Epidemiology of facial fractures: incidence, prevalence and years lived with disability estimates from the Global Burden of Disease 2017 study

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► Additional material is published online only. To view please visit the journal online (http://dx.doi.org/10.1136/injuryprev-2019-043297).

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Received 3 May 2019
Revised 7 August 2019
Accepted 12 August 2019

Check for updates

To cite: Lalloo R, Lucchesi LR, Bisignano C, *et al*. *Inj Prev* Epub ahead of print: [*please include* Day Month Year]. doi:10.1136/injuryprev-2019-043297

ABSTRACT

Background The Global Burden of Disease Study (GBD) has historically produced estimates of causes of injury such as falls but not the resulting types of injuries that occur. The objective of this study was to estimate the global incidence, prevalence and years lived with disability (YLDs) due to facial fractures and to estimate the leading injurious causes of facial fracture.

Methods We obtained results from GBD 2017. First, the study estimated the incidence from each injury cause (eg, falls), and then the proportion of each cause that would result in facial fracture being the most disabling injury. Incidence, prevalence and YLDs of facial fractures are then calculated across causes.

Results Globally, in 2017, there were 7 538 663 (95% uncertainty interval 6 116 489 to 9 493 113) new cases, 1 819 732 (1 609 419 to 2 091 618) prevalent cases, and 117 402 (73 266 to 169 689) YLDs due to facial fractures. In terms of age-standardised incidence, prevalence and YLDs, the global rates were 98 (80 to 123) per 100 000, 23 (20 to 27) per 100 000, and 2 (1 to 2) per 100 000, respectively. Facial fractures were most concentrated in Central Europe. Falls were the predominant cause in most regions.

Conclusions Facial fractures are predominantly caused by falls and occur worldwide. Healthcare systems and public health agencies should investigate methods of all injury prevention. It is important for healthcare systems in every part of the world to ensure access to treatment resources.

INTRODUCTION

Facial fractures can be disabling injuries that may require complex surgical care from reconstructive plastic surgeons or oral-maxillofacial specialists. While sophisticated diagnostics and surgical treatment approaches have been developed and are routinely utilised in high resource healthcare systems, occult facial fractures are frequent, especially with low energy mechanisms, and may be missed on initial trauma surveys across the wide array of possible causes of trauma.[1–4] Without a high degree of clinical suspicion and proper diagnostic equipment (CT scans with multiplanar reconstruction, panorex films), the diagnosis of facial fracture may be significantly delayed and may only be apparent once swelling has subsided.[5 6] In certain instances, this can have devastating consequences, for example, an orbital floor fracture with entrapment of extraocular muscle leading to permanent dysfunction of congruent eye movements.[7] In addition, there may be considerable burden of such injuries in lower resource areas of the world that lack access to timely and effective care, even if surgical intervention is not indicated. In some cases, effective care may involve non-operative management. For instance, a minimally displaced mandibular condyle fracture may be managed with a soft, non-chew diet for several weeks.[8] In the instance of a mandible fracture, meticulous oral hygiene is imperative to prevent odontogenic infections.[9] Regions in which dental hygiene is poor and routine dental care is sparse may be predisposed to poor outcomes with conservative management strategies such as this. Thus, it is important to measure and understand how these injuries occur and where they are most concentrated geographically. Such efforts could help lead to improved resource allocation and better health system planning to ensure that people suffering from such injuries have access to the treatment resources that can mitigate the disability of such conditions and could also help emphasise the importance of injury prevention strategies. Consequently, there is likely considerable value in measuring the burden of these conditions.

To date, there has not been a systematic assessment of the global burden of facial fractures that produced estimates for all countries and across all age and sex groups. Existing literature has focused on anatomically based subsets of fracture patterns,[10] aetiological factors of known facial fractures,[10–12] a specific age group of interest,[13] and assessments in limited, specific geographies such as the USA.[4 14] Some studies, for example, have estimated the proportions of different injurious aetiologies or have examined risk factors such as age and sex for sustaining facial fractures,[12 15] but do not attempt to estimate or model these trends in areas that lack data. Given the lack of comprehensive assessments of these injuries, it is of interest to estimate the burden of facial fractures due to all causes of injury ranging from interpersonal violence to falls to road injuries.

The Global Burden of Disease Study (GBD) is the most comprehensive effort to date to measure the burden and trends of injury and disease worldwide.[16–21] GBD produces annual estimates of all-cause mortality, causes of death, non-fatal health outcomes (ie, incidence, prevalence and years lived with disability (YLDs)), and risk factors. For non-fatal health outcomes such as facial fractures, GBD quantifies health loss by incorporating disability weights and prevalence. This is an important advent for measuring the burden of facial fractures given that these injuries may affect quality of life differently than other injuries and diseases, especially with regard to the social importance of facial structure and function.[22] The GBD framework also measures the burden of each condition across all countries, ages, sexes and for a range of years. Such analysis is also important for facial fractures, since the mechanisms of injury that lead to a fracture may be concentrated in certain locations or age groups. More detailed estimation of the burden of facial fractures would not only strengthen the ability of healthcare systems to adequately plan for and care for this population, but, from a policy standpoint, would also contribute to the body of evidence that could lead to injury prevention programme targeted at the causes of injuries that most commonly lead to facial fractures.

To date, estimates for the facial fracture burden in the GBD framework have not been available as reported results. Instead, the distribution of sequelae was incorporated as part of the analytical process that computed disability, but results were ultimately only provided by the cause of injury, such as falls, and not the type, or 'nature' of injury, in this case facial fracture. Here, we describe an approach of estimating sequela-specific non-fatal burden estimates across all causes of injury and then we report the incidence, prevalence and YLDs for facial fractures, as well as the distribution of injurious causes that lead to facial fractures. This study represents an important step forward in terms of increasing the level of detail provided in GBD estimates.

METHODS

This study's approach to measuring facial fractures was developed within the existing GBD framework.[16–21] A summary of key GBD methods is provided in online supplementary appendix 1, and more detailed methods including detailed injury modelling methods are described in the GBD 2017 capstone publications.[16–21] Our measurement of the burden of facial fractures included two custom analytic components as follows.

First, GBD categorises facial fractures as being a nature of injury as opposed to a *cause* of injury. The specific case definition for facial fractures in GBD includes fractures to nasal bones, orbits, mandible, maxilla and other facial bones, as coded in ICD9 codes 802 and ICD10 codes S02.2, S02.3, S02.4, S02.5, S02.6, S02.7. The incidence, prevalence and YLDs of these facial fractures have previously been included under each external cause estimate (eg, falls, road injuries, interpersonal violence).

Second, facial fractures are only measured in terms of non-fatal burden and therefore in this study we report incidence, prevalence and YLDs, but not cause-specific mortality rates or years of life lost.

Facial fracture estimation was otherwise conducted as follows. First, the incidence rates of 30 different causes of injury are modelled using DisMod MR 2.1, a meta-regression tool that is used extensively in GBD.[17] These cause models use various data types including surveillance studies, literature studies, hospital discharge records and emergency department records. Each cause model also use cause-specific mortality to predict the incidence of the external cause-of-injury models (eg, falls), which can cause death, though facial fractures are not themselves considered to be a cause of death.

In the next step, we measure the proportion of each cause that lead to a facial fracture being the most disabling nature of injury. For instance, if an individual falls and sustains an abrasion and also sustains a facial fracture, the facial fracture is used to determine the disability suffered by the individual. For this process, we utilised dual-coded clinical data sources where both the cause and nature of injury are coded using ICD9 or ICD10 coding systems. A full list of sources used in this process is provided in table 1. These proportions are then modelled using a Dirichlet regression technique such that the proportions of nature of injury sum to one across all natures for a given cause, such that every injury requiring medical care has some nature of injury assigned based on the dual-coded clinical data sources. The output from this step is incidence for each cause-nature combination; for instance, the incidence of falls that result in facial fracture.

We then separately model short-term and long-term prevalence estimates using proportions expected to experience short-term versus long-term disability based on long-term follow-up studies.[23–29] The cause-nature incidence rates are converted to prevalence using the differential equation solver that is used in DisMod MR 2.1. YLDs are then calculated by multiplying the prevalence estimate by the disability weight for each specific nature of injury. Disability weight measurement is described in more detail elsewhere in the GBD literature.[30] Prevalence, incidence and YLDs for facial fractures are then summed across all causes of injury in order to estimate the all-injury prevalence, incidence and YLDs for facial fractures.

We also present results of facial fracture burden by quintile groupings of countries based on their 2017 Socio-demographic Index (SDI) value, which is a composite measure of lag-distributed income per capita, educational attainment over the age of 15 years, and fertility rate in women under the age of 25.[17] Additionally, we measured the most common causes of

Table 1 Sources of clinical records used for calculating cause-nature proportions for facial fractures

Dual-coded data	Source	Description
Argentina Public Hospital Injury Discharges 2007–2011	Directorate of Health Statistics and Information, Ministry of Health (Argentina)	Public hospital records aggregated to the country level
China Injury Comprehensive Surveillance Study 2009–2011	Chinese Center for Disease Control and Prevention (CCDC)	Inpatient data collected as part of an injury surveillance study in several subnational sites in China: Chongqing, Dalian, Ningbo, Songjiang, Wuzhong, Zhanjiang and Zhuhai
China National Injury Surveillance System 2006–2014	CCDC, Ministry of Health (China)	Nationally representative surveillance system of outpatients with injuries
United Kingdom—England Hospital Episode Statistics 2002–2015	National Health Service (NHS) England	Records of inpatient, outpatient and emergency attendances at NHS hospitals in England
Netherlands National Medical Registry (LMR) 1998–2012	Dutch Hospital Data	Cases of inpatient care in Dutch hospitals
Netherlands Injury Surveillance System 1998–2012	Consumer Safety Institute (Netherlands)	Emergency department data from a representative sample of private hospitals in the Netherlands
Argentina Injury Surveillance System Tabulations 2008	National Institute of Epidemiology, National Administration of Laboratories and Health Institutes, Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
United States National Hospital Discharge Survey 1990–2006	National Center for Health Statistics, Centers for Disease Control and Prevention	Sample of inpatient records selected from a national sample of non-Federal, short-stay hospitals
Bulgaria Hospital Discharge Injury Tabulations 2004	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Czech Republic Hospital Discharge Injury Tabulations 2004	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Denmark Hospital Discharge Injury Tabulations 2005	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Estonia Hospital Discharge Injury Tabulations 2003	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Hungary Hospital Discharge Injury Tabulations 2004	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Iceland Hospital Discharge Injury Tabulations 2005	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Italy Hospital Discharge Injury Tabulations 2003	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Latvia Hospital Discharge Injury Tabulations 2004	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Malta Hospital Discharge Injury Tabulations 2005	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Netherlands Hospital Discharge Injury Tabulations 2004–2005	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Norway Hospital Discharge Injury Tabulations 2004	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Portugal Hospital Discharge Injury Tabulations 2004	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Slovenia Hospital Discharge Injury Tabulations 2004	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Sweden Hospital Discharge Injury Tabulations 2004	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Macedonia Hospital Discharge Injury Tabulations 2005	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Spain Hospital Discharge Injury Tabulations 2000–2007	Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Mauritius Hospital Discharge Injury Tabulations 2003–2007	Ministry of Health and Quality of Life (Mauritius), Global Burden of Disease 2010 Injury Expert Group	Inpatient administrative records
Mexico Ministry of Health Hospital Discharge Tabulations 2005	Secretariat of Health (Mexico)	Inpatient administrative records
Brazil Hospital Information System 1997–2014	Rio de Janeiro, Brazil: Ministry of Health (Brazil)	Nationally representative administrative discharge records for inpatients and outpatients
Austria Hospital Inpatient Discharges 2001–2010	Federal Ministry of Health (Austria), Statistics Austria	Inpatient administrative records
Canada Discharge Abstract Database 1994–2009	Canadian Institute for Health Information	Hospital administrative data on inpatient discharges from acute care facilities in all Canadian provinces and territories other than Quebec

Continued

Table 1 Continued

Dual-coded data	Source	Description
Mexico Ministry of Health Hospital Discharges 2003–2011	Secretariat of Health (Mexico)	Discharge database from Mexico's Automated Hospital Discharge System
New Zealand National Minimum Dataset 2000–2014	Ministry of Health (New Zealand)	Hospital discharge data for inpatients and day patients
Chile Hospital Discharges 2001–2011	Santiago, Chile: Ministry of Health (Chile)	Administrative discharge records for inpatients

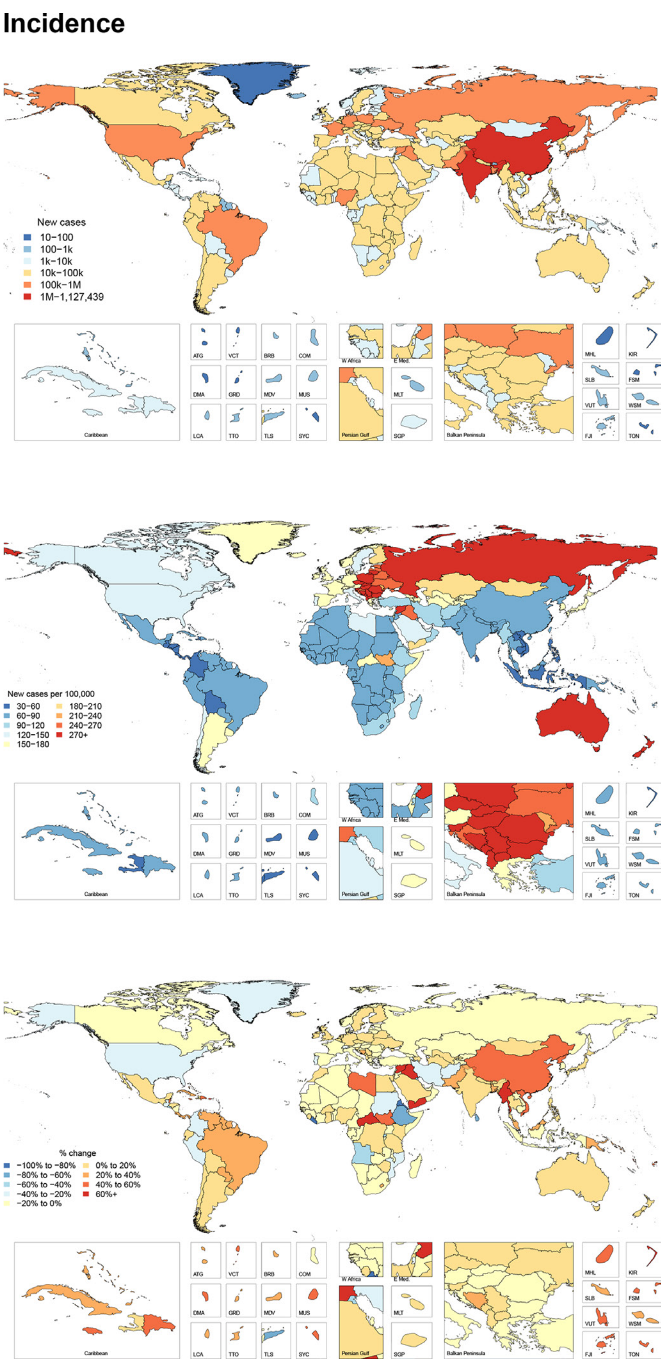

Figure 1 All age new cases, age-standardised incidence and per cent change in age-standardised incidence between 1990 and 2017 of facial fractures per 100 000 by location for both sexes, 2017.

facial fractures in terms of the original cause of injury that led to the disability.

