

GBD PROFILE: SENEGAL

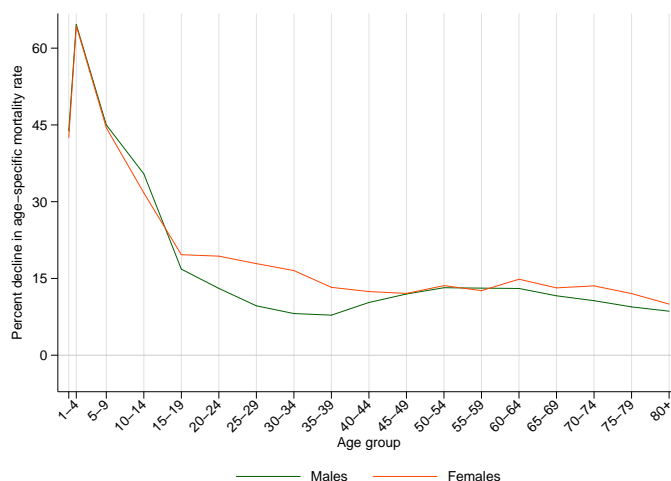
GLOBAL BURDEN OF DISEASES, INJURIES, AND RISK FACTORS STUDY 2010

The Global Burden of Disease Study 2010 (GBD 2010) is a collaborative project of nearly 500 researchers in 50 countries led by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington. It is the largest systematic scientific effort in history to quantify levels and trends of health loss due to diseases, injuries, and risk factors. GBD serves as a global public good to inform evidence-based policymaking and health systems design.

PROFILE OVERVIEW

- In terms of the number of years of life lost (YLLs) due to premature death in Senegal, malaria, diarrheal diseases, and lower respiratory infections were the highest ranking causes in 2010.
- Of the 25 most important causes of burden, as measured by disability-adjusted life years (DALYs), measles showed the largest decrease, falling by 64% from 1990 to 2010.
- The leading risk factor in Senegal is childhood underweight.

Percent decline in age-specific mortality rate by sex from 1990-2010 in Senegal



ALL-CAUSE MORTALITY RATE

- This chart shows the decline in mortality rate at every age range. The higher points on the chart indicate that declines in mortality rates were faster in those age groups between 1990 and 2010.
- The greatest reductions in all-cause mortality rate were experienced by males aged 1-4 years (65%). Males aged 35-39 years saw the smallest decrease in mortality rate (8%).

CAUSES OF PREMATURE DEATH

Years of life lost (YLLs) quantify premature mortality by weighting younger deaths more than older deaths.

