology. *Public Health Nutr* 2000;3(4):385–93.
33. Pasricha S-R., Black J., Muthayya S., et al. Determinants of anemia among young children in rural India. *Pediatrics* 2010;126(1):e140–9. Doi: 10.1542/peds.2009-3108.
34. WHO | Essential Nutrition Actions: improving maternal, newborn, infant and young child health and nutrition. WHO. Available at: http://www.who.int/nutrition/publications/infantfeeding/essential_nutrition_actions/en/. Accessed September 18, 2013.
35. Pasricha S-R., Drakesmith H., Black J., et al. Control of iron deficiency anemia in low- and middle-income countries. *Blood* 2013;121(14):2607–17. Doi: 10.1182/blood-2012-09-453522.
36. Ganz T., Nemeth E. Heparin and Disorders of Iron Metabolism. *Annu Rev Med* 2011;62(1):347–60. Doi: 10.1146/annurev-med-050109-142444.
37. Siegenberg D., Baynes RD., Bothwell TH., et al. Ascorbic acid prevents the dose-dependent inhibitory effects of polyphenols and phytates on nonheme-iron absorption. *Am J Clin Nutr* 1991;53(2):537–41.

38. Sungthong R., Mo-suwan L., Chongsuvivatwong V., et al. Once Weekly Is Superior to Daily Iron Supplementation on Height Gain but Not on Hematological Improvement among Schoolchildren in Thailand. *J Nutr* 2002;132(3):418–22.
39. Oppenheimer SJ., Gibson FD., Macfarlane SB., et al. Iron supplementation increases prevalence and effects of malaria: Report on clinical studies in Papua New Guinea. *Trans R Soc Trop Med Hyg* 1986;80(4):603–12. Doi: 10.1016/0035-9203(86)90154-9.
40. Smith AW., Hendrickse RG., Harrison C., et al. The effects on malaria of treatment of iron-deficiency anaemia with oral iron in Gambian children. *Ann Trop Paediatr* 1989;9(1):17–23.
41. Sazawal S., Black RE., Ramsan M., et al. Effects of routine prophylactic supplementation with iron and folic acid on admission to hospital and mortality in preschool children in a high malaria transmission setting: community-based, randomised, placebo-controlled trial. *The Lancet* 2006;367(9505):133–43. Doi: 10.1016/S0140-6736(06)67962-2.
42. Menendez C., Kahigwa E., Hirt R., et al. Randomised placebo-controlled trial of iron supplementation and malaria chemoprophylaxis for prevention of severe anaemia and malaria in Tanzanian infants. *Lancet Lond Engl* 1997;350(9081):844–50. Doi: 10.1016/S0140-6736(97)04229-3.
43. Christian P., Shrestha J., LeClerq SC., et al. Supplementation with Micronutrients in Addition to Iron and Folic Acid Does Not Further Improve the Hematologic Status of Pregnant Women in Rural Nepal. *J Nutr* 2003;133(11):3492–8.
44. Hooper L., Brown TJ., Elliott R., et al. The effectiveness of five strategies for the prevention of gastrointestinal toxicity induced by non-steroidal anti-inflammatory drugs: systematic review. *BMJ* 2004;329(7472):948. Doi: 10.1136/bmj.38232.680567.EB.
45. Gooch K., Culleton BF., Manns BJ., et al. NSAID Use and Progression of Chronic Kidney Disease. *Am J Med* 2007;120(3):280.e1–280.e7. Doi: 10.1016/j.amjmed.2006.02.015.
46. Financing Global Health 2014: Shifts in Funding as the MDG Era Closes. Available at: <http://www.healthdata.org/policy-report/financing-global-health-2014-shifts-funding-mdg-era-closes>. Accessed July 1, 2015.
47. The Bangladesh Integrated Nutrition Project Effectiveness and Lessons Bangladesh Development Series – paper no.8 2005.
48. WHO Scientific Group on Nutritional Anaemias. Nutritional anaemias: report of a WHO scientific group [meeting held in Geneva from 13 to 17 March 1967] 1968.
49. Beutler E., Waalen J. The definition of anemia: what is the lower limit of normal of the blood hemoglobin concentration? *Blood* 2006;107(5):1747–50. Doi: 10.1182/blood-2005-07-3046.

Figure and Table Legends

Table 1: Hemoglobin thresholds (in grams per liter) by age, sex, and pregnancy status used in classifying anemia cases as mild, moderate and severe in GBD 2010 versus GBD 2013. GBD 2010 definitions for each severity of anemia are in gray in the top panel. These were based on GBD 2000. Subsequent revisions to WHO hemoglobin threshold recommendations led to changes in GBD 2013 definitions as shown in the lower panel. Cutoffs for mild, moderate, and severe anemia vary by age, sex, and pregnancy status. Disability weights were determined via a worldwide health survey. Additional surveys were administered for GBD 2013 which resulted in slight changes to disability weight values.

Table 2: Global, regional and national levels of anemia burden in 2013. Total years of life lived with disability (YLDs), prevalent cases of mild, moderate, and severe anemia are presented for each country, region, and super-region are presented as well as comparisons for developed versus developing countries and at the global level. Age-standardized prevalence and YLD rates were calculated by aggregation of cause-specific anemia estimates for each country, age group, sex, and year and then standardizing to the global standard population table used in GBD 2013.

Table 3: Global cause pattern of anemia prevalence and disability in 1990 and 2013. Total prevalent case numbers and total years of life lived with disability (YLDs) are listed for each of the 23 unique etiologies of anemia in both 1990 and 2013 at the global level. They are in descending order by total prevalent cases in 2013.

Modified from GBD 2013 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and YLDs for 301 acute and chronic diseases and injuries for 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. The Lancet. June 2015. [http://dx.doi.org/10.1016/S0140-6736\(15\)60692-4](http://dx.doi.org/10.1016/S0140-6736(15)60692-4).

Figure 1: Global prevalence rate (%) and total years of life lived with disability (YLDs) due to anemia for both sexes combined from 1990 to 2013. The left panel shows the global prevalence rate of anemia, by severity, for all ages combined. The total YLDs globally is shown on the right, also by severity. A majority of anemia cases are mild and moderate, but a majority of the disability is due to moderate and severe anemia.

Figure 2: All ages anemia prevalence rate (%) in 1990 (top) and 2013 (bottom). The maps demonstrate the anemia prevalence comparing 1990 to 2013 for all ages combined. This is the final result of the GBD 2013 analysis. As can be seen, there has been substantial progress in many countries since 1990, especially in East, Southeast and South Asia, North Africa and the Middle East, and Eastern sub-Saharan Africa. Anemia prevalence is non-trivial in all locations as no country has a prevalence rate under 10%.

Figure 3: Disability due to anemia expressed as YLD rate per 100,000 population in 2013 (top) and change in age-standardized YLD rate from 1990 to 2013 (bottom). The top map show the age-standardized rate of anemia disability measured in YLDs in 2013. The burden, when compared to prevalence figures, is even more concentrated in many of the countries with the highest prevalence rates of anemia, indicating a greater severity of disease. Changes from 1990 to 2013 are shown in the bottom panel. South Asia, Southeast Asia and East Asia decreased anemia burden the most. Age-standardization helps control for differences in population structure between countries and over time.

Figure 4: Global prevalence rate of anemia by age and sex for 1990 and 2013. Global prevalence rates of anemia by age are shown in red (females) and blue (males) for both 1990 (solid lines) and 2013

(dotted lines). Anemia prevalence is highest in preschool children and consistently higher amongst females. Global improvements were greater for males than females from 1990 to 2013.

Figure 5: Underlying cause of prevalent anemia cases by sex for 1990 and 2013 at the global level by

gender (top) and by age (bottom). All ages anemia prevalence dropped for both sexes, though the decrease was greater in males. In both sexes, iron-deficiency anemia (IDA) was the dominant cause globally, though there were significant contributions from several other causes. In females, these

include hemoglobinopathies, gynecologic conditions, gastrointestinal losses, and malaria. In males,

these include hemoglobinopathies, non-malaria infectious diseases, gastrointestinal losses, and malaria.

Anemia Prevalence, Global, 1990–2013

Healthstate ■ Mild ■ Moderate ■ Severe

Anemia Total YLDs (in millions), Global, 1990–2013

Healthstate ■ Mild ■ Moderate ■ Severe

FIG 2A

Anemia prevalence in 1990, all ages

FIG 2B

Anemia prevalence in 2013, all ages

FIG 3A

Anemia YLDs per 100,000 population in 2013, age-standardized

FIG 3B

Percent change in Anemia YLDs 1990 to 2013, age-standardized

FIG 4

FIG 5A

TABLE 1

Severity definitions and corresponding disability weights used to calculate GBD 2010 anemia envelope			
	Severity of Anemia		
	Mild	Moderate	Severe
Age < 5 years			
Males	110 - 119 g/L	80 - 109 g/L	50 - 79 g/L
Females	110 - 119 g/L	80 - 109 g/L	50 - 79 g/L
Age 5+ years			
Males	120 - 129 g/L	90 - 119 g/L	60 - 89 g/L
Females, non-pregnant	110 - 119 g/L	80 - 109 g/L	50 - 79 g/L
Females, pregnant	100 - 109 g/L	70 - 99 g/L	40 - 69 g/L
Disability Weights			
All cases	0.004 (0.001-0.008)	0.052 (0.034-0.076)	0.149 (0.101-0.209)

Severity definitions and corresponding disability weights used to calculate GBD 2013 anemia envelope			
	Severity of Anemia		
	Mild	Moderate	Severe
Age < 1 month			
Males	130 - 149 g/L	90 - 129 g/L	< 90 g/L
Females	130 - 149 g/L	90 - 129 g/L	< 90 g/L
Age 1 month - 5 years			
Males	100 - 109 g/L	70 - 99 g/L	< 70 g/L
Females	100 - 109 g/L	70 - 99 g/L	< 70 g/L
Age 5 - 14 years			
Males	110 - 114 g/L	80 - 109 g/L	< 80 g/L
Females	110 - 114 g/L	80 - 109 g/L	< 80 g/L
Age 5+ years			
Males	110 - 129 g/L	80 - 109 g/L	< 80 g/L
Females, non-pregnant	110 - 119 g/L	80 - 109 g/L	< 80 g/L
Females, pregnant	100 - 109 g/L	70 - 99 g/L	< 70 g/L
Disability Weights			
All cases	0.005 (0.002-0.011)	0.058 (0.038-0.086)	0.164 (0.112-0.228)