Analyses were completed using Python V.2.7, Stata V.13.1, or R V.3.3. Statistical code used for GBD estimation will be made available on publication.

This study complies with the Guidelines for Accurate and Transparent Health Estimates Reporting recommendations (online supplementary appendix 2).

RESULTS

All results are also available via GBD online results tools and visualisations and are publicly available at ghdx.healthdata.org. These resources provide additional detail by cause of injury, age group, sex, year and location.

Incidence

Figure 1 shows the number of new cases for 2017, the age-standardised incidence per 100 000 for 2017, and the per cent change between 1990 and 2017 by country and territory. This figure shows that there are a large number of total cases in populous areas of the world, but that incidence is the highest in the GBD super region of Central Europe, Eastern Europe and Central Asia, with a regional age-standardised incidence of 254 (193 to 335) per 100 000. Within Central Europe, Slovenia had the highest age-standardised incidence rate of 376 (272 to 507) per 100 000, while Poland had the most new cases with 116 518 (84 517 to 161 202) cases in 2017. Select countries in the Middle East, Sub-Saharan Africa and South Asia have also experienced relatively large increases in incidence between 1990 and 2017. Online supplementary appendix table 1 shows the incidence, prevalence and YLDs in terms of all-age counts, age-standardised rates and percentage change from 1990 to 2017 for facial fractures. In 2017, there were an estimated 7 538 663 (95% uncertainty interval (UI) 6 116 489 to 9 493 113) new facial fractures globally. Between 1990 and 2017, the global age-standardised incidence rate did not change significantly. In 2017, it was 98 (80 to 123) per 100 000.

New cases of facial fractures occur across all SDI quintiles. The high SDI quintile had the highest age-standardised incidence rate of facial fractures at a rate of 158 (122 to 206) per 100 000 while the middle SDI quintile had the lowest with an age-standardised incidence rate of 72 (58 to 89) per 100 000. From 1990 to 2017, age-standardised incidence rates decreased in high and low SDI quintiles, while they increased in low-middle and middle SDI. High-middle SDI had no significant change in incidence.

Prevalence

Figure 2 shows the number of prevalent cases for 2017, the age-standardised prevalence per 100 000 for 2017, and the per cent

Prevalence

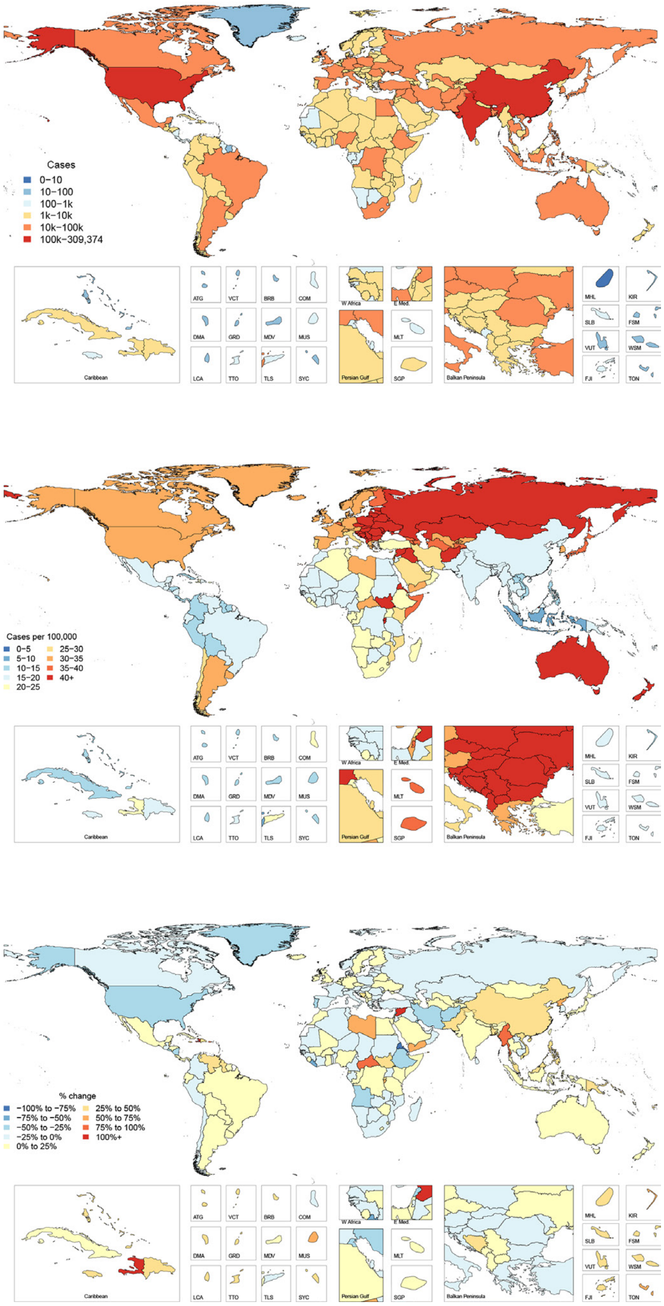

Figure 2 All age cases, age-standardised prevalence and per cent change in age-standardised prevalence between 1990 and 2017 of facial fractures per 100 000 by location for both sexes, 2017.

change between 1990 and 2017 by country. In terms of age-standardised prevalence, the global age-standardised prevalence of facial fractures was 23 (20 to 27) per 100 000 in 2017. This equated to 1 819 732 (1 609 419 to 2 091 618) individuals globally living with any disability from a facial fracture. From 1990 to 2017, there was a significant decrease in the age-standardised prevalence of facial fractures by 2.8% (1.4%–4.1%).

Prevalent cases of facial fractures were distributed across all SDI quintiles in a pattern similar to incident cases. The highest age-standardised prevalence was also in the high SDI quintile with 35 (30 to 41) cases per 100 000, and the lowest was in the middle SDI quintile with 17 (15 to 19) cases per 100 000.

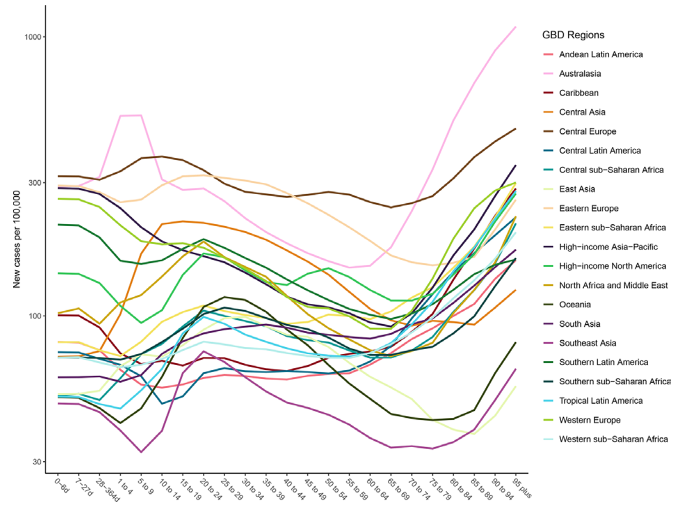

Figure 3 Age-specific incidence of facial fractures per 100 000 by region and age for both sexes, 2017.

The geographic distribution of prevalent cases was also similar to that of incident cases. In 2017, the age-standardised prevalence of facial fractures was highest in Central Europe with 68 cases (57 to 82) per 100 000, representing 92 387 (80 541 to 108 397) prevalent cases. Within Central Europe, Slovenia and Czech Republic had the highest age-standardised prevalence with identical prevalences of 81 (69 to 99) cases per 100 000, while Poland had the highest total number of prevalent cases with 31 345 (27 039 to 36 935) total cases in 2017.

Age patterns of incidence and prevalence

Figures 3 and 4 show the age-specific incidence and prevalence of facial fractures by GBD region, respectively. Incident cases rise in most regions from ages 5 to 20 and rise again in the 70+ age groups. A few regions, like Western Europe and Central Latin America, have distinct age-specific patterns. Figure 3 shows that prevalence of facial fractures increases with age and is the highest in the Australasia, Eastern Europe and Central Europe.

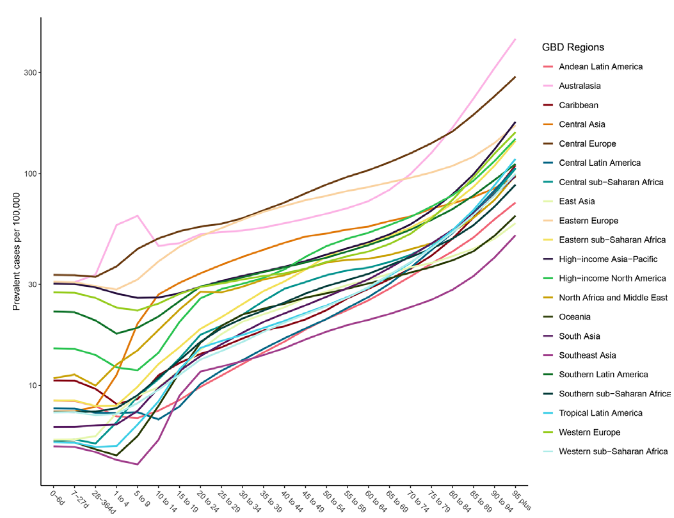

Figure 4 Age-specific prevalence of facial fractures per 100 000 by region and age for both sexes, 2017.

Years lived with disability

Globally, facial fractures caused 117 402 (73 266 to 169 689) YLDs in 2017. The average disability weight across all ages, sexes and locations was approximately 6.5%, meaning that on average each person with a prevalent facial fracture lost 6.5% of their normal health status. The age-standardised YLD rates globally and by country and territory were all relatively low, with fewer than 10 YLDs per 100 000 in every location in 2017. The age-standardised YLD rates decreased significantly in the high and high-middle SDI quintiles and increased significantly in the middle and low-middle SDI quintiles. The geographic distributions of YLDs were similar to those for incidence and prevalence, as described above.

Cause of facial fractures

The external causes of the injuries that led to YLDs from facial fracture varied by geographical region and sex, as shown in figure 5. We found that falls were generally the leading driver of age-standardised incidence rates of facial fractures for both sexes, though certain regions such as Oceania and southern sub-Saharan Africa had higher rates from physical violence by other means for males. The proportions due to falls were particularly high in the regions with high facial fracture burden, specifically Central and Eastern Europe. Physical violence by other means, other exposure to mechanical forces, and other unintentional injuries were also important causes of facial fractures in both sexes. In the North Africa and Middle East region, conflict and terrorism was the leading cause of facial fractures in 2017 in both sexes.

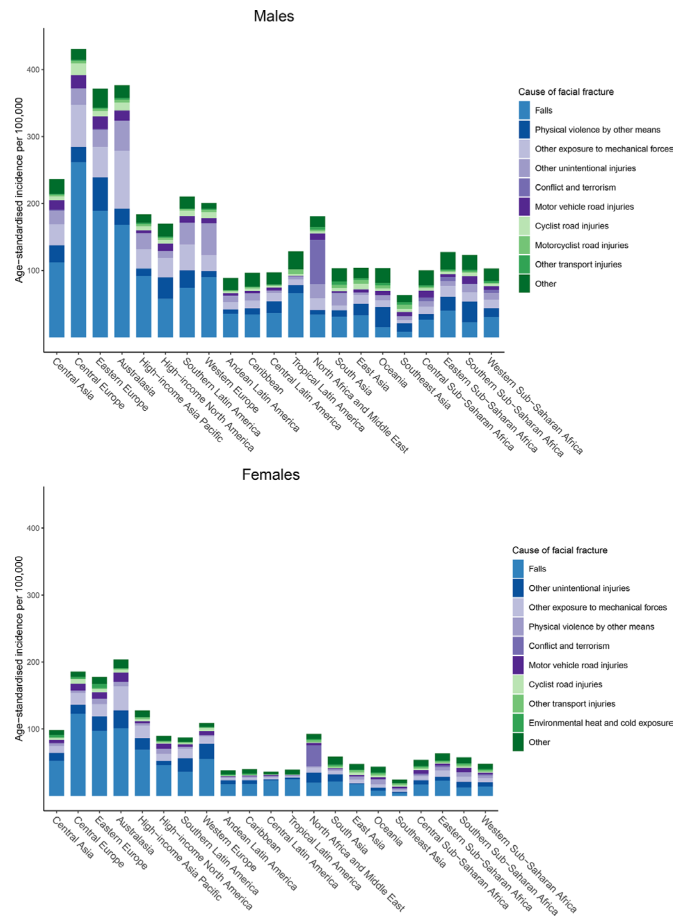

Figure 5 External cause composition of age-standardised incidence of facial fracture by Global Burden of Disease region.

DISCUSSION

This is the first known study to systematically measure the burden of facial fractures from every injurious cause for every country, age group and sex over a study period of several decades. The findings from this study can be organised into three overarching points. First, the burden of facial fractures is distributed across a wide span of geographies and income groups. Whereas some communicable diseases are concentrated in certain regions of the world or some non-communicable diseases become more common after a country experiences an epidemiological transition, injuries, and in this case facial fractures, occur ubiquitously. This is perhaps unsurprising as there are various traumatic mechanisms and risk factors of facial fractures that are unrelated to region or SDI. Nevertheless, this highlights the importance of every country and income group in the world having injury prevention strategies, particularly for causes such as falls,[31–33] as well as access to medical and surgical care to both diagnose and treat facial fractures that require intervention. Such prevention and care resources are likely more available in higher income areas of the world, and lower resource healthcare systems should ensure that their populations have access to adequate specialist care for managing these injuries. While the burden of facial fractures does afflict every geography in the world, it is also evident that Eastern and Central European countries have a particularly high burden, which may be related to higher risk of falls in those countries as described below. We also identified regions where falls were not the leading cause, such as Oceania, where physical violence by other means predominated in males. This finding may be related to the relatively higher incidence of physical violence by other means in Oceania and Southern sub-Saharan Africa in GBD 2017.

The second overarching theme is that falls are the predominant cause of facial fractures, which is consistent with our clinical experiences at level 1 trauma centres in the USA. While falls are not frequently considered global health priorities, they nevertheless inflict considerable disability in multiple populations around the globe and have persisted as a high-ranking cause of YLDs in the GBD.[34] This study highlights the disabling effects falls can have, specifically when they result in a condition that requires a higher level of care and subspecialised intervention. The potential complexity of these injuries is a compelling argument for prevention strategies focused on mitigating fall risk. The factors that can prevent such injuries from occurring likely depend largely on geographical and age-related factors. In young age groups, the risk of falls may be related to the built environment,[35–37] income,[35] furniture,[38] or other factors. Some falls in this population may be averted through educational programme and ensuring safe conditions early in life.[39 40] In adult populations, according to research that did not include the elderly, alcohol use appears to be one of the prominent risk factors associated with falls.[41] In elderly populations, in which there is an increased incidence of falls with increasing age,[34] the incidence of falls may also be driven by medication use, vision impairment, frailty, alcohol abuse and environmental factors.[31 33 42 43] A disabling injury such as a facial fracture is detrimental to one's functional status and can be costly both for the individual and the healthcare system.[44–46] Hence, addressing the factors that lead to falls may be one of the most tractable methods for preventing facial fractures in this population. We also observed that while falls were the predominant cause of facial fractures, there were other critical causes, in particular related to physical violence by other means and other exposure to mechanical forces.