Ranks for top 25 causes of YLLs 1990-2010, Senegal

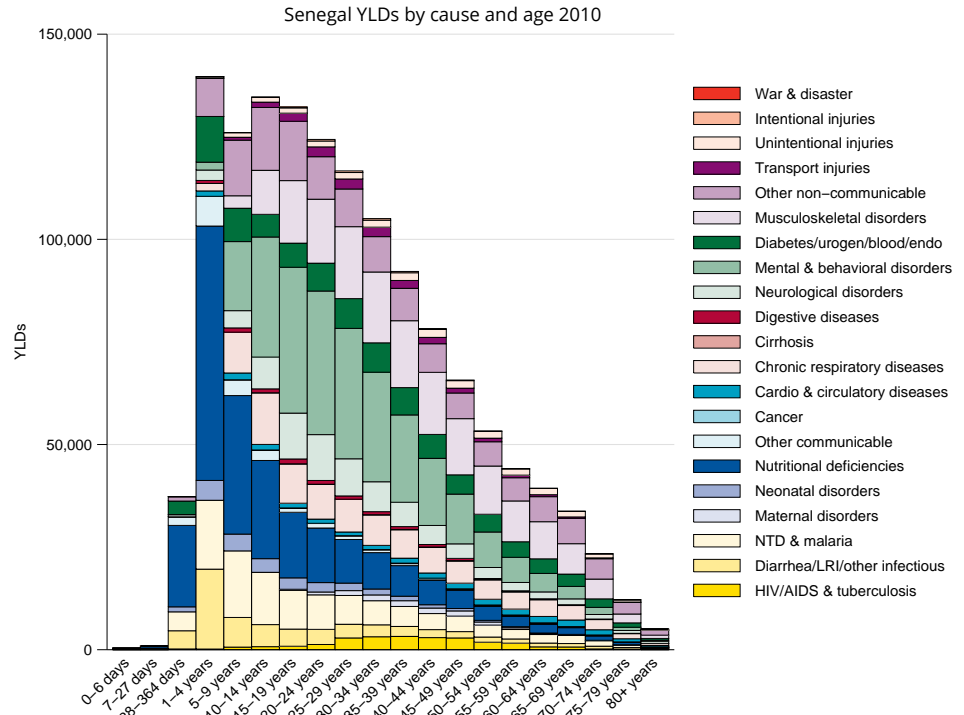
| # YLLs in thousands (% of total) | Rank and disorder 1990 | Rank and disorder 2010 | # YLLs in thousands (% of total) | % change |
|-------------------------------------|--------------------------------|--------------------------------|-------------------------------------|----------|
| 913 (19.1%) | 1 Diarrheal diseases | 1 Malaria | 614 (14.1%) | 17 |
| 544 (11.4%) | 2 Lower respiratory infections | 2 Diarrheal diseases | 545 (12.6%) | -41 |
| 519 (10.9%) | 3 Malaria | 3 Lower respiratory infections | 363 (8.4%) | -34 |
| 284 (5.9%) | 4 Measles | 4 Neonatal sepsis | 252 (5.8%) | 34 |
| 193 (4.1%) | 5 Meningitis | 5 Preterm birth complications | 211 (4.9%) | 14 |
| 187 (3.9%) | 6 Preterm birth complications | 6 Meningitis | 168 (3.9%) | -13 |
| 189 (4.0%) | 7 Neonatal sepsis | 7 Neonatal encephalopathy | 132 (3.1%) | 21 |
| 143 (3.0%) | 8 Tuberculosis | 8 Tuberculosis | 120 (2.8%) | -15 |
| 108 (2.3%) | 9 Neonatal encephalopathy | 9 HIV/AIDS | 115 (2.7%) | 611 |
| 76 (1.6%) | 10 Maternal disorders | 10 Measles | 102 (2.4%) | -64 |
| 64 (1.3%) | 11 Protein-energy malnutrition | 11 Maternal disorders | 81 (1.9%) | 5 |
| 58 (1.2%) | 12 Stroke | 12 Epilepsy | 80 (1.9%) | 50 |
| 50 (1.1%) | 13 Congenital anomalies | 13 Stroke | 63 (1.4%) | 7 |
| 58 (1.2%) | 14 Epilepsy | 14 Ischemic heart disease | 47 (1.1%) | 23 |
| 50 (1.1%) | 15 Tetanus | 15 Diabetes | 45 (1.0%) | 89 |
| 38 (0.8%) | 16 Ischemic heart disease | 16 Congenital anomalies | 48 (1.1%) | -7 |
| 33 (0.7%) | 17 Falls | 17 Cirrhosis | 40 (0.9%) | 53 |
| 29 (0.6%) | 18 COPD | 18 Falls | 39 (0.9%) | 15 |
| 28 (0.6%) | 19 Liver cancer | 19 Protein-energy malnutrition | 39 (0.9%) | -39 |
| 30 (0.6%) | 20 Asthma | 20 Typhoid fevers | 41 (1.0%) | 72 |
| 28 (0.6%) | 21 Animal contact | 21 Liver cancer | 32 (0.7%) | 10 |
| 27 (0.6%) | 22 Fire | 22 Road injury | 30 (0.7%) | 52 |
| 26 (0.5%) | 23 Cirrhosis | 23 Chronic kidney disease | 26 (0.6%) | 79 |
| 24 (0.5%) | 24 Diabetes | 24 Animal contact | 28 (0.6%) | -6 |
| 22 (0.5%) | 25 Drowning | 25 Sickle cell | 27 (0.6%) | 57 |
| | 26 Typhoid fevers | 26 Fire | | |
| | 28 Sickle cell | 27 Drowning | | |
| | 29 Road injury | 30 COPD | | |
| | 32 HIV/AIDS | 31 Asthma | | |
| | 36 Chronic kidney disease | 34 Tetanus | | |

