

GBD PROFILE: SIERRA LEONE

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.

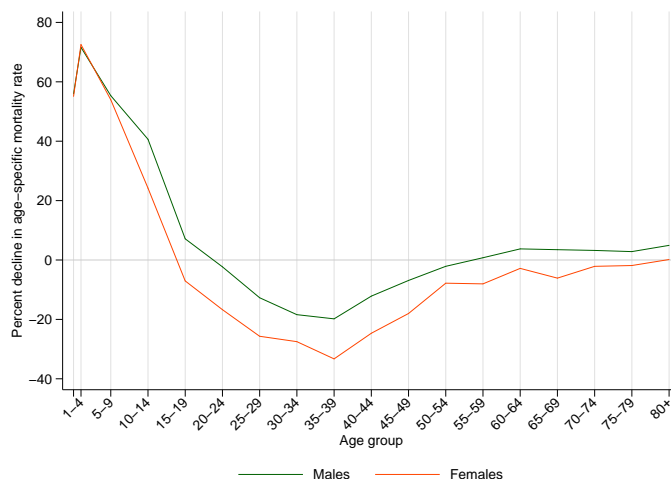
PROFILE OVERVIEW

- In terms of the number of years of life lost (YLLs) due to premature death in Sierra Leone, malaria, protein-energy malnutrition, 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), diarrheal diseases showed the largest decrease, falling by 54% from 1990 to 2010.
- The leading risk factor in Sierra Leone is childhood underweight.

ALL-CAUSE MORTALITY RATE

- This chart shows the change in mortality rate at every age range. The points above 0 on the chart indicate positive declines in the all-cause mortality rate, while points below 0 indicate an increase in mortality rate between 1990 and 2010.
- The greatest reductions in all-cause mortality rate were experienced by females aged 1-4 years (73%). Females aged 35-39 years saw the largest increase in mortality rate (33%).

