

# GBD PROFILE: RWANDA

## 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.

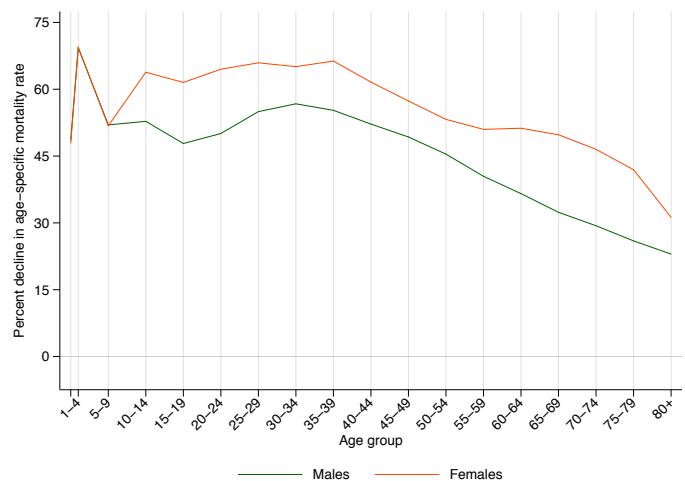
### PROFILE OVERVIEW

- In terms of the number of years of life lost (YLLs) due to premature death in Rwanda, malaria, lower respiratory infections, and HIV/AIDS 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 70% from 1990 to 2010.
- The leading risk factor in Rwanda is household air pollution from solid fuels.

### 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 females aged 1-4 years (69%). Males aged 80+ years saw the smallest decrease in mortality rate (23%).

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



### 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, Rwanda

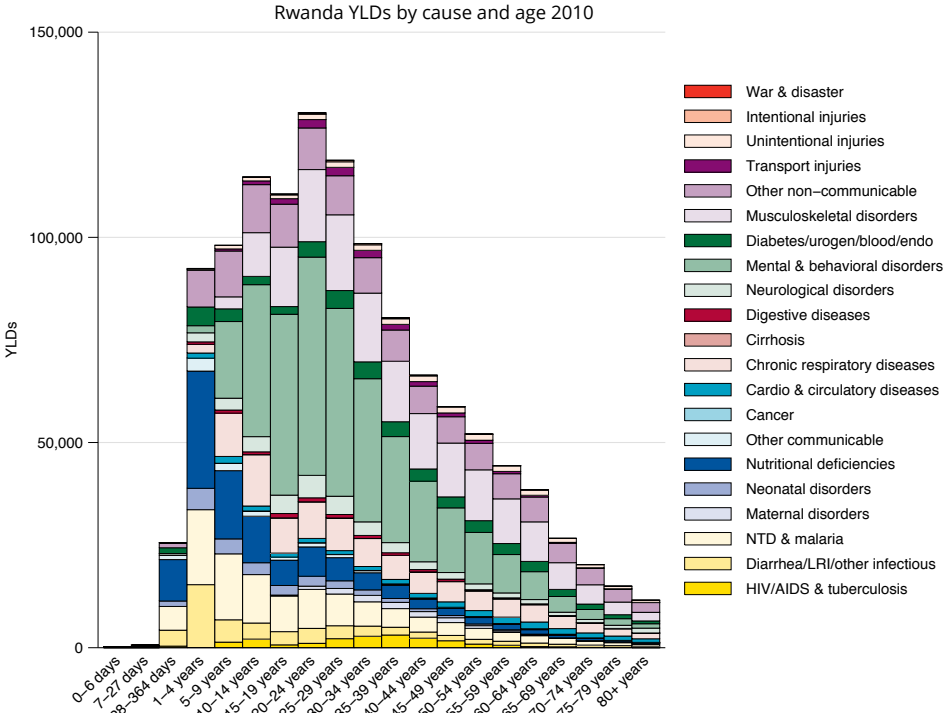
# YLLs in thousands		# YLLs in thousands		# YLLs in thousands	% change
(% of total)	Rank and disorder 1990	Rank and disorder 2010	(% of total)		
814 (13.4%)	1 Lower respiratory infections	1 Malaria	598 (14.6%)	-13	
786 (12.9%)	2 Diarrheal diseases	2 Lower respiratory infections	383 (9.5%)	-53	
683 (11.1%)	3 Malaria	3 HIV/AIDS	271 (6.7%)	-50	
541 (8.9%)	4 HIV/AIDS	4 Preterm birth complications	244 (6.0%)	16	
369 (6.1%)	5 Protein-energy malnutrition	5 Diarrheal diseases	218 (5.4%)	-72	
219 (3.6%)	6 Tuberculosis	6 Neonatal sepsis	196 (4.8%)	40	
211 (3.5%)	7 Preterm birth complications	7 Neonatal encephalopathy	184 (4.6%)	34	
161 (2.6%)	8 Road injury	8 Tuberculosis	166 (4.1%)	-24	
148 (2.4%)	9 Neonatal sepsis	9 Protein-energy malnutrition	133 (3.3%)	-64	
137 (2.2%)	10 Neonatal encephalopathy	10 Road injury	129 (3.2%)	-26	
138 (2.3%)	11 Meningitis	11 Interpersonal violence	108 (2.7%)	229	
114 (1.9%)	12 Stroke	12 Stroke	100 (2.5%)	-14	
110 (1.8%)	13 War & legal intervention	13 Meningitis	94 (2.3%)	-32	
103 (1.7%)	14 Maternal disorders	14 Congenital anomalies	64 (1.6%)	-42	
106 (1.7%)	15 Congenital anomalies	15 Ischemic heart disease	60 (1.5%)	-16	
71 (1.2%)	16 Ischemic heart disease	16 Syphilis	59 (1.5%)	-3	
62 (1.0%)	17 Fire	17 Fire	49 (1.2%)	-23	
61 (1.0%)	18 Syphilis	18 Epilepsy	44 (1.1%)	9	
66 (1.1%)	19 Measles	19 Maternal disorders	40 (1.0%)	-62	
46 (0.8%)	20 Cirrhosis	20 Drowning	36 (0.9%)	-17	
44 (0.7%)	21 Interpersonal violence	21 Self-harm	31 (0.8%)	-8	
44 (0.7%)	22 Drowning	22 Diabetes	30 (0.7%)	29	
41 (0.7%)	23 Epilepsy	23 Cirrhosis	29 (0.7%)	-36	
38 (0.6%)	24 COPD	24 Typhoid fevers	32 (0.8%)	30	
35 (0.6%)	25 Poisonings	25 Falls	22 (0.5%)	0	
	26 Self-harm	27 Poisonings			
	27 Diabetes	28 COPD			
	30 Falls	35 Measles			
	31 Typhoid fevers	49 War & legal intervention			