The third main finding is that the North Africa and Middle East region stands out by being the only region where facial fractures were not predominantly driven by falls in 2017. Instead, the burden was most heavily driven by conflict and terrorism. Since war can have significantly detrimental impacts on a country's healthcare system and impair the population's ability to access and receive medical and surgical services, the victims of facial fractures due to conflict and terrorism in North Africa and the Middle East likely lack proper access to the surgical and medical services that would help mitigate the disability and disfigurement from these injuries. Furthermore, these injuries are more likely to be secondary to high-energy mechanism injuries (eg, high-velocity blunt force trauma, shrapnel and ballistic injuries). These mechanisms more frequently result in operative facial fracture patterns with varying degrees of soft-tissue, ocular and nerve injury, based on our clinical experience. Since improperly treated facial fractures, especially in this setting, can cause considerable long-term disability and disfigurement, the victims of these war-time injuries may experience lifelong sequelae of their facial trauma. Other violent aetiologies of facial fractures, such as physical violence by other means (which is the interpersonal violence subcause in the GBD hierarchy that excludes violence with firearms, sharp objects and sexual violence), also appear as significant contributors to the burden of facial fractures in this study, and indicate how violent behaviour such as domestic abuse and other assault that don't involve weapons are important drivers of facial fractures.

The current study has several limitations. First, since our estimation of facial fractures depends on the GBD 2017 estimates for all external causes of injury, the limitations in terms of data coverage and modelling processes that are described in other GBD literature also apply here.[17] The limitations of data coverage are particularly pertinent to lower income areas in which the GBD has limited amounts of the clinical and hospital data that are used heavily in injuries estimation, so models must rely more heavily on covariates in these locations. Second, our method for estimating the cause-nature relationships of injuries to facial fractures depends on dual-coded hospital data, which is not available in every country with hospital data and therefore represents a limited subset of all areas included in the GBD location hierarchy. It would improve our estimation process to have more dual-coded hospital data in our estimation process, and in future iterations of the GBD, we plan to continue adding such datasets to our clinical database. Third, due to data constraints in GBD 2017, we were unable to separately estimate disability weights for treated and untreated facial fractures (regardless of whether 'treated' status refers to non-operative care or to a form of reduction with or without rigid fixation). This limitation has likely impacted the geographic heterogeneity of our facial fracture YLD estimates since higher income locations likely have higher rates of treatment than lower income locations, though it does not impact the incidence and prevalence estimation processes. Finally, as noted in the methods section above, the study design employs an assumption that injury disability is determined by the most severe nature of injury sustained for a given cause of injury. As such, in the instances where an individual sustains both a facial fracture and a more disabling injury such as a spinal cord or closed head injury in the dual-coded proportion split process, facial fractures go uncounted in the process where the per cent of a given cause that lead to facial fractures are estimated. As a result, it is likely that a number of facial fractures are missed as being the most severe injury sustained. In addition, mechanistically, since the face acts as an air-filled network of bones and sinuses that decelerate the head and cushion the neurological structures behind them, there is likely considerable risk of concomitant intracranial and cervical spine injuries occurring in the event of facial bone trauma.[14 47] Future iterations of the GBD could address this limitation by modelling and estimating both cause of injury and nature of injury as separate entities, since we would not need to make the assumption about hierarchical severities determining disability.

What is already known on this subject

- Facial fractures are disabling injuries that can occur as the result of various causes of injury.
- Facial fractures are known to occur globally, but resulting disability can be affected by the availability of surgical treatment and by the severity of injury.

What this study adds

- Falls are the leading cause of facial fractures globally.
- Facial fractures are most concentrated in Central Europe.
- In 2017, there were an estimated 7.5 million new cases of facial fractures with 1.8 million individuals living with disability from a facial fracture.

Conclusion

Facial fractures have various causes and occur within every population in the world, though select locations currently experience a higher burden. Facial fractures are predominantly driven by falls except in regions suffering from conflict. Given that surgical treatment of facial fractures can require considerable expertise and that the disability experienced with facial fractures may be mitigated with such treatment, it is important for healthcare systems around the world to develop injury prevention programme and to ensure that individuals who experience facial fractures have adequate access to care and treatment. In addition, this study emphasises the need for more expansive data collection and utilisation where both cause and nature of injury can be identified.

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Acknowledgements Nikita Otstavnov acknowledges the support from Government of the Russian Federation (Agreement № 075-02-2019-967). Abdallah M Samy acknowledges support from a fellowship from the Egyptian Fulbright Mission Program.

Funding This study was funded by The Bill and Melinda Gates Foundation.

Competing interests SLJ works on a grant for influenza and respiratory syncytial disease that is funded by Sanofi Pasteur. This work does not relate to facial fracture burden.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available in a public, open access repository. Data are available upon reasonable request. Data may be obtained from a third party and are not publicly available.

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Correction: *Epidemiology of facial fractures: incidence, prevalence and years lived with disability estimates from the Global Burden of Disease 2017 study*

Lalloo R, Lucchesi LR, Bisignano C, *et al*. Epidemiology of facial fractures: incidence, prevalence and years lived with disability estimates from the Global Burden of Disease 2017 study. *Inj Prev* 2020;26:i27–i35. doi: 10.1136/injuryprev-2019-043297

The author Navid Manafi's surname was incorrectly spelt as 'Manaf'.

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Inj Prev 2023;**29**:e1. doi:10.1136/injuryprev-2019-043297corr1

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Appendix 1

Summary of General Global Burden of Disease Study Methods

The Institute for Health Metrics and Evaluation with a growing collaboration of scientists produces annual updates of the Global Burden of Disease study. Estimates span the period from 1990 to the most recent completed year (2017). By the time of the release of GBD 2017 in November 2018, there were 3,676 collaborators in 144 countries and 2 territories who contributed to this global public good. Annual updates allow incorporation of new data and method improvements to ensure that the most up-to-date information is available to policy makers in a timely fashion to help make resource allocation decisions.

The guiding principle of GBD is to assess health loss due to mortality and disability comprehensively, where we define disability as any departure from full health. In GBD 2017, estimates were made for 195 countries and territories, and 579 subnational locations, for 28 years starting from 1990, for 23 age groups and both sexes. Deaths were estimated for 282 diseases and injuries, while prevalence and incidence were estimated for 355 diseases and injuries. In order to allow meaningful comparisons between deaths and non-fatal disease outcomes as well as between diseases, the data on deaths and prevalence are summarised in a single indicator, the disability-adjusted life-year (DALY). DALYs are the sum of years of life lost (YLLs) and years lived with disability (YLDs). YLLs are estimated as the multiplication of counts of death and a standard, “ideal”, remaining life expectancy at the age of death. The standard life expectancy is derived from the lowest observed mortality rates in any population in the world greater than 5 million. YLDs are estimated as the product of prevalence of individual consequences of disease (or “sequelae”) times a disability weight that quantifies the relative severity of a sequela as a number between zero (representing “full health”) and 1 (representing death). Disability weights have been estimated in nine population surveys and an open-access internet survey in which respondents are asked to choose the “healthier” between random pairs of health states that are presented with a short description of the main features.

All-cause mortality rates are estimated from vital registration data in countries with complete coverage[1]. For other countries, the probabilities of death before age 5 and between ages 15 and 60 are estimated from censuses and surveys asking mothers to provide a history of children ever born and those still alive, and surveys asking adults about siblings who are alive or have passed away. Using model life tables, these probabilities of death are transformed into age-specific death rates by location, year, and sex.

For cause of death estimation, GBD has collated a large database of cause of death data from vital registrations and verbal autopsy surveys in which relatives are asked a standard set of questions to ascertain the likely cause of death, supplemented with police and mortuary data for injury deaths in countries with no other data[2]. For countries with vital registration data, the completeness is assessed with demographic methods based on comparing recorded deaths with population counts between two successive censuses. The cause of death information is provided in a large number of different classification systems based on versions of the

International Classification of Diseases or bespoke classifications in some countries. All data are mapped into the disease and injury categories of GBD. All classification systems contain codes that are less informative because they lack a specific diagnosis (eg, unspecified cancer) or refer to codes that cannot be underlying cause of death (eg, low back pain or senility) or are intermediate causes (eg, heart failure or sepsis). Such deaths are redistributed to more precise underlying causes of death. After these redistributions and corrections for under-registration, the data are analysed in CODEm (cause of death ensemble model), a highly systematised tool that runs many different models on the same data and chooses an ensemble of models that best reflects all the available input data. Models are chosen with variations in the statistical approach ("mixed effects" of spatiotemporal Gaussian Process Regression), in the unit of analysis (rates or cause fractions), and the choice of predictive covariates. The statistical performance of all models is tested by holding out 30% of the data and checking how well a model covers the data that were held out. To enforce consistency from CODEm, the sum of all cause-specific mortality rates is scaled to that of the all-cause mortality rates in each age, sex, location, and year category.

Non-fatal estimates are based on systematic reviews of published papers and unpublished documents, survey microdata, administrative records of health encounters, registries, and disease surveillance systems[3]. Our Global Health Data Exchange (GHDx, http://ghdx.healthdata.org/) is the largest repository of health data globally. We first set a reference case definition and/or study method that best quantifies each disease or injury or consequence thereof. If there is evidence of a systematic bias in data that used different case definitions or methods compared to reference data we adjust those data points to reflect what its value would have been if measured as the reference. This is a necessary step if one wants to use all data pertaining to a particular quantity of interest rather than choosing a small subset of data of the highest quality only. DisMod-MR 2.1, a Bayesian meta-regression tool, is our main method of analyzing non-fatal data. It is designed as a geographical cascade where a first model is run on all the world's data, which produces an initial global fit and estimates coefficients for predictor variables and the adjustments for alternative study characteristics. The global fit adjusted by the values of random effects for each of seven GBD super-regions, the coefficients on sex and country predictors, are passed down as data to a model for each super-region together with the input data for that geography. The same steps are repeated going from super-region to 21 region fits and then to 195 fits by country and where applicable a further level down to subnational units. Below the global fit, all models are run separately by sex and for six time periods: 1990, 1995, 2000, 2005, 2010, and 2017. During each fit all data on prevalence, incidence, remission, and mortality are forced to be internally consistent. For most diseases, the bulk of data on prevalence or incidence is at the disease level with fewer studies providing data on the proportions of cases of disease in each of the sequelae defined for the disease. The proportions in each sequela are pooled using DisMod-MR 2.1 or meta-analysis, or derived from analyses of patient-level datasets. The multiplication of prevalent cases for each disease sequela and the appropriate disability weight produces YLD estimates that do not yet take into account comorbidity. To correct for comorbidity, these data are used in a simulation to create hypothetical individuals in each age, sex, location, and year combination who experience no, one, or multiple sequelae simultaneously. We assume that disability weights are multiplicative rather than additive as this avoids assigning a combined disability weight value in any individual to exceed 1, ie, be worse than a "year lost due to death". This comorbidity adjustment leads to an average scaling down of disease-specific YLDs ranging from about 2% in young children up to 17% in oldest ages.

All our estimates of causes of death are categorical: each death is assigned to a single underlying cause. This has the attractive property that all estimates add to 100%. For risks, we use a different, "counterfactual" approach, ie, answering the question: "what would the burden have been if the population had been exposed to a theoretical minimum level of exposure to a risk". Thus, we need to define what level of exposure to a risk factor leads to the lowest amount of disease. We then analyse data on the prevalence of exposure to a risk and derive relative risks for any risk-outcome pair for which we find sufficient evidence of a causal relationship. Prevalence of exposure is estimated in DisMod-MR 2.1, using spatiotemporal Gaussian Process Regression, or from satellite imagery in the case of ambient air pollution. Relative risk data are pooled using meta-analysis of cohort, case-control and/or intervention studies. For each risk and outcome pair, we evaluate the evidence and judge if the evidence falls into the categories of "convincing" or "probable" as defined by the World Cancer Research Fund[4].

From the prevalence and relative risk results, population attributable fractions are estimated relative to the theoretical minimum risk exposure level (TMREL). When we aggregate estimates for clusters of risks, eg, metabolic or behavioural risks, we use a multiplicative function rather than simple addition and take into account how much of each risk is mediated through another risk. For instance, some of the risk of high body mass index is directly onto stroke as an outcome but much of its impact is mediated through high blood pressure, high cholesterol, or high fasting plasma glucose, and we would not want to double count the mediated effects when we estimate aggregates across risk factors[5].

Uncertainty is propagated throughout all these calculations by creating 1,000 values for each prevalence, death, YLL, YLD, or DALY estimate and performing aggregations across causes and locations at the level of each of the 1,000 values for all intermediate steps in the calculation. The lower and upper bounds of the 95% uncertainty interval are the 25th and 975th values of the ordered 1,000 values. For all age-standardised rates, GBD uses a standard population estimated elsewhere in the GBD analytical process.

GBD uses a composite indicator or sociodemographic development, SDI, which reflects the geometric mean of normalised values of a location's income per capita, the average years of schooling in the population 15 and over, and the total fertility rate under age 25. Countries and territories are grouped into five quintiles of high, high-middle, middle, low-middle, and low SDI based on their 2017 values.

1 GBD 2017 Collaborators. Global, regional, and national age- and sex-specific mortality and life expectancy for 195 countries and territories, 1950–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet* 2018.

2 GBD 2017 Collaborators. Global, regional, and national age-sex-specific mortality for 282 causes of death for 195 countries and territories, 1980–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet* 2018.

3 GBD 2017 Collaborators. Global, regional, and national incidence, prevalence, and YLDs for 328 acute and chronic diseases and injuries for 195 countries, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet* 2018.

4 Food, nutrition, physical activity, and the prevention of cancer: a global perspective. 2007. http://www.aicr.org/assets/docs/pdf/reports/Second_Expert_Report.pdf.

5 GBD 2017 Collaborators. Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet* 2018.

Appendix 2

GATHER checklist of information that should be included in reports of global health estimates, with description of compliance and location of information for GBD 2017.