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



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, Sierra Leone

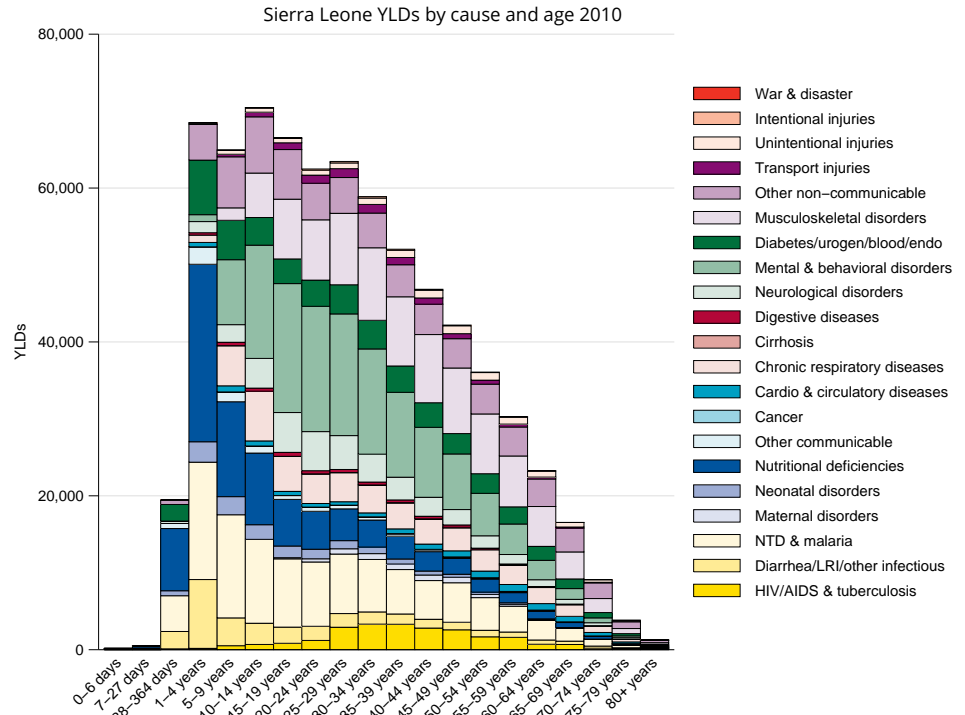
# YLLs in thousands (% of total)	Rank and disorder 1990	Rank and disorder 2010	# YLLs in thousands (% of total)	% change
701 (15.4%)	1 Protein-energy malnutrition	1 Malaria	640 (19.3%)	-3
654 (14.3%)	2 Malaria	2 Protein-energy malnutrition	331 (10.1%)	-54
596 (13.1%)	3 Lower respiratory infections	3 Lower respiratory infections	288 (8.7%)	-52
384 (8.4%)	4 Diarrheal diseases	4 Preterm birth complications	236 (7.2%)	-14
273 (6.0%)	5 Preterm birth complications	5 Diarrheal diseases	171 (5.2%)	-56
182 (4.0%)	6 Meningitis	6 Meningitis	133 (4.0%)	-28
130 (2.9%)	7 Neonatal encephalopathy	7 HIV/AIDS	123 (3.8%)	4,124
107 (2.4%)	8 Iron-deficiency anemia	8 Neonatal encephalopathy	121 (3.7%)	-7
113 (2.5%)	9 Measles	9 Neonatal sepsis	105 (3.2%)	5
100 (2.2%)	10 Neonatal sepsis	10 Tuberculosis	89 (2.7%)	4
86 (1.9%)	11 Tuberculosis	11 Stroke	63 (1.9%)	-6
87 (1.9%)	12 Tetanus	12 Maternal disorders	60 (1.8%)	28
68 (1.5%)	13 Stroke	13 Road injury	59 (1.8%)	10
64 (1.4%)	14 Congenital anomalies	14 Iron-deficiency anemia	53 (1.6%)	-51
54 (1.2%)	15 Road injury	15 Congenital anomalies	42 (1.3%)	-35
48 (1.0%)	16 Maternal disorders	16 Ischemic heart disease	39 (1.2%)	6
37 (0.8%)	17 Ischemic heart disease	17 Cirrhosis	36 (1.1%)	24
34 (0.7%)	18 Falls	18 Epilepsy	40 (1.2%)	17
40 (0.9%)	19 Epilepsy	19 Measles	33 (1.0%)	-71
31 (0.7%)	20 Syphilis	20 Tetanus	31 (0.9%)	-67
32 (0.7%)	21 Fire	21 Diabetes	24 (0.7%)	49
30 (0.7%)	22 Cirrhosis	22 Falls	24 (0.7%)	-27
26 (0.6%)	23 COPD	23 Fire	23 (0.7%)	-29
19 (0.4%)	24 Liver cancer	24 Syphilis	22 (0.7%)	-28
20 (0.4%)	25 Asthma	25 Liver cancer	18 (0.6%)	-2
	26 Diabetes	32 COPD		
	59 HIV/AIDS	34 Asthma		

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 Sierra Leone are iron-deficiency anemia, major depressive disorder, low back pain, schistosomiasis, and malaria.

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.