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 Rwanda are major depressive disorder, anxiety disorders, iron-deficiency anemia, low back pain, and chronic obstructive pulmonary disease.

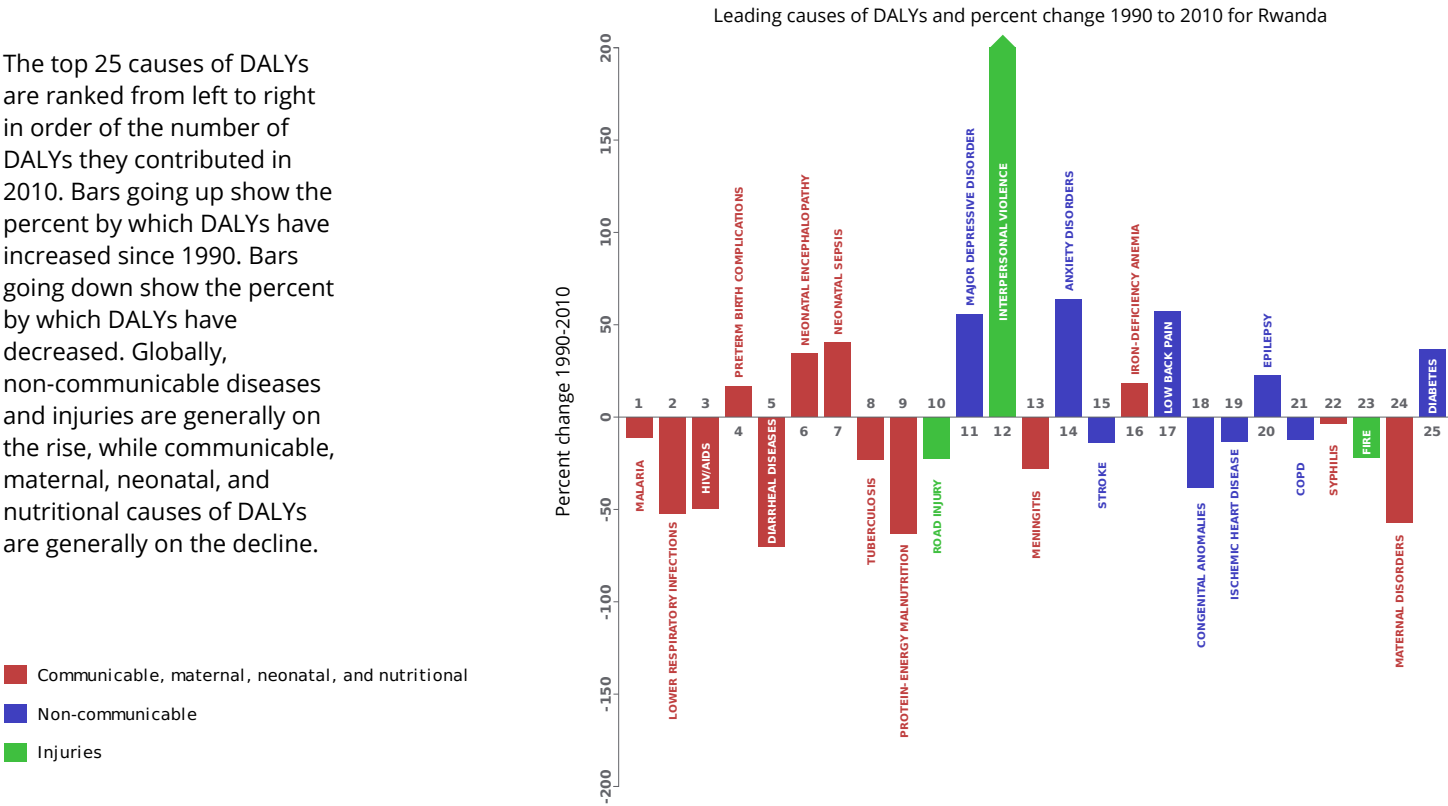
The size of the colored portion in each bar represents the number of YLDs attributable to each cause. The height of each bar shows which age groups had the most YLDs in 2010. The causes are aggregated. For