#	GATHER checklist item	Description of compliance	Reference
Objectives and funding			
1	Define the indicators, populations, and time periods for which estimates were made.	Narrative provided in paper and appendix describing indicators, definitions, and populations	Main text (Methods) and appendix
2	List the funding sources for the work.	Funding sources listed in paper	Summary (Funding)
Data Inputs			
For all data inputs from multiple sources that are synthesised as part of the study:			
3	Describe how the data were identified and how the data were accessed.	Narrative description of data seeking methods provided	Main text (Methods) and appendix
4	Specify the inclusion and exclusion criteria. Identify all ad-hoc exclusions.	Narrative about inclusion and exclusion criteria by data type provided; ad hoc exclusions in cause-specific write-ups	Main text (Methods) and appendix
5	Provide information on all included data sources and their main characteristics. For each data source used, report reference information or contact name/institution, population represented, data collection method, year(s) of data collection, sex and age range, diagnostic criteria or measurement method, and sample size, as relevant.	An interactive, online data source tool that provides metadata for data sources by component, geography, cause, risk, or impairment has been developed	Online data citation tools: http://ghdx.healthdata.org/gbd-2017
6	Identify and describe any categories of input data that have potentially important biases (e.g., based on characteristics listed in item 5).	Summary of known biases by cause included in appendix	Appendix
For data inputs that contribute to the analysis but were not synthesised as part of the study:			
7	Describe and give sources for any other data inputs.	Included in online data source tool	http://ghdx.healthdata.org/gbd-2017
For all data inputs:			
8	Provide all data inputs in a file format from which data can be efficiently extracted (e.g., a spreadsheet as opposed to a PDF), including all relevant meta-data listed in item 5. For any data inputs that cannot be shared due to ethical or legal reasons, such as third-party ownership, provide a contact name or the name of the institution that retains the right to the data.	Downloads of input data available through online tools, including data visualisation tools and data query tools; input data not available in tools will be made available upon request	Online data visualisation tools, data query tools, and the Global Health Data Exchange
Data analysis			

9	Provide a conceptual overview of the data analysis method. A diagram may be helpful.	Flow diagrams of the overall methodological processes, as well as cause-specific modelling processes, have been provided	Main text (Methods) and appendix
10	Provide a detailed description of all steps of the analysis, including mathematical formulae. This description should cover, as relevant, data cleaning, data pre-processing, data adjustments and weighting of data sources, and mathematical or statistical model(s).	Flow diagrams and corresponding methodological write-ups for each cause, as well as the databases and modelling processes, have been provided	Main text (Methods) and appendix
11	Describe how candidate models were evaluated and how the final model(s) were selected.	Provided in the methodological write-ups	Appendix
12	Provide the results of an evaluation of model performance, if done, as well as the results of any relevant sensitivity analysis.	Provided in the methodological write-ups	Appendix
13	Describe methods for calculating uncertainty of the estimates. State which sources of uncertainty were, and were not, accounted for in the uncertainty analysis.	Appendix	Appendix
14	State how analytic or statistical source code used to generate estimates can be accessed.	Appendix	http://ghdx.healthdata.org/gbd-2017/code
Results and Discussion			
15	Provide published estimates in a file format from which data can be efficiently extracted.	GBD 2017 results are available through online data visualisation tools, the Global Health Data Exchange, and the online data query tool	Main text, and online data tools (data visualisation tools, data query tools, and the Global Health Data Exchange)
16	Report a quantitative measure of the uncertainty of the estimates (e.g. uncertainty intervals).	Uncertainty intervals are provided with all results	Main text, appendix, and online data tools (data visualisation tools, data query tools, and the Global Health Data Exchange)
17	Interpret results in light of existing evidence. If updating a previous set of estimates, describe the reasons for changes in estimates.	Discussion of methodological changes between GBD rounds provided in the narrative of the manuscript and appendix	Main text (Methods and Discussion) and appendix
18	Discuss limitations of the estimates. Include a discussion of any modelling assumptions or data limitations that affect interpretation of the estimates.	Discussion of limitations provided in the narrative of the main paper, as well as in the methodological write-ups in the appendix	Main text (Limitations) and appendix

Table 1: Incidence, prevalence, and YLDs for 2017 and percentage change of age-standardised rates by location for facial fractures