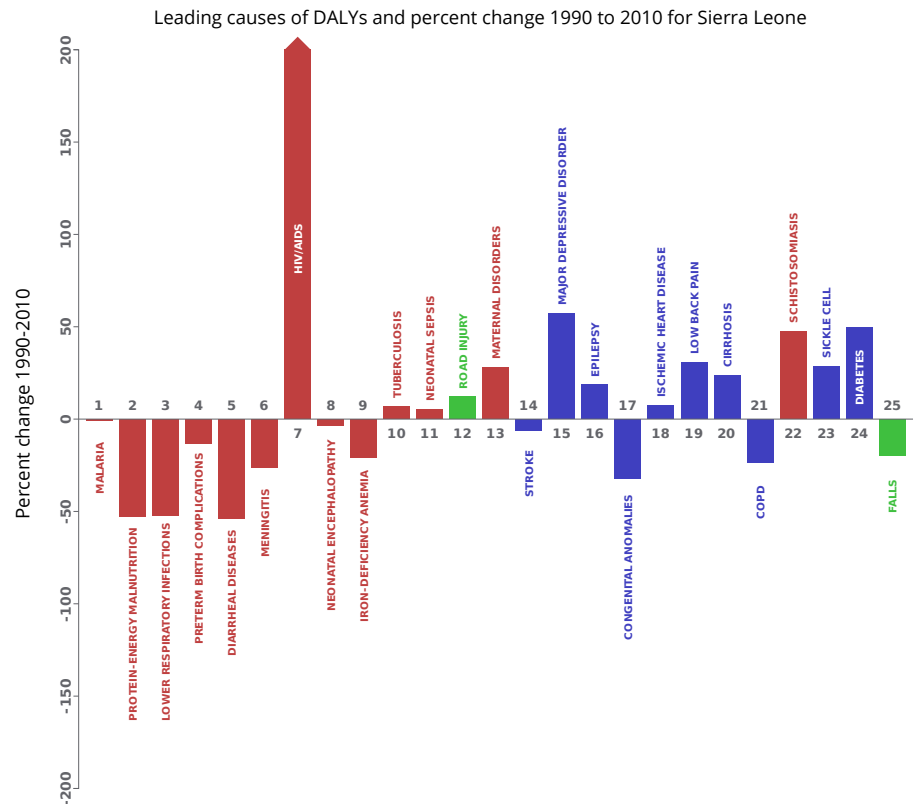


DISABILITY-ADJUSTED LIFE YEARS (DALYs)

Disability-adjusted life years (DALYs) quantify both premature mortality (YLLs) and disability (YLDs) within a population. In Sierra Leone, the top three causes of DALYs in 2010 were malaria, protein-energy malnutrition, 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

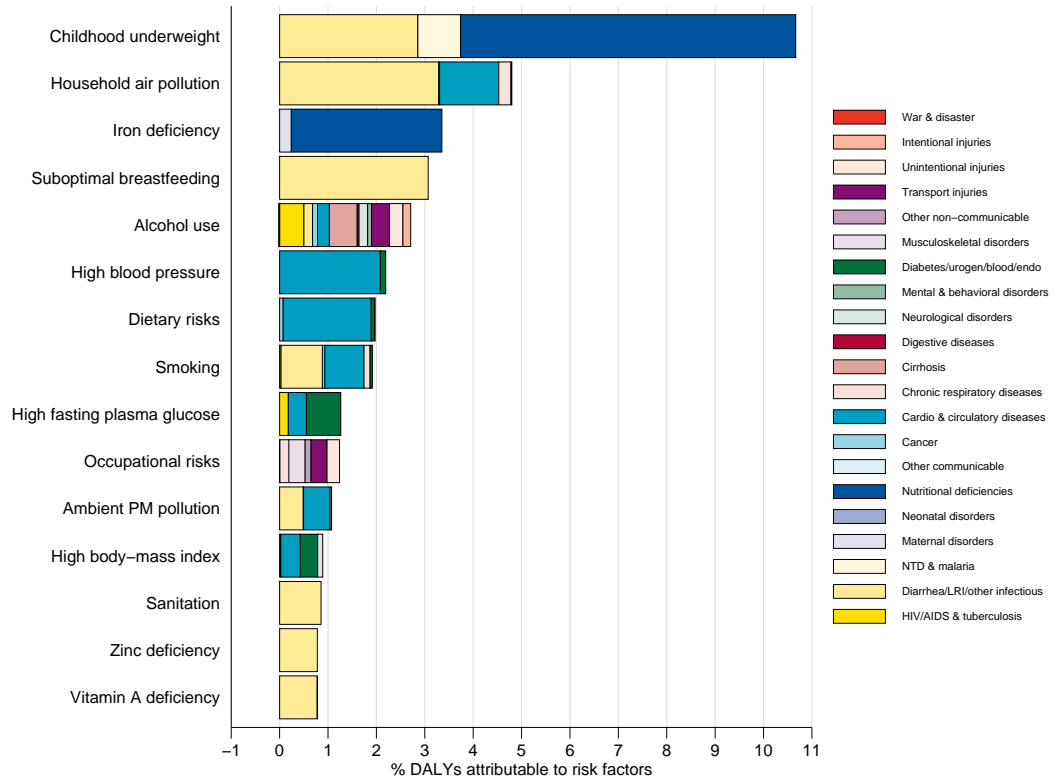


RISK FACTORS

Overall, the three risk factors that account for the most disease burden in Sierra Leone are childhood underweight, household air pollution from solid fuels, and iron deficiency. The leading risk factors for children under 5 and adults aged 15-49 years were childhood underweight and alcohol use, respectively, in 2010.