example, musculoskeletal disorders include low back pain and neck pain.



DISABILITY-ADJUSTED LIFE YEARS (DALYs)

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

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.

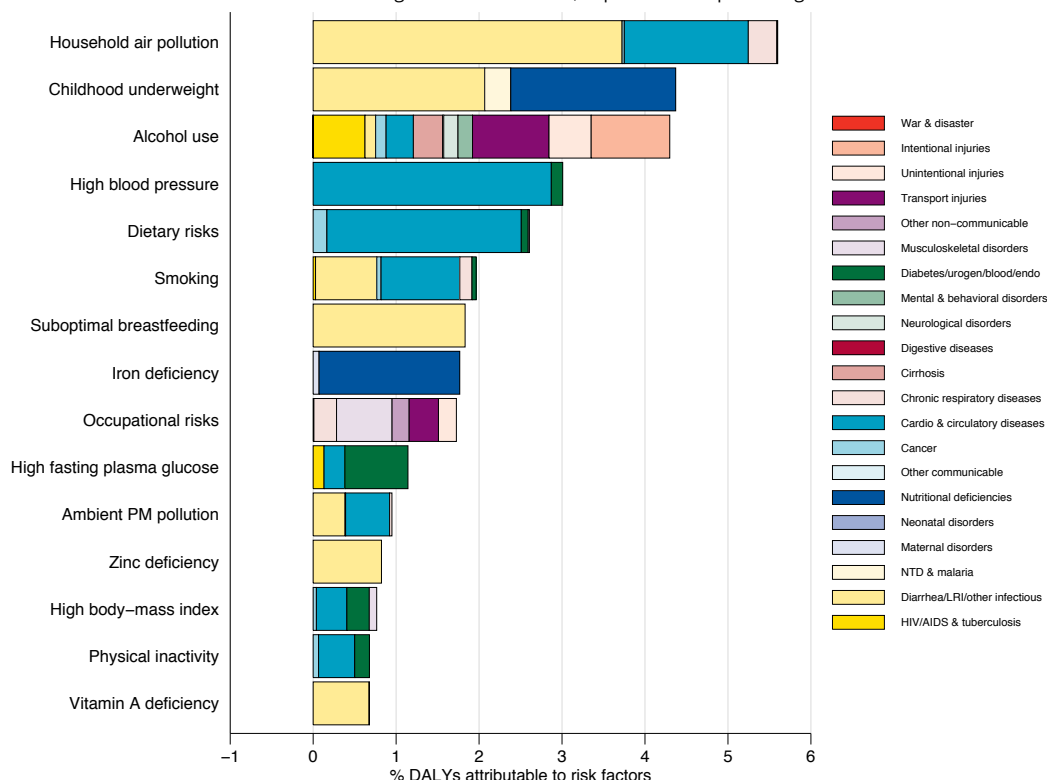


## RISK FACTORS

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

The graph shows the top 15 risk factors for Rwanda. 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.