TABLE 2

Location	Year	Mild cases	Moderate cases	Severe cases	Age-standardized prevalence (%)	Total YLDs	Age-standardized YLDs (per 100,000)
Global	1990	839,101,225 [▮] (838,208,707 - 839,955,790)	901,120,023 [▮] (899,990,319 - 902,046,164)	88,720,928 [▮] (88,552,511 - 88,859,873)	33.3 [▮] (33.3 - 33.3)	62,023,831 [▮] (41,591,487 - 89,266,761)	1,092 [▮] (732 - 1,569)
Global	2013	950,135,190 [▮] (949,030,314 - 951,108,861)	905,501,750 [▮] (904,278,930 - 906,519,017)	75,565,628 [▮] (75,357,541 - 75,721,856)	27.0 [▮] (27.0 - 27.0)	61,525,570 [▮] (41,020,763 - 88,730,696)	859 [▮] (573 - 1,239)
Developing	1990	717,671,655 [▮] (716,867,101 - 718,498,928)	803,792,125 [▮] (802,749,358 - 804,607,118)	82,149,100 [▮] (81,975,157 - 82,287,959)	38.0 [▮] (37.9 - 38.0)	55,406,696 [▮] (37,199,421 - 79,697,036)	1,249 [▮] (839 - 1,792)
Developing	2013	816,531,244 [▮] (815,466,758 - 817,478,532)	809,200,194 [▮] (808,094,427 - 810,128,653)	69,480,441 [▮] (69,275,554 - 69,633,255)	28.7 [▮] (28.7 - 28.7)	54,943,619 [▮] (36,684,322 - 79,166,056)	916 [▮] (611 - 1,319)
Developed	1990	121,429,570 [▮] (121,222,265 - 121,614,941)	97,327,898 [▮] (97,066,040 - 97,597,283)	6,571,828 [▮] (6,553,301 - 6,588,473)	19.7 [▮] (19.7 - 19.8)	6,617,135 [▮] (4,406,510 - 9,587,496)	600 [▮] (399 - 869)
Developed	2013	133,603,946 [▮] (133,431,595 - 133,779,612)	96,301,556 [▮] (96,037,353 - 96,515,839)	6,085,187 [▮] (6,067,444 - 6,101,388)	19.3 [▮] (19.2 - 19.3)	6,581,951 [▮] (4,387,351 - 9,536,710)	581 [▮] (386 - 843)
Southeast Asia, East Asia, and Oceania	1990	272,843,163 [▮] (272,517,509 - 273,114,892)	259,280,129 [▮] (258,953,407 - 259,543,749)	21,568,299 [▮] (21,540,573 - 21,598,183)	32.9 [▮] (32.9 - 32.9)	17,333,764 [▮] (11,541,978 - 25,090,126)	1,002 [▮] (668 - 1,450)
Southeast Asia, East Asia, and Oceania	2013	248,399,344 [▮] (248,087,264 - 248,675,600)	203,469,040 [▮] (203,237,375 - 203,682,641)	14,075,628 [▮] (14,055,441 - 14,097,074)	23.5 [▮] (23.5 - 23.6)	13,503,539 [▮] (8,943,372 - 19,685,330)	708 [▮] (470 - 1,029)
East Asia	1990	185,710,650 [▮] (185,467,649 - 185,906,404)	166,410,636 [▮] (166,187,372 - 166,593,444)	12,806,104 [▮] (12,787,096 - 12,826,907)	30.4 [▮] (30.4 - 30.4)	11,048,546 [▮] (7,337,047 - 16,046,122)	909 [▮] (604 - 1,317)
East Asia	2013	160,676,129 [▮] (160,442,998 - 160,882,358)	124,256,712 [▮] (124,094,331 - 124,412,866)	8,089,471 [▮] (8,076,865 - 8,101,250)	22.1 [▮] (22.0 - 22.1)	8,240,351 [▮] (5,446,746 - 12,043,703)	662 [▮] (439 - 963)
China	1990	180,178,919 [▮] (179,944,202 - 180,368,074)	161,341,194 [▮] (161,124,102 - 161,518,767)	12,415,638 [▮] (12,397,214 - 12,436,711)	30.5 [▮] (30.5 - 30.5)	10,711,188 [▮] (7,112,679 - 15,556,171)	911 [▮] (606 - 1,321)
China	2013	154,517,804 [▮] (154,288,559 - 154,716,500)	119,303,240 [▮] (119,142,419 - 119,454,208)	7,742,259 [▮] (7,729,816 - 7,753,759)	22.0 [▮] (21.9 - 22.0)	7,909,598 [▮] (5,226,887 - 11,563,250)	658 [▮] (436 - 958)
North Korea	1990	3,391,424 [▮] (3,384,779 - 3,398,260)	3,084,557 [▮] (3,077,948 - 3,089,530)	245,760 [▮] (244,772 - 247,432)	33.5 [▮] (33.5 - 33.6)	205,501 [▮] (136,769 - 298,362)	1,025 [▮] (683 - 1,484)
North Korea	2013	3,820,260 [▮] (3,813,691 - 3,825,353)	3,222,265 [▮] (3,216,318 - 3,227,823)	239,662 [▮] (238,711 - 240,670)	30.1 [▮] (30.0 - 30.1)	214,486 [▮] (142,313 - 310,981)	909 [▮] (604 - 1,318)
Taiwan	1990	2,140,307 [▮] (2,135,514 - 2,143,997)	1,984,884 [▮] (1,979,936 - 1,989,970)	144,706 [▮] (144,359 - 144,966)	21.1 [▮] (21.1 - 21.2)	131,856 [▮] (88,026 - 191,590)	634 [▮] (423 - 922)
Taiwan	2013	2,338,065 [▮] (2,331,318 - 2,343,940)	1,731,207 [▮] (1,721,648 - 1,739,303)	107,550 [▮] (107,057 - 107,958)	20.1 [▮] (20.0 - 20.2)	116,267 [▮] (77,736 - 169,281)	611 [▮] (408 - 883)
Southeast Asia	1990	86,149,050 [▮] (86,047,549 - 86,252,014)	91,700,835 [▮] (91,567,083 - 91,805,537)	8,656,439 [▮] (8,639,493 - 8,672,082)	40.1 [▮] (40.0 - 40.1)	6,206,885 [▮] (4,150,478 - 8,952,476)	1,258 [▮] (845 - 1,812)
Southeast Asia	2013	86,391,594 [▮] (86,282,468 - 86,488,516)	77,709,847 [▮] (77,610,065 - 77,800,784)	5,864,052 [▮] (5,849,391 - 5,878,256)	26.8 [▮] (26.8 - 26.8)	5,163,748 [▮] (3,432,159 - 7,501,408)	804 [▮] (535 - 1,166)
Cambodia	1990	2,061,813 [▮] (2,058,387 - 2,069,947)	2,958,193 [▮] (2,950,675 - 2,961,684)	393,544 [▮] (392,411 - 394,659)	59.4 [▮] (59.3 - 59.5)	207,817 [▮] (140,641 - 295,987)	2,117 [▮] (1,449 - 3,009)
Cambodia	2013	2,815,221 [▮] (2,810,037 - 2,820,587)	2,943,218 [▮] (2,936,418 - 2,948,611)	267,097 [▮] (265,738 - 268,214)	39.1 [▮] (39.0 - 39.2)	197,913 [▮] (132,501 - 285,981)	1,244 [▮] (834 - 1,794)
Indonesia	1990	34,871,514 [▮] (34,819,231 - 34,945,635)	36,636,878 [▮] (36,542,150 - 36,688,203)	3,417,771 [▮] (3,404,678 - 3,429,302)	41.6 [▮] (41.5 - 41.7)	2,486,375 [▮] (1,657,029 - 3,591,988)	1,304 [▮] (872 - 1,878)
Indonesia	2013	34,609,446 [▮] (34,539,775 - 34,664,356)	31,522,620 [▮] (31,467,502 - 31,578,172)	2,402,193 [▮] (2,390,572 - 2,411,039)	27.4 [▮] (27.3 - 27.4)	2,101,005 [▮] (1,396,800 - 3,051,890)	818 [▮] (544 - 1,186)
Laos	1990	915,674 [▮] (914,560 - 917,613)	1,111,372 [▮] (1,109,288 - 1,112,722)	120,198 [▮] (119,616 - 120,574)	50.3 [▮] (50.2 - 50.4)	76,865 [▮] (51,516 - 110,504)	1,679 [▮] (1,129 - 2,408)
Laos	2013	1,183,417 [▮] (1,181,368 - 1,185,151)	1,178,915 [▮] (1,176,790 - 1,180,746)	100,865 [▮] (99,999 - 101,417)	35.8 [▮] (35.8 - 35.9)	79,188 [▮] (52,736 - 114,371)	1,094 [▮] (729 - 1,579)
Malaysia	1990	2,877,959 [▮] (2,872,965 - 2,883,472)	2,885,387 [▮] (2,879,712 - 2,889,153)	238,036 [▮] (237,307 - 238,786)	31.9 [▮] (31.8 - 31.9)	192,696 [▮] (128,563 - 278,682)	957 [▮] (638 - 1,384)
Malaysia	2013	3,062,031 [▮] (3,038,828 - 3,077,982)	2,718,242 [▮] (2,693,915 - 2,737,496)	187,728 [▮] (186,127 - 188,866)	20.4 [▮] (20.2 - 20.5)	178,787 [▮] (118,224 - 260,389)	604 [▮] (400 - 879)
Maldives	1990	45,957 [▮] (45,882 - 46,030)	54,740 [▮] (54,657 - 54,804)	5,695 [▮] (5,664 - 5,719)	48.5 [▮] (48.5 - 48.6)	3,776 [▮] (2,529 - 5,439)	1,582 [▮] (1,063 - 2,273)
Maldives	2013	52,331 [▮] (52,253 - 52,383)	46,986 [▮] (46,905 - 47,060)	3,595 [▮] (3,565 - 3,614)	29.9 [▮] (29.9 - 29.9)	3,131 [▮] (2,080 - 4,549)	893 [▮] (594 - 1,297)
Myanmar	1990	8,355,107 [▮] (8,335,273 - 8,370,630)	9,039,293 [▮] (8,985,513 - 9,056,608)	860,099 [▮] (853,475 - 863,674)	42.8 [▮] (42.7 - 42.9)	611,448 [▮] (409,900 - 878,705)	1,347 [▮] (905 - 1,935)
Myanmar	2013	7,535,176 [▮] (7,523,390 - 7,544,098)	6,554,959 [▮] (6,543,637 - 6,567,105)	480,969 [▮] (476,204 - 482,937)	27.8 [▮] (27.8 - 27.9)	434,239 [▮] (288,183 - 631,172)	831 [▮] (553 - 1,206)
Philippines	1990	10,715,626 [▮] (10,699,275 - 10,729,089)	11,224,111 [▮] (11,207,776 - 11,237,570)	973,241 [▮] (969,850 - 976,349)	35.5 [▮] (35.4 - 35.5)	749,518 [▮] (500,564 - 1,081,333)	1,065 [▮] (712 - 1,537)
Philippines	2013	13,759,337 [▮] (13,732,474 - 13,780,931)	13,279,134 [▮] (13,256,612 - 13,301,210)	1,038,787 [▮] (1,036,072 - 1,041,570)	27.5 [▮] (27.4 - 27.5)	881,368 [▮] (586,376 - 1,281,441)	814 [▮] (542 - 1,182)
Sri Lanka	1990	3,053,760 [▮] (3,048,479 - 3,060,025)	3,060,485 [▮] (3,053,114 - 3,065,657)	267,266 [▮] (265,911 - 268,364)	36.6 [▮] (36.5 - 36.6)	205,967 [▮] (137,620 - 298,286)	1,132 [▮] (756 - 1,638)
Sri Lanka	2013	2,777,895 [▮] (2,772,264 - 2,782,739)	2,483,388 [▮] (2,478,502 - 2,488,171)	179,876 [▮] (179,242 - 180,444)	25.9 [▮] (25.8 - 25.9)	164,705 [▮] (109,212 - 238,933)	788 [▮] (523 - 1,143)
Thailand	1990	8,018,299 [▮] (8,003,328 - 8,029,778)	7,458,609 [▮] (7,446,706 - 7,471,115)	576,550 [▮] (572,455 - 579,425)	28.1 [▮] (28.1 - 28.1)	497,686 [▮] (331,359 - 721,706)	841 [▮] (560 - 1,220)
Thailand	2013	6,730,495 [▮] (6,712,527 - 6,744,684)	5,281,975 [▮] (5,265,396 - 5,298,619)	340,136 [▮] (334,011 - 342,552)	19.9 [▮] (19.9 - 20.0)	352,441 [▮] (234,572 - 513,271)	600 [▮] (399 - 871)
Timor-Leste	1990	170,782 [▮] (170,556 - 170,979)	195,393 [▮] (195,169 - 195,649)	22,658 [▮] (22,566 - 22,731)	50.9 [▮] (50.9 - 51.0)	13,766 [▮] (9,226 - 19,754)	1,733 [▮] (1,168 - 2,476)
Timor-Leste	2013	217,414 [▮] (217,154 - 217,589)	234,106 [▮] (233,881 - 234,322)	22,703 [▮] (22,616 - 22,768)	39.9 [▮] (39.9 - 40.0)	15,976 [▮] (10,666 - 23,056)	1,208 [▮] (807 - 1,743)
Vietnam	1990	14,945,547 [▮] (14,925,924 - 14,977,732)	16,959,275 [▮] (16,925,270 - 16,981,213)	1,770,581 [▮] (1,765,647 - 1,776,719)	48.6 [▮] (48.6 - 48.7)	1,153,066 [▮] (776,727 - 1,655,720)	1,579 [▮] (1,068 - 2,267)
Vietnam	2013	13,528,685 [▮] (13,502,561 - 13,550,805)	11,361,621 [▮] (11,339,379 - 11,384,059)	832,335 [▮] (825,600 - 836,906)	28.8 [▮] (28.7 - 28.8)	748,045 [▮] (495,542 - 1,088,429)	854 [▮] (567 - 1,241)
Oceania	1990	983,463 [▮] (981,819 - 984,995)	1,168,659 [▮] (1,166,889 - 1,170,074)	105,756 [▮] (105,470 - 106,035)	32.2 [▮] (32.2 - 32.3)	78,333 [▮] (52,212 - 113,119)	1,045 [▮] (697 - 1,506)
Oceania	2013	1,331,621 [▮] (1,329,589 - 1,333,330)	1,502,481 [▮] (1,500,563 - 1,504,109)	122,104 [▮] (121,684 - 122,461)	26.5 [▮] (26.4 - 26.5)	99,440 [▮] (66,307 - 143,978)	847 [▮] (564 - 1,225)
Fiji	1990	80,902 [▮] (80,675 - 81,064)	92,492 [▮] (92,315 - 92,640)	7,109 [▮] (7,066 - 7,144)	22.5 [▮] (22.4 - 22.5)	6,080 [▮] (4,047 - 8,820)	714 [▮] (475 - 1,033)
Fiji	2013	86,410 [▮] (86,177 - 86,604)	89,959 [▮] (89,645 - 90,192)	6,410 [▮] (6,362 - 6,445)	20.5 [▮] (20.4 - 20.5)	5,914 [▮] (3,925 - 8,571)	652 [▮] (433 - 943)

Kiribati	1990	8,676 (8,657 - 8,694)	9,989 (9,970 - 10,004)	785 (781 - 791)	25.0 (25.0 - 25.1)	654 (434 - 943)	794 (528 - 1,144)
Kiribati	2013	10,834 (10,803 - 10,858)	11,746 (11,721 - 11,770)	874 (871 - 877)	22.2 (22.1 - 22.2)	770 (514 - 1,116)	706 (472 - 1,023)
Marshall Islands	1990	5,260 (5,249 - 5,270)	6,031 (6,019 - 6,040)	457 (454 - 460)	22.2 (22.1 - 22.2)	395 (263 - 574)	705 (469 - 1,020)
Marshall Islands	2013	7,299 (7,282 - 7,313)	8,147 (8,134 - 8,161)	610 (608 - 613)	21.6 (21.6 - 21.7)	535 (357 - 774)	688 (459 - 995)
Federated States of Micronesia	1990	12,296 (12,270 - 12,321)	14,795 (14,765 - 14,817)	1,227 (1,219 - 1,237)	26.4 (26.3 - 26.4)	981 (654 - 1,419)	843 (562 - 1,221)
Federated States of Micronesia	2013	11,394 (11,366 - 11,419)	12,845 (12,820 - 12,869)	995 (987 - 999)	23.0 (22.9 - 23.0)	848 (566 - 1,232)	733 (489 - 1,063)
Papua New Guinea	1990	674,178 (672,989 - 675,368)	813,596 (812,253 - 814,659)	76,370 (76,118 - 76,600)	35.9 (35.8 - 35.9)	54,780 (36,543 - 79,024)	1,167 (780 - 1,681)
Papua New Guinea	2013	969,186 (967,435 - 970,545)	1,113,089 (1,111,548 - 1,114,336)	92,455 (92,069 - 92,774)	28.1 (28.0 - 28.1)	73,768 (49,238 - 106,861)	897 (598 - 1,298)
Samoa	1990	16,357 (16,273 - 16,407)	18,729 (18,625 - 18,800)	1,380 (1,366 - 1,391)	19.2 (19.1 - 19.3)	1,230 (814 - 1,789)	614 (406 - 893)
Samoa	2013	17,782 (17,717 - 17,826)	20,162 (20,041 - 20,242)	1,472 (1,455 - 1,483)	18.5 (18.5 - 18.6)	1,327 (887 - 1,932)	593 (397 - 863)
Solomon Islands	1990	43,317 (43,196 - 43,386)	52,181 (52,096 - 52,242)	4,407 (4,380 - 4,428)	28.4 (28.3 - 28.4)	3,462 (2,306 - 5,009)	903 (602 - 1,305)
Solomon Islands	2013	67,213 (67,093 - 67,302)	77,745 (77,645 - 77,839)	6,146 (6,119 - 6,167)	24.4 (24.3 - 24.4)	5,124 (3,418 - 7,419)	774 (515 - 1,117)
Tonga	1990	11,053 (11,013 - 11,083)	13,174 (13,124 - 13,207)	1,057 (1,050 - 1,065)	24.3 (24.2 - 24.3)	872 (581 - 1,266)	800 (534 - 1,159)
Tonga	2013	11,568 (11,536 - 11,592)	13,667 (13,614 - 13,701)	1,079 (1,070 - 1,085)	23.3 (23.2 - 23.3)	905 (605 - 1,311)	765 (511 - 1,109)
Vanuatu	1990	18,815 (18,780 - 18,845)	22,378 (22,342 - 22,413)	1,837 (1,819 - 1,846)	26.0 (25.9 - 26.0)	1,483 (988 - 2,147)	827 (549 - 1,197)
Vanuatu	2013	28,793 (28,740 - 28,829)	32,535 (32,480 - 32,582)	2,537 (2,507 - 2,548)	23.7 (23.7 - 23.7)	2,144 (1,428 - 3,107)	753 (501 - 1,091)
Central Europe, Eastern Europe, and Central Asia	1990	41,741,255 (41,611,512 - 41,844,040)	38,532,521 (38,329,850 - 38,714,797)	2,697,952 (2,684,969 - 2,708,352)	20.4 (20.3 - 20.4)	2,694,007 (1,800,541 - 3,887,838)	663 (443 - 957)
Central Europe, Eastern Europe, and Central Asia	2013	40,421,690 (40,319,419 - 40,503,455)	32,955,223 (32,822,062 - 33,085,404)	2,095,222 (2,085,642 - 2,102,686)	19.8 (19.8 - 19.9)	2,319,146 (1,549,887 - 3,353,069)	640 (427 - 927)
Central Asia	1990	7,474,994 (7,453,138 - 7,493,734)	8,268,778 (8,188,616 - 8,295,200)	627,090 (623,668 - 629,367)	22.2 (22.2 - 22.3)	562,890 (377,222 - 810,728)	746 (501 - 1,072)
Central Asia	2013	8,325,013 (8,301,378 - 8,346,297)	8,431,509 (8,397,191 - 8,457,311)	595,609 (591,416 - 598,046)	20.5 (20.5 - 20.6)	579,073 (386,646 - 840,116)	689 (461 - 998)
Armenia	1990	347,427 (345,392 - 349,095)	369,278 (365,388 - 371,980)	26,321 (25,903 - 26,637)	20.5 (20.4 - 20.7)	25,408 (16,944 - 36,873)	694 (464 - 1,006)
Armenia	2013	270,998 (268,944 - 272,849)	256,590 (253,629 - 258,847)	17,177 (16,860 - 17,361)	19.4 (19.3 - 19.6)	18,096 (12,046 - 26,294)	659 (438 - 958)
Azerbaijan	1990	861,947 (858,410 - 865,387)	1,013,536 (1,009,119 - 1,017,221)	84,578 (84,084 - 85,042)	27.0 (26.8 - 27.1)	69,132 (46,398 - 99,779)	936 (630 - 1,345)
Azerbaijan	2013	1,050,215 (1,044,892 - 1,054,113)	1,105,203 (1,098,894 - 1,109,941)	84,081 (83,495 - 84,518)	24.5 (24.4 - 24.6)	75,849 (51,043 - 109,482)	847 (570 - 1,221)
Georgia	1990	496,630 (494,476 - 498,474)	483,101 (475,909 - 486,611)	32,351 (31,905 - 32,629)	18.9 (18.8 - 19.0)	33,212 (22,079 - 47,876)	625 (415 - 901)
Georgia	2013	386,391 (384,524 - 388,028)	336,402 (333,849 - 339,134)	20,943 (20,728 - 21,138)	18.5 (18.5 - 18.6)	23,730 (15,949 - 34,026)	615 (411 - 884)
Kazakhstan	1990	1,605,736 (1,592,635 - 1,617,343)	1,685,036 (1,602,849 - 1,703,435)	119,920 (117,203 - 121,577)	20.2 (19.8 - 20.4)	115,782 (77,652 - 166,432)	678 (455 - 973)
Kazakhstan	2013	1,534,185 (1,522,933 - 1,542,553)	1,498,370 (1,483,450 - 1,510,422)	100,297 (98,161 - 101,495)	19.2 (19.1 - 19.3)	103,893 (69,470 - 150,805)	645 (432 - 936)
Kyrgyzstan	1990	478,206 (476,380 - 479,899)	528,735 (526,246 - 530,799)	39,558 (39,274 - 39,720)	21.9 (21.8 - 22.0)	35,817 (23,894 - 51,647)	725 (485 - 1,044)
Kyrgyzstan	2013	543,258 (540,356 - 545,506)	554,612 (549,955 - 557,641)	38,402 (37,925 - 38,724)	19.7 (19.6 - 19.9)	37,854 (25,251 - 54,795)	661 (444 - 954)
Mongolia	1990	213,552 (211,562 - 214,393)	230,587 (228,690 - 231,758)	16,772 (16,574 - 16,897)	17.8 (17.7 - 17.9)	15,763 (10,489 - 22,707)	587 (391 - 844)
Mongolia	2013	221,005 (219,561 - 222,025)	206,810 (204,525 - 208,724)	13,560 (13,369 - 13,695)	15.3 (15.2 - 15.5)	14,535 (9,769 - 21,091)	517 (347 - 747)
Tajikistan	1990	653,565 (651,568 - 655,323)	750,332 (747,961 - 752,340)	59,095 (58,682 - 59,328)	24.6 (24.5 - 24.7)	50,726 (33,738 - 73,398)	814 (545 - 1,178)
Tajikistan	2013	986,363 (983,465 - 988,712)	1,062,705 (1,059,708 - 1,065,541)	80,744 (80,206 - 81,046)	24.1 (24.0 - 24.2)	71,683 (47,929 - 103,814)	792 (530 - 1,143)
Turkmenistan	1990	407,908 (406,149 - 409,346)	461,590 (459,561 - 463,290)	35,185 (35,020 - 35,299)	22.3 (22.1 - 22.3)	31,246 (20,856 - 45,461)	740 (497 - 1,072)
Turkmenistan	2013	519,987 (517,193 - 522,094)	534,402 (531,149 - 537,309)	38,003 (37,757 - 38,192)	20.5 (20.3 - 20.6)	36,647 (24,382 - 53,134)	687 (457 - 991)
Uzbekistan	1990	2,410,023 (2,402,125 - 2,416,020)	2,746,583 (2,737,475 - 2,753,732)	213,312 (212,315 - 214,084)	23.6 (23.5 - 23.7)	185,805 (124,188 - 267,591)	782 (525 - 1,124)
Uzbekistan	2013	2,812,611 (2,801,377 - 2,821,943)	2,876,417 (2,864,343 - 2,888,427)	202,401 (200,838 - 203,662)	20.0 (19.9 - 20.1)	196,786 (131,780 - 285,420)	667 (448 - 965)
Central Europe	1990	15,529,394 (15,504,389 - 15,553,787)	12,627,916 (12,587,852 - 12,660,594)	912,996 (911,602 - 914,364)	23.9 (23.9 - 24.0)	876,516 (587,478 - 1,267,822)	729 (488 - 1,054)
Central Europe	2013	14,886,039 (14,857,650 - 14,913,721)	10,284,650 (10,241,897 - 10,324,825)	659,383 (657,709 - 660,960)	23.2 (23.1 - 23.2)	725,712 (483,876 - 1,053,241)	706 (471 - 1,023)
Albania	1990	588,394 (587,210 - 589,472)	529,186 (527,833 - 530,271)	44,775 (44,600 - 44,883)	33.6 (33.5 - 33.6)	36,398 (24,312 - 52,741)	1,008 (675 - 1,456)
Albania	2013	509,559 (508,526 - 510,540)	382,935 (381,313 - 384,406)	28,854 (28,758 - 28,915)	29.5 (29.4 - 29.5)	26,634 (17,693 - 38,590)	880 (584 - 1,275)
Bosnia and Herzegovina	1990	638,342 (636,176 - 640,154)	523,389 (520,728 - 525,714)	38,767 (38,681 - 38,853)	27.2 (27.1 - 27.3)	36,100 (24,082 - 52,152)	829 (554 - 1,196)
Bosnia and Herzegovina	2013	474,060 (472,457 - 475,548)	339,491 (336,487 - 342,185)	22,493 (22,344 - 22,605)	23.2 (23.1 - 23.3)	23,991 (15,924 - 34,682)	708 (470 - 1,022)
Bulgaria	1990	1,083,261 (1,078,976 - 1,088,173)	827,842 (821,671 - 834,079)	57,552 (57,369 - 57,738)	23.1 (23.0 - 23.2)	58,294 (38,792 - 83,687)	707 (470 - 1,017)