Burden of disease attributable to 15 leading risk factors in 2010, expressed as a percentage of Sierra Leone DALYs

The graph shows the top 15 risk factors for Sierra Leone. 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 Sierra Leone against other comparator countries provides key insight into public health successes and areas where Sierra Leone might be falling behind. The table identifies Sierra Leone'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, Sierra Leone ranked 7th for age-standardized YLL rate and 13th for age-standardized YLD 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
Myanmar	1,640	5	1,185	3	55,134	3	36,251	2	13,542	1	11,974	1	56.5	3	63.9	2	48.6	3	55.6	1
Rwanda	2,000	13	1,062	1	76,083	10	35,591	1	15,064	9	13,895	3	49.7	10	64.6	1	42.3	9	54.8	2
Guinea-Bissau	1,603	4	1,391	9	72,398	8	55,214	10	14,670	7	14,148	7	50.8	8	56.6	10	42.8	7	48	9
Afghanistan	1,931	12	1,668	11	68,958	6	52,078	8	17,727	15	17,252	15	51.9	6	57.7	8	42.4	8	47.3	11
Madagascar	1,451	3	1,156	2	56,586	4	37,200	3	14,116	3	14,145	6	56.1	4	63.6	3	47.6	4	53.8	3
Togo	1,282	2	1,199	4	51,184	4	46,594	6	14,577	6	13,973	5	58.3	2	60.2	6	49.1	2	51	6
Mozambique	1,659	6	1,725	12	74,370	2	67,547	14	15,342	12	14,841	11	50	9	52.5	14	41.9	10	44.5	14
Sierra Leone	1,682	7	1,347	7	78,271	11	49,641	7	15,322	11	15,221	13	48.9	11	58.6	7	40.9	12	49.1	7
Ethiopia	2,152	15	1,292	6	86,420	14	43,719	4	13,713	2	12,723	2	46.7	14	60.9	4	40.2	14	52.5	4
Malawi	1,768	10	1,730	13	79,007	12	66,486	13	15,082	10	14,549	9	48.7	12	52.9	13	41	11	45	12
Central African Republic	2,131	14	2,408	15	81,026	13	90,581	15	15,696	14	15,022	12	48.3	13	46.2	15	40.8	13	39.5	15
Eritrea	1,807	11	1,353	8	67,111	5	44,346	5	15,508	13	14,614	10	52.4	5	60.6	5	44	5	51.2	5
Somalia	1,738	8	1,606	10	70,184	7	57,208	11	14,350	4	14,546	8	51.3	7	55.8	11	43.6	6	47.4	10
Niger	1,765	9	1,268	5	88,497	15	52,955	9	14,526	5	13,915	4	46.1	15	57.7	9	39	15	48.9	8
Zimbabwe	1,144	1	1,801	14	39,368	1	65,919	12	15,058	8	15,659	14	63	1	53.1	12	52.7	1	44.7	13