Location	Incidence (95% UI)			Prevalence (95% UI)			YLDs (95% UI)		
	2017 counts	2017 age-standardised rates per 100,000	Percentage change in age-standardised rates between 1990 and 2017	2017 counts	2017 age-standardised rates per 100,000	Percentage change in age-standardised rates between 1990 and 2017	2017 counts	2017 age-standardised rates per 100,000	Percentage change in age-standardised rates between 1990 and 2017
Global	**7 538 663 (6 116 489 to 9 493 113)**	**98 (80 to 123)**	**-2.0 (-3.9 to 0.2)**	**1 819 732 (1 609 419 to 2 091 618)**	**23 (20 to 27)**	**-2.8 (-4.1 to -1.4)**	**117 402 (73 266 to 169 689)**	**1 (1 to 2)**	**-2.7 (-4.3 to -1.0)**
Low SDI	**1 089 162 (886 300 to 1 327 015)**	**86 (70 to 105)**	**-12.3 (-28.2 to -0.3)**	**219 785 (184 916 to 270 384)**	**21 (18 to 25)**	**-1.8 (-12.0 to 4.6)**	**14 292 (9 003 to 20 425)**	**1 (1 to 2)**	**-2.2 (-12.7 to 5.5)**
Low-middle SDI	**1 456 718 (1 200 207 to 1 777 972)**	**86 (70 to 104)**	**17.3 (13.4 to 21.6)**	**300 831 (259 456 to 352 338)**	**19 (17 to 23)**	**15.7 (13.5 to 18.0)**	**19 567 (12 174 to 28 035)**	**1 (1 to 2)**	**15.7 (12.1 to 19.2)**
Middle SDI	**1 511 639 (1 213 269 to 1 875 589)**	**72 (58 to 89)**	**24.3 (18.8 to 30.8)**	**364 245 (322 625 to 418 366)**	**17 (15 to 19)**	**22.4 (19.2 to 26.5)**	**23 653 (14 840 to 34 586)**	**1 (1 to 2)**	**22.2 (18.3 to 26.9)**
High-middle SDI	**1 749 211 (1 386 163 to 2 235 915)**	**128 (102 to 164)**	**0.4 (-2.6 to 3.5)**	**453 558 (402 694 to 517 635)**	**29 (26 to 34)**	**-3.1 (-4.6 to -1.5)**	**29 163 (18 075 to 42 458)**	**2 (1 to 3)**	**-2.8 (-5.2 to -0.2)**
High SDI	**1 709 496 (1 307 361 to 2 264 741)**	**158 (122 to 206)**	**-10.3 (-12.4 to -8.1)**	**475 199 (420 916 to 544 481)**	**35 (30 to 41)**	**-9.6 (-10.8 to -8.4)**	**30 332 (18 841 to 44 614)**	**2 (1 to 3)**	**-9.7 (-11.7 to -7.7)**
Central Europe, Eastern Europe, and Central Asia	**1 024 479 (774 842 to 1 360 176)**	**254 (193 to 335)**	**-5.4 (-8.2 to -2.5)**	**265 683 (232 728 to 309 889)**	**56 (48 to 67)**	**-4.9 (-6.5 to -3.1)**	**16 947 (10 461 to 24 821)**	**4 (2 to 5)**	**-4.9 (-7.3 to -2.4)**
Central Asia	**154 199 (120 104 to 199 933)**	**167 (130 to 217)**	**-3.4 (-7.5 to 0.6)**	**33 550 (28 926 to 39 751)**	**38 (33 to 44)**	**-2.5 (-5.1 to 0.9)**	**2 176 (1 332 to 3 192)**	**2 (1 to 4)**	**-2.5 (-7.6 to 3.3)**
Armenia	4 734 (3 647 to 6 235)	163 (125 to 214)	-22.7 (-32.5 to -15.6)	1 235 (1 072 to 1 435)	37 (32 to 44)	-21.9 (-27.7 to -17.5)	79 (49 to 117)	2 (1 to 4)	-21.8 (-31.6 to -11.6)
Azerbaijan	17 127 (13 275 to 22 375)	166 (128 to 215)	0.4 (-7.9 to 7.3)	3 964 (3 427 to 4 683)	38 (33 to 45)	4.6 (-0.8 to 12.2)	256 (162 to 377)	2 (2 to 4)	4.4 (-6.9 to 18.1)
Georgia	6 094 (4 723 to 7 897)	171 (133 to 220)	-3.9 (-10.1 to 2.9)	1 627 (1 435 to 1 871)	38 (33 to 45)	-2.1 (-6.3 to 2.9)	104 (64 to 152)	2 (2 to 4)	-2.4 (-11.3 to 8.6)
Kazakhstan	34 224 (26 818 to 43 925)	191 (149 to 246)	-2.3 (-7.0 to 2.6)	7 567 (6 554 to 8 897)	42 (36 to 49)	-2.9 (-5.7 to 0.1)	489 (300 to 730)	3 (2 to 4)	-2.7 (-12.9 to 8.4)
Kyrgyzstan	9 831 (7 635 to 12 776)	150 (117 to 196)	-19.5 (-25.1 to -14.3)	2 020 (1 718 to 2 414)	34 (29 to 40)	-18.6 (-21.9 to -15.7)	132 (79 to 199)	2 (1 to 3)	-18.4 (-27.4 to -8.1)
Mongolia	6 683 (5 137 to 8 665)	200 (154 to 260)	17.3 (12.9 to 21.9)	1 397 (1 197 to 1 654)	44 (38 to 52)	13.9 (10.7 to 16.9)	91 (55 to 136)	3 (2 to 4)	14.0 (2.6 to 27.6)
Tajikistan	14 906 (11 428 to 19 539)	156 (119 to 204)	-4.1 (-9.2 to 0.8)	3 189 (2 646 to 3 950)	39 (32 to 47)	5.4 (-3.9 to 26.3)	207 (128 to 309)	2 (2 to 4)	4.9 (-8.7 to 29.0)
Turkmenistan	8 405 (6 489 to 10 855)	166 (128 to 216)	9.3 (3.6 to 15.0)	1 772 (1 520 to 2 104)	37 (31 to 43)	6.6 (3.3 to 9.7)	115 (70 to 173)	2 (1 to 4)	6.6 (-4.9 to 20.1)
Uzbekistan	52 196 (40 394 to 67 877)	157 (122 to 204)	2.8 (-2.1 to 7.7)	10 777 (9 222 to 12 843)	35 (30 to 41)	2.8 (-0.1 to 5.7)	702 (421 to 1 047)	2 (1 to 3)	2.8 (-7.4 to 14.3)
Central Europe	**337 910 (245 337 to 464 014)**	**310 (228 to 420)**	**-1.8 (-6.0 to 2.1)**	**92 387 (80 541 to 108 397)**	**68 (57 to 82)**	**-2.9 (-5.2 to -0.5)**	**5 861 (3 621 to 8 694)**	**4 (3 to 7)**	**-2.8 (-6.8 to 1.3)**
Albania	7 390 (5 473 to 9 981)	281 (208 to 377)	10.1 (2.4 to 17.3)	1 897 (1 649 to 2 240)	62 (52 to 74)	9.5 (4.8 to 14.3)	122 (74 to 182)	4 (2 to 6)	9.5 (-0.3 to 20.8)
Bosnia and Herzegovina	8 812 (6 479 to 12 000)	286 (211 to 386)	29.5 (25.0 to 34.4)	2 686 (2 294 to 3 257)	68 (57 to 83)	38.7 (29.0 to 60.4)	170 (108 to 242)	4 (3 to 6)	38.1 (22.7 to 65.3)
Bulgaria	18 901 (13 796 to 25 776)	295 (218 to 396)	-4.2 (-9.4 to 1.2)	5 452 (4 777 to 6 356)	64 (54 to 77)	-4.1 (-7.4 to -0.5)	346 (214 to 514)	4 (2 to 6)	-4.0 (-12.0 to 4.3)
Croatia	10 801 (7 838 to 14 942)	248 (187 to 331)	-16.5 (-22.7 to -10.4)	3 017 (2 630 to 3 542)	55 (47 to 66)	-13.5 (-17.6 to -8.6)	191 (118 to 282)	4 (2 to 5)	-13.5 (-21.7 to -4.5)
Czech Republic	36 609 (26 366 to 49 959)	374 (275 to 500)	4.2 (-2.5 to 11.1)	10 166 (8 837 to 12 000)	81 (69 to 99)	3.8 (-0.1 to 8.2)	642 (391 to 958)	5 (3 to 8)	3.8 (-4.3 to 14.1)
Hungary	28 311 (20 302 to 39 443)	303 (220 to 413)	-10.2 (-16.1 to -4.1)	7 785 (6 705 to 9 226)	66 (55 to 80)	-12.2 (-15.8 to -8.5)	493 (298 to 742)	4 (3 to 6)	-11.6 (-19.0 to -3.0)
Macedonia	5 698 (4 197 to 7 813)	282 (208 to 382)	10.2 (0.6 to 18.0)	1 500 (1 300 to 1 772)	62 (52 to 75)	12.4 (7.7 to 16.8)	96 (59 to 144)	4 (2 to 6)	12.3 (1.5 to 23.2)
Montenegro	1 759 (1 306 to 2 362)	298 (222 to 402)	3.6 (-2.0 to 9.0)	455 (394 to 533)	65 (55 to 78)	4.5 (1.0 to 8.4)	29 (18 to 43)	4 (3 to 6)	4.3 (-5.2 to 14.3)
Poland	116 518 (84 517 to 161 202)	316 (233 to 427)	1.5 (-3.5 to 6.9)	31 345 (27 039 to 36 935)	69 (58 to 83)	-0.4 (-3.7 to 2.8)	1 991 (1 228 to 2 954)	4 (3 to 7)	-0.2 (-8.7 to 8.5)
Romania	55 334 (40 328 to 75 628)	300 (220 to 407)	-12.4 (-18.0 to -6.4)	15 183 (13 164 to 17 819)	65 (55 to 79)	-14.0 (-17.2 to -10.5)	963 (582 to 1 428)	4 (3 to 6)	-13.9 (-21.4 to -6.1)
Serbia	23 331 (17 109 to 31 741)	284 (210 to 383)	10.1 (4.2 to 15.9)	6 397 (5 559 to 7 558)	63 (53 to 76)	10.0 (5.9 to 15.0)	406 (249 to 594)	4 (2 to 6)	9.9 (0.3 to 21.1)
Slovakia	16 811 (12 185 to 23 128)	320 (235 to 430)	-7.0 (-11.8 to -2.4)	4 401 (3 789 to 5 199)	69 (58 to 84)	-8.5 (-11.4 to -5.5)	280 (168 to 417)	4 (3 to 7)	-8.2 (-15.3 to -0.6)
Slovenia	7 634 (5 419 to 10 622)	376 (272 to 507)	0.3 (-5.4 to 6.6)	2 105 (1 829 to 2 484)	81 (69 to 99)	-0.8 (-4.2 to 3.0)	133 (81 to 199)	5 (3 to 8)	-0.7 (-8.6 to 8.0)
Eastern Europe	**532 370 (407 819 to 700 276)**	**268 (205 to 351)**	**-2.3 (-5.2 to 1.0)**	**139 745 (122 815 to 161 152)**	**58 (50 to 69)**	**-2.3 (-4.1 to -0.4)**	**8 911 (5 526 to 13 012)**	**4 (2 to 6)**	**-2.3 (-5.4 to 0.9)**
Belarus	23 553 (17 817 to 31 184)	262 (198 to 344)	2.0 (-3.0 to 6.8)	6 181 (5 380 to 7 219)	56 (48 to 67)	0.7 (-2.1 to 3.7)	395 (242 to 579)	4 (2 to 5)	0.9 (-8.0 to 11.0)
Estonia	3 101 (2 357 to 4 110)	257 (195 to 336)	-16.9 (-22.0 to -11.7)	852 (748 to 991)	55 (47 to 66)	-17.3 (-20.3 to -14.1)	54 (33 to 81)	4 (2 to 5)	-17.1 (-24.7 to -9.4)
Latvia	4 778 (3 612 to 6 356)	263 (199 to 346)	-17.1 (-22.1 to -12.1)	1 324 (1 164 to 1 528)	56 (48 to 67)	-18.4 (-21.3 to -15.3)	84 (52 to 125)	4 (2 to 5)	-18.2 (-24.9 to -11.3)
Lithuania	7 612 (5 696 to 10 252)	277 (210 to 362)	-6.2 (-11.0 to -1.1)	2 091 (1 826 to 2 431)	60 (51 to 71)	-7.0 (-9.9 to -3.8)	132 (82 to 194)	4 (2 to 6)	-7.0 (-14.8 to 1.1)
Moldova	7 737 (5 897 to 10 158)	224 (170 to 293)	-12.7 (-17.6 to -7.3)	2 032 (1 772 to 2 361)	49 (42 to 58)	-13.7 (-16.8 to -10.4)	130 (80 to 193)	3 (2 to 5)	-13.3 (-22.2 to -4.3)