This chart shows the change in the top 25 causes of YLLs due to premature mortality from 1990 to 2010. Solid lines indicate a cause has moved up in rank or stayed the same. Broken lines indicate a cause has moved down in rank. The causes are color coded by blue for non-communicable diseases, green for injuries, and red for communicable, maternal, neonatal, and nutritional causes of death.

YEARS LIVED WITH DISABILITY (YLDs)

Years lived with disability (YLDs) are estimated by weighting the prevalence of different conditions based on severity. The top five leading causes of YLDs in Senegal are iron-deficiency anemia, major depressive disorder, low back pain, neck pain, and chronic obstructive pulmonary disease.

The size of the colored portion in each bar represents the number of YLDs attributable to each cause. The height of each bar shows which age groups had the most YLDs in 2010. The causes are aggregated. For example, musculoskeletal disorders include low back pain and neck pain.

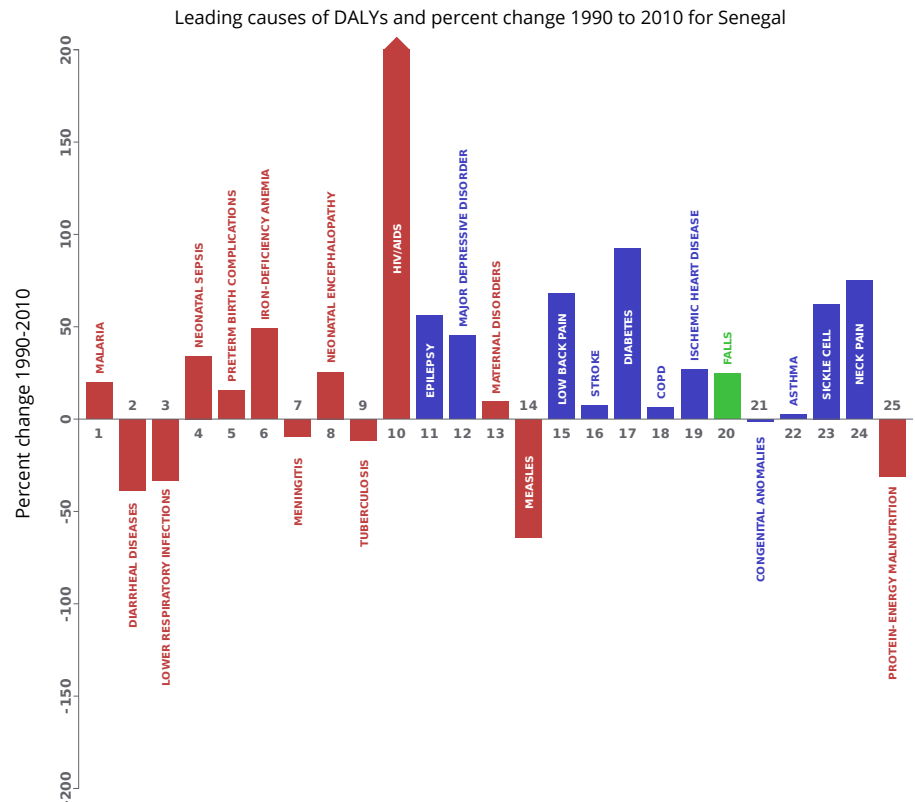


DISABILITY-ADJUSTED LIFE YEARS (DALYs)

Disability-adjusted life years (DALYs) quantify both premature mortality (YLLs) and disability (YLDs) within a population. In Senegal, the top three causes of DALYs in 2010 were malaria, diarrheal diseases, and lower respiratory infections. The only cause to appear in the 10 leading causes of DALYs in 2010 and not 1990 was HIV/AIDS.