COUNTRY BENCHMARKING OF BURDEN OF DISEASE, CONTINUED

This figure shows the rank of Sierra Leone 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 Sierra Leone 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	Protein-energy malnutrition	Malaria	Lower respiratory infections	Diarrheal diseases	Preterm birth complications	Meningitis	Iron-deficiency anemia	Neonatal encephalopathy	Tuberculosis	Neonatal sepsis	Measles	Tetanus	Stroke	Congenital anomalies	Road injury	Maternal disorders	COPD	Epilepsy	Ischemic heart disease	Falls	Major depressive disorder	Low back pain	Fire	Syphilis	Cirrhosis
Myanmar	2	7	2	7	7	2	3	13	13	1	5	6	11	12	1	2	14	2	8	12	6	1	2	3	15
Rwanda	7	10	7	5	8	4	1	9	10	8	2	2	13	7	15	12	12	7	12	7	14	12	9	7	13
Guinea-Bissau	8	13	10	9	13	12	13	11	5	14	12	11	6	8	12	10	9	13	7	13	4	6	7	12	8
Afghanistan	3	2	13	3	4	6	2	1	4	3	3	15	15	14	14	6	4	1	15	10	15	15	8	1	9
Madagascar	10	4	4	6	11	3	4	2	1	9	10	3	14	11	8	4	8	8	13	2	2	11	5	14	5
Togo	4	8	3	2	9	8	10	10	2	13	9	5	5	3	7	3	3	11	4	11	9	10	3	10	7
Mozambique	5	15	9	8	12	10	9	14	11	15	11	4	1	4	3	8	1	12	1	9	11	9	12	15	3
Sierra Leone	15	14	12	4	15	13	15	15	6	10	8	12	7	9	6	5	10	14	6	15	3	8	6	6	12
Ethiopia	6	5	14	10	14	11	6	6	14	6	15	14	3	10	11	14	13	5	3	6	1	2	15	8	14
Malawi	9	12	5	14	2	5	7	12	8	12	4	9	12	15	9	9	5	6	11	3	7	3	14	5	10
Central African Republic	13	11	6	12	10	14	12	5	15	4	7	8	10	13	13	11	15	4	14	8	13	5	4	13	11
Eritrea	11	3	8	13	1	7	11	4	12	5	14	7	9	1	5	15	11	9	10	4	12	13	10	9	4
Somalia	12	9	11	11	5	9	5	7	9	7	6	10	8	6	10	13	7	10	9	5	10	14	11	4	2
Niger	14	6	15	15	3	15	14	8	7	11	13	13	4	5	4	7	6	15	5	14	5	7	13	11	6
Zimbabwe	1	1	1	1	6	1	8	3	3	2	1	1	2	2	2	1	2	3	2	1	8	4	1	2	1
Ranking of leading age-standardized rates of disability-adjusted life years (DALYs) relative to comparator countries in 2010																									
Country	Malaria	Protein-energy malnutrition	Lower respiratory infections	Preterm birth complications	Diarrheal diseases	Meningitis	HIV/AIDS	Neonatal encephalopathy	Iron-deficiency anemia	Tuberculosis	Neonatal sepsis	Road injury	Maternal disorders	Stroke	Major depressive disorder	Epilepsy	Congenital anomalies	Ischemic heart disease	Low back pain	Cirrhosis	COPD	Schistosomiasis	Sickle cell	Diabetes	Falls
Myanmar	3	1	3	5	4	1	6	13	1	7	1	3	1	12	7	2	14	8	1	15	13	1	1	11	15
Rwanda	7	4	1	6	1	3	8	9	2	6	7	6	2	5	14	5	1	4	10	1	3	7	6	4	3
Guinea-Bissau	15	10	8	11	12	14	9	12	12	4	14	11	9	7	2	15	11	11	9	8	6	5	11	12	14
Afghanistan	1	2	9	12	2	6	1	1	3	3	2	14	11	15	15	1	13	15	15	9	12	1	5	15	11
Madagascar	6	7	2	7	5	2	2	2	6	1	10	2	6	14	6	7	2	13	12	2	10	13	10	1	1
Togo	11	6	7	10	9	11	11	10	8	2	15	5	3	4	4	13	9	7	8	7	1	9	14	7	8
Mozambique	14	5	4	9	6	8	13	15	7	12	13	12	8	1	5	12	3	1	13	4	5	14	8	3	10
Sierra Leone	12	14	6	15	3	12	7	14	15	8	9	4	7	8	8	11	7	9	7	12	4	15	13	14	13
Ethiopia	4	9	11	14	7	7	4	3	4	10	5	9	5	2	1	6	4	2	2	10	11	6	3	2	4
Malawi	8	8	10	1	10	5	14	11	5	9	11	13	13	13	10	8	12	12	3	13	8	12	9	9	7
Central African Republic	13	15	14	13	15	15	12	6	13	15	4	15	15	11	9	4	15	14	5	14	15	3	15	10	12
Eritrea	5	11	5	3	11	9	5	5	11	11	8	8	12	10	13	10	5	10	11	6	7	10	7	8	5
Somalia	9	13	12	4	13	10	10	7	9	14	6	7	14	9	11	9	6	6	14	5	9	11	4	6	6
Niger	10	12	15	2	14	13	3	4	14	5	12	1	10	3	3	14	8	5	6	3	2	4	12	5	9
Zimbabwe	2	3	13	8	8	4	15	8	10	13	3	10	4	6	12	3	10	3	4	11	14	8	2	13	2
Ranking Legend		1 - 3		4 - 7		8 - 11		12 - 15																	