Bulgaria	2013	900,781 (896,407 - 904,038)	601,846 (596,651 - 607,182)	37,529 (37,314 - 37,683)	22.8 (22.8 - 22.9)	42,762 (28,308 - 61,673)	696 (462 - 1,008)
Croatia	1990	565,490 (563,623 - 567,058)	433,893 (430,986 - 436,383)	29,710 (29,585 - 29,803)	22.3 (22.2 - 22.4)	30,402 (20,372 - 44,044)	682 (457 - 989)
Croatia	2013	513,610 (511,985 - 514,948)	354,150 (350,814 - 357,166)	22,550 (22,381 - 22,692)	22.1 (22.0 - 22.2)	25,340 (16,894 - 36,459)	677 (450 - 979)
Czech Republic	1990	1,228,017 (1,222,267 - 1,233,375)	969,015 (961,634 - 976,748)	68,305 (67,990 - 68,551)	22.6 (22.5 - 22.7)	67,765 (45,319 - 97,664)	689 (461 - 992)
Czech Republic	2013	1,312,551 (1,308,609 - 1,315,549)	894,226 (887,461 - 900,439)	56,458 (56,188 - 56,660)	22.9 (22.9 - 23.0)	62,988 (42,046 - 90,695)	696 (464 - 1,005)
Hungary	1990	1,283,935 (1,278,769 - 1,288,632)	995,587 (989,122 - 1,001,759)	69,199 (68,928 - 69,439)	23.3 (23.2 - 23.4)	69,683 (46,980 - 100,440)	713 (480 - 1,029)
Hungary	2013	1,235,360 (1,229,934 - 1,240,368)	851,122 (844,034 - 858,738)	54,047 (53,744 - 54,271)	22.9 (22.8 - 23.0)	60,479 (40,694 - 87,137)	701 (469 - 1,012)
Macedonia	1990	248,315 (247,477 - 249,191)	207,893 (206,859 - 208,819)	15,212 (15,165 - 15,249)	23.5 (23.5 - 23.6)	14,397 (9,549 - 20,839)	717 (476 - 1,037)
Macedonia	2013	256,280 (255,368 - 257,207)	182,815 (181,211 - 184,269)	12,121 (12,066 - 12,172)	22.8 (22.7 - 22.9)	12,905 (8,617 - 18,648)	697 (466 - 1,006)
Montenegro	1990	73,490 (73,264 - 73,677)	61,479 (61,168 - 61,794)	4,491 (4,475 - 4,504)	23.2 (23.1 - 23.2)	4,247 (2,847 - 6,160)	703 (471 - 1,019)
Montenegro	2013	76,818 (76,547 - 77,047)	57,035 (56,625 - 57,410)	3,874 (3,857 - 3,887)	23.2 (23.1 - 23.3)	3,998 (2,689 - 5,808)	706 (475 - 1,025)
Poland	1990	4,645,105 (4,628,971 - 4,657,870)	3,893,376 (3,865,255 - 3,916,318)	282,890 (282,147 - 283,668)	23.2 (23.1 - 23.3)	268,899 (180,231 - 388,589)	706 (473 - 1,021)
Poland	2013	4,733,796 (4,710,410 - 4,750,268)	3,212,294 (3,177,640 - 3,242,682)	200,792 (199,625 - 201,918)	22.8 (22.7 - 22.9)	225,926 (150,274 - 327,505)	694 (463 - 1,004)
Romania	1990	3,105,162 (3,098,139 - 3,112,503)	2,491,303 (2,480,029 - 2,504,235)	180,230 (179,689 - 180,613)	25.3 (25.2 - 25.3)	172,407 (114,740 - 249,175)	765 (510 - 1,107)
Romania	2013	2,778,671 (2,769,687 - 2,784,797)	1,940,870 (1,920,737 - 1,954,331)	125,831 (125,130 - 126,389)	23.7 (23.6 - 23.8)	136,783 (91,283 - 198,752)	723 (482 - 1,052)
Serbia	1990	1,177,209 (1,172,903 - 1,180,171)	959,484 (954,097 - 964,501)	68,909 (68,611 - 69,150)	23.0 (22.9 - 23.1)	67,058 (44,939 - 97,318)	703 (471 - 1,021)
Serbia	2013	1,168,068 (1,162,690 - 1,172,494)	834,179 (825,854 - 841,217)	55,150 (54,849 - 55,441)	22.9 (22.8 - 23.0)	59,229 (39,675 - 85,084)	701 (467 - 1,010)
Slovakia	1990	646,965 (645,105 - 648,692)	542,436 (539,620 - 545,162)	39,432 (39,248 - 39,581)	23.4 (23.3 - 23.5)	37,469 (25,073 - 54,283)	712 (477 - 1,032)
Slovakia	2013	671,628 (669,505 - 673,432)	461,391 (458,565 - 464,277)	28,761 (28,626 - 28,867)	23.0 (22.9 - 23.0)	32,355 (21,563 - 46,867)	700 (466 - 1,014)
Slovenia	1990	245,711 (244,905 - 246,363)	193,032 (191,693 - 194,346)	13,524 (13,464 - 13,563)	23.4 (23.3 - 23.5)	13,399 (8,999 - 19,287)	712 (477 - 1,025)
Slovenia	2013	254,857 (253,616 - 256,053)	172,296 (170,527 - 174,019)	10,924 (10,835 - 10,981)	22.7 (22.6 - 22.8)	12,321 (8,231 - 17,855)	692 (464 - 1,003)
Eastern Europe	1990	18,736,868 (18,630,095 - 18,817,836)	17,635,827 (17,466,193 - 17,790,198)	1,157,865 (1,146,129 - 1,167,171)	17.7 (17.6 - 17.8)	1,254,601 (839,602 - 1,809,219)	597 (400 - 861)
Eastern Europe	2013	17,210,639 (17,143,872 - 17,264,952)	14,239,065 (14,137,994 - 14,335,559)	840,230 (833,256 - 846,102)	17.4 (17.4 - 17.5)	1,014,361 (677,963 - 1,468,178)	578 (384 - 840)
Belarus	1990	883,188 (877,404 - 888,806)	839,260 (828,777 - 847,655)	55,348 (54,276 - 56,046)	18.2 (18.0 - 18.3)	58,659 (39,366 - 84,715)	605 (406 - 873)
Belarus	2013	800,675 (796,219 - 804,333)	664,978 (657,415 - 672,078)	39,030 (38,490 - 39,421)	17.9 (17.7 - 18.0)	47,064 (31,353 - 67,966)	591 (393 - 858)
Estonia	1990	138,839 (137,996 - 139,641)	130,566 (129,183 - 131,788)	8,560 (8,429 - 8,645)	18.5 (18.4 - 18.6)	9,134 (6,132 - 13,157)	617 (413 - 890)
Estonia	2013	114,412 (113,581 - 115,069)	96,416 (94,931 - 97,772)	5,857 (5,784 - 5,906)	17.9 (17.8 - 18.0)	6,876 (4,587 - 9,828)	593 (395 - 854)
Latvia	1990	230,809 (229,499 - 232,138)	213,622 (211,820 - 215,290)	13,620 (13,428 - 13,756)	18.2 (18.1 - 18.3)	14,996 (9,992 - 21,585)	608 (405 - 877)
Latvia	2013	172,790 (171,574 - 173,879)	144,695 (143,093 - 146,172)	8,525 (8,417 - 8,611)	18.0 (17.9 - 18.1)	10,335 (6,965 - 14,843)	597 (400 - 864)
Lithuania	1990	319,333 (316,996 - 321,258)	299,776 (296,977 - 302,703)	19,724 (19,453 - 19,933)	18.0 (17.9 - 18.2)	21,039 (14,047 - 30,341)	602 (403 - 870)
Lithuania	2013	250,455 (249,117 - 251,652)	208,771 (206,057 - 211,049)	12,369 (12,205 - 12,486)	17.8 (17.7 - 17.9)	14,894 (10,076 - 21,469)	592 (397 - 855)
Moldova	1990	443,852 (441,490 - 445,937)	474,533 (471,884 - 476,709)	34,244 (33,837 - 34,528)	21.7 (21.6 - 21.8)	32,147 (21,522 - 46,578)	728 (488 - 1,055)
Moldova	2013	353,831 (352,156 - 355,400)	335,458 (333,703 - 337,032)	22,517 (22,331 - 22,656)	22.0 (21.9 - 22.1)	22,727 (15,176 - 32,873)	733 (489 - 1,059)
Russia	1990	13,049,161 (12,956,927 - 13,118,580)	12,419,745 (12,270,317 - 12,544,911)	821,871 (811,901 - 829,524)	18.5 (18.4 - 18.7)	884,463 (593,506 - 1,280,193)	628 (421 - 909)
Russia	2013	12,375,904 (12,311,963 - 12,424,640)	10,417,162 (10,310,245 - 10,514,772)	622,151 (615,371 - 627,851)	18.2 (18.1 - 18.2)	738,889 (495,032 - 1,072,774)	603 (402 - 878)
Ukraine	1990	3,671,685 (3,639,293 - 3,693,070)	3,258,325 (3,202,533 - 3,302,497)	204,498 (199,068 - 207,968)	14.9 (14.7 - 15.0)	234,163 (156,789 - 336,700)	495 (331 - 713)
Ukraine	2013	3,142,573 (3,122,475 - 3,160,930)	2,371,585 (2,335,775 - 2,407,392)	129,782 (127,348 - 131,317)	14.7 (14.5 - 14.8)	173,576 (116,391 - 249,750)	483 (325 - 700)
High-income	1990	91,083,814 (90,934,395 - 91,220,399)	71,010,515 (70,802,445 - 71,188,012)	4,779,754 (4,764,654 - 4,792,742)	19.5 (19.4 - 19.5)	4,750,005 (3,158,562 - 6,903,729)	577 (384 - 838)
High-income	2013	106,261,799 (106,115,450 - 106,405,045)	76,176,751 (75,923,183 - 76,373,988)	4,877,228 (4,861,253 - 4,891,995)	18.9 (18.9 - 19.0)	5,138,030 (3,424,410 - 7,449,344)	560 (372 - 814)
High-income Asia Pacific	1990	21,842,239 (21,810,745 - 21,875,605)	18,315,674 (18,284,192 - 18,339,201)	1,291,751 (1,287,209 - 1,296,859)	25.6 (25.6 - 25.7)	1,210,187 (801,664 - 1,761,995)	774 (512 - 1,124)
High-income Asia Pacific	2013	23,505,546 (23,468,556 - 23,544,072)	17,270,792 (17,240,503 - 17,296,910)	1,109,057 (1,105,956 - 1,111,935)	24.8 (24.8 - 24.8)	1,132,997 (752,872 - 1,660,164)	744 (494 - 1,085)
Brunei	1990	32,428 (32,350 - 32,500)	31,240 (31,174 - 31,297)	2,323 (2,312 - 2,331)	23.9 (23.8 - 23.9)	2,065 (1,367 - 3,010)	705 (467 - 1,027)
Brunei	2013	50,487 (50,374 - 50,584)	44,109 (44,026 - 44,186)	3,160 (3,148 - 3,174)	23.9 (23.8 - 23.9)	2,921 (1,935 - 4,261)	708 (470 - 1,032)
Japan	1990	15,304,862 (15,276,324 - 15,336,802)	12,525,738 (12,496,326 - 12,547,347)	855,481 (851,117 - 859,316)	24.7 (24.6 - 24.7)	826,793 (548,013 - 1,205,089)	746 (494 - 1,085)
Japan	2013	16,200,919 (16,163,136 - 16,236,192)	11,904,219 (11,877,596 - 11,927,601)	753,868 (751,312 - 756,264)	24.1 (24.1 - 24.2)	780,478 (518,822 - 1,142,286)	729 (484 - 1,064)