The top 25 causes of DALYs are ranked from left to right in order of the number of DALYs they contributed in 2010. Bars going up show the percent by which DALYs have increased since 1990. Bars going down show the percent by which DALYs have decreased. Globally, non-communicable diseases and injuries are generally on the rise, while communicable, maternal, neonatal, and nutritional causes of DALYs are generally on the decline.

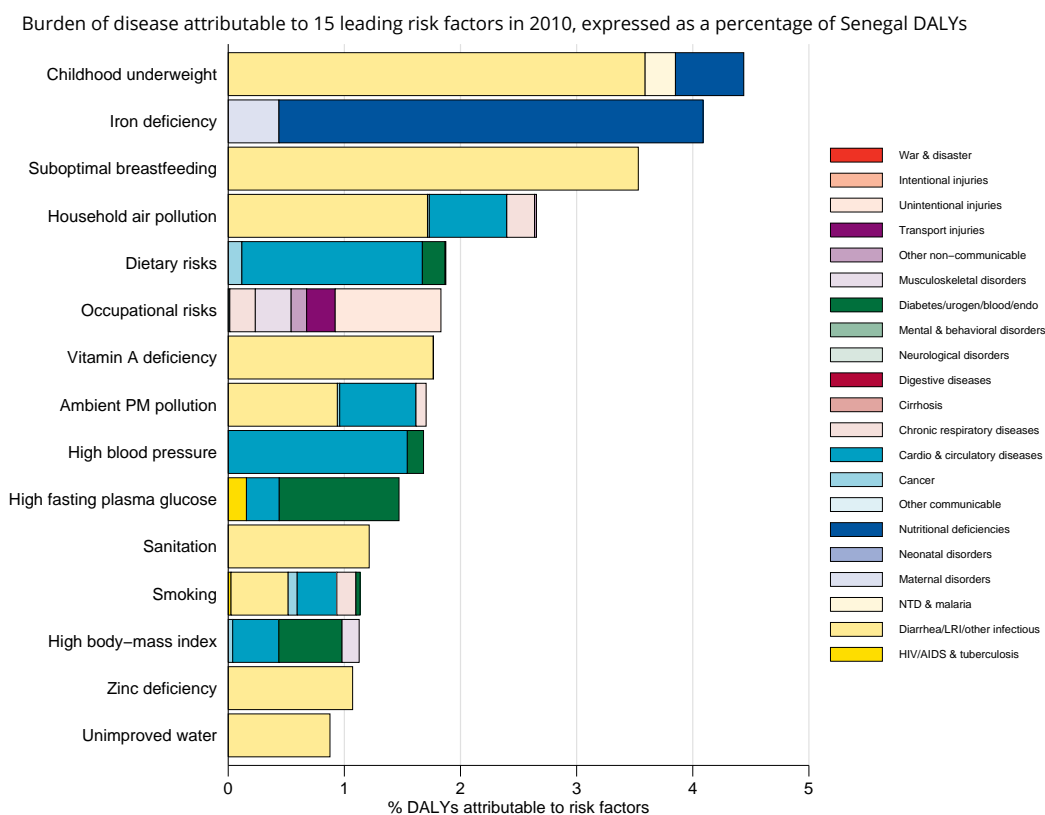
- Communicable, maternal, neonatal, and nutritional
- Non-communicable
- Injuries



RISK FACTORS

Overall, the three risk factors that account for the most disease burden in Senegal are childhood underweight, iron deficiency, and suboptimal breastfeeding. The leading risk factors for children under 5 and adults aged 15-49 years were childhood underweight and iron deficiency, respectively, in 2010.

The graph shows the top 15 risk factors for Senegal. The colored portion of each bar represents the specific diseases attributable to that risk factor while bar size represents the percentage of DALYs linked to specific risk factors.