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



## COUNTRY BENCHMARKING OF BURDEN OF DISEASE

Understanding the relative performance of Rwanda against other comparator countries provides key insight into public health successes and areas where Rwanda might be falling behind. The table identifies Rwanda'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, Rwanda ranked 2nd for age-standardized YLL rate and 7th 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
Nepal	1,285	2	832	1	49,745	1	26,361	1	13,660	3	12,959	4	58.8	1	69.2	1	49.8	1	58.8	1
Comoros	1,439	3	1,223	6	52,340	3	38,959	5	13,050	1	12,879	3	57.5	3	62.8	5	49.5	2	54	4
Burkina Faso	1,521	6	1,396	13	68,852	6	59,507	14	14,862	10	13,409	5	52.1	6	55.2	14	43.8	6	47.1	14
Uganda	1,658	9	1,290	8	75,253	11	45,587	7	15,596	14	13,882	6	50.4	10	60.3	7	42.2	11	51.5	7
Mali	1,726	12	1,331	10	78,963	14	53,703	12	14,609	7	13,991	9	48.7	14	57.3	12	41.1	13	48.6	11
Guinea	1,508	5	1,233	7	69,094	8	48,350	9	14,811	9	14,194	12	52.1	7	59.4	9	43.7	7	50.2	9
Myanmar	1,640	8	1,185	4	55,134	4	36,251	3	13,542	2	11,974	1	56.5	4	63.9	3	48.6	4	55.6	2
<b>Rwanda</b>	<b>2,000</b>	<b>14</b>	<b>1,062</b>	<b>2</b>	<b>76,083</b>	<b>12</b>	<b>35,591</b>	<b>2</b>	<b>15,064</b>	<b>11</b>	<b>13,895</b>	<b>7</b>	<b>49.7</b>	<b>12</b>	<b>64.6</b>	<b>2</b>	<b>42.3</b>	<b>10</b>	<b>54.8</b>	<b>3</b>
Guinea-Bissau	1,603	7	1,391	12	72,398	9	55,214	13	14,670	8	14,148	11	50.8	9	56.6	13	42.8	8	48	12
Afghanistan	1,931	13	1,668	14	68,958	7	52,078	11	17,727	15	17,252	15	51.9	8	57.7	11	42.4	9	47.3	13
Madagascar	1,451	4	1,156	3	56,586	5	37,200	4	14,116	5	14,145	10	56.1	5	63.6	4	47.6	5	53.8	5
Togo	1,282	1	1,199	5	51,184	2	46,594	8	14,577	6	13,973	8	58.3	2	60.2	8	49.1	3	51	8
Mozambique	1,659	10	1,725	15	74,370	10	67,547	15	15,342	13	14,841	13	50	11	52.5	15	41.9	12	44.5	15
Sierra Leone	1,682	11	1,347	11	78,271	13	49,641	10	15,322	12	15,221	14	48.9	13	58.6	10	40.9	14	49.1	10
Ethiopia	2,152	15	1,292	9	86,420	15	43,719	6	13,713	4	12,723	2	46.7	15	60.9	6	40.2	15	52.5	6