Russian Federation	377 124 (289 211 to 496 594)	271 (207 to 354)	-3.2 (-7.3 to 1.1)	98 094 (86 163 to 113 401)	59 (50 to 70)	-2.8 (-5.2 to -0.4)	6 259 (3 864 to 9 187)	4 (2 to 6)	-2.8 (-6.1 to 0.5)
Ukraine	108 465 (83 222 to 142 677)	264 (202 to 346)	2.0 (-2.2 to 6.4)	29 173 (25 707 to 33 553)	57 (49 to 68)	1.2 (-1.6 to 4.1)	1 856 (1 138 to 2 740)	4 (2 to 5)	1.0 (-7.2 to 10.5)
High-income	**1 530 492 (1 180 646 to 2 011 370)**	**150 (117 to 195)**	**-10.8 (-13.0 to -8.5)**	**420 726 (373 075 to 481 966)**	**33 (28 to 39)**	**-10.4 (-11.6 to -9.1)**	**26 878 (16 711 to 39 478)**	**2 (1 to 3)**	**-10.5 (-12.6 to -8.4)**
Australasia	**77 125 (58 731 to 101 370)**	**291 (222 to 381)**	**10.1 (5.6 to 14.7)**	**19 522 (17 023 to 22 762)**	**62 (53 to 73)**	**9.5 (6.4 to 12.8)**	**1 250 (773 to 1 852)**	**4 (2 to 6)**	**9.4 (1.4 to 18.6)**
Australia	62 547 (47 525 to 82 203)	281 (214 to 366)	10.1 (4.9 to 15.1)	15 858 (13 802 to 18 496)	60 (51 to 71)	9.7 (6.2 to 13.3)	1 016 (627 to 1 508)	4 (2 to 6)	9.7 (0.1 to 20.7)
New Zealand	14 579 (11 142 to 19 157)	345 (266 to 449)	11.8 (6.2 to 18.3)	3 663 (3 195 to 4 278)	73 (63 to 87)	10.0 (6.0 to 14.4)	234 (144 to 347)	5 (3 to 7)	10.0 (1.3 to 19.1)
High-income Asia-Pacific	**259 948 (194 962 to 350 170)**	**158 (119 to 214)**	**4.7 (0.3 to 8.9)**	**80 146 (70 927 to 91 929)**	**35 (30 to 42)**	**5.6 (3.3 to 7.9)**	**5 112 (3 201 to 7 511)**	**2 (1 to 3)**	**5.6 (1.1 to 10.2)**
Brunei	812 (635 to 1 046)	190 (149 to 246)	-0.2 (-4.9 to 4.1)	172 (148 to 204)	41 (35 to 48)	-3.2 (-6.0 to -0.4)	11 (7 to 17)	3 (2 to 4)	-2.8 (-13.1 to 8.2)
Japan	174 530 (126 189 to 241 959)	155 (114 to 215)	16.7 (12.4 to 20.6)	57 496 (50 719 to 66 017)	35 (30 to 42)	16.7 (14.0 to 19.2)	3 653 (2 280 to 5 403)	2 (1 to 3)	16.8 (12.6 to 20.9)
South Korea	76 028 (59 055 to 99 388)	163 (126 to 211)	-15.2 (-20.1 to -10.3)	20 334 (17 868 to 23 353)	35 (30 to 41)	-17.0 (-19.9 to -14.2)	1 308 (798 to 1 912)	2 (1 to 3)	-16.8 (-25.0 to -7.4)
Singapore	8 578 (6 664 to 11 129)	169 (131 to 220)	1.3 (-2.6 to 5.4)	2 144 (1 871 to 2 488)	36 (31 to 43)	3.0 (0.3 to 5.8)	139 (86 to 207)	2 (1 to 4)	2.9 (-8.1 to 15.2)
High-income North America	**481 467 (361 683 to 642 026)**	**131 (101 to 170)**	**-30.6 (-34.2 to -27.1)**	**132 599 (117 213 to 151 321)**	**30 (27 to 35)**	**-29.2 (-31.4 to -27.0)**	**8 451 (5 258 to 12 337)**	**2 (1 to 3)**	**-29.4 (-32.4 to -26.3)**
Canada	49 267 (38 614 to 63 397)	143 (113 to 181)	-0.5 (-4.2 to 3.4)	13 435 (11 901 to 15 335)	31 (27 to 36)	-1.0 (-3.4 to 1.2)	863 (530 to 1 269)	2 (1 to 3)	-1.0 (-10.1 to 9.2)
Greenland	87 (68 to 112)	154 (121 to 197)	-33.2 (-36.6 to -30.3)	21 (18 to 24)	34 (30 to 40)	-34.7 (-36.8 to -32.7)	1 (1 to 2)	2 (1 to 3)	-34.6 (-41.2 to -27.4)
USA	432 104 (322 525 to 576 650)	130 (99 to 170)	-32.8 (-36.7 to -29.1)	119 141 (105 314 to 136 479)	30 (27 to 35)	-31.2 (-33.6 to -28.9)	7 586 (4 709 to 11 040)	2 (1 to 3)	-31.5 (-34.6 to -28.3)
Southern Latin America	**95 910 (76 815 to 122 752)**	**149 (120 to 191)**	**13.8 (8.5 to 19.7)**	**22 100 (19 379 to 25 409)**	**32 (28 to 37)**	**10.7 (7.5 to 14.0)**	**1 428 (887 to 2 089)**	**2 (1 to 3)**	**10.5 (1.7 to 20.8)**
Argentina	66 405 (52 911 to 84 872)	152 (121 to 194)	18.0 (12.1 to 24.8)	15 189 (13 284 to 17 529)	33 (29 to 38)	15.0 (11.5 to 19.0)	982 (612 to 1 444)	2 (1 to 3)	14.8 (2.8 to 28.5)
Chile	24 217 (19 347 to 30 820)	138 (110 to 175)	3.2 (-4.6 to 10.6)	5 612 (4 931 to 6 479)	29 (25 to 34)	-0.2 (-4.5 to 4.0)	363 (223 to 531)	2 (1 to 3)	-0.3 (-11.9 to 12.4)
Uruguay	5 283 (4 170 to 6 836)	159 (126 to 205)	13.7 (7.9 to 20.1)	1 297 (1 141 to 1 487)	34 (30 to 40)	11.9 (8.3 to 15.5)	84 (52 to 123)	2 (1 to 3)	12.1 (1.3 to 26.0)
Western Europe	**616 043 (474 017 to 813 742)**	**155 (120 to 202)**	**-2.9 (-5.8 to -0.2)**	**166 361 (145 619 to 192 115)**	**33 (28 to 39)**	**-3.3 (-5.0 to -1.7)**	**10 637 (6 602 to 15 577)**	**2 (1 to 3)**	**-3.3 (-6.9 to 0.1)**
Andorra	118 (91 to 156)	165 (127 to 215)	1.6 (-1.8 to 4.9)	32 (28 to 37)	35 (30 to 41)	1.5 (-0.5 to 3.7)	2 (1 to 3)	2 (1 to 3)	1.2 (-8.8 to 13.0)
Austria	13 112 (10 096 to 17 329)	163 (125 to 211)	-10.9 (-15.2 to -6.2)	3 537 (3 094 to 4 104)	34 (29 to 41)	-11.3 (-13.8 to -8.8)	226 (138 to 332)	2 (1 to 3)	-11.4 (-20.1 to -1.8)
Belgium	19 363 (14 793 to 25 487)	179 (138 to 234)	8.3 (3.8 to 13.1)	5 067 (4 403 to 5 909)	38 (32 to 45)	6.5 (3.5 to 9.6)	323 (200 to 479)	2 (1 to 4)	6.6 (-4.7 to 18.3)
Cyprus	1 894 (1 474 to 2 441)	163 (127 to 210)	-2.0 (-5.8 to 1.9)	476 (417 to 550)	34 (29 to 41)	-4.7 (-7.4 to -2.1)	31 (19 to 45)	2 (1 to 3)	-4.4 (-14.7 to 6.5)
Denmark	8 270 (6 353 to 10 854)	159 (123 to 206)	-3.5 (-7.4 to 0.4)	2 183 (1 907 to 2 530)	33 (28 to 40)	-3.2 (-5.9 to -0.4)	140 (86 to 205)	2 (1 to 3)	-3.0 (-12.0 to 8.2)
Finland	9 791 (7 437 to 13 057)	188 (145 to 245)	1.7 (-2.1 to 6.0)	2 607 (2 277 to 3 036)	39 (33 to 47)	2.2 (-0.3 to 4.7)	166 (102 to 245)	3 (2 to 4)	2.3 (-7.6 to 13.5)
France	103 333 (79 304 to 136 871)	166 (128 to 216)	-5.3 (-9.2 to -1.7)	27 149 (23 707 to 31 425)	35 (30 to 41)	-6.0 (-8.4 to -3.7)	1 740 (1 060 to 2 569)	2 (1 to 3)	-5.9 (-15.6 to 4.0)
Germany	119 967 (91 450 to 159 297)	159 (122 to 207)	1.7 (-2.2 to 5.6)	33 493 (29 396 to 38 795)	33 (28 to 40)	1.0 (-1.9 to 3.6)	2 137 (1 313 to 3 131)	2 (1 to 3)	1.1 (-8.7 to 11.7)
Greece	14 251 (11 043 to 18 542)	157 (123 to 203)	-2.9 (-6.7 to 0.6)	4 085 (3 620 to 4 680)	33 (29 to 40)	-3.0 (-5.4 to -0.5)	260 (159 to 382)	2 (1 to 3)	-3.2 (-14.1 to 8.3)
Iceland	510 (395 to 663)	160 (125 to 208)	2.5 (-1.1 to 6.1)	125 (108 to 146)	34 (29 to 40)	1.5 (-0.6 to 4.1)	8 (5 to 12)	2 (1 to 3)	1.4 (-9.4 to 14.5)
Ireland	7 077 (5 452 to 9 232)	157 (121 to 205)	3.1 (-0.5 to 6.7)	1 725 (1 498 to 2 012)	33 (28 to 39)	2.6 (0.1 to 5.2)	111 (67 to 164)	2 (1 to 3)	2.5 (-8.4 to 14.1)
Israel	13 578 (10 495 to 17 550)	155 (120 to 200)	0.7 (-5.6 to 5.6)	3 109 (2 663 to 3 673)	34 (29 to 40)	6.1 (1.2 to 13.4)	201 (124 to 294)	2 (1 to 3)	6.0 (-6.4 to 21.0)
Italy	77 022 (58 634 to 101 556)	138 (107 to 180)	-13.0 (-16.5 to -9.7)	21 913 (19 264 to 25 209)	29 (25 to 34)	-13.3 (-15.5 to -11.0)	1 398 (865 to 2 060)	2 (1 to 3)	-13.4 (-21.6 to -4.6)
Luxembourg	939 (726 to 1 234)	169 (131 to 220)	-16.9 (-21.5 to -12.3)	239 (209 to 277)	36 (30 to 42)	-14.4 (-17.0 to -11.7)	15 (9 to 23)	2 (1 to 3)	-14.5 (-23.2 to -4.5)
Malta	659 (499 to 869)	170 (131 to 221)	3.5 (-1.1 to 8.2)	177 (155 to 206)	35 (30 to 42)	5.6 (2.6 to 8.5)	11 (7 to 17)	2 (1 to 3)	5.8 (-4.5 to 17.3)
Netherlands	21 351 (16 375 to 28 253)	137 (107 to 176)	3.0 (-2.7 to 8.2)	5 542 (4 867 to 6 402)	28 (24 to 33)	0.9 (-2.3 to 4.1)	355 (219 to 516)	2 (1 to 3)	1.0 (-10.2 to 13.3)
Norway	7 732 (5 558 to 10 734)	154 (112 to 214)	-2.1 (-4.9 to 0.6)	2 104 (1 828 to 2 486)	34 (29 to 42)	-1.7 (-3.2 to -0.1)	134 (82 to 200)	2 (1 to 3)	-1.7 (-5.2 to 1.7)
Portugal	12 649 (9 806 to 16 515)	132 (104 to 170)	-25.1 (-29.5 to -20.7)	3 544 (3 130 to 4 078)	28 (24 to 33)	-26.0 (-28.7 to -23.3)	226 (136 to 334)	2 (1 to 3)	-26.0 (-34.1 to -16.5)
Spain	61 719 (47 790 to 80 736)	150 (116 to 195)	-6.0 (-10.0 to -2.0)	17 066 (15 010 to 19 557)	32 (27 to 38)	-6.3 (-8.5 to -3.9)	1 092 (672 to 1 604)	2 (1 to 3)	-6.3 (-16.0 to 4.7)
Sweden	13 904 (9 877 to 19 514)	146 (106 to 204)	7.8 (4.5 to 11.3)	3 940 (3 420 to 4 617)	33 (28 to 40)	7.8 (5.5 to 10.6)	252 (157 to 379)	2 (1 to 3)	7.9 (-2.6 to 18.7)
Switzerland	13 030 (9 896 to 17 419)	158 (122 to 208)	-25.5 (-29.5 to -21.0)	3 469 (3 042 to 4 013)	33 (29 to 40)	-24.1 (-26.5 to -21.4)	222 (135 to 329)	2 (1 to 3)	-24.0 (-30.9 to -15.8)