COUNTRY BENCHMARKING OF BURDEN OF DISEASE

Understanding the relative performance of Senegal against other comparator countries provides key insight into public health successes and areas where Senegal might be falling behind. The table identifies Senegal's rank across 14 other comparator countries, selected and ordered by income per capita, for five metrics of interest, with 1 indicating the best rank and 15 indicating the worst rank.

- Age-standardized rates are used to make meaningful comparisons across time by adjusting for changes in population size and age structure.
- Life expectancy incorporates mortality, and health-adjusted life expectancy further incorporates years lived in less than ideal health.
- In 2010, Senegal ranked 7th for age-standardized death rate and 7th for age-standardized YLL rate.

| Age-standardized death rates, YLL rates, YLD rates, and life expectancy at birth and health-adjusted life expectancy at birth for 1990 and 2010, both sexes combined | | | | | | | | | | | | | | | | | | | | |
|--|---|----------|--------------|----------|---|----------|---------------|----------|---|----------|---------------|----------|--------------------------|----------|-------------|----------|--|----------|-------------|----------|
| Country | Age-standardized death rate (per 100,000) | | | | Age-standardized YLL rate (per 100,000) | | | | Age-standardized YLD rate (per 100,000) | | | | Life expectancy at birth | | | | Health-adjusted life expectancy at birth | | | |
| | 1990 | | 2010 | | 1990 | | 2010 | | 1990 | | 2010 | | 1990 | | 2010 | | 1990 | | 2010 | |
| | Rate | Rank | Rate | Rank | Rate | Rank | Rate | Rank | Rate | Rank | Rate | Rank | LE | Rank | LE | Rank | HALE | Rank | HALE | Rank |
| Kyrgyzstan | 1,047 | 2 | 999 | 6 | 33,446 | 1 | 30,037 | 6 | 12,606 | 2 | 12,336 | 2 | 65.5 | 1 | 66.9 | 6 | 56.2 | 1 | 57.6 | 5 |
| Sudan | 1,110 | 5 | 799 | 2 | 41,735 | 5 | 28,295 | 4 | 15,584 | 15 | 14,781 | 15 | 62.1 | 5 | 68.8 | 2 | 51.4 | 5 | 57 | 6 |
| Cameroon | 1,296 | 9 | 1,277 | 13 | 51,072 | 10 | 49,262 | 12 | 14,617 | 9 | 13,891 | 11 | 58.3 | 10 | 59.1 | 13 | 49.1 | 10 | 50.2 | 13 |
| Nigeria | 1,343 | 12 | 1,159 | 12 | 60,604 | 14 | 49,276 | 13 | 14,273 | 6 | 13,842 | 10 | 55.1 | 14 | 59.6 | 12 | 46.4 | 14 | 50.4 | 12 |
| Mauritania | 1,244 | 7 | 1,031 | 9 | 45,799 | 7 | 36,003 | 8 | 15,248 | 14 | 14,307 | 13 | 60.2 | 7 | 64.5 | 9 | 50.3 | 7 | 54.3 | 9 |
| Cambodia | 1,355 | 13 | 957 | 5 | 47,844 | 8 | 28,770 | 5 | 14,501 | 8 | 12,603 | 3 | 59.2 | 8 | 67.5 | 5 | 50.1 | 8 | 58 | 3 |
| Tajikistan | 1,067 | 3 | 911 | 4 | 38,138 | 2 | 27,409 | 3 | 12,331 | 1 | 12,296 | 1 | 63.8 | 2 | 68.3 | 4 | 54.8 | 2 | 58.7 | 2 |
| Senegal | 1,278 | 8 | 1,009 | 7 | 49,632 | 9 | 33,824 | 7 | 13,914 | 5 | 13,379 | 7 | 58.8 | 9 | 65.3 | 7 | 49.9 | 9 | 55.6 | 7 |
| São Tomé and Príncipe | 1,044 | 1 | 794 | 1 | 39,144 | 3 | 24,592 | 1 | 13,532 | 4 | 13,252 | 5 | 63.5 | 3 | 70.2 | 1 | 53.9 | 3 | 59.6 | 1 |
| Côte d'Ivoire | 1,400 | 14 | 1,457 | 15 | 58,331 | 12 | 56,879 | 14 | 14,774 | 11 | 13,910 | 12 | 55.7 | 13 | 56 | 14 | 46.8 | 12 | 47.7 | 14 |
| The Gambia | 1,315 | 11 | 1,109 | 11 | 54,039 | 11 | 41,302 | 11 | 14,365 | 7 | 13,291 | 6 | 57.2 | 11 | 62.2 | 11 | 48.4 | 11 | 53.2 | 11 |
| Kenya | 1,092 | 4 | 1,013 | 8 | 39,731 | 4 | 36,153 | 9 | 13,184 | 3 | 12,884 | 4 | 63 | 4 | 64.8 | 8 | 53.8 | 4 | 55.5 | 8 |
| Timor-Leste | 1,223 | 6 | 872 | 3 | 45,244 | 6 | 26,770 | 2 | 14,698 | 10 | 13,715 | 8 | 60.5 | 6 | 68.7 | 3 | 50.7 | 6 | 58 | 4 |
| Chad | 1,508 | 15 | 1,389 | 14 | 67,610 | 15 | 58,839 | 15 | 15,080 | 12 | 14,364 | 14 | 52.5 | 15 | 55.5 | 15 | 43.9 | 15 | 46.8 | 15 |
| Benin | 1,312 | 10 | 1,080 | 10 | 58,713 | 13 | 38,726 | 10 | 15,237 | 13 | 13,830 | 9 | 55.9 | 12 | 63.4 | 10 | 46.6 | 13 | 53.7 | 10 |