South Korea	1990	6,141,168 (6,130,792 - 6,152,572)	5,453,549 (5,442,216 - 5,461,756)	412,330 (410,599 - 414,694)	28.4 (28.4 - 28.4)	361,117 (238,899 - 524,647)	847 (561 - 1,229)
South Korea	2013	6,771,595 (6,760,228 - 6,783,253)	4,956,905 (4,945,833 - 4,967,774)	328,097 (326,392 - 329,476)	26.4 (26.4 - 26.5)	325,518 (216,182 - 477,185)	783 (521 - 1,139)
Singapore	1990	363,781 (362,879 - 364,543)	305,147 (304,418 - 305,768)	21,617 (21,497 - 21,690)	26.1 (26.0 - 26.1)	20,211 (13,385 - 29,555)	778 (516 - 1,132)
Singapore	2013	482,545 (481,588 - 483,227)	365,559 (364,832 - 366,132)	23,933 (23,836 - 23,994)	24.2 (24.1 - 24.2)	24,080 (15,948 - 35,303)	720 (479 - 1,050)
Australasia	1990	2,041,156 (2,032,590 - 2,047,135)	1,619,514 (1,611,464 - 1,626,396)	110,824 (110,081 - 111,416)	19.0 (18.9 - 19.1)	108,353 (72,006 - 156,822)	562 (374 - 815)
Australasia	2013	2,832,044 (2,818,340 - 2,842,269)	2,067,254 (2,049,506 - 2,079,665)	133,335 (132,334 - 134,143)	18.8 (18.7 - 18.9)	139,094 (93,187 - 201,867)	556 (372 - 807)
Australia	1990	1,709,729 (1,701,082 - 1,715,184)	1,361,353 (1,353,902 - 1,367,308)	93,269 (92,605 - 93,828)	19.1 (19.0 - 19.2)	91,069 (60,531 - 132,170)	567 (377 - 822)
Australia	2013	2,390,187 (2,376,327 - 2,400,388)	1,749,619 (1,731,914 - 1,761,875)	112,916 (111,912 - 113,670)	18.9 (18.8 - 19.0)	117,663 (78,980 - 170,545)	560 (375 - 811)
New Zealand	1990	331,428 (328,419 - 332,927)	258,161 (254,807 - 259,888)	17,555 (17,248 - 17,761)	18.4 (18.2 - 18.5)	17,285 (11,555 - 25,145)	539 (361 - 786)
New Zealand	2013	441,857 (437,875 - 444,006)	317,635 (314,349 - 320,257)	20,419 (20,125 - 20,655)	18.2 (18.0 - 18.3)	21,431 (14,308 - 31,140)	534 (355 - 777)
Western Europe	1990	38,670,349 (38,534,657 - 38,765,225)	28,256,886 (28,077,515 - 28,403,568)	1,838,612 (1,828,621 - 1,846,945)	19.2 (19.2 - 19.3)	1,899,010 (1,263,821 - 2,753,933)	565 (376 - 819)
Western Europe	2013	43,617,260 (43,488,873 - 43,709,623)	29,626,465 (29,411,043 - 29,781,579)	1,854,600 (1,843,600 - 1,865,784)	19.0 (18.9 - 19.0)	2,009,946 (1,339,892 - 2,910,262)	557 (370 - 808)
Andorra	1990	5,008 (4,974 - 5,036)	3,652 (3,591 - 3,691)	237 (232 - 241)	19.0 (18.8 - 19.2)	248 (165 - 361)	562 (373 - 817)
Andorra	2013	8,068 (8,015 - 8,113)	5,496 (5,407 - 5,565)	343 (335 - 350)	19.0 (18.8 - 19.1)	374 (249 - 542)	558 (372 - 812)
Austria	1990	775,909 (770,768 - 780,346)	559,568 (540,695 - 567,032)	35,918 (35,139 - 36,379)	19.2 (18.8 - 19.4)	37,903 (25,470 - 54,761)	567 (378 - 825)
Austria	2013	873,442 (868,018 - 878,071)	578,470 (565,046 - 586,512)	35,049 (34,264 - 36,199)	19.1 (18.8 - 19.2)	39,986 (26,376 - 57,760)	566 (374 - 824)
Belgium	1990	1,008,874 (1,003,858 - 1,012,884)	733,041 (723,752 - 739,869)	47,448 (46,907 - 48,003)	19.3 (19.1 - 19.3)	49,612 (33,129 - 71,782)	569 (379 - 822)
Belgium	2013	1,145,620 (1,137,735 - 1,151,455)	787,691 (775,478 - 799,297)	49,670 (48,941 - 50,502)	19.1 (18.9 - 19.2)	53,979 (36,261 - 77,831)	564 (377 - 818)
Cyprus	1990	68,928 (68,703 - 69,131)	58,164 (57,928 - 58,433)	4,102 (4,054 - 4,129)	19.6 (19.5 - 19.7)	3,899 (2,592 - 5,653)	581 (387 - 843)
Cyprus	2013	88,347 (88,008 - 88,737)	62,004 (61,584 - 62,475)	3,925 (3,881 - 3,948)	19.3 (19.3 - 19.4)	4,210 (2,800 - 6,125)	576 (385 - 834)
Denmark	1990	521,946 (518,967 - 524,426)	368,827 (363,100 - 372,639)	23,169 (22,777 - 23,500)	19.1 (19.0 - 19.3)	25,018 (16,667 - 36,205)	565 (377 - 819)
Denmark	2013	573,906 (569,462 - 577,531)	401,396 (392,597 - 408,377)	25,660 (25,008 - 26,320)	19.0 (18.8 - 19.2)	27,406 (18,278 - 39,864)	560 (373 - 816)
Finland	1990	422,768 (420,392 - 424,337)	309,725 (307,557 - 311,939)	20,516 (20,312 - 20,610)	16.4 (16.3 - 16.4)	21,197 (14,075 - 30,675)	485 (322 - 702)
Finland	2013	469,421 (466,755 - 471,752)	308,720 (305,628 - 311,903)	19,244 (19,021 - 19,414)	16.2 (16.2 - 16.3)	21,918 (14,629 - 31,293)	486 (324 - 701)
France	1990	5,446,713 (5,420,329 - 5,469,123)	4,038,904 (4,006,476 - 4,068,178)	268,622 (264,941 - 271,054)	18.1 (18.0 - 18.2)	275,595 (183,750 - 400,622)	535 (357 - 777)
France	2013	6,149,029 (6,115,642 - 6,187,176)	4,334,285 (4,296,791 - 4,374,898)	282,672 (279,239 - 285,404)	17.8 (17.8 - 17.9)	300,654 (200,463 - 434,060)	529 (352 - 767)
Germany	1990	8,190,916 (8,105,535 - 8,237,748)	5,718,198 (5,563,672 - 5,817,113)	355,307 (349,188 - 360,102)	19.6 (19.4 - 19.8)	384,268 (257,243 - 552,774)	577 (384 - 835)
Germany	2013	8,609,962 (8,535,625 - 8,652,726)	5,548,520 (5,360,260 - 5,661,568)	332,078 (325,858 - 339,195)	19.3 (19.1 - 19.5)	377,944 (253,049 - 547,207)	568 (379 - 827)
Greece	1990	1,085,146 (1,080,733 - 1,089,070)	815,481 (810,579 - 820,038)	55,724 (55,106 - 56,090)	20.3 (20.2 - 20.3)	55,259 (36,846 - 80,620)	598 (399 - 871)
Greece	2013	1,178,250 (1,172,550 - 1,183,670)	784,347 (776,486 - 792,957)	49,196 (48,561 - 49,685)	19.6 (19.5 - 19.7)	54,047 (36,108 - 78,184)	580 (386 - 844)
Iceland	1990	26,000 (25,805 - 26,118)	21,318 (21,157 - 21,439)	1,477 (1,457 - 1,494)	19.3 (19.2 - 19.4)	1,426 (949 - 2,072)	568 (378 - 825)
Iceland	2013	32,453 (32,135 - 32,611)	24,072 (23,774 - 24,294)	1,585 (1,559 - 1,604)	19.2 (19.0 - 19.3)	1,623 (1,081 - 2,363)	563 (374 - 821)
Ireland	1990	357,860 (354,681 - 359,847)	308,757 (301,861 - 312,184)	22,274 (22,016 - 22,480)	19.3 (19.0 - 19.4)	20,729 (13,808 - 29,941)	567 (377 - 820)
Ireland	2013	464,893 (459,807 - 468,105)	352,789 (344,709 - 359,080)	23,470 (23,103 - 23,849)	19.1 (18.8 - 19.3)	23,863 (15,817 - 34,378)	562 (373 - 812)
Israel	1990	460,983 (456,628 - 463,697)	414,550 (408,284 - 418,180)	30,201 (29,665 - 30,502)	19.3 (19.1 - 19.4)	27,897 (18,509 - 40,388)	572 (379 - 828)
Israel	2013	792,320 (785,565 - 796,197)	667,230 (658,637 - 672,575)	46,780 (46,126 - 47,273)	19.2 (19.0 - 19.3)	44,962 (29,943 - 65,326)	568 (378 - 824)
Italy	1990	5,688,383 (5,667,987 - 5,707,594)	4,064,799 (4,040,573 - 4,085,987)	265,029 (262,547 - 266,547)	19.2 (19.1 - 19.2)	269,714 (178,835 - 393,642)	559 (371 - 813)
Italy	2013	6,371,104 (6,347,847 - 6,397,764)	4,189,152 (4,155,311 - 4,225,955)	260,732 (257,915 - 263,680)	19.1 (19.0 - 19.1)	278,730 (186,480 - 404,043)	555 (369 - 806)
Luxembourg	1990	38,242 (37,991 - 38,435)	27,198 (26,628 - 27,574)	1,698 (1,656 - 1,733)	19.1 (18.9 - 19.3)	1,836 (1,230 - 2,678)	565 (378 - 824)
Luxembourg	2013	54,262 (53,922 - 54,536)	37,893 (36,874 - 38,503)	2,407 (2,354 - 2,458)	19.0 (18.7 - 19.1)	2,579 (1,726 - 3,729)	558 (373 - 803)
Malta	1990	38,246 (37,968 - 38,430)	31,355 (30,837 - 31,650)	2,167 (2,127 - 2,196)	19.4 (19.2 - 19.6)	2,102 (1,404 - 3,052)	573 (383 - 831)
Malta	2013	43,140 (42,890 - 43,333)	28,582 (27,817 - 28,971)	1,793 (1,754 - 1,822)	19.1 (18.8 - 19.2)	1,943 (1,294 - 2,833)	560 (374 - 815)
Netherlands	1990	1,529,951 (1,521,890 - 1,536,317)	1,114,297 (1,100,700 - 1,122,319)	70,714 (69,683 - 71,692)	19.5 (19.4 - 19.6)	74,916 (49,412 - 107,892)	575 (381 - 831)
Netherlands	2013	1,740,514 (1,730,312 - 1,748,714)	1,227,307 (1,211,040 - 1,240,101)	78,226 (76,872 - 79,769)	19.3 (19.1 - 19.3)	83,919 (56,241 - 122,531)	569 (378 - 832)
Norway	1990	430,120 (428,264 - 431,833)	313,464 (311,418 - 315,034)	20,262 (20,024 - 20,555)	19.1 (19.0 - 19.1)	20,571 (13,567 - 30,052)	551 (365 - 802)

Norway	2013	513,713 (511,282 - 516,180)	365,384 (362,108 - 367,797)	23,378 (23,057 - 23,799)	18.9 (18.8 - 19.0)	24,095 (16,061 - 35,127)	547 (363 - 796)
Portugal	1990	993,415 (985,720 - 999,092)	773,643 (764,334 - 780,290)	52,929 (52,228 - 53,475)	19.1 (18.9 - 19.2)	52,224 (35,027 - 75,874)	565 (378 - 822)
Portugal	2013	1,075,657 (1,070,002 - 1,080,675)	730,302 (720,015 - 738,614)	45,663 (45,055 - 46,351)	18.9 (18.8 - 19.0)	50,043 (33,426 - 72,050)	559 (372 - 808)
Spain	1990	4,035,921 (3,994,779 - 4,065,168)	3,089,178 (3,026,436 - 3,116,425)	206,268 (203,728 - 209,216)	19.8 (19.6 - 19.9)	203,696 (135,973 - 296,868)	572 (382 - 834)
Spain	2013	4,966,008 (4,931,761 - 4,990,857)	3,320,990 (3,257,996 - 3,351,095)	200,650 (197,343 - 208,226)	19.4 (19.3 - 19.5)	218,518 (144,996 - 318,758)	560 (372 - 814)
Sweden	1990	879,252 (873,219 - 884,004)	625,993 (616,077 - 632,559)	39,487 (38,765 - 40,067)	19.2 (18.9 - 19.3)	42,451 (28,327 - 61,747)	565 (376 - 822)
Sweden	2013	988,924 (983,341 - 993,399)	678,255 (665,305 - 686,980)	42,389 (41,459 - 43,177)	19.1 (18.9 - 19.2)	46,150 (30,705 - 66,264)	560 (374 - 810)
Switzerland	1990	679,202 (675,785 - 682,501)	479,171 (471,960 - 484,887)	30,468 (30,067 - 30,869)	19.1 (19.0 - 19.3)	32,262 (21,634 - 46,738)	562 (376 - 813)
Switzerland	2013	827,037 (822,002 - 830,784)	549,874 (537,935 - 557,749)	33,832 (33,212 - 34,515)	19.1 (19.0 - 19.2)	37,132 (24,835 - 54,091)	559 (372 - 812)
United Kingdom	1990	5,942,606 (5,915,434 - 5,959,707)	4,355,888 (4,303,300 - 4,385,568)	282,542 (278,553 - 285,102)	19.5 (19.3 - 19.6)	294,055 (195,066 - 428,499)	575 (382 - 839)
United Kingdom	2013	6,600,939 (6,578,110 - 6,617,572)	4,609,475 (4,555,018 - 4,641,020)	293,693 (289,577 - 296,511)	19.3 (19.1 - 19.3)	313,552 (208,817 - 454,453)	567 (376 - 825)
Southern Latin America	1990	3,920,505 (3,904,421 - 3,935,320)	3,946,360 (3,923,309 - 3,966,101)	278,788 (276,533 - 280,445)	16.1 (16.0 - 16.2)	263,987 (176,117 - 383,023)	511 (340 - 740)
Southern Latin America	2013	4,754,530 (4,737,246 - 4,770,057)	4,398,909 (4,373,375 - 4,422,755)	291,655 (289,430 - 293,267)	15.5 (15.5 - 15.6)	296,152 (196,583 - 428,936)	494 (328 - 715)
Argentina	1990	2,699,171 (2,684,876 - 2,710,756)	2,748,168 (2,727,745 - 2,765,133)	196,378 (194,273 - 197,824)	16.6 (16.6 - 16.7)	183,920 (122,972 - 267,204)	529 (353 - 767)
Argentina	2013	3,280,959 (3,267,156 - 3,293,740)	3,084,842 (3,061,250 - 3,105,566)	206,652 (204,629 - 208,110)	16.1 (16.0 - 16.2)	207,184 (137,532 - 299,800)	512 (340 - 741)
Chile	1990	956,555 (951,334 - 960,712)	944,790 (938,749 - 950,246)	64,919 (64,138 - 65,635)	14.4 (14.3 - 14.5)	63,093 (41,875 - 91,367)	456 (303 - 661)
Chile	2013	1,191,308 (1,185,285 - 1,196,299)	1,058,261 (1,048,365 - 1,066,615)	68,084 (67,297 - 68,715)	14.0 (13.9 - 14.0)	71,628 (47,818 - 104,466)	444 (296 - 647)
Uruguay	1990	264,625 (263,378 - 265,661)	253,266 (251,488 - 254,796)	17,482 (17,308 - 17,588)	17.2 (17.1 - 17.3)	16,965 (11,293 - 24,547)	545 (363 - 789)
Uruguay	2013	282,034 (280,766 - 283,104)	255,616 (253,109 - 257,434)	16,906 (16,658 - 17,067)	16.7 (16.6 - 16.7)	17,327 (11,620 - 25,140)	531 (356 - 772)
High-income North America	1990	24,609,564 (24,557,839 - 24,657,768)	18,872,081 (18,805,540 - 18,940,056)	1,259,780 (1,249,109 - 1,264,667)	16.8 (16.8 - 16.8)	1,268,468 (844,332 - 1,848,492)	495 (330 - 719)
High-income North America	2013	31,552,419 (31,483,374 - 31,616,433)	22,813,332 (22,697,818 - 22,911,283)	1,488,581 (1,479,730 - 1,496,457)	16.8 (16.7 - 16.8)	1,559,840 (1,041,759 - 2,254,252)	496 (330 - 718)
Canada	1990	1,951,937 (1,942,569 - 1,961,961)	1,627,597 (1,616,899 - 1,636,032)	104,435 (103,172 - 105,726)	14.4 (14.3 - 14.4)	110,474 (73,706 - 159,332)	446 (298 - 645)
Canada	2013	2,463,158 (2,450,918 - 2,473,180)	1,808,410 (1,796,167 - 1,822,467)	108,130 (107,346 - 108,814)	14.3 (14.2 - 14.3)	124,874 (83,611 - 181,029)	442 (295 - 641)
United States	1990	22,652,315 (22,601,377 - 22,700,375)	17,240,356 (17,175,082 - 17,306,760)	1,155,067 (1,144,355 - 1,159,516)	17.1 (17.0 - 17.1)	1,157,718 (770,573 - 1,687,741)	501 (333 - 728)
United States	2013	29,083,602 (29,014,430 - 29,151,338)	21,000,827 (20,884,770 - 21,101,540)	1,380,184 (1,371,228 - 1,388,057)	17.1 (17.0 - 17.1)	1,434,687 (957,548 - 2,074,547)	502 (334 - 726)
Latin America and Caribbean	1990	42,911,725 (42,703,992 - 43,042,155)	46,100,041 (45,769,852 - 46,280,907)	3,675,445 (3,639,955 - 3,695,871)	21.8 (21.7 - 21.9)	3,127,640 (2,091,548 - 4,519,422)	701 (470 - 1,012)
Latin America and Caribbean	2013	52,639,465 (52,420,319 - 52,828,336)	51,116,185 (50,794,607 - 51,368,106)	3,746,593 (3,707,985 - 3,770,656)	19.3 (19.2 - 19.4)	3,505,008 (2,339,161 - 5,053,678)	623 (417 - 897)
Caribbean	1990	5,938,744 (5,930,111 - 5,947,202)	6,199,108 (6,190,005 - 6,207,389)	571,155 (567,476 - 574,110)	34.7 (34.7 - 34.8)	428,480 (286,814 - 616,317)	1,134 (761 - 1,629)
Caribbean	2013	6,898,142 (6,887,287 - 6,908,127)	6,554,902 (6,545,172 - 6,563,892)	554,742 (550,744 - 557,840)	31.6 (31.6 - 31.7)	452,787 (302,763 - 652,170)	1,020 (682 - 1,469)
Antigua and Barbuda	1990	8,801 (8,774 - 8,822)	8,338 (8,311 - 8,358)	647 (635 - 653)	28.8 (28.7 - 28.8)	568 (379 - 820)	899 (600 - 1,298)
Antigua and Barbuda	2013	12,588 (12,551 - 12,615)	11,302 (11,270 - 11,328)	844 (834 - 852)	27.8 (27.7 - 27.8)	772 (514 - 1,113)	869 (579 - 1,252)
The Bahamas	1990	35,390 (35,308 - 35,465)	34,566 (34,477 - 34,657)	2,732 (2,609 - 2,771)	27.5 (27.5 - 27.6)	2,379 (1,589 - 3,435)	869 (581 - 1,252)
The Bahamas	2013	51,234 (50,995 - 51,436)	42,757 (42,582 - 42,900)	3,116 (3,027 - 3,175)	26.8 (26.7 - 26.9)	2,973 (1,995 - 4,283)	846 (568 - 1,215)
Barbados	1990	37,580 (37,452 - 37,669)	33,393 (33,295 - 33,475)	2,507 (2,451 - 2,530)	28.8 (28.7 - 28.9)	2,283 (1,524 - 3,313)	905 (604 - 1,311)
Barbados	2013	39,705 (39,538 - 39,846)	32,022 (31,926 - 32,102)	2,270 (2,246 - 2,293)	27.3 (27.2 - 27.3)	2,220 (1,490 - 3,208)	854 (573 - 1,234)
Belize	1990	29,056 (28,997 - 29,125)	31,805 (31,739 - 31,863)	2,681 (2,661 - 2,696)	31.1 (31.0 - 31.2)	2,151 (1,440 - 3,114)	968 (649 - 1,397)
Belize	2013	47,786 (47,654 - 47,886)	47,725 (47,621 - 47,822)	3,827 (3,797 - 3,856)	29.1 (29.1 - 29.2)	3,240 (2,153 - 4,701)	907 (605 - 1,316)
Cuba	1990	1,580,506 (1,575,875 - 1,584,728)	1,351,668 (1,347,509 - 1,354,773)	100,671 (99,423 - 101,449)	29.3 (29.3 - 29.4)	92,271 (61,656 - 133,328)	913 (611 - 1,316)
Cuba	2013	1,591,646 (1,586,202 - 1,596,587)	1,238,238 (1,234,912 - 1,241,316)	86,748 (85,820 - 87,369)	27.4 (27.3 - 27.4)	85,599 (57,173 - 123,985)	851 (568 - 1,231)
Dominica	1990	9,213 (9,191 - 9,233)	8,902 (8,880 - 8,925)	686 (665 - 694)	26.7 (26.7 - 26.8)	608 (408 - 878)	835 (562 - 1,202)
Dominica	2013	9,288 (9,264 - 9,307)	8,293 (8,273 - 8,315)	621 (608 - 631)	26.1 (26.0 - 26.2)	571 (381 - 825)	816 (545 - 1,180)
Dominican Republic	1990	1,135,834 (1,133,055 - 1,138,217)	1,182,298 (1,179,555 - 1,184,695)	99,622 (97,419 - 100,470)	31.8 (31.7 - 31.8)	80,804 (53,893 - 116,682)	995 (664 - 1,436)
Dominican Republic	2013	1,472,016 (1,467,697 - 1,475,047)	1,390,020 (1,386,328 - 1,392,821)	109,278 (107,493 - 110,609)	28.1 (28.0 - 28.1)	95,552 (64,103 - 137,474)	880 (591 - 1,262)
Grenada	1990	16,629 (16,603 - 16,656)	16,634 (16,599 - 16,668)	1,407 (1,377 - 1,421)	34.5 (34.4 - 34.5)	1,136 (761 - 1,636)	1,067 (719 - 1,535)
Grenada	2013	17,196 (17,154 - 17,233)	14,880 (14,843 - 14,919)	1,175 (1,151 - 1,195)	31.5 (31.5 - 31.6)	1,029 (688 - 1,483)	973 (652 - 1,401)