Location	Incidence (95% UI)			Prevalence (95% UI)			YLDs (95% UI)		
	2017 counts	2017 age-standardised rates per 100,000	Percentage change in age-standardised rates between 1990 and 2017	2017 counts	2017 age-standardised rates per 100,000	Percentage change in age-standardised rates between 1990 and 2017	2017 counts	2017 age-standardised rates per 100,000	Percentage change in age-standardised rates between 1990 and 2017
United Kingdom	95 135 (73 259 to 125 133)	156 (120 to 203)	8.7 (5.9 to 11.5)	24 606 (21 455 to 28 573)	33 (28 to 39)	9.1 (7.3 to 11.0)	1 575 (973 to 2 307)	2 (1 to 3)	9.0 (6.2 to 11.8)
Latin America and Caribbean	**408 817 (312 608 to 535 700)**	**70 (54 to 92)**	**9.3 (-0.7 to 17.5)**	**94 277 (81 944 to 111 340)**	**16 (14 to 19)**	**10.3 (3.9 to 15.4)**	**6 119 (3 803 to 9 103)**	**1 (1 to 2)**	**10.1 (3.4 to 16.3)**
Andean Latin America	**38 201 (30 281 to 48 250)**	**63 (50 to 79)**	**-15.1 (-39.3 to 3.9)**	**8 463 (7 330 to 9 954)**	**14 (12 to 17)**	**-6.4 (-21.6 to 4.2)**	**551 (341 to 804)**	**1 (1 to 1)**	**-6.6 (-23.4 to 7.9)**
Bolivia	6 615 (5 232 to 8 393)	59 (46 to 74)	3.8 (-0.8 to 9.0)	1 357 (1 167 to 1 596)	13 (11 to 15)	1.8 (-0.9 to 4.8)	89 (53 to 130)	1 (1 to 1)	1.7 (-9.8 to 14.4)
Ecuador	11 444 (9 107 to 14 542)	69 (55 to 88)	14.7 (10.0 to 19.6)	2 471 (2 133 to 2 901)	15 (13 to 18)	9.5 (5.6 to 12.9)	161 (100 to 238)	1 (1 to 1)	9.8 (-4.0 to 24.2)
Peru	20 141 (15 991 to 25 494)	61 (48 to 77)	-28.5 (-55.5 to -2.1)	4 635 (3 954 to 5 541)	14 (12 to 17)	-14.3 (-34.4 to 1.9)	302 (185 to 440)	1 (1 to 1)	-14.6 (-36.2 to 7.6)
Caribbean	**33 496 (26 849 to 41 646)**	**72 (58 to 90)**	**36.3 (28.5 to 52.0)**	**8 430 (6 982 to 10 524)**	**18 (14 to 22)**	**50.7 (33.0 to 84.0)**	**543 (344 to 782)**	**1 (1 to 2)**	**48.8 (29.8 to 84.3)**
Antigua and Barbuda	59 (47 to 75)	68 (55 to 87)	32.1 (27.2 to 38.1)	14 (12 to 16)	14 (13 to 17)	27.6 (24.3 to 31.2)	1 (1 to 1)	1 (1 to 1)	27.3 (13.6 to 42.9)
The Bahamas	245 (198 to 306)	67 (54 to 83)	28.1 (23.4 to 33.2)	55 (48 to 63)	14 (12 to 17)	25.8 (22.7 to 29.3)	4 (2 to 5)	1 (1 to 1)	25.4 (11.1 to 42.0)
Barbados	179 (142 to 226)	63 (50 to 78)	34.1 (29.6 to 38.6)	45 (40 to 52)	13 (11 to 15)	32.1 (29.2 to 34.8)	3 (2 to 4)	1 (1 to 1)	31.5 (17.2 to 47.6)
Belize	269 (219 to 335)	69 (56 to 86)	43.8 (38.1 to 49.3)	56 (48 to 65)	16 (14 to 18)	46.7 (41.7 to 54.5)	4 (2 to 5)	1 (1 to 1)	45.5 (27.4 to 67.5)
Bermuda	44 (34 to 56)	68 (54 to 84)	27.0 (22.1 to 31.6)	12 (11 to 14)	15 (13 to 17)	20.8 (13.5 to 25.3)	1 (0 to 1)	1 (1 to 1)	21.1 (4.7 to 37.9)
Cuba	8 317 (6 399 to 10 908)	70 (55 to 90)	24.7 (19.3 to 30.0)	2 032 (1 776 to 2 372)	15 (13 to 17)	20.7 (17.3 to 24.2)	131 (80 to 193)	1 (1 to 1)	20.5 (7.0 to 35.4)
Dominica	42 (33 to 52)	61 (49 to 76)	41.8 (37.0 to 46.5)	10 (9 to 12)	13 (12 to 15)	41.2 (36.7 to 45.0)	1 (0 to 1)	1 (1 to 1)	40.4 (23.5 to 59.6)
Dominican Republic	7 644 (6 224 to 9 472)	73 (60 to 91)	52.3 (46.4 to 58.3)	1 617 (1 405 to 1 873)	16 (14 to 18)	48.7 (44.9 to 52.2)	106 (65 to 156)	1 (1 to 2)	47.6 (29.4 to 67.6)
Grenada	70 (56 to 89)	63 (51 to 80)	31.9 (27.4 to 36.7)	17 (15 to 19)	14 (12 to 16)	29.7 (26.3 to 32.9)	1 (1 to 2)	1 (1 to 1)	29.1 (15.3 to 45.1)
Guyana	474 (381 to 589)	65 (52 to 81)	34.7 (29.6 to 39.7)	100 (87 to 117)	14 (12 to 16)	33.2 (30.1 to 36.7)	7 (4 to 10)	1 (1 to 1)	32.5 (17.5 to 48.9)
Haiti	6 116 (4 946 to 7 567)	53 (43 to 66)	5.3 (-0.7 to 10.9)	2 368 (1 474 to 4 052)	24 (15 to 41)	105.7 (29.8 to 261.6)	149 (85 to 264)	1 (1 to 3)	97.5 (25.4 to 257.4)
Jamaica	1 977 (1 592 to 2 492)	71 (58 to 90)	49.8 (42.0 to 58.4)	437 (382 to 507)	15 (13 to 18)	48.8 (43.8 to 53.5)	29 (18 to 42)	1 (1 to 1)	48.1 (30.0 to 69.1)
Puerto Rico	5 245 (3 382 to 8 556)	148 (94 to 248)	152.0 (71.4 to 337.1)	985 (777 to 1 360)	24 (18 to 34)	86.9 (47.7 to 170.6)	64 (36 to 102)	2 (1 to 3)	88.4 (43.5 to 180.0)
Saint Lucia	109 (88 to 136)	63 (51 to 79)	31.8 (27.3 to 36.5)	25 (22 to 29)	14 (12 to 16)	28.7 (26.0 to 31.4)	2 (1 to 2)	1 (1 to 1)	28.0 (13.1 to 45.5)
Saint Vincent and the Grenadines	77 (61 to 96)	67 (54 to 85)	46.0 (40.9 to 50.9)	18 (16 to 21)	15 (13 to 17)	47.1 (43.5 to 50.7)	1 (1 to 2)	1 (1 to 1)	46.5 (29.4 to 65.3)
Suriname	358 (286 to 447)	63 (50 to 79)	34.0 (29.4 to 38.6)	84 (73 to 97)	14 (13 to 17)	22.6 (14.4 to 29.0)	5 (3 to 8)	1 (1 to 1)	22.8 (4.2 to 43.5)
Trinidad and Tobago	985 (788 to 1 238)	72 (58 to 90)	20.8 (-4.6 to 40.2)	232 (202 to 268)	15 (13 to 18)	28.0 (12.6 to 40.1)	15 (9 to 22)	1 (1 to 1)	27.4 (6.6 to 50.0)
Virgin Islands	84 (67 to 104)	80 (65 to 98)	41.1 (33.0 to 57.4)	20 (18 to 23)	16 (14 to 19)	33.6 (29.3 to 41.0)	1 (1 to 2)	1 (1 to 2)	33.7 (18.7 to 50.3)
Central Latin America	**164 811 (126 716 to 211 666)**	**65 (50 to 84)**	**-2.7 (-12.5 to 4.1)**	**37 303 (32 239 to 44 039)**	**15 (13 to 18)**	**-4.7 (-11.5 to 0.2)**	**2 424 (1 513 to 3 540)**	**1 (1 to 1)**	**-4.6 (-11.8 to 1.3)**
Colombia	28 322 (22 705 to 35 180)	56 (45 to 70)	-24.2 (-37.2 to -14.6)	6 684 (5 774 to 7 821)	13 (11 to 15)	-20.4 (-27.9 to -14.5)	434 (271 to 633)	1 (1 to 1)	-20.6 (-31.8 to -7.4)
Costa Rica	2 689 (2 134 to 3 386)	58 (46 to 73)	26.6 (20.9 to 33.2)	597 (520 to 692)	12 (11 to 15)	24.0 (20.9 to 27.4)	39 (24 to 59)	1 (0 to 1)	24.3 (10.0 to 39.7)
El Salvador	3 530 (2 757 to 4 466)	59 (46 to 74)	-41.7 (-66.6 to -12.2)	1 083 (805 to 1 717)	18 (14 to 30)	-37.6 (-51.8 to -17.8)	68 (42 to 107)	1 (1 to 2)	-37.9 (-53.0 to -14.4)
Guatemala	9 434 (7 455 to 11 770)	58 (45 to 72)	-22.8 (-46.5 to -2.8)	2 129 (1 743 to 2 720)	15 (12 to 20)	-24.3 (-39.5 to -8.1)	138 (86 to 203)	1 (1 to 1)	-24.3 (-41.2 to -1.6)
Honduras	4 849 (3 861 to 6 019)	53 (42 to 66)	7.0 (1.4 to 12.6)	1 024 (869 to 1 219)	13 (11 to 15)	15.8 (8.0 to 29.8)	67 (42 to 97)	1 (1 to 1)	15.3 (-1.3 to 37.6)
Mexico	87 911 (64 642 to 118 936)	71 (52 to 97)	6.5 (0.1 to 12.5)	19 379 (16 541 to 23 111)	16 (14 to 19)	3.5 (0.5 to 6.8)	1 261 (769 to 1 889)	1 (1 to 2)	3.6 (-0.9 to 7.8)
Nicaragua	2 879 (2 269 to 3 651)	46 (36 to 59)	-1.7 (-12.6 to 6.7)	870 (619 to 1 438)	16 (11 to 27)	-30.1 (-43.6 to -10.4)	55 (33 to 89)	1 (1 to 2)	-29.6 (-45.8 to -1.5)
Panama	2 177 (1 738 to 2 739)	56 (45 to 70)	22.1 (15.7 to 28.9)	485 (424 to 561)	12 (11 to 14)	18.4 (12.7 to 22.9)	32 (20 to 47)	1 (0 to 1)	18.1 (5.7 to 31.8)
Venezuela	23 021 (18 415 to 28 435)	75 (60 to 92)	25.0 (16.1 to 35.2)	5 054 (4 371 to 5 850)	16 (14 to 19)	26.0 (19.2 to 34.8)	329 (206 to 486)	1 (1 to 2)	25.7 (10.2 to 45.7)
Tropical Latin America	**172 309 (127 267 to 235 272)**	**77 (57 to 105)**	**24.5 (11.5 to 34.1)**	**40 082 (34 217 to 47 980)**	**17 (15 to 21)**	**23.9 (17.4 to 29.1)**	**2 600 (1 585 to 3 904)**	**1 (1 to 2)**	**23.8 (15.9 to 31.2)**
Brazil	167 348 (123 096 to 228 651)	77 (57 to 105)	24.5 (11.4 to 34.4)	39 076 (33 336 to 46 781)	17 (15 to 21)	24.0 (17.3 to 29.3)	2 535 (1 546 to 3 806)	1 (1 to 2)	23.9 (15.7 to 31.5)
Paraguay	4 961 (3 919 to 6 361)	72 (56 to 92)	21.6 (16.7 to 26.2)	1 006 (860 to 1 195)	16 (13 to 18)	21.1 (17.9 to 24.0)	66 (40 to 99)	1 (1 to 2)	20.8 (5.3 to 37.7)
North Africa and Middle East	**783 025 (582 997 to 1 151 971)**	**127 (94 to 187)**	**19.9 (0.2 to 54.7)**	**159 838 (123 889 to 221 217)**	**28 (22 to 39)**	**5.0 (-3.1 to 21.7)**	**10 345 (6 319 to 15 711)**	**2 (1 to 3)**	**5.6 (-3.4 to 23.4)**
North Africa and Middle East	**783 025 (582 997 to 1 151 971)**	**127 (94 to 187)**	**19.9 (0.2 to 54.7)**	**159 838 (123 889 to 221 217)**	**28 (22 to 39)**	**5.0 (-3.1 to 21.7)**	**10 345 (6 319 to 15 711)**	**2 (1 to 3)**	**5.6 (-3.4 to 23.4)**
Afghanistan	31 927 (25 419 to 40 306)	94 (76 to 119)	-23.4 (-37.4 to -11.9)	10 321 (6 219 to 20 034)	50 (26 to 107)	-30.4 (-36.4 to -19.8)	646 (362 to 1 158)	3 (2 to 6)	-30.3 (-38.3 to -15.8)
Algeria	35 979 (29 269 to 45 071)	88 (72 to 110)	-1.2 (-5.3 to 2.9)	8 053 (7 009 to 9 354)	20 (18 to 24)	-1.2 (-5.4 to 6.0)	523 (327 to 758)	1 (1 to 2)	-1.1 (-13.8 to 13.5)
Bahrain	1 481 (1 204 to 1 853)	99 (81 to 124)	11.3 (5.0 to 17.0)	328 (286 to 380)	21 (19 to 25)	4.5 (0.9 to 8.0)	21 (13 to 32)	1 (1 to 2)	4.9 (-8.6 to 20.7)
Egypt	86 892 (70 964 to 107 197)	88 (72 to 109)	18.9 (12.5 to 27.0)	17 095 (14 754 to 19 908)	19 (17 to 22)	10.0 (6.4 to 14.1)	1 117 (672 to 1 644)	1 (1 to 2)	10.3 (-2.1 to 24.8)
Iran	81 084 (65 990 to 101 119)	98 (80 to 121)	-33.2 (-50.1 to -16.8)	20 907 (17 475 to 26 507)	25 (21 to 32)	-26.7 (-36.8 to -15.9)	1 338 (872 to 1 896)	2 (1 to 2)	-27.1 (-37.9 to -15.9)
Iraq	120 169 (67 097 to 239 652)	266 (148 to 525)	61.5 (3.9 to 157.4)	22 718 (13 391 to 41 289)	59 (35 to 111)	-1.6 (-18.5 to 41.2)	1 461 (768 to 2 740)	4 (2 to 7)	0.1 (-22.2 to 45.1)
Jordan	9 071 (7 357 to 11 393)	82 (67 to 102)	-7.8 (-12.8 to -3.0)	1 741 (1 502 to 2 049)	18 (16 to 21)	-11.1 (-13.8 to -8.3)	114 (70 to 169)	1 (1 to 2)	-11.2 (-21.5 to 0.6)
Kuwait	4 504 (3 640 to 5 719)	103 (84 to 131)	-59.7 (-79.2 to -32.8)	995 (870 to 1 151)	23 (20 to 27)	-42.2 (-63.8 to -21.1)	65 (40 to 95)	2 (1 to 2)	-42.9 (-64.1 to -19.5)
Lebanon	8 928 (7 231 to 11 180)	101 (82 to 127)	-18.7 (-41.6 to 3.3)	2 251 (1 693 to 3 412)	29 (21 to 46)	-26.3 (-40.7 to -6.0)	144 (89 to 220)	2 (1 to 3)	-26.0 (-41.5 to -1.0)
Libya	10 491 (7 642 to 16 021)	147 (107 to 222)	56.3 (21.4 to 136.5)	2 383 (1 687 to 3 771)	35 (25 to 54)	56.2 (19.4 to 127.1)	153 (91 to 244)	2 (1 to 3)	55.0 (15.5 to 132.7)
Morocco	28 893 (23 311 to 36 006)	81 (65 to 101)	6.4 (2.6 to 10.2)	6 439 (5 668 to 7 429)	18 (16 to 21)	2.8 (0.1 to 5.3)	418 (259 to 616)	1 (1 to 2)	2.7 (-9.3 to 17.4)
Palestine	4 685 (3 781 to 5 846)	92 (74 to 113)	-29.7 (-53.1 to -7.4)	1 479 (968 to 2 661)	37 (23 to 69)	-5.8 (-24.0 to 6.0)	93 (55 to 156)	2 (1 to 4)	-7.3 (-27.5 to 10.7)
Oman	5 260 (4 243 to 6 633)	108 (87 to 134)	-0.7 (-6.6 to 5.2)	1 056 (911 to 1 231)	24 (21 to 27)	-5.9 (-9.3 to -2.5)	69 (42 to 104)	2 (1 to 2)	-5.3 (-17.6 to 8.9)
Qatar	3 691 (2 964 to 4 666)	120 (98 to 150)	-4.1 (-8.1 to -0.3)	747 (647 to 872)	26 (23 to 30)	-6.6 (-8.8 to -4.2)	49 (30 to 75)	2 (1 to 3)	-5.7 (-17.4 to 7.1)
Saudi Arabia	48 290 (38 557 to 61 106)	131 (106 to 166)	11.5 (1.0 to 31.8)	9 204 (7 848 to 10 914)	27 (24 to 32)	0.2 (-5.2 to 9.1)	605 (364 to 906)	2 (1 to 3)	1.0 (-11.5 to 15.9)
Sudan	31 586 (24 224 to 41 585)	76 (58 to 99)	-38.8 (-60.4 to -14.4)	6 640 (5 276 to 8 825)	20 (16 to 27)	-16.1 (-37.8 to 0.8)	431 (265 to 643)	1 (1 to 2)	-17.2 (-39.0 to 4.3)
Syria	106 605 (45 416 to 251 316)	588 (248 to 1 389)	724.8 (244.3 to 1 866.0)	15 859 (7 688 to 32 403)	90 (44 to 185)	407.9 (162.2 to 866.4)	1 039 (439 to 2 244)	6 (3 to 13)	415.7 (161.8 to 924.8)
Tunisia	10 387 (8 377 to 13 147)	92 (74 to 116)	-0.2 (-6.9 to 5.7)	2 410 (2 123 to 2 780)	20 (18 to 24)	-3.6 (-7.0 to -0.3)	156 (95 to 231)	1 (1 to 2)	-3.3 (-14.3 to 9.3)
Turkey	76 033 (61 070 to 96 363)	96 (77 to 121)	-3.7 (-9.4 to 4.8)	17 012 (14 862 to 19 694)	20 (18 to 24)	-4.7 (-8.8 to 1.3)	1 100 (689 to 1 625)	1 (1 to 2)	-4.8 (-17.2 to 10.0)
United Arab Emirates	12 860 (10 296 to 16 154)	121 (98 to 151)	-9.3 (-12.5 to -5.9)	2 848 (2 491 to 3 298)	27 (24 to 31)	-10.7 (-12.7 to -8.6)	185 (111 to 286)	2 (1 to 3)	-10.8 (-22.9 to 2.0)
Yemen	63 478 (36 243 to 125 623)	201 (115 to 393)	138.9 (38.9 to 374.8)	9 200 (5 942 to 15 705)	33 (23 to 54)	57.8 (14.2 to 148.9)	606 (317 to 1 131)	2 (1 to 4)	60.8 (12.1 to 166.8)
South Asia	**1 443 652 (1 176 395 to 1 791 176)**	**82 (66 to 102)**	**14.8 (9.8 to 19.8)**	**303 065 (264 030 to 353 590)**	**18 (16 to 21)**	**18.1 (15.3 to 20.9)**	**19 715 (12 066 to 28 938)**	**1 (1 to 2)**	**17.9 (13.9 to 22.6)**
South Asia	**1 443 652 (1 176 395 to 1 791 176)**	**82 (66 to 102)**	**14.8 (9.8 to 19.8)**	**303 065 (264 030 to 353 590)**	**18 (16 to 21)**	**18.1 (15.3 to 20.9)**	**19 715 (12 066 to 28 938)**	**1 (1 to 2)**	**17.9 (13.9 to 22.6)**
Bangladesh	115 800 (93 862 to 143 607)	73 (60 to 91)	32.6 (25.0 to 39.5)	24 134 (20 774 to 28 226)	16 (14 to 19)	31.8 (27.0 to 37.3)	1 574 (968 to 2 329)	1 (1 to 2)	31.4 (16.5 to 47.9)
Bhutan	803 (650 to 996)	83 (67 to 103)	3.6 (-2.5 to 8.9)	162 (141 to 188)	18 (16 to 21)	2.0 (-1.9 to 6.2)	11 (6 to 15)	1 (1 to 2)	2.0 (-10.9 to 16.6)
India	1 127 439 (912 482 to 1 405 764)	82 (66 to 103)	10.8 (5.3 to 16.3)	239 382 (209 120 to 279 201)	19 (16 to 21)	14.4 (11.6 to 17.2)	15 553 (9 516 to 22 858)	1 (1 to 2)	14.3 (10.1 to 18.7)
Nepal	21 104 (17 237 to 25 975)	71 (57 to 87)	9.5 (5.4 to 13.4)	4 548 (3 932 to 5 277)	17 (15 to 19)	15.3 (10.3 to 23.8)	295 (185 to 428)	1 (1 to 2)	14.8 (-0.2 to 32.5)
Pakistan	178 507 (145 900 to 220 224)	83 (68 to 103)	37.4 (33.0 to 41.8)	34 838 (30 022 to 40 928)	19 (17 to 22)	39.4 (35.0 to 45.3)	2 282 (1 409 to 3 390)	1 (1 to 2)	38.6 (20.2 to 58.6)
Southeast Asia, East Asia, and Oceania	**1 496 755 (1 196 902 to 1 864 446)**	**68 (55 to 85)**	**36.9 (26.7 to 47.7)**	**407 812 (365 133 to 459 124)**	**17 (15 to 19)**	**36.9 (31.8 to 41.9)**	**26 426 (16 522 to 38 419)**	**1 (1 to 2)**	**36.5 (30.2 to 42.9)**
East Asia	**1 157 965 (916 300 to 1 459 547)**	**78 (62 to 97)**	**48.8 (36.6 to 61.3)**	**324 195 (291 060 to 364 297)**	**19 (17 to 21)**	**45.5 (40.2 to 51.5)**	**20 983 (13 043 to 30 670)**	**1 (1 to 2)**	**45.1 (37.7 to 52.7)**
China	1 104 811 (874 083 to 1 393 248)	78 (62 to 97)	49.8 (37.2 to 62.6)	309 374 (277 663 to 347 850)	19 (17 to 22)	46.1 (40.8 to 52.3)	20 025 (12 458 to 29 263)	1 (1 to 2)	45.8 (38.1 to 53.6)
North Korea	17 172 (13 807 to 21 112)	66 (54 to 81)	51.8 (43.3 to 61.0)	4 549 (4 070 to 5 131)	16 (14 to 18)	53.1 (48.0 to 58.4)	295 (181 to 436)	1 (1 to 2)	52.3 (33.1 to 74.0)
Taiwan (Province of China)	17 327 (13 955 to 21 606)	75 (60 to 93)	5.4 (-4.8 to 15.2)	5 049 (4 544 to 5 659)	18 (16 to 20)	9.3 (3.5 to 14.1)	325 (198 to 476)	1 (1 to 2)	9.0 (-5.3 to 26.6)
Oceania	**9 608 (7 838 to 11 569)**	**75 (61 to 91)**	**30.7 (18.4 to 40.1)**	**1 963 (1 703 to 2 270)**	**18 (16 to 21)**	**38.4 (31.8 to 44.0)**	**128 (80 to 185)**	**1 (1 to 2)**	**37.1 (23.4 to 52.5)**
American Samoa	43 (35 to 52)	78 (64 to 95)	25.0 (19.5 to 31.8)	10 (8 to 11)	18 (16 to 21)	27.2 (22.8 to 33.4)	1 (0 to 1)	1 (1 to 2)	26.4 (12.4 to 43.0)
Federated States of Micronesia	77 (63 to 94)	73 (60 to 89)	45.4 (38.5 to 53.2)	17 (14 to 19)	17 (15 to 20)	45.0 (40.5 to 49.9)	1 (1 to 2)	1 (1 to 2)	44.1 (24.3 to 67.1)
Fiji	632 (518 to 769)	69 (56 to 83)	42.2 (34.3 to 51.3)	141 (124 to 161)	16 (14 to 18)	44.2 (39.3 to 49.2)	9 (6 to 14)	1 (1 to 2)	43.0 (25.0 to 63.9)
Guam	148 (121 to 181)	89 (73 to 109)	38.3 (28.9 to 47.0)	36 (32 to 41)	21 (18 to 24)	42.1 (36.4 to 47.5)	2 (1 to 3)	1 (1 to 2)	41.1 (23.3 to 62.1)
Kiribati	70 (58 to 85)	58 (47 to 70)	69.5 (59.2 to 79.0)	14 (13 to 17)	14 (12 to 16)	68.8 (63.1 to 74.7)	1 (1 to 1)	1 (1 to 1)	65.6 (45.2 to 87.5)