COUNTRY BENCHMARKING OF BURDEN OF DISEASE, CONTINUED

This figure shows the rank of Senegal relative to the same comparator countries for the leading causes of DALYs in 1990 (top) and 2010 (bottom).

- The columns are ordered by the absolute number of DALYs in Senegal for that particular year, with greatest burden on the left.
- The numbers indicate the rank across countries for each cause in terms of age-standardized DALY rates, with 1 as the best performance and 15 as the worst.

| Ranking of leading age-standardized rates of disability-adjusted life years (DALYs) relative to comparator countries in 1990 | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--------------------|------------------------------|------------------------------|-----------------|-----------------------------|-----------------------------|-----------------|-------------------------|------------------------|-------------------------|--------------------|-----------------------------|--------------------|---------------------------|---------------|----------|----------------------|-----------|------------------------|------------------------|----------------------|---------------|-------------|-------------|-----------------------------|
| Country | Diarrheal diseases | Lower respiratory infections | Malaria | Measles | Meningitis | Preterm birth complications | Neonatal sepsis | Tuberculosis | Iron-deficiency anemia | Neonatal encephalopathy | Maternal disorders | Protein-energy malnutrition | Epilepsy | Major depressive disorder | COPD | Stroke | Congenital anomalies | Asthma | Tetanus | Ischemic heart disease | Falls | Low back pain | Diabetes | Sickle cell | Liver cancer |
| Kyrgyzstan | 1 | 6 | 1 | 1 | 1 | 4 | 1 | 2 | 1 | 15 | 1 | 1 | 3 | 3 | 15 | 15 | 12 | 1 | 1 | 14 | 6 | 6 | 1 | 4 | 4 |
| Sudan | 7 | 2 | 4 | 3 | 6 | 6 | 5 | 5 | 7 | 8 | 9 | 12 | 6 | 14 | 3 | 4 | 7 | 4 | 5 | 7 | 2 | 15 | 3 | 5 | 3 |
| Cameroon | 10 | 3 | 12 | 9 | 9 | 7 | 8 | 4 | 6 | 6 | 10 | 8 | 15 | 9 | 9 | 7 | 6 | 5 | 6 | 10 | 14 | 11 | 10 | 12 | 14 |