Guyana	1990	137,840 (137,542 - 138,228)	148,006 (147,622 - 148,295)	14,215 (14,113 - 14,270)	41.7 (41.6 - 41.8)	10,188 (6,819 - 14,673)	1,363 (913 - 1,961)
Guyana	2013	128,156 (127,850 - 128,406)	138,191 (137,941 - 138,417)	12,339 (12,262 - 12,405)	34.4 (34.3 - 34.5)	9,442 (6,299 - 13,623)	1,099 (737 - 1,583)
Haiti	1990	1,483,355 (1,480,691 - 1,487,982)	1,918,393 (1,913,567 - 1,921,500)	218,620 (216,488 - 219,994)	50.2 (50.1 - 50.3)	135,177 (90,781 - 193,914)	1,763 (1,187 - 2,518)
Haiti	2013	1,963,466 (1,959,492 - 1,966,763)	2,236,910 (2,232,900 - 2,240,651)	224,121 (222,203 - 225,825)	42.6 (42.5 - 42.7)	155,140 (104,085 - 223,089)	1,436 (966 - 2,062)
Jamaica	1990	361,467 (360,654 - 362,250)	366,215 (365,312 - 366,991)	30,142 (29,291 - 30,505)	30.4 (30.3 - 30.4)	25,078 (16,778 - 36,211)	959 (643 - 1,381)
Jamaica	2013	398,738 (397,364 - 399,653)	366,061 (364,952 - 367,002)	28,342 (27,418 - 28,753)	28.3 (28.2 - 28.4)	25,112 (16,755 - 36,200)	888 (592 - 1,280)
Saint Lucia	1990	21,558 (21,516 - 21,604)	22,037 (21,984 - 22,079)	1,805 (1,770 - 1,820)	30.9 (30.8 - 30.9)	1,490 (994 - 2,143)	960 (643 - 1,379)
Saint Lucia	2013	26,365 (26,273 - 26,432)	23,133 (23,068 - 23,188)	1,743 (1,717 - 1,760)	28.5 (28.4 - 28.6)	1,588 (1,058 - 2,293)	892 (595 - 1,287)
Saint Vincent and the Grenadines	1990	16,737 (16,699 - 16,769)	17,616 (17,572 - 17,646)	1,492 (1,472 - 1,503)	31.9 (31.8 - 32.0)	1,198 (801 - 1,730)	999 (669 - 1,442)
Saint Vincent and the Grenadines	2013	15,521 (15,472 - 15,558)	13,796 (13,758 - 13,829)	1,045 (1,034 - 1,054)	28.1 (28.0 - 28.1)	947 (631 - 1,370)	876 (584 - 1,267)
Suriname	1990	70,034 (69,862 - 70,227)	69,801 (69,623 - 69,936)	6,012 (5,939 - 6,047)	35.3 (35.2 - 35.4)	4,758 (3,186 - 6,873)	1,106 (742 - 1,593)
Suriname	2013	83,795 (83,570 - 83,966)	77,382 (77,198 - 77,533)	6,168 (6,117 - 6,217)	31.1 (31.1 - 31.2)	5,294 (3,536 - 7,630)	974 (651 - 1,403)
Trinidad and Tobago	1990	179,140 (178,598 - 179,615)	178,902 (178,429 - 179,314)	14,435 (14,224 - 14,598)	29.4 (29.3 - 29.5)	12,211 (8,188 - 17,703)	920 (616 - 1,329)
Trinidad and Tobago	2013	185,962 (185,229 - 186,561)	154,639 (154,109 - 155,101)	11,088 (10,936 - 11,200)	27.3 (27.2 - 27.4)	10,642 (7,112 - 15,404)	854 (571 - 1,235)
Andean Latin America	1990	4,618,222 (4,607,097 - 4,628,421)	5,687,410 (5,676,194 - 5,696,378)	483,781 (482,404 - 484,914)	25.0 (25.0 - 25.1)	384,622 (256,395 - 553,457)	847 (568 - 1,219)
Andean Latin America	2013	5,883,485 (5,863,267 - 5,900,842)	6,670,009 (6,636,303 - 6,690,541)	518,491 (513,063 - 521,656)	22.2 (22.1 - 22.2)	454,301 (302,822 - 656,720)	758 (506 - 1,094)
Bolivia	1990	893,010 (890,879 - 895,767)	1,265,211 (1,262,004 - 1,267,326)	128,881 (128,510 - 129,268)	29.5 (29.4 - 29.6)	87,714 (58,901 - 125,541)	1,065 (716 - 1,526)
Bolivia	2013	1,236,047 (1,230,900 - 1,239,722)	1,630,994 (1,623,937 - 1,635,127)	149,088 (148,065 - 149,725)	26.1 (26.0 - 26.2)	111,723 (74,543 - 160,626)	932 (623 - 1,340)
Ecuador	1990	1,294,061 (1,290,173 - 1,298,533)	1,580,851 (1,576,638 - 1,584,138)	134,546 (133,746 - 135,111)	27.0 (26.9 - 27.1)	106,915 (71,329 - 154,214)	913 (609 - 1,317)
Ecuador	2013	1,702,894 (1,697,887 - 1,707,958)	1,904,618 (1,899,350 - 1,909,751)	146,145 (145,490 - 146,684)	23.1 (23.0 - 23.1)	129,585 (86,485 - 187,389)	784 (525 - 1,132)
Peru	1990	2,431,152 (2,423,304 - 2,439,481)	2,841,347 (2,832,693 - 2,848,154)	220,354 (219,301 - 221,087)	22.7 (22.6 - 22.7)	189,994 (126,657 - 273,267)	746 (500 - 1,073)
Peru	2013	2,944,544 (2,930,083 - 2,957,754)	3,134,397 (3,109,727 - 3,151,404)	223,258 (218,806 - 225,869)	20.3 (20.2 - 20.4)	212,993 (142,665 - 308,811)	678 (455 - 980)
Central Latin America	1990	19,133,876 (19,069,419 - 19,182,094)	20,220,047 (20,136,035 - 20,274,141)	1,621,519 (1,614,034 - 1,626,667)	22.8 (22.7 - 22.9)	1,367,224 (913,632 - 1,977,547)	715 (478 - 1,031)
Central Latin America	2013	24,431,030 (24,247,487 - 24,535,719)	23,343,422 (23,140,958 - 23,495,804)	1,726,159 (1,712,911 - 1,737,200)	19.7 (19.6 - 19.8)	1,595,451 (1,064,379 - 2,312,758)	624 (418 - 903)
Colombia	1990	3,713,051 (3,669,732 - 3,741,897)	3,782,072 (3,720,336 - 3,812,499)	290,577 (285,438 - 293,554)	22.1 (21.9 - 22.3)	254,852 (170,136 - 368,140)	686 (460 - 990)
Colombia	2013	4,778,030 (4,598,648 - 4,847,796)	4,379,710 (4,187,494 - 4,485,974)	310,934 (298,436 - 319,573)	19.5 (18.8 - 19.9)	298,208 (198,855 - 434,377)	609 (407 - 885)
Costa Rica	1990	289,563 (286,782 - 290,629)	291,916 (288,185 - 293,958)	21,676 (21,469 - 21,772)	18.3 (18.2 - 18.4)	19,731 (13,202 - 28,584)	573 (385 - 829)
Costa Rica	2013	435,201 (432,308 - 436,809)	381,094 (375,753 - 384,758)	26,213 (25,974 - 26,359)	17.8 (17.6 - 17.9)	26,348 (17,555 - 38,151)	564 (376 - 815)
El Salvador	1990	744,093 (742,062 - 746,519)	923,800 (920,937 - 925,585)	88,098 (87,790 - 88,363)	32.2 (32.1 - 32.3)	62,960 (42,259 - 90,530)	1,096 (737 - 1,572)
El Salvador	2013	824,626 (822,331 - 826,709)	942,974 (940,651 - 945,314)	82,966 (82,660 - 83,222)	29.2 (29.1 - 29.3)	64,118 (42,957 - 91,816)	996 (667 - 1,424)
Guatemala	1990	1,670,040 (1,666,664 - 1,673,715)	1,864,783 (1,859,822 - 1,867,471)	179,425 (178,977 - 180,207)	41.3 (41.2 - 41.4)	126,580 (84,961 - 182,418)	1,290 (870 - 1,851)
Guatemala	2013	2,544,893 (2,536,366 - 2,550,015)	2,675,208 (2,666,191 - 2,680,102)	234,427 (233,420 - 235,173)	34.6 (34.4 - 34.7)	181,313 (121,048 - 261,515)	1,072 (721 - 1,542)
Honduras	1990	763,829 (762,151 - 765,249)	801,054 (799,228 - 802,408)	67,389 (67,099 - 67,621)	31.1 (31.0 - 31.2)	54,009 (36,089 - 78,086)	932 (625 - 1,345)
Honduras	2013	1,020,981 (1,014,010 - 1,026,065)	957,860 (945,858 - 967,266)	73,529 (72,564 - 74,263)	24.2 (24.0 - 24.3)	64,929 (43,407 - 93,886)	725 (486 - 1,047)
Mexico	1990	9,570,894 (9,545,210 - 9,588,308)	10,135,055 (10,094,687 - 10,155,407)	791,597 (786,607 - 794,170)	22.3 (22.2 - 22.3)	685,402 (457,590 - 991,449)	700 (467 - 1,011)
Mexico	2013	11,604,867 (11,568,413 - 11,630,086)	11,113,281 (11,057,118 - 11,144,276)	792,756 (786,663 - 796,012)	18.9 (18.8 - 19.0)	760,374 (507,699 - 1,100,585)	602 (402 - 870)
Nicaragua	1990	475,634 (474,117 - 476,891)	519,756 (517,456 - 522,036)	41,348 (41,179 - 41,518)	22.1 (22.0 - 22.1)	34,472 (23,236 - 49,796)	648 (438 - 924)
Nicaragua	2013	598,185 (593,360 - 603,624)	567,862 (560,866 - 574,178)	41,604 (41,121 - 42,084)	19.0 (18.8 - 19.2)	38,586 (25,875 - 55,617)	583 (391 - 838)
Panama	1990	262,495 (261,007 - 263,725)	265,242 (263,284 - 266,765)	20,157 (20,026 - 20,260)	20.8 (20.6 - 20.8)	17,890 (11,976 - 25,857)	644 (431 - 929)
Panama	2013	382,762 (375,082 - 387,234)	351,468 (342,913 - 358,387)	25,226 (24,596 - 25,721)	19.4 (19.0 - 19.7)	24,052 (16,055 - 34,857)	606 (405 - 877)
Venezuela	1990	1,644,277 (1,614,671 - 1,672,559)	1,636,367 (1,610,063 - 1,670,614)	121,253 (119,183 - 123,408)	15.3 (15.1 - 15.5)	111,327 (74,797 - 162,257)	471 (316 - 682)
Venezuela	2013	2,241,486 (2,181,356 - 2,281,629)	1,973,965 (1,910,589 - 2,046,598)	138,504 (134,515 - 143,372)	14.0 (13.6 - 14.4)	137,524 (91,348 - 198,872)	436 (290 - 631)
Tropical Latin America	1990	13,220,883 (13,034,569 - 13,327,194)	13,993,477 (13,729,045 - 14,152,340)	998,991 (967,631 - 1,017,564)	16.9 (16.7 - 17.0)	947,314 (631,365 - 1,374,494)	544 (363 - 787)
Tropical Latin America	2013	15,426,809 (15,284,747 - 15,544,259)	14,547,852 (14,310,424 - 14,696,683)	947,201 (918,883 - 962,969)	15.3 (15.1 - 15.4)	1,002,468 (669,698 - 1,442,087)	496 (332 - 713)
Brazil	1990	12,861,292 (12,676,605 - 12,966,255)	13,595,548 (13,334,661 - 13,751,878)	970,135 (939,161 - 988,576)	16.9 (16.7 - 17.1)	920,494 (613,647 - 1,335,499)	545 (364 - 788)