## COUNTRY BENCHMARKING OF BURDEN OF DISEASE, CONTINUED

This figure shows the rank of Rwanda 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 Rwanda 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	Lower respiratory infections	Diarrheal diseases	Malaria	HIV/AIDS	Protein-energy malnutrition	Tuberculosis	Preterm birth complications	Road injury	Neonatal encephalopathy	Meningitis	Neonatal sepsis	Stroke	Maternal disorders	War & legal intervention	Congenital anomalies	Major depressive disorder	Ischemic heart disease	Iron-deficiency anemia	COPD
Nepal	7	7	1	2	2	9	6	2	15	1	3	2	1	1	13	1	5	8	15
Comoros	4	1	5	1	6	3	12	13	7	2	8	12	9	1	9	9	12	5	7
Burkina Faso	11	15	10	13	4	4	2	10	4	10	9	1	3	1	5	10	2	12	6
Uganda	6	6	7	15	7	13	1	5	9	9	7	4	6	11	3	13	4	6	2
Mali	3	14	14	11	14	10	14	6	10	12	15	9	14	10	1	7	10	14	12
Guinea	14	5	11	10	9	5	8	4	14	13	11	7	13	1	6	5	7	11	4
Myanmar	1	10	6	3	1	14	4	1	11	3	1	11	2	9	14	8	11	3	14
<b>Rwanda</b>	<b>8</b>	<b>8</b>	<b>9</b>	<b>14</b>	<b>11</b>	<b>11</b>	<b>5</b>	<b>15</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>13</b>	<b>12</b>	<b>14</b>	<b>7</b>	<b>14</b>	<b>13</b>	<b>1</b>	<b>11</b>
Guinea-Bissau	10	12	12	7	12	7	11	12	8	14	13	8	11	1	8	6	9	13	9
Afghanistan	13	3	2	4	3	6	3	14	1	6	2	15	8	12	15	15	15	2	5
Madagascar	5	9	3	8	13	1	9	9	2	4	6	14	5	1	12	3	14	4	8
Togo	2	2	8	12	5	2	7	8	6	7	12	6	4	1	2	11	6	10	3
Mozambique	9	11	15	6	8	12	10	3	12	8	14	3	10	13	4	12	1	9	1
Sierra Leone	12	4	13	5	15	8	15	7	13	15	10	10	7	1	10	4	8	15	10
Ethiopia	15	13	4	9	10	15	13	11	3	11	4	5	15	15	11	2	3	7	13
Ranking of leading age-standardized rates of disability-adjusted life years (DALYs) relative to comparator countries in 2010																			
Country	Malaria	Lower respiratory infections	HIV/AIDS	Preterm birth complications	Diarrheal diseases	Neonatal encephalopathy	Neonatal sepsis	Tuberculosis	Protein-energy malnutrition	Road injury	Major depressive disorder	Interpersonal violence	Meningitis	Anxiety disorders	Stroke	Iron-deficiency anemia	Low back pain	Congenital anomalies	Ischemic heart disease
Nepal	1	1	3	2	4	12	3	4	2	1	1	1	1	12	1	4	15	3	11
Comoros	5	7	1	9	3	7	9	8	7	11	12	8	5	10	12	9	5	9	6
Burkina Faso	15	15	8	5	15	4	10	2	10	14	4	5	15	2	6	13	4	13	7
Uganda	8	2	14	1	1	6	6	14	4	9	13	11	9	6	4	6	13	2	3
Mali	14	4	9	14	12	13	15	6	14	6	11	4	12	5	8	14	1	12	14
Guinea	11	14	6	8	6	15	11	5	9	4	5	2	13	7	7	11	8	10	10
Myanmar	3	6	7	3	8	10	1	11	1	3	9	13	2	3	13	1	2	15	8
<b>Rwanda</b>	<b>7</b>	<b>3</b>	<b>11</b>	<b>4</b>	<b>2</b>	<b>5</b>	<b>5</b>	<b>10</b>	<b>5</b>	<b>8</b>	<b>14</b>	<b>14</b>	<b>4</b>	<b>15</b>	<b>9</b>	<b>2</b>	<b>10</b>	<b>4</b>	<b>4</b>
Guinea-Bissau	13	11	12	11	14	9	13	9	13	12	3	6	14	1	10	12	9	12	13
Afghanistan	2	12	2	12	5	1	2	7	3	15	15	15	6	14	15	3	14	14	15
Madagascar	6	5	4	6	9	2	8	1	11	2	8	10	3	13	14	7	11	5	14
Togo	9	10	13	10	13	8	14	3	8	7	6	7	10	8	5	10	7	11	5
Mozambique	12	8	15	7	10	14	12	15	6	13	7	9	8	11	2	8	12	6	1
Sierra Leone	10	9	10	15	7	11	7	12	15	5	10	3	11	4	11	15	6	8	9
Ethiopia	4	13	5	13	11	3	4	13	12	10	2	12	7	9	3	5	3	7	2
Ranking Legend																			
	1 - 3					4 - 7					8 - 11								12 - 15