| Nigeria | 12 | 11 | 15 | 14 | 12 | 12 | 15 | 11 | 11 | 14 | 7 | 13 | 9 | 1 | 2 | 2 | 5 | 6 | 11 | 2 | 15 | 14 | 8 | 15 | 9 |
| Mauritania | 11 | 4 | 3 | 11 | 8 | 9 | 11 | 9 | 13 | 9 | 15 | 6 | 8 | 10 | 7 | 8 | 2 | 13 | 10 | 8 | 5 | 10 | 14 | 7 | 12 |
| Cambodia | 3 | 8 | 6 | 7 | 3 | 11 | 4 | 14 | 10 | 5 | 5 | 5 | 1 | 8 | 12 | 14 | 14 | 15 | 14 | 13 | 4 | 3 | 7 | 1 | 8 |
| Tajikistan | 8 | 13 | 2 | 2 | 2 | 15 | 2 | 1 | 2 | 13 | 2 | 2 | 4 | 2 | 6 | 13 | 11 | 2 | 2 | 15 | 7 | 7 | 13 | 3 | 2 |
| Senegal | 13 | 10 | 11 | 10 | 10 | 2 | 7 | 12 | 9 | 2 | 11 | 3 | 13 | 6 | 11 | 1 | 1 | 11 | 7 | 1 | 9 | 1 | 15 | 10 | 13 |
| São Tomé and Príncipe | 4 | 1 | 9 | 5 | 4 | 5 | 9 | 3 | 8 | 7 | 3 | 9 | 7 | 13 | 14 | 11 | 13 | 7 | 4 | 4 | 8 | 9 | 2 | 13 | 5 |
| Côte d'Ivoire | 14 | 5 | 13 | 6 | 11 | 14 | 13 | 7 | 5 | 11 | 6 | 7 | 12 | 11 | 10 | 9 | 8 | 9 | 9 | 9 | 13 | 5 | 12 | 9 | 6 |
| The Gambia | 6 | 14 | 10 | 8 | 13 | 3 | 14 | 10 | 12 | 3 | 12 | 11 | 11 | 15 | 13 | 12 | 10 | 12 | 12 | 11 | 12 | 12 | 9 | 11 | 15 |
| Kenya | 2 | 7 | 8 | 4 | 7 | 1 | 6 | 8 | 4 | 4 | 4 | 10 | 5 | 4 | 1 | 3 | 3 | 3 | 3 | 3 | 1 | 2 | 5 | 6 | 1 |
| Timor-Leste | 5 | 9 | 5 | 12 | 5 | 10 | 3 | 15 | 3 | 1 | 8 | 4 | 2 | 12 | 8 | 10 | 15 | 14 | 13 | 12 | 3 | 4 | 11 | 2 | 7 |
| Chad | 15 | 15 | 7 | 13 | 15 | 8 | 10 | 13 | 15 | 10 | 13 | 15 | 10 | 7 | 5 | 5 | 4 | 10 | 15 | 5 | 11 | 13 | 4 | 8 | 11 |
| Benin | 9 | 12 | 14 | 15 | 14 | 13 | 12 | 6 | 14 | 12 | 14 | 14 | 14 | 5 | 4 | 6 | 9 | 8 | 6 | 10 | 8 | 6 | 14 | 10 | 10 |
| Ranking of leading age-standardized rates of disability-adjusted life years (DALYs) relative to comparator countries in 2010 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Country | Malaria | Diarrheal diseases | Lower respiratory infections | Neonatal sepsis | Preterm birth complications | Iron-deficiency anemia | Meningitis | Neonatal encephalopathy | Tuberculosis | HIV/AIDS | Epilepsy | Major depressive disorder | Maternal disorders | Measles | Low back pain | Stroke | Diabetes | COPD | Ischemic heart disease | Falls | Congenital anomalies | Asthma | Sickle cell | Neck pain | Protein-energy malnutrition |