Brazil	2013	14,889,578 (14,749,941 - 15,006,240)	13,998,035 (13,770,276 - 14,145,407)	908,913 (882,333 - 924,269)	15.2 (15.1 - 15.4)	965,059 (644,703 - 1,387,392)	496 (331 - 712)
Paraguay	1990	359,591 (355,009 - 361,717)	397,929 (389,362 - 401,290)	28,855 (27,956 - 29,279)	15.9 (15.7 - 16.0)	26,820 (17,851 - 38,992)	518 (346 - 751)
Paraguay	2013	537,231 (532,612 - 539,397)	549,817 (535,858 - 555,115)	38,288 (36,648 - 38,975)	15.5 (15.3 - 15.6)	37,409 (24,973 - 54,217)	503 (335 - 729)
North Africa and Middle East	1990	50,945,835 (50,878,768 - 51,004,122)	56,166,967 (56,096,039 - 56,222,509)	4,957,999 (4,947,922 - 4,968,631)	32.8 (32.7 - 32.8)	3,766,789 (2,515,159 - 5,440,566)	1,010 (676 - 1,456)
North Africa and Middle East	2013	71,231,001 (71,135,177 - 71,317,287)	68,788,986 (68,701,153 - 68,866,186)	5,584,632 (5,571,568 - 5,596,303)	28.4 (28.3 - 28.4)	4,594,913 (3,055,767 - 6,646,118)	872 (581 - 1,261)
North Africa and Middle East	1990	50,945,835 (50,878,768 - 51,004,122)	56,166,967 (56,096,039 - 56,222,509)	4,957,999 (4,947,922 - 4,968,631)	32.8 (32.7 - 32.8)	3,766,789 (2,515,159 - 5,440,566)	1,010 (676 - 1,456)
North Africa and Middle East	2013	71,231,001 (71,135,177 - 71,317,287)	68,788,986 (68,701,153 - 68,866,186)	5,584,632 (5,571,568 - 5,596,303)	28.4 (28.3 - 28.4)	4,594,913 (3,055,767 - 6,646,118)	872 (581 - 1,261)
Algeria	1990	3,816,843 (3,809,789 - 3,825,362)	4,228,533 (4,219,189 - 4,234,590)	353,816 (352,357 - 355,173)	29.7 (29.6 - 29.7)	281,566 (188,123 - 407,568)	898 (600 - 1,299)
Algeria	2013	5,157,278 (5,147,598 - 5,166,450)	4,642,047 (4,631,397 - 4,651,334)	335,432 (333,484 - 337,343)	25.9 (25.9 - 26.0)	306,735 (203,505 - 446,708)	783 (521 - 1,138)
Bahrain	1990	73,812 (73,669 - 73,963)	76,561 (76,350 - 76,788)	6,998 (6,773 - 7,103)	31.8 (31.8 - 31.9)	5,253 (3,531 - 7,578)	1,027 (691 - 1,477)
Bahrain	2013	175,858 (175,462 - 176,234)	160,552 (160,125 - 160,949)	14,117 (13,631 - 14,348)	28.9 (28.8 - 28.9)	11,086 (7,442 - 15,913)	929 (624 - 1,330)
Egypt	1990	8,860,824 (8,842,398 - 8,886,812)	9,673,875 (9,642,458 - 9,690,365)	831,695 (827,830 - 838,031)	32.9 (32.8 - 33.0)	645,816 (431,452 - 932,099)	1,026 (687 - 1,480)
Egypt	2013	11,609,429 (11,583,596 - 11,630,385)	11,597,127 (11,572,394 - 11,617,718)	918,878 (915,095 - 922,202)	29.0 (28.9 - 29.0)	769,570 (512,865 - 1,113,636)	898 (599 - 1,297)
Iran	1990	8,659,326 (8,646,339 - 8,670,243)	9,367,289 (9,353,771 - 9,378,781)	790,430 (786,307 - 793,769)	30.7 (30.7 - 30.8)	624,665 (417,629 - 904,496)	906 (604 - 1,314)
Iran	2013	9,192,375 (9,170,816 - 9,208,772)	7,544,080 (7,524,942 - 7,561,072)	516,376 (513,794 - 518,089)	23.0 (23.0 - 23.1)	497,980 (330,648 - 723,405)	677 (450 - 980)
Iraq	1990	2,712,130 (2,707,236 - 2,717,481)	3,037,040 (3,031,087 - 3,041,299)	261,174 (258,984 - 262,808)	31.8 (31.8 - 31.9)	202,819 (135,396 - 293,607)	968 (648 - 1,399)
Iraq	2013	4,973,410 (4,964,796 - 4,980,040)	5,276,367 (5,268,060 - 5,283,281)	436,710 (433,072 - 439,139)	29.9 (29.9 - 30.0)	352,033 (235,145 - 510,786)	910 (609 - 1,318)
Jordan	1990	454,606 (453,861 - 455,413)	518,841 (517,969 - 519,452)	44,187 (43,994 - 44,405)	28.0 (27.9 - 28.0)	34,539 (23,014 - 49,976)	850 (567 - 1,231)
Jordan	2013	934,577 (932,811 - 936,110)	936,352 (934,481 - 937,827)	72,428 (71,925 - 72,758)	26.1 (26.1 - 26.1)	61,909 (40,980 - 89,822)	795 (527 - 1,150)
Kuwait	1990	278,198 (277,669 - 278,786)	267,312 (266,749 - 267,779)	21,321 (21,240 - 21,398)	26.8 (26.8 - 26.9)	17,856 (11,858 - 25,872)	780 (519 - 1,133)
Kuwait	2013	409,003 (408,425 - 409,590)	324,183 (323,519 - 324,811)	23,216 (23,105 - 23,310)	23.6 (23.6 - 23.7)	21,667 (14,340 - 31,643)	681 (452 - 990)
Lebanon	1990	353,648 (352,810 - 354,420)	360,149 (359,289 - 360,856)	27,887 (27,743 - 28,032)	26.0 (26.0 - 26.1)	23,651 (15,825 - 34,189)	788 (528 - 1,138)
Lebanon	2013	606,319 (605,039 - 607,463)	524,200 (522,929 - 525,373)	37,612 (37,420 - 37,793)	25.4 (25.4 - 25.5)	34,688 (23,101 - 50,198)	774 (516 - 1,118)
Libya	1990	559,178 (558,019 - 560,515)	606,428 (605,094 - 607,379)	49,595 (48,989 - 49,926)	26.1 (26.1 - 26.2)	40,339 (26,933 - 58,502)	782 (520 - 1,132)
Libya	2013	807,051 (805,443 - 808,448)	763,064 (761,569 - 764,382)	57,471 (56,866 - 57,800)	26.0 (26.0 - 26.0)	50,613 (33,733 - 73,416)	786 (525 - 1,139)
Morocco	1990	3,798,890 (3,790,834 - 3,807,124)	4,096,148 (4,087,921 - 4,102,359)	345,906 (343,612 - 347,732)	31.7 (31.7 - 31.8)	273,141 (182,392 - 394,121)	968 (647 - 1,395)
Morocco	2013	4,665,117 (4,656,941 - 4,672,845)	4,284,234 (4,277,021 - 4,291,420)	321,134 (318,158 - 322,771)	28.2 (28.1 - 28.2)	283,184 (188,054 - 411,403)	853 (567 - 1,238)
Palestine	1990	291,065 (290,570 - 291,590)	329,286 (328,722 - 329,696)	26,900 (26,779 - 27,074)	27.6 (27.5 - 27.6)	21,810 (14,526 - 31,617)	832 (554 - 1,204)
Palestine	2013	559,741 (558,786 - 560,590)	595,905 (594,941 - 596,795)	47,279 (47,123 - 47,428)	25.8 (25.7 - 25.8)	39,503 (26,352 - 57,203)	777 (518 - 1,124)
Oman	1990	317,480 (317,015 - 317,954)	341,988 (341,454 - 342,482)	30,631 (30,306 - 30,815)	35.6 (35.5 - 35.6)	23,060 (15,350 - 33,282)	1,069 (716 - 1,539)
Oman	2013	483,640 (482,929 - 484,308)	376,985 (376,215 - 377,654)	28,268 (27,735 - 28,610)	26.7 (26.7 - 26.8)	25,477 (16,976 - 36,900)	787 (526 - 1,134)
Qatar	1990	54,928 (54,860 - 54,990)	45,657 (45,583 - 45,722)	3,416 (3,396 - 3,433)	22.4 (22.4 - 22.4)	3,054 (2,025 - 4,442)	641 (426 - 928)
Qatar	2013	210,064 (209,797 - 210,258)	125,481 (125,204 - 125,769)	8,269 (8,236 - 8,296)	20.4 (20.4 - 20.4)	8,520 (5,617 - 12,565)	584 (388 - 851)
Saudi Arabia	1990	2,554,371 (2,550,535 - 2,558,788)	2,645,914 (2,639,525 - 2,653,645)	227,771 (221,942 - 230,551)	31.8 (31.7 - 31.8)	179,059 (119,610 - 258,075)	949 (637 - 1,368)
Saudi Arabia	2013	3,688,488 (3,682,139 - 3,694,103)	3,329,648 (3,322,347 - 3,335,752)	262,500 (252,835 - 266,738)	25.5 (25.4 - 25.5)	225,632 (150,689 - 326,409)	762 (510 - 1,100)
Syria	1990	1,936,074 (1,932,880 - 1,939,296)	2,202,104 (2,198,537 - 2,204,845)	190,827 (189,704 - 192,007)	32.3 (32.2 - 32.3)	146,523 (97,797 - 211,711)	968 (648 - 1,397)
Syria	2013	2,995,763 (2,991,179 - 3,000,167)	3,032,303 (3,027,728 - 3,036,825)	241,584 (239,987 - 242,525)	27.6 (27.5 - 27.6)	200,884 (133,737 - 290,686)	828 (551 - 1,199)
Tunisia	1990	1,132,215 (1,129,883 - 1,134,557)	1,181,462 (1,179,073 - 1,183,428)	95,381 (94,563 - 96,072)	28.1 (28.0 - 28.1)	78,710 (52,406 - 113,894)	851 (567 - 1,232)
Tunisia	2013	1,384,441 (1,381,363 - 1,387,051)	1,197,197 (1,193,864 - 1,200,001)	84,370 (83,840 - 84,809)	25.0 (24.9 - 25.0)	79,327 (52,639 - 115,458)	757 (503 - 1,099)
Turkey	1990	7,995,034 (7,978,789 - 8,012,062)	8,240,304 (8,221,706 - 8,251,609)	669,135 (666,432 - 671,593)	30.1 (30.0 - 30.1)	547,122 (366,404 - 793,084)	914 (612 - 1,325)
Turkey	2013	9,395,772 (9,379,645 - 9,410,221)	8,540,660 (8,527,692 - 8,552,710)	620,104 (617,793 - 622,109)	25.1 (25.0 - 25.1)	563,057 (374,569 - 818,364)	759 (505 - 1,101)
United Arab Emirates	1990	271,903 (271,571 - 272,215)	231,790 (231,390 - 232,111)	18,775 (18,634 - 18,879)	29.5 (29.5 - 29.6)	15,603 (10,365 - 22,616)	854 (570 - 1,234)
United Arab Emirates	2013	1,155,442 (1,153,637 - 1,157,024)	758,283 (756,449 - 759,870)	51,520 (50,993 - 51,839)	25.4 (25.4 - 25.5)	51,054 (33,907 - 74,936)	738 (494 - 1,069)
Yemen	1990	2,441,119 (2,437,185 - 2,449,189)	3,198,997 (3,187,981 - 3,203,282)	346,641 (345,142 - 349,185)	49.6 (49.5 - 49.7)	220,563 (147,554 - 316,604)	1,665 (1,119 - 2,384)
Yemen	2013	5,305,270 (5,298,666 - 5,312,045)	6,366,823 (6,357,722 - 6,375,408)	699,324 (697,604 - 701,072)	50.8 (50.7 - 50.9)	442,193 (296,560 - 636,199)	1,714 (1,153 - 2,457)