Location	Incidence (95% UI)			Prevalence (95% UI)			YLDs (95% UI)		
	2017 counts	2017 age-standardised rates per 100,000	Percentage change in age-standardised rates between 1990 and 2017	2017 counts	2017 age-standardised rates per 100,000	Percentage change in age-standardised rates between 1990 and 2017	2017 counts	2017 age-standardised rates per 100,000	Percentage change in age-standardised rates between 1990 and 2017
Marshall Islands	43 (35 to 52)	75 (61 to 91)	48.6 (41.1 to 56.5)	9 (8 to 10)	18 (16 to 20)	48.4 (43.9 to 53.1)	1 (0 to 1)	1 (1 to 2)	47.4 (27.5 to 68.9)
Northern Mariana Islands	37 (30 to 45)	84 (69 to 102)	18.0 (12.0 to 23.9)	9 (8 to 10)	19 (17 to 22)	16.7 (13.5 to 20.0)	1 (0 to 1)	1 (1 to 2)	16.9 (2.2 to 34.2)
Papua New Guinea	7 074 (5 776 to 8 538)	76 (62 to 92)	25.9 (9.6 to 37.4)	1 423 (1 231 to 1 650)	19 (16 to 21)	35.4 (26.7 to 42.2)	93 (57 to 135)	1 (1 to 2)	34.1 (16.3 to 55.4)
Samoa	145 (119 to 175)	74 (60 to 90)	36.3 (24.1 to 45.8)	31 (27 to 36)	18 (16 to 20)	46.6 (39.4 to 54.6)	2 (1 to 3)	1 (1 to 2)	45.2 (27.5 to 66.8)
Solomon Islands	513 (419 to 620)	81 (66 to 99)	36.3 (31.0 to 41.8)	103 (89 to 118)	20 (17 to 22)	36.7 (33.5 to 40.4)	7 (4 to 10)	1 (1 to 2)	35.3 (18.8 to 54.5)
Tonga	69 (57 to 84)	67 (55 to 82)	48.0 (36.9 to 57.7)	15 (13 to 17)	16 (14 to 18)	51.8 (46.0 to 57.4)	1 (1 to 1)	1 (1 to 1)	50.1 (30.1 to 73.3)
Vanuatu	226 (184 to 275)	80 (64 to 97)	45.8 (38.5 to 53.2)	47 (41 to 54)	20 (17 to 22)	47.6 (43.0 to 52.7)	3 (2 to 4)	1 (1 to 2)	46.2 (27.0 to 68.9)
Southeast Asia	**329 183 (265 766 to 403 670)**	**49 (40 to 60)**	**13.0 (-6.2 to 29.3)**	**81 653 (71 535 to 94 303)**	**12 (11 to 14)**	**16.6 (6.9 to 24.7)**	**5 315 (3 398 to 7 693)**	**1 (1 to 1)**	**16.2 (5.3 to 25.8)**
Cambodia	8 575 (6 881 to 10 738)	53 (42 to 66)	-0.8 (-24.6 to 18.7)	2 521 (1 961 to 3 701)	17 (14 to 26)	-13.6 (-30.4 to 7.3)	161 (100 to 240)	1 (1 to 2)	-13.4 (-34.1 to 14.0)
Indonesia	78 421 (60 624 to 102 250)	30 (24 to 39)	-2.0 (-9.6 to 6.5)	21 926 (19 352 to 25 469)	9 (8 to 10)	0.7 (-3.8 to 5.9)	1 432 (911 to 2 074)	1 (0 to 1)	0.4 (-5.6 to 6.8)
Laos	3 425 (2 766 to 4 241)	48 (39 to 59)	-18.1 (-44.9 to 6.1)	761 (666 to 877)	12 (11 to 14)	-0.6 (-20.2 to 12.4)	50 (30 to 74)	1 (0 to 1)	-1.2 (-23.9 to 22.3)
Malaysia	19 322 (15 463 to 24 449)	61 (49 to 77)	32.3 (23.3 to 42.1)	4 546 (3 980 to 5 187)	15 (13 to 17)	28.9 (23.4 to 34.7)	297 (183 to 444)	1 (1 to 1)	28.7 (10.6 to 48.1)
Maldives	243 (195 to 301)	49 (40 to 60)	24.8 (16.8 to 31.8)	54 (48 to 63)	12 (11 to 13)	21.5 (16.7 to 27.2)	4 (2 to 5)	1 (0 to 1)	21.6 (4.9 to 40.0)
Mauritius	612 (492 to 754)	49 (40 to 60)	54.4 (46.2 to 63.7)	168 (151 to 189)	12 (10 to 13)	52.6 (47.8 to 57.6)	11 (7 to 16)	1 (0 to 1)	51.5 (32.1 to 73.0)
Myanmar	53 661 (35 743 to 83 624)	98 (66 to 151)	161.3 (76.9 to 313.5)	9 905 (7 584 to 13 604)	19 (14 to 25)	81.8 (42.2 to 145.7)	647 (397 to 1 029)	1 (1 to 2)	84.2 (38.0 to 151.8)
Philippines	57 754 (46 012 to 71 206)	55 (44 to 68)	12.6 (-5.6 to 30.6)	12 395 (10 710 to 14 423)	13 (11 to 15)	27.5 (14.9 to 37.1)	809 (508 to 1 203)	1 (1 to 1)	25.8 (6.9 to 45.9)
Sri Lanka	10 769 (8 726 to 13 146)	50 (41 to 61)	-65.9 (-84.0 to -33.0)	4 057 (3 018 to 6 366)	18 (13 to 27)	-22.1 (-57.8 to 15.2)	258 (156 to 389)	1 (1 to 2)	-24.7 (-58.7 to 16.7)
Seychelles	58 (47 to 72)	56 (46 to 69)	46.6 (38.6 to 55.0)	15 (13 to 16)	14 (12 to 15)	44.6 (39.7 to 49.3)	1 (1 to 1)	1 (1 to 1)	43.9 (26.0 to 64.3)
Thailand	43 907 (34 746 to 54 921)	62 (50 to 78)	17.0 (10.4 to 24.6)	12 380 (11 049 to 13 978)	15 (13 to 17)	15.7 (11.8 to 19.8)	801 (507 to 1 174)	1 (1 to 1)	15.7 (1.8 to 32.7)
Timor-Leste	551 (448 to 668)	43 (35 to 52)	-61.0 (-81.6 to -23.4)	226 (139 to 438)	23 (13 to 46)	-15.2 (-46.1 to 6.5)	14 (8 to 26)	1 (1 to 3)	-17.9 (-48.0 to 12.4)
Vietnam	51 452 (41 604 to 63 669)	52 (42 to 65)	42.1 (34.8 to 50.0)	12 592 (11 136 to 14 333)	13 (11 to 14)	38.3 (34.4 to 42.9)	822 (509 to 1 237)	1 (1 to 1)	38.0 (20.1 to 55.3)
Sub-Saharan Africa	**851 444 (699 830 to 1 036 091)**	**85 (70 to 104)**	**-26.3 (-44.1 to -11.8)**	**168 331 (141 460 to 206 341)**	**21 (18 to 26)**	**-13.4 (-25.9 to -5.9)**	**10 971 (6 919 to 15 759)**	**1 (1 to 2)**	**-13.9 (-26.9 to -5.7)**
Central sub-Saharan Africa	**99 549 (80 404 to 122 693)**	**84 (68 to 104)**	**-4.0 (-8.7 to 0.6)**	**20 296 (16 624 to 26 184)**	**22 (18 to 28)**	**3.1 (-4.0 to 16.0)**	**1 317 (828 to 1 906)**	**1 (1 to 2)**	**2.8 (-9.0 to 18.4)**
Angola	21 094 (17 144 to 25 961)	79 (64 to 99)	-47.3 (-67.3 to -26.7)	4 895 (3 893 to 6 819)	25 (20 to 37)	-29.6 (-44.9 to -19.8)	314 (199 to 451)	2 (1 to 2)	-30.7 (-48.6 to -14.9)
Central African Republic	7 943 (4 846 to 14 964)	168 (104 to 312)	135.7 (48.9 to 335.3)	1 277 (868 to 2 034)	31 (22 to 47)	76.4 (30.3 to 169.4)	84 (46 to 148)	2 (1 to 3)	78.2 (27.3 to 180.7)
Congo (Brazzaville)	3 802 (3 085 to 4 680)	79 (64 to 98)	-7.1 (-11.0 to -3.7)	928 (752 to 1 252)	23 (19 to 31)	10.2 (-5.5 to 49.0)	60 (37 to 87)	1 (1 to 2)	9.0 (-11.0 to 51.2)
DR Congo	64 193 (51 954 to 78 794)	81 (66 to 99)	13.2 (4.8 to 28.4)	12 698 (10 544 to 15 927)	20 (17 to 25)	16.1 (4.0 to 42.0)	827 (516 to 1 197)	1 (1 to 2)	16.4 (-3.1 to 48.5)
Equatorial Guinea	1 067 (861 to 1 321)	82 (66 to 102)	6.2 (0.9 to 11.1)	193 (166 to 228)	19 (17 to 22)	0.4 (-2.4 to 3.2)	13 (8 to 19)	1 (1 to 2)	0.5 (-10.7 to 13.9)
Gabon	1 452 (1 167 to 1 800)	87 (70 to 108)	-14.2 (-17.2 to -11.1)	306 (267 to 352)	21 (18 to 24)	-14.5 (-16.3 to -12.7)	20 (12 to 29)	1 (1 to 2)	-14.4 (-23.8 to -2.9)
Eastern sub-Saharan Africa	**368 278 (297 463 to 456 040)**	**98 (79 to 120)**	**-42.2 (-61.9 to -20.5)**	**74 997 (61 127 to 97 449)**	**26 (21 to 34)**	**-22.1 (-40.3 to -9.9)**	**4 874 (3 097 to 7 018)**	**2 (1 to 2)**	**-23.0 (-41.4 to -9.5)**
Burundi	9 575 (7 802 to 11 793)	92 (75 to 113)	-10.4 (-15.5 to -2.8)	3 278 (2 026 to 6 281)	42 (25 to 83)	74.5 (5.4 to 242.8)	208 (115 to 364)	3 (1 to 5)	68.5 (2.4 to 236.2)
Comoros	646 (519 to 804)	92 (74 to 114)	-16.3 (-19.6 to -12.8)	132 (115 to 153)	21 (19 to 24)	-18.1 (-20.3 to -16.0)	9 (5 to 13)	1 (1 to 2)	-17.6 (-26.2 to -8.0)
Djibouti	1 059 (860 to 1 310)	98 (80 to 122)	-27.8 (-44.0 to -16.1)	221 (192 to 258)	24 (21 to 27)	-16.4 (-26.9 to -9.6)	14 (9 to 21)	2 (1 to 2)	-17.1 (-31.0 to -3.6)
Eritrea	5 182 (4 181 to 6 410)	92 (74 to 115)	-94.0 (-97.4 to -84.1)	1 974 (1 159 to 3 952)	51 (27 to 107)	-77.1 (-89.4 to -61.9)	123 (67 to 227)	3 (2 to 6)	-78.5 (-90.1 to -61.7)
Ethiopia	89 633 (72 465 to 110 542)	90 (73 to 111)	-65.6 (-81.1 to -41.7)	18 544 (14 981 to 24 682)	24 (20 to 33)	-43.4 (-64.1 to -24.7)	1 205 (760 to 1 744)	2 (1 to 2)	-44.6 (-64.8 to -24.9)
Kenya	48 962 (37 752 to 63 083)	107 (83 to 139)	13.0 (9.4 to 17.9)	9 493 (8 058 to 11 307)	25 (22 to 29)	11.4 (9.1 to 15.0)	621 (382 to 913)	2 (1 to 2)	11.4 (8.2 to 15.7)
Madagascar	23 208 (18 758 to 28 693)	93 (75 to 115)	-10.6 (-14.3 to -6.8)	4 271 (3 655 to 5 005)	21 (19 to 24)	-12.8 (-15.2 to -10.4)	280 (170 to 417)	1 (1 to 2)	-12.7 (-22.6 to -1.1)
Malawi	13 148 (10 473 to 16 497)	79 (63 to 100)	-2.1 (-5.2 to 1.0)	2 418 (2 055 to 2 868)	18 (16 to 21)	-4.2 (-6.4 to -2.3)	159 (96 to 234)	1 (1 to 2)	-4.1 (-14.8 to 8.7)
Mozambique	25 417 (20 459 to 31 690)	91 (72 to 114)	-22.0 (-43.3 to -5.5)	5 286 (4 311 to 6 811)	26 (21 to 36)	-23.8 (-37.7 to -9.8)	342 (213 to 495)	2 (1 to 2)	-23.7 (-39.6 to -4.7)
Rwanda	10 532 (8 492 to 13 105)	87 (70 to 109)	-54.0 (-72.6 to -33.9)	4 009 (2 364 to 8 000)	45 (25 to 95)	30.1 (-28.8 to 157.2)	252 (137 to 478)	3 (1 to 5)	23.8 (-30.5 to 146.6)
Somalia	28 886 (19 473 to 49 035)	176 (121 to 293)	-3.1 (-9.8 to 7.6)	4 738 (3 397 to 7 194)	35 (27 to 52)	3.7 (-3.9 to 13.5)	310 (182 to 517)	2 (1 to 4)	3.0 (-8.3 to 17.9)
South Sudan	20 547 (13 379 to 36 318)	214 (142 to 373)	45.6 (24.1 to 69.9)	3 270 (2 278 to 5 060)	41 (30 to 61)	41.5 (20.0 to 74.7)	214 (120 to 369)	3 (2 to 4)	41.8 (17.0 to 77.7)
Tanzania	45 017 (36 126 to 56 211)	87 (69 to 109)	3.0 (-0.9 to 7.2)	8 296 (7 074 to 9 802)	20 (17 to 23)	0.0 (-2.2 to 2.5)	544 (330 to 816)	1 (1 to 2)	0.5 (-10.4 to 12.7)
Uganda	31 943 (25 696 to 40 063)	85 (68 to 106)	-5.4 (-21.2 to 4.4)	6 404 (5 280 to 8 041)	24 (19 to 32)	-13.5 (-27.0 to -1.4)	416 (259 to 597)	2 (1 to 2)	-12.7 (-29.0 to 6.2)
Zambia	14 295 (11 407 to 17 917)	87 (69 to 110)	-9.9 (-13.6 to -6.4)	2 617 (2 238 to 3 093)	20 (18 to 23)	-10.4 (-12.6 to -8.2)	172 (106 to 257)	1 (1 to 2)	-10.2 (-21.1 to 0.8)
Southern sub-Saharan Africa	**67 961 (55 412 to 82 604)**	**87 (71 to 106)**	**-12.7 (-16.3 to -8.9)**	**14 515 (12 692 to 16 689)**	**20 (18 to 23)**	**-14.2 (-16.3 to -12.2)**	**943 (599 to 1 364)**	**1 (1 to 2)**	**-14.1 (-18.2 to -10.1)**
Botswana	1 801 (1 466 to 2 200)	79 (64 to 96)	-0.4 (-4.5 to 3.3)	369 (321 to 425)	18 (16 to 20)	-0.8 (-3.0 to 1.3)	24 (15 to 36)	1 (1 to 2)	-0.8 (-12.1 to 12.0)
Lesotho	1 760 (1 443 to 2 127)	89 (73 to 109)	20.2 (16.1 to 24.2)	357 (311 to 414)	21 (18 to 23)	20.7 (18.0 to 23.2)	23 (15 to 34)	1 (1 to 2)	20.1 (6.4 to 35.1)
Namibia	2 048 (1 682 to 2 482)	87 (71 to 105)	-5.1 (-8.5 to -1.9)	470 (392 to 596)	24 (20 to 31)	-20.3 (-32.7 to -10.3)	30 (19 to 44)	1 (1 to 2)	-19.6 (-35.7 to -2.7)
South Africa	50 482 (40 984 to 61 568)	90 (74 to 110)	-18.3 (-22.5 to -13.9)	11 039 (9 673 to 12 680)	21 (18 to 24)	-19.5 (-22.0 to -17.1)	716 (453 to 1 034)	1 (1 to 2)	-19.5 (-23.9 to -15.0)
Swaziland	1 017 (832 to 1 238)	90 (73 to 109)	6.3 (3.2 to 9.5)	197 (170 to 228)	21 (18 to 23)	5.0 (3.1 to 7.0)	13 (8 to 19)	1 (1 to 2)	4.8 (-7.2 to 18.2)
Zimbabwe	10 853 (8 905 to 13 211)	76 (62 to 92)	11.0 (7.6 to 14.5)	2 083 (1 802 to 2 424)	18 (16 to 20)	13.0 (10.8 to 15.3)	137 (84 to 201)	1 (1 to 2)	13.1 (0.6 to 28.5)
Western sub-Saharan Africa	**315 655 (259 857 to 382 659)**	**75 (62 to 91)**	**-3.3 (-8.7 to 0.6)**	**58 522 (50 205 to 68 115)**	**17 (15 to 20)**	**-1.4 (-4.5 to 2.6)**	**3 837 (2 360 to 5 549)**	**1 (1 to 2)**	**-1.5 (-7.5 to 5.7)**
Benin	8 479 (6 995 to 10 339)	76 (62 to 93)	-3.0 (-5.9 to -0.2)	1 575 (1 352 to 1 842)	18 (16 to 20)	-5.5 (-7.1 to -3.8)	104 (64 to 153)	1 (1 to 2)	-5.2 (-16.8 to 7.5)
Burkina Faso	14 345 (11 734 to 17 664)	71 (58 to 89)	3.1 (-0.4 to 7.2)	2 595 (2 207 to 3 047)	16 (14 to 18)	1.2 (-0.9 to 3.4)	171 (105 to 251)	1 (1 to 2)	1.8 (-9.8 to 15.1)
Cameroon	20 587 (16 913 to 24 964)	77 (63 to 93)	-1.5 (-6.7 to 6.3)	3 772 (3 235 to 4 409)	17 (15 to 20)	-6.7 (-9.6 to -2.3)	248 (151 to 364)	1 (1 to 2)	-6.1 (-16.5 to 5.6)
Cape Verde	416 (341 to 512)	76 (62 to 93)	8.6 (5.2 to 12.0)	87 (76 to 101)	17 (15 to 19)	7.2 (5.1 to 9.2)	6 (3 to 8)	1 (1 to 2)	7.0 (-4.2 to 19.3)
Chad	11 239 (9 205 to 13 697)	77 (63 to 94)	-15.1 (-35.8 to 1.6)	2 159 (1 796 to 2 683)	20 (17 to 26)	-5.5 (-18.5 to 4.4)	141 (88 to 205)	1 (1 to 2)	-6.3 (-22.3 to 11.1)
Cote d'Ivoire	17 881 (14 702 to 21 968)	74 (61 to 91)	-3.5 (-6.6 to -0.6)	3 413 (2 941 to 3 984)	17 (15 to 20)	-3.7 (-5.8 to -0.6)	224 (138 to 334)	1 (1 to 2)	-3.2 (-14.6 to 10.3)
The Gambia	1 491 (1 228 to 1 833)	71 (59 to 88)	2.0 (-1.2 to 5.3)	283 (243 to 330)	17 (15 to 19)	-2.6 (-7.6 to 0.4)	19 (12 to 28)	1 (1 to 2)	-2.2 (-14.5 to 11.8)
Ghana	22 251 (18 182 to 27 383)	76 (62 to 94)	9.9 (6.7 to 13.2)	4 348 (3 760 to 5 050)	17 (15 to 20)	8.1 (6.3 to 10.0)	286 (174 to 423)	1 (1 to 2)	8.7 (-3.8 to 22.9)
Guinea	8 291 (6 816 to 10 137)	73 (60 to 90)	-1.4 (-4.6 to 2.0)	1 582 (1 364 to 1 842)	17 (15 to 20)	-1.2 (-3.8 to 2.3)	104 (63 to 151)	1 (1 to 2)	-1.1 (-12.5 to 12.3)
Guinea-Bissau	1 231 (1 011 to 1 508)	68 (56 to 84)	-12.9 (-15.9 to -10.1)	234 (201 to 274)	17 (15 to 19)	-11.1 (-14.4 to -4.4)	15 (9 to 23)	1 (1 to 2)	-11.2 (-21.7 to 2.4)
Liberia	2 934 (2 395 to 3 615)	64 (52 to 78)	-87.2 (-94.6 to -68.3)	749 (561 to 1 151)	21 (16 to 33)	-66.7 (-85.4 to -38.2)	48 (29 to 73)	1 (1 to 2)	-68.5 (-85.5 to -39.5)
Mali	16 204 (13 123 to 20 192)	82 (66 to 102)	-2.6 (-5.9 to 1.0)	3 026 (2 490 to 3 827)	20 (16 to 25)	4.6 (-4.9 to 26.5)	198 (125 to 292)	1 (1 to 2)	4.3 (-11.9 to 29.7)
Mauritania	2 689 (2 193 to 3 320)	70 (57 to 87)	-12.0 (-16.4 to -8.4)	510 (438 to 596)	16 (14 to 18)	-12.9 (-15.0 to -10.9)	33 (20 to 49)	1 (1 to 2)	-12.6 (-22.3 to -1.6)
Niger	14 866 (12 186 to 18 065)	73 (60 to 89)	-8.8 (-13.0 to -5.0)	2 572 (2 180 to 3 037)	17 (15 to 19)	-9.1 (-11.5 to -6.8)	169 (103 to 250)	1 (1 to 2)	-9.4 (-19.7 to 3.1)
Nigeria	151 936 (124 561 to 185 566)	76 (62 to 92)	7.7 (1.7 to 17.3)	27 450 (23 430 to 32 080)	17 (15 to 19)	3.3 (-0.3 to 9.3)	1 801 (1 096 to 2 617)	1 (1 to 2)	3.2 (-8.4 to 17.0)
Sao Tome and Principe	152 (121 to 190)	77 (61 to 97)	3.7 (-0.5 to 8.0)	29 (25 to 35)	18 (15 to 20)	1.7 (-0.7 to 4.1)	2 (1 to 3)	1 (1 to 2)	1.6 (-9.8 to 14.8)
Senegal	10 045 (8 239 to 12 365)	71 (58 to 87)	-9.3 (-15.3 to -5.2)	1 931 (1 664 to 2 251)	16 (15 to 19)	-8.0 (-10.9 to -5.4)	126 (77 to 185)	1 (1 to 2)	-8.0 (-19.4 to 4.6)
Sierra Leone	5 496 (4 505 to 6 673)	72 (59 to 88)	0.6 (-4.2 to 8.6)	1 227 (984 to 1 665)	20 (16 to 29)	20.3 (0.7 to 66.9)	79 (49 to 117)	1 (1 to 2)	19.3 (-4.6 to 66.1)
Togo	5 118 (4 209 to 6 281)	69 (57 to 85)	-0.7 (-4.0 to 2.6)	979 (845 to 1 142)	16 (14 to 18)	-3.0 (-4.9 to -0.9)	64 (39 to 95)	1 (1 to 2)	-2.5 (-14.5 to 12.0)