| Kyrgyzstan | 1 | 1 | 5 | 1 | 10 | 1 | 1 | 15 | 3 | 4 | 3 | 5 | 2 | 1 | 7 | 15 | 1 | 15 | 15 | 7 | 12 | 1 | 4 | 3 | 1 |
| Sudan | 5 | 9 | 3 | 5 | 4 | 9 | 6 | 7 | 4 | 9 | 7 | 15 | 5 | 3 | 15 | 1 | 2 | 3 | 1 | 3 | 4 | 6 | 5 | 13 | 9 |
| Cameroon | 11 | 12 | 12 | 10 | 8 | 6 | 13 | 8 | 5 | 15 | 15 | 3 | 13 | 7 | 10 | 6 | 14 | 7 | 10 | 14 | 9 | 4 | 14 | 11 | 10 |
| Nigeria | 15 | 10 | 11 | 15 | 14 | 10 | 12 | 13 | 9 | 12 | 8 | 1 | 12 | 10 | 14 | 3 | 6 | 1 | 5 | 15 | 5 | 5 | 15 | 5 | 14 |
| Mauritania | 6 | 11 | 10 | 11 | 11 | 13 | 9 | 10 | 8 | 6 | 12 | 7 | 14 | 15 | 9 | 8 | 12 | 4 | 7 | 9 | 7 | 13 | 7 | 9 | 7 |
| Cambodia | 3 | 2 | 4 | 4 | 12 | 8 | 3 | 5 | 11 | 3 | 2 | 6 | 3 | 8 | 4 | 13 | 5 | 13 | 13 | 4 | 13 | 15 | 2 | 2 | 4 |
| Tajikistan | 2 | 4 | 6 | 2 | 9 | 2 | 4 | 11 | 2 | 2 | 4 | 8 | 1 | 5 | 6 | 14 | 11 | 11 | 14 | 5 | 14 | 2 | 3 | 4 | 2 |
| Senegal | 9 | 13 | 8 | 7 | 2 | 12 | 8 | 1 | 10 | 5 | 11 | 4 | 9 | 14 | 1 | 2 | 13 | 8 | 2 | 10 | 1 | 8 | 8 | 12 | 3 |
| São Tomé and Príncipe | 8 | 3 | 1 | 6 | 1 | 4 | 5 | 3 | 1 | 8 | 6 | 14 | 4 | 2 | 8 | 9 | 3 | 14 | 4 | 6 | 6 | 11 | 10 | 14 | 6 |
| Côte d'Ivoire | 14 | 14 | 14 | 14 | 15 | 7 | 14 | 14 | 13 | 13 | 14 | 9 | 11 | 9 | 5 | 12 | 15 | 12 | 11 | 13 | 10 | 12 | 12 | 7 | 12 |
| The Gambia | 12 | 7 | 13 | 13 | 5 | 11 | 10 | 6 | 7 | 10 | 9 | 10 | 10 | 13 | 11 | 10 | 10 | 6 | 8 | 11 | 11 | 10 | 11 | 8 | 8 |
| Kenya | 7 | 8 | 7 | 8 | 3 | 5 | 7 | 4 | 12 | 14 | 5 | 12 | 6 | 6 | 2 | 4 | 4 | 2 | 3 | 2 | 2 | 3 | 6 | 15 | 13 |
| Timor-Leste | 4 | 5 | 2 | 3 | 6 | 3 | 2 | 2 | 15 | 1 | 1 | 13 | 7 | 11 | 3 | 11 | 7 | 10 | 12 | 1 | 15 | 14 | 1 | 1 | 5 |
| Chad | 10 | 15 | 15 | 12 | 13 | 15 | 15 | 12 | 14 | 11 | 13 | 11 | 15 | 4 | 13 | 5 | 9 | 9 | 6 | 12 | 8 | 9 | 9 | 6 | 15 |
| Benin | 13 | 6 | 9 | 9 | 7 | 14 | 11 | 9 | 6 | 7 | 10 | 2 | 8 | 12 | 12 | 7 | 8 | 5 | 9 | 8 | 3 | 7 | 13 | 10 | 11 |
| Ranking Legend | 1 - 3 | | 4 - 7 | | | 8 - 11 | | | | 12 - 15 | | | | | | | | | | | | | | | |