South Asia	1990	250,534,908 (250,163,550 - 251,141,169)	311,017,380 (310,342,025 - 311,427,364)	37,085,993 (36,949,765 - 37,188,026)	53.6 (53.5 - 53.7)	21,931,898 (14,751,354 - 31,334,204)	1,874 (1,266 - 2,669)
South Asia	2013	283,437,230 (282,888,457 - 283,888,687)	283,419,710 (282,907,233 - 283,916,295)	24,828,082 (24,676,216 - 24,941,750)	35.8 (35.7 - 35.8)	19,207,951 (12,843,106 - 27,610,019)	1,131 (757 - 1,623)
South Asia	1990	250,534,908 (250,163,550 - 251,141,169)	311,017,380 (310,342,025 - 311,427,364)	37,085,993 (36,949,765 - 37,188,026)	53.6 (53.5 - 53.7)	21,931,898 (14,751,354 - 31,334,204)	1,874 (1,266 - 2,669)
South Asia	2013	283,437,230 (282,888,457 - 283,888,687)	283,419,710 (282,907,233 - 283,916,295)	24,828,082 (24,676,216 - 24,941,750)	35.8 (35.7 - 35.8)	19,207,951 (12,843,106 - 27,610,019)	1,131 (757 - 1,623)
Afghanistan	1990	2,685,508 (2,682,917 - 2,691,891)	3,721,216 (3,714,592 - 3,724,662)	463,670 (462,655 - 464,669)	57.4 (57.3 - 57.5)	262,727 (176,944 - 374,725)	2,051 (1,392 - 2,912)
Afghanistan	2013	6,452,643 (6,446,491 - 6,459,349)	8,288,074 (8,280,278 - 8,295,777)	926,906 (924,586 - 928,890)	51.1 (51.0 - 51.1)	575,290 (386,497 - 825,711)	1,717 (1,162 - 2,458)
Bangladesh	1990	24,912,860 (24,864,013 - 24,994,350)	34,909,928 (34,810,076 - 34,959,452)	4,782,565 (4,771,293 - 4,792,239)	60.7 (60.5 - 60.8)	2,524,040 (1,705,123 - 3,585,872)	2,254 (1,529 - 3,193)
Bangladesh	2013	29,369,954 (29,302,142 - 29,429,323)	29,449,553 (29,385,453 - 29,521,574)	2,664,553 (2,651,850 - 2,677,623)	39.3 (39.3 - 39.4)	1,994,020 (1,333,002 - 2,874,180)	1,239 (828 - 1,780)
Bhutan	1990	81,930 (81,765 - 82,125)	92,037 (91,806 - 92,181)	7,882 (7,841 - 7,911)	31.5 (31.4 - 31.5)	6,171 (4,131 - 8,925)	978 (655 - 1,411)
Bhutan	2013	76,123 (74,663 - 76,550)	74,245 (72,676 - 74,769)	5,350 (5,256 - 5,395)	20.5 (20.1 - 20.6)	4,955 (3,297 - 7,199)	642 (427 - 931)
India	1990	197,484,226 (197,146,528 - 198,074,870)	242,764,403 (242,131,840 - 243,121,156)	28,911,010 (28,772,479 - 29,006,790)	54.2 (54.1 - 54.3)	17,124,430 (11,520,720 - 24,457,190)	1,897 (1,281 - 2,699)
India	2013	215,706,218 (215,258,354 - 216,083,184)	212,827,806 (212,383,415 - 213,251,013)	18,525,569 (18,380,241 - 18,629,698)	35.7 (35.7 - 35.8)	14,440,373 (9,649,496 - 20,755,590)	1,132 (758 - 1,624)
Nepal	1990	3,787,670 (3,782,162 - 3,794,798)	4,379,261 (4,372,302 - 4,384,761)	445,528 (444,624 - 446,309)	46.5 (46.5 - 46.6)	300,038 (201,110 - 431,414)	1,505 (1,010 - 2,160)
Nepal	2013	4,671,258 (4,661,887 - 4,678,193)	4,737,408 (4,731,125 - 4,743,305)	402,863 (401,714 - 403,911)	34.4 (34.4 - 34.5)	317,721 (212,078 - 459,017)	1,047 (697 - 1,514)
Pakistan	1990	21,582,715 (21,545,993 - 21,625,073)	25,150,536 (25,107,712 - 25,184,918)	2,475,338 (2,465,720 - 2,482,502)	42.7 (42.6 - 42.8)	1,714,493 (1,148,332 - 2,469,076)	1,374 (924 - 1,971)
Pakistan	2013	27,161,034 (27,100,435 - 27,212,548)	28,042,623 (27,990,980 - 28,092,652)	2,302,840 (2,288,204 - 2,312,991)	30.7 (30.6 - 30.7)	1,875,593 (1,254,379 - 2,709,540)	955 (638 - 1,378)
Sub-Saharan Africa	1990	89,040,525 (88,898,292 - 89,127,145)	119,012,468 (118,880,038 - 119,160,980)	13,955,485 (13,868,657 - 13,999,980)	42.1 (42.0 - 42.1)	8,419,729 (5,669,257 - 11,988,879)	1,457 (986 - 2,072)
Sub-Saharan Africa	2013	147,744,661 (147,576,626 - 147,888,295)	189,575,856 (189,363,383 - 189,748,395)	20,358,244 (20,238,276 - 20,423,532)	36.3 (36.3 - 36.3)	13,256,983 (8,892,692 - 18,928,346)	1,237 (833 - 1,766)
Central Sub-Saharan Africa	1990	10,779,193 (10,748,089 - 10,795,139)	13,888,708 (13,854,074 - 13,929,190)	1,550,850 (1,528,489 - 1,561,418)	48.5 (48.4 - 48.6)	967,430 (651,239 - 1,374,681)	1,664 (1,126 - 2,358)
Central Sub-Saharan Africa	2013	19,907,992 (19,876,522 - 19,937,899)	24,830,871 (24,789,361 - 24,865,088)	2,641,819 (2,609,248 - 2,655,513)	45.1 (45.0 - 45.2)	1,724,435 (1,156,488 - 2,455,378)	1,516 (1,021 - 2,154)
Angola	1990	2,342,842 (2,330,371 - 2,350,223)	3,136,500 (3,125,469 - 3,153,169)	383,109 (378,167 - 385,877)	57.0 (56.8 - 57.2)	222,188 (149,751 - 314,625)	2,071 (1,406 - 2,920)
Angola	2013	3,892,962 (3,884,611 - 3,899,775)	4,517,405 (4,507,280 - 4,526,290)	428,234 (421,792 - 431,557)	39.9 (39.8 - 40.0)	309,072 (206,772 - 443,366)	1,297 (871 - 1,854)
Central African Republic	1990	602,129 (599,623 - 602,954)	746,986 (745,892 - 748,157)	79,602 (78,709 - 80,085)	47.8 (47.7 - 47.9)	51,489 (34,739 - 73,557)	1,614 (1,094 - 2,296)
Central African Republic	2013	964,924 (962,792 - 966,364)	1,170,966 (1,168,820 - 1,172,852)	125,967 (124,353 - 126,661)	48.2 (48.1 - 48.3)	81,348 (54,645 - 116,268)	1,644 (1,107 - 2,344)
Congo	1990	434,352 (429,520 - 436,165)	583,435 (581,747 - 585,089)	63,963 (62,817 - 64,473)	43.2 (43.0 - 43.4)	40,556 (27,250 - 57,824)	1,519 (1,026 - 2,156)
Congo	2013	778,436 (776,519 - 779,676)	1,019,582 (1,017,691 - 1,021,393)	106,941 (105,235 - 107,579)	40.4 (40.3 - 40.5)	70,627 (47,395 - 101,201)	1,414 (953 - 2,019)
Democratic Republic of the Congo	1990	7,125,941 (7,100,249 - 7,139,927)	9,081,767 (9,050,253 - 9,113,767)	985,947 (964,302 - 994,667)	46.6 (46.5 - 46.8)	629,394 (424,372 - 894,358)	1,564 (1,061 - 2,224)
Democratic Republic of the Congo	2013	13,827,331 (13,800,898 - 13,853,706)	17,594,031 (17,558,513 - 17,621,538)	1,925,321 (1,893,735 - 1,936,558)	47.0 (46.8 - 47.0)	1,226,619 (822,876 - 1,744,438)	1,586 (1,069 - 2,249)
Equatorial Guinea	1990	80,294 (80,108 - 80,475)	90,149 (89,936 - 90,462)	9,226 (9,004 - 9,329)	46.7 (46.5 - 46.8)	6,233 (4,192 - 8,928)	1,561 (1,054 - 2,229)
Equatorial Guinea	2013	117,921 (117,553 - 118,179)	127,580 (127,059 - 127,956)	10,848 (10,473 - 10,963)	31.7 (31.5 - 31.7)	8,680 (5,808 - 12,487)	1,017 (685 - 1,457)
Gabon	1990	193,634 (193,006 - 194,147)	249,871 (249,198 - 251,014)	29,003 (28,587 - 29,198)	49.5 (49.3 - 49.6)	17,570 (11,852 - 24,963)	1,770 (1,200 - 2,506)
Gabon	2013	326,418 (325,752 - 326,962)	401,307 (400,585 - 402,031)	44,507 (43,866 - 44,772)	45.9 (45.8 - 45.9)	28,088 (18,965 - 40,076)	1,609 (1,090 - 2,285)
Eastern Sub-Saharan Africa	1990	30,641,448 (30,599,833 - 30,672,076)	40,295,837 (40,250,545 - 40,336,253)	4,208,706 (4,198,469 - 4,217,786)	35.6 (35.6 - 35.7)	2,780,443 (1,865,408 - 3,982,776)	1,193 (803 - 1,704)
Eastern Sub-Saharan Africa	2013	50,127,608 (50,073,010 - 50,175,435)	63,556,994 (63,473,733 - 63,620,244)	5,942,691 (5,925,087 - 5,956,033)	29.1 (29.0 - 29.1)	4,325,199 (2,892,742 - 6,215,771)	966 (648 - 1,384)
Burundi	1990	737,078 (734,102 - 739,550)	893,311 (888,373 - 897,911)	76,514 (75,227 - 77,394)	23.7 (23.7 - 23.8)	60,007 (40,218 - 86,320)	749 (500 - 1,079)
Burundi	2013	1,415,708 (1,412,429 - 1,418,869)	1,656,302 (1,649,015 - 1,661,843)	145,249 (143,427 - 146,359)	25.9 (25.8 - 26.0)	112,389 (75,252 - 162,720)	819 (549 - 1,182)
Comoros	1990	58,955 (58,852 - 59,046)	74,905 (74,791 - 75,006)	6,818 (6,795 - 6,833)	29.5 (29.5 - 29.6)	5,074 (3,389 - 7,300)	972 (650 - 1,393)
Comoros	2013	102,740 (102,502 - 102,931)	126,316 (126,098 - 126,524)	11,199 (11,153 - 11,234)	28.5 (28.4 - 28.5)	8,553 (5,736 - 12,316)	940 (632 - 1,355)
Djibouti	1990	80,983 (80,724 - 81,211)	101,588 (101,285 - 101,798)	9,237 (9,199 - 9,276)	29.2 (29.1 - 29.3)	6,898 (4,616 - 9,930)	967 (648 - 1,389)
Djibouti	2013	131,012 (130,628 - 131,320)	146,941 (146,561 - 147,272)	13,112 (13,003 - 13,165)	31.6 (31.5 - 31.7)	10,015 (6,699 - 14,419)	1,045 (701 - 1,501)
Eritrea	1990	648,904 (647,680 - 651,459)	892,740 (888,707 - 894,101)	107,380 (107,082 - 107,709)	47.8 (47.6 - 47.9)	63,222 (42,510 - 90,233)	1,664 (1,122 - 2,366)
Eritrea	2013	1,103,451 (1,100,205 - 1,105,768)	1,403,286 (1,400,646 - 1,405,806)	145,689 (145,163 - 146,061)	39.1 (39.0 - 39.1)	96,979 (64,967 - 139,135)	1,312 (882 - 1,878)
Ethiopia	1990	8,198,619 (8,182,482 - 8,212,110)	9,965,302 (9,947,863 - 9,981,395)	1,029,149 (1,025,600 - 1,032,238)	35.4 (35.3 - 35.5)	689,633 (462,352 - 988,737)	1,124 (756 - 1,611)
Ethiopia	2013	12,346,102 (12,319,878 - 12,367,307)	14,391,355 (14,344,121 - 14,429,957)	1,279,837 (1,274,224 - 1,284,207)	25.6 (25.5 - 25.7)	976,831 (654,020 - 1,400,903)	809 (544 - 1,161)
Kenya	1990	3,467,083 (3,456,024 - 3,473,931)	4,551,630 (4,541,110 - 4,560,968)	426,300 (419,237 - 429,835)	30.7 (30.6 - 30.7)	309,491 (207,177 - 444,968)	1,013 (679 - 1,450)

Kenya	2013	5,581,201 (5,568,202 - 5,590,174)	6,823,546 (6,810,631 - 6,836,251)	573,008 (562,925 - 577,774)	25.0 (24.9 - 25.0)	460,039 (308,057 - 664,567)	825 (554 - 1,189)
Madagascar	1990	2,186,819 (2,182,248 - 2,189,586)	2,683,162 (2,680,073 - 2,687,594)	281,939 (279,683 - 283,220)	41.1 (41.1 - 41.2)	185,248 (124,458 - 264,359)	1,328 (892 - 1,896)
Madagascar	2013	4,251,782 (4,245,259 - 4,256,822)	5,060,968 (5,053,548 - 5,067,824)	519,550 (513,168 - 521,987)	40.3 (40.2 - 40.4)	349,664 (234,329 - 501,652)	1,308 (878 - 1,873)
Malawi	1990	1,556,361 (1,550,687 - 1,559,202)	2,227,168 (2,223,511 - 2,232,448)	258,813 (257,417 - 259,711)	37.3 (37.2 - 37.4)	156,410 (105,476 - 223,020)	1,295 (876 - 1,846)
Malawi	2013	2,244,952 (2,240,840 - 2,248,006)	3,128,396 (3,122,846 - 3,132,304)	317,316 (315,087 - 318,451)	29.3 (29.2 - 29.3)	215,443 (144,151 - 309,387)	1,012 (680 - 1,449)
Mauritius	1990	143,264 (143,015 - 143,500)	131,920 (131,664 - 132,172)	9,933 (9,869 - 9,991)	26.7 (26.6 - 26.7)	8,772 (5,805 - 12,699)	798 (529 - 1,154)
Mauritius	2013	122,219 (121,843 - 122,559)	99,816 (99,321 - 100,149)	6,571 (6,529 - 6,604)	19.7 (19.7 - 19.8)	6,638 (4,402 - 9,662)	595 (395 - 867)
Mozambique	1990	2,367,555 (2,358,588 - 2,375,267)	3,724,325 (3,715,669 - 3,734,240)	470,785 (469,540 - 473,237)	45.5 (45.4 - 45.6)	264,515 (178,486 - 375,085)	1,723 (1,167 - 2,426)
Mozambique	2013	3,919,072 (3,908,205 - 3,926,411)	5,824,599 (5,812,806 - 5,834,377)	621,206 (618,519 - 623,285)	36.7 (36.6 - 36.8)	400,297 (268,619 - 571,773)	1,335 (901 - 1,893)
Rwanda	1990	1,064,779 (1,061,406 - 1,066,954)	1,314,625 (1,308,033 - 1,317,672)	115,865 (115,114 - 116,345)	29.2 (29.1 - 29.3)	88,470 (58,924 - 127,375)	927 (621 - 1,335)
Rwanda	2013	1,438,223 (1,433,747 - 1,442,370)	1,660,638 (1,653,502 - 1,666,581)	132,880 (132,106 - 133,478)	23.4 (23.3 - 23.4)	111,070 (74,344 - 160,274)	744 (498 - 1,072)
Seychelles	1990	6,862 (6,843 - 6,871)	6,964 (6,950 - 6,978)	510 (506 - 513)	18.9 (18.8 - 18.9)	459 (305 - 668)	568 (377 - 825)
Seychelles	2013	8,116 (8,098 - 8,128)	6,845 (6,827 - 6,860)	441 (438 - 444)	17.2 (17.2 - 17.2)	452 (299 - 656)	521 (345 - 755)
Somalia	1990	962,311 (959,532 - 964,478)	1,210,678 (1,207,742 - 1,213,520)	111,585 (111,090 - 111,894)	30.6 (30.5 - 30.7)	81,969 (54,806 - 117,948)	1,007 (676 - 1,447)
Somalia	2013	1,710,983 (1,707,722 - 1,713,463)	2,232,258 (2,228,865 - 2,235,220)	221,413 (220,593 - 222,014)	34.9 (34.8 - 34.9)	152,806 (102,343 - 219,160)	1,156 (778 - 1,659)
Tanzania	1990	4,281,260 (4,263,002 - 4,294,759)	6,016,615 (5,993,549 - 6,026,862)	654,587 (651,290 - 657,146)	39.3 (39.2 - 39.4)	417,066 (280,074 - 596,295)	1,381 (929 - 1,968)
Tanzania	2013	7,064,407 (7,046,944 - 7,077,002)	9,550,906 (9,532,978 - 9,567,514)	911,191 (902,162 - 917,890)	31.3 (31.3 - 31.4)	650,797 (434,744 - 934,844)	1,085 (727 - 1,557)
Uganda	1990	2,674,331 (2,669,160 - 2,678,321)	3,684,123 (3,678,991 - 3,688,269)	371,887 (370,125 - 373,117)	32.7 (32.7 - 32.8)	250,643 (168,287 - 359,651)	1,096 (737 - 1,570)
Uganda	2013	5,022,958 (5,013,564 - 5,030,553)	6,857,499 (6,846,117 - 6,867,444)	631,527 (628,597 - 633,492)	27.2 (27.1 - 27.2)	463,214 (309,845 - 665,650)	915 (614 - 1,312)
Zambia	1990	1,139,898 (1,137,134 - 1,141,903)	1,448,661 (1,445,696 - 1,452,523)	132,446 (129,113 - 133,598)	29.8 (29.8 - 29.9)	98,189 (65,792 - 140,945)	979 (655 - 1,403)
Zambia	2013	1,945,537 (1,942,028 - 1,948,030)	2,468,996 (2,464,604 - 2,473,831)	215,029 (209,608 - 216,686)	26.3 (26.3 - 26.4)	166,320 (111,335 - 239,991)	864 (579 - 1,242)
Southern Sub-Saharan Africa	1990	8,084,397 (8,066,636 - 8,102,575)	8,875,349 (8,854,796 - 8,889,088)	750,356 (748,530 - 753,620)	31.3 (31.2 - 31.3)	599,500 (401,005 - 861,737)	993 (668 - 1,425)
Southern Sub-Saharan Africa	2013	10,130,467 (10,106,789 - 10,150,394)	10,262,962 (10,242,247 - 10,283,158)	805,802 (803,807 - 807,438)	27.4 (27.3 - 27.5)	692,462 (462,410 - 997,765)	871 (582 - 1,252)
Botswana	1990	226,680 (226,133 - 227,277)	264,810 (264,083 - 265,270)	23,562 (23,437 - 23,660)	34.3 (34.2 - 34.4)	17,948 (11,981 - 25,841)	1,096 (733 - 1,578)
Botswana	2013	265,222 (263,649 - 266,113)	272,008 (269,245 - 273,040)	21,256 (21,013 - 21,365)	26.5 (26.3 - 26.6)	18,280 (12,242 - 26,486)	834 (560 - 1,204)
Lesotho	1990	246,147 (245,534 - 246,815)	277,692 (277,062 - 278,192)	23,562 (23,414 - 23,752)	31.4 (31.3 - 31.5)	18,753 (12,541 - 26,962)	992 (665 - 1,428)
Lesotho	2013	276,709 (275,821 - 277,484)	288,116 (287,324 - 288,756)	22,823 (22,721 - 22,884)	26.9 (26.8 - 27.0)	19,390 (12,968 - 27,972)	845 (568 - 1,218)
Namibia	1990	256,952 (256,329 - 257,635)	300,286 (299,167 - 300,818)	28,106 (28,002 - 28,200)	39.0 (38.9 - 39.1)	20,468 (13,705 - 29,565)	1,261 (846 - 1,813)
Namibia	2013	357,033 (353,858 - 358,036)	379,892 (375,656 - 381,076)	31,801 (31,424 - 31,950)	32.0 (31.7 - 32.1)	25,656 (17,125 - 37,047)	1,017 (679 - 1,462)
South Africa	1990	5,682,152 (5,666,420 - 5,700,148)	6,014,717 (5,994,831 - 6,026,629)	499,867 (498,138 - 503,101)	31.2 (31.1 - 31.3)	406,723 (272,469 - 583,883)	990 (667 - 1,418)
South Africa	2013	6,950,168 (6,927,802 - 6,967,705)	6,747,398 (6,728,770 - 6,765,971)	509,447 (507,554 - 510,758)	26.4 (26.3 - 26.5)	455,557 (304,850 - 655,797)	835 (560 - 1,201)
Swaziland	1990	131,653 (131,315 - 131,940)	153,862 (153,554 - 154,170)	12,939 (12,902 - 12,964)	31.0 (30.9 - 31.1)	10,307 (6,884 - 14,808)	979 (656 - 1,409)
Swaziland	2013	172,409 (171,864 - 172,841)	182,248 (181,796 - 182,652)	14,496 (14,445 - 14,535)	27.7 (27.6 - 27.7)	12,182 (8,126 - 17,516)	865 (578 - 1,245)
Zimbabwe	1990	1,540,814 (1,536,731 - 1,543,768)	1,863,982 (1,860,777 - 1,868,070)	162,320 (161,767 - 162,754)	29.9 (29.8 - 29.9)	125,301 (83,902 - 181,121)	953 (640 - 1,372)
Zimbabwe	2013	2,108,926 (2,104,150 - 2,113,051)	2,393,301 (2,388,101 - 2,397,726)	205,979 (205,073 - 206,573)	30.8 (30.8 - 30.9)	161,397 (107,643 - 232,420)	987 (663 - 1,421)
Western Sub-Saharan Africa	1990	39,535,488 (39,389,009 - 39,593,152)	55,952,573 (55,863,047 - 56,072,320)	7,445,573 (7,365,221 - 7,482,216)	49.5 (49.4 - 49.6)	4,072,356 (2,757,081 - 5,773,071)	1,780 (1,207 - 2,522)
Western Sub-Saharan Africa	2013	67,578,594 (67,485,043 - 67,677,191)	90,925,029 (90,799,140 - 91,037,379)	10,967,931 (10,845,694 - 11,021,409)	43.2 (43.1 - 43.3)	6,514,886 (4,380,919 - 9,270,522)	1,511 (1,019 - 2,151)
Benin	1990	1,003,490 (993,515 - 1,007,637)	1,561,973 (1,557,504 - 1,578,579)	226,353 (223,482 - 227,877)	54.3 (54.0 - 54.6)	115,731 (78,450 - 163,619)	2,094 (1,429 - 2,943)
Benin	2013	1,923,823 (1,918,283 - 1,930,628)	2,762,804 (2,755,703 - 2,768,703)	350,170 (344,446 - 353,411)	46.8 (46.7 - 47.0)	199,898 (134,885 - 283,911)	1,739 (1,179 - 2,468)
Burkina Faso	1990	1,637,745 (1,627,375 - 1,643,764)	2,562,085 (2,556,425 - 2,570,468)	446,958 (443,055 - 448,985)	48.9 (48.8 - 49.1)	200,357 (135,649 - 282,742)	1,833 (1,245 - 2,586)
Burkina Faso	2013	3,008,005 (3,001,000 - 3,017,185)	4,536,585 (4,528,458 - 4,543,540)	739,159 (729,943 - 743,467)	44.7 (44.6 - 44.8)	350,767 (236,260 - 498,595)	1,660 (1,119 - 2,352)
Cameroon	1990	2,148,274 (2,139,483 - 2,152,234)	2,832,292 (2,826,925 - 2,846,002)	302,234 (295,473 - 304,842)	39.7 (39.5 - 39.8)	196,372 (131,913 - 280,109)	1,332 (899 - 1,901)
Cameroon	2013	3,712,200 (3,704,311 - 3,719,067)	4,693,450 (4,683,857 - 4,702,688)	474,328 (463,503 - 477,605)	36.4 (36.3 - 36.5)	324,304 (217,102 - 465,589)	1,216 (817 - 1,741)
Cape Verde	1990	59,152 (59,023 - 59,279)	79,926 (79,777 - 80,053)	8,495 (8,456 - 8,518)	37.4 (37.3 - 37.5)	5,566 (3,737 - 7,986)	1,284 (863 - 1,843)
Cape Verde	2013	71,245 (70,991 - 71,448)	78,758 (78,555 - 78,968)	7,093 (7,045 - 7,124)	30.9 (30.8 - 31.0)	5,410 (3,615 - 7,786)	1,042 (698 - 1,501)

Chad	1990	1,265,613 (1,262,472 - 1,268,408)	1,859,516 (1,856,060 - 1,862,193)	267,547 (266,307 - 268,395)	54.3 (54.1 - 54.4)	136,825 (92,602 - 193,970)	1,952 (1,321 - 2,769)
Chad	2013	2,512,955 (2,508,218 - 2,516,475)	3,484,962 (3,481,038 - 3,489,370)	438,278 (434,239 - 439,831)	46.1 (46.0 - 46.2)	249,585 (168,060 - 355,684)	1,570 (1,056 - 2,244)
Cote d'Ivoire	1990	2,326,223 (2,314,114 - 2,330,806)	3,089,841 (3,084,532 - 3,095,408)	360,152 (356,607 - 362,850)	44.9 (44.8 - 45.0)	217,368 (146,240 - 309,431)	1,538 (1,039 - 2,179)
Cote d'Ivoire	2013	3,946,363 (3,939,229 - 3,951,969)	5,120,819 (5,113,261 - 5,128,039)	592,975 (587,928 - 596,871)	45.3 (45.3 - 45.4)	361,130 (242,420 - 515,732)	1,567 (1,056 - 2,230)
The Gambia	1990	173,165 (172,738 - 173,628)	237,682 (236,868 - 238,279)	28,752 (28,353 - 28,961)	44.5 (44.4 - 44.6)	16,929 (11,392 - 24,110)	1,536 (1,039 - 2,187)
The Gambia	2013	316,270 (315,452 - 316,884)	426,481 (425,412 - 427,312)	46,577 (46,061 - 46,891)	38.2 (38.1 - 38.3)	29,841 (20,055 - 42,680)	1,301 (878 - 1,864)
Ghana	1990	2,883,316 (2,867,918 - 2,893,662)	3,978,759 (3,969,198 - 3,991,513)	491,610 (483,817 - 495,790)	48.4 (48.3 - 48.6)	284,956 (191,475 - 405,574)	1,737 (1,172 - 2,472)
Ghana	2013	4,464,871 (4,452,603 - 4,476,976)	5,654,549 (5,641,058 - 5,666,482)	597,042 (584,224 - 603,175)	39.6 (39.5 - 39.7)	395,770 (265,596 - 566,790)	1,380 (928 - 1,972)
Guinea	1990	1,115,116 (1,112,367 - 1,117,905)	1,580,915 (1,577,304 - 1,583,896)	207,967 (205,289 - 209,421)	44.9 (44.7 - 45.0)	114,436 (77,256 - 162,798)	1,596 (1,079 - 2,267)
Guinea	2013	2,063,618 (2,059,364 - 2,067,080)	2,831,922 (2,826,432 - 2,837,178)	347,963 (343,037 - 350,632)	41.5 (41.4 - 41.6)	203,217 (136,864 - 289,422)	1,468 (989 - 2,089)
Guinea-Bissau	1990	199,646 (199,094 - 200,284)	273,176 (272,169 - 273,869)	33,645 (33,399 - 33,829)	46.6 (46.5 - 46.7)	19,446 (13,088 - 27,675)	1,624 (1,098 - 2,309)
Guinea-Bissau	2013	311,750 (311,092 - 312,320)	404,191 (403,465 - 405,181)	45,643 (45,370 - 45,886)	42.1 (42.0 - 42.2)	28,361 (19,058 - 40,609)	1,439 (970 - 2,054)
Liberia	1990	388,961 (387,750 - 389,525)	526,493 (525,779 - 527,539)	59,911 (59,459 - 60,229)	41.6 (41.5 - 41.7)	36,710 (24,723 - 52,370)	1,407 (951 - 2,009)
Liberia	2013	800,614 (799,084 - 801,639)	1,057,385 (1,055,914 - 1,058,648)	122,351 (121,568 - 123,005)	43.6 (43.5 - 43.7)	74,176 (49,928 - 105,715)	1,488 (1,008 - 2,121)
Mali	1990	1,635,217 (1,631,234 - 1,640,825)	2,622,107 (2,615,680 - 2,626,593)	412,637 (408,390 - 414,737)	56.9 (56.7 - 57.0)	197,571 (133,779 - 280,119)	2,215 (1,510 - 3,114)
Mali	2013	2,970,336 (2,964,442 - 2,975,652)	4,600,133 (4,593,958 - 4,607,091)	661,505 (650,997 - 665,560)	51.1 (51.0 - 51.1)	340,961 (230,706 - 484,594)	1,925 (1,306 - 2,725)
Mauritania	1990	437,090 (435,131 - 438,364)	651,878 (650,324 - 652,918)	94,979 (94,590 - 95,252)	56.9 (56.7 - 57.0)	48,038 (32,448 - 68,215)	2,123 (1,441 - 2,995)
Mauritania	2013	714,900 (713,012 - 716,203)	913,333 (911,725 - 914,980)	102,763 (101,959 - 103,174)	41.9 (41.8 - 42.0)	64,190 (43,103 - 91,722)	1,436 (966 - 2,046)
Niger	1990	1,431,966 (1,428,838 - 1,434,936)	2,053,473 (2,049,899 - 2,057,578)	264,513 (260,753 - 266,736)	43.8 (43.7 - 43.9)	148,586 (100,131 - 211,361)	1,534 (1,039 - 2,185)
Niger	2013	3,191,938 (3,183,289 - 3,197,712)	4,604,933 (4,598,174 - 4,612,176)	580,984 (571,605 - 585,505)	41.9 (41.8 - 42.0)	332,567 (223,814 - 472,319)	1,455 (977 - 2,081)
Nigeria	1990	19,757,353 (19,607,644 - 19,807,358)	27,729,298 (27,654,492 - 27,835,401)	3,690,951 (3,615,311 - 3,722,729)	51.3 (51.2 - 51.5)	2,022,909 (1,370,838 - 2,865,970)	1,849 (1,258 - 2,623)
Nigeria	2013	32,301,981 (32,227,250 - 32,383,902)	42,691,793 (42,590,057 - 42,780,664)	5,008,708 (4,899,840 - 5,053,752)	43.1 (43.0 - 43.2)	3,049,358 (2,056,420 - 4,342,622)	1,489 (1,006 - 2,117)
Sao Tome and Principe	1990	20,786 (20,735 - 20,833)	27,397 (27,337 - 27,477)	2,882 (2,816 - 2,908)	40.2 (40.1 - 40.3)	1,908 (1,279 - 2,735)	1,346 (903 - 1,924)
Sao Tome and Principe	2013	33,305 (33,227 - 33,377)	40,415 (40,335 - 40,499)	4,009 (3,927 - 4,049)	37.4 (37.3 - 37.5)	2,804 (1,882 - 4,032)	1,243 (834 - 1,782)
Senegal	1990	1,492,172 (1,488,896 - 1,496,808)	2,208,882 (2,203,280 - 2,212,695)	298,791 (295,886 - 300,296)	51.1 (50.9 - 51.2)	160,977 (108,874 - 228,502)	1,874 (1,269 - 2,660)
Senegal	2013	2,723,142 (2,716,770 - 2,727,746)	3,844,384 (3,837,846 - 3,850,356)	485,811 (481,085 - 489,249)	47.8 (47.7 - 47.9)	276,651 (186,001 - 393,736)	1,732 (1,169 - 2,458)
Sierra Leone	1990	833,945 (831,341 - 835,857)	1,074,627 (1,071,854 - 1,078,084)	125,438 (122,360 - 126,685)	48.2 (48.1 - 48.3)	75,989 (51,305 - 108,313)	1,637 (1,110 - 2,324)
Sierra Leone	2013	1,222,298 (1,219,210 - 1,225,081)	1,492,622 (1,488,829 - 1,496,050)	164,960 (161,588 - 166,504)	45.0 (44.9 - 45.1)	105,445 (70,870 - 150,543)	1,516 (1,020 - 2,166)
Togo	1990	725,097 (723,465 - 726,707)	1,000,865 (998,552 - 1,003,849)	121,591 (119,054 - 122,830)	45.7 (45.6 - 45.8)	71,583 (48,074 - 101,786)	1,600 (1,081 - 2,279)
Togo	2013	1,288,163 (1,284,875 - 1,290,951)	1,684,684 (1,681,289 - 1,688,516)	197,525 (193,373 - 199,260)	44.2 (44.1 - 44.3)	120,393 (81,064 - 171,464)	1,543 (1,040 - 2,194)
South Sudan	1990	1,051,346 (1,048,922 - 1,053,905)	1,348,468 (1,345,389 - 1,350,605)	142,899 (142,234 - 143,420)	40.0 (39.9 - 40.1)	93,017 (62,448 - 133,265)	1,328 (895 - 1,898)
South Sudan	2013	1,688,384 (1,683,931 - 1,691,763)	2,078,583 (2,074,293 - 2,082,367)	193,763 (192,719 - 194,601)	31.7 (31.7 - 31.8)	140,990 (94,127 - 202,333)	1,039 (696 - 1,487)
Sudan	1990	4,349,963 (4,340,285 - 4,358,298)	5,481,366 (5,471,676 - 5,488,897)	612,388 (610,225 - 615,257)	51.7 (51.7 - 51.8)	379,228 (254,667 - 542,774)	1,742 (1,177 - 2,483)
Sudan	2013	7,442,698 (7,433,356 - 7,451,250)	8,340,594 (8,329,841 - 8,350,242)	802,225 (798,475 - 804,919)	42.6 (42.6 - 42.7)	564,922 (377,719 - 813,977)	1,347 (901 - 1,935)

TABLE 3

Cause	Prevalent cases in thousands (% of total)		Total YLDs in thousands (% of total)	
	1990	2013	1990	2013
Iron-deficiency anaemia	1211369.9 (66.23%)	1208360.1 (62.57%)	40035.5 (64.55%)	36612.3 (59.51%)
Thalassaemia trait	75180.1 (4.11%)	104232.6 (5.40%)	2799.6 (4.51%)	3769.6 (6.13%)
Malaria	57969.1 (3.17%)	80602.4 (4.17%)	2196.1 (3.54%)	2935.0 (4.77%)
Gastritis and duodenitis	56836.8 (3.11%)	63222.9 (3.27%)	2092.4 (3.37%)	2204.4 (3.58%)
Other neglected tropical diseases	62877.1 (3.44%)	59728.3 (3.09%)	2244.9 (3.62%)	2048.5 (3.33%)
Other haemoglobinopathies and haemolytic anaemias	57242.2 (3.13%)	55804.0 (2.89%)	1566.7 (2.53%)	1325.5 (2.15%)
Other infectious diseases	52324.3 (2.86%)	49771.4 (2.58%)	1742.5 (2.81%)	1542.4 (2.51%)
Endocrine, metabolic, blood, and immune disorders	49928.4 (2.73%)	49327.8 (2.55%)	1549.8 (2.50%)	1376.0 (2.24%)
Sickle cell trait	29862.3 (1.63%)	43353.9 (2.24%)	1003.5 (1.62%)	1396.6 (2.27%)
Uterine fibroids (females only)	28043.2 (1.53%)	36833.7 (1.91%)	1106.6 (1.78%)	1304.9 (2.12%)
Hookworm disease	32039.8 (1.75%)	34579.6 (1.79%)	1021.8 (1.65%)	1004.0 (1.63%)
Peptic ulcer disease	34671.6 (1.90%)	32726.7 (1.69%)	980.6 (1.58%)	974.6 (1.58%)
Chronic kidney disease due to other causes	16459.1 (0.90%)	26007.2 (1.35%)	857.2 (1.38%)	1330.6 (2.16%)
Schistosomiasis	14488.1 (0.79%)	20635.1 (1.07%)	485.3 (0.78%)	671.0 (1.09%)
Other gynaecological diseases (females only)	15576.9 (0.85%)	17383.2 (0.90%)	462.8 (0.75%)	448.6 (0.73%)
Chronic kidney disease due to hypertension	10850.3 (0.59%)	14142.6 (0.73%)	587.6 (0.95%)	733.8 (1.19%)
Chronic kidney disease due to glomerulonephritis	11180.9 (0.61%)	14059.9 (0.73%)	613.3 (0.99%)	745.9 (1.21%)
Chronic kidney disease due to diabetes mellitus	6569.6 (0.36%)	12116.3 (0.63%)	348.0 (0.56%)	606.6 (0.99%)
Sickle cell disorders	1801.5 (0.10%)	3185.0 (0.16%)	182.5 (0.29%)	321.4 (0.52%)
G6PD deficiency trait (females only)	1253.7 (0.07%)	1983.8 (0.10%)	39.5 (0.06%)	48.8 (0.08%)
Maternal haemorrhage (females only)	1388.0 (0.08%)	1858.5 (0.10%)	39.4 (0.06%)	45.1 (0.07%)
G6PD deficiency	519.3 (0.03%)	743.5 (0.04%)	24.9 (0.04%)	33.8 (0.05%)
Thalassaemias	509.8 (0.03%)	544.2 (0.03%)	43.2 (0.07%)	46.2 (0.08%)
Total prevalence	1828942.2 (100.00%)	1931202.6 (100.00%)	..	..
Total YLDs	..	..	62023.8 (100.00%)	61525.6 (100.00%)