

# GBD PROFILE: MADAGASCAR

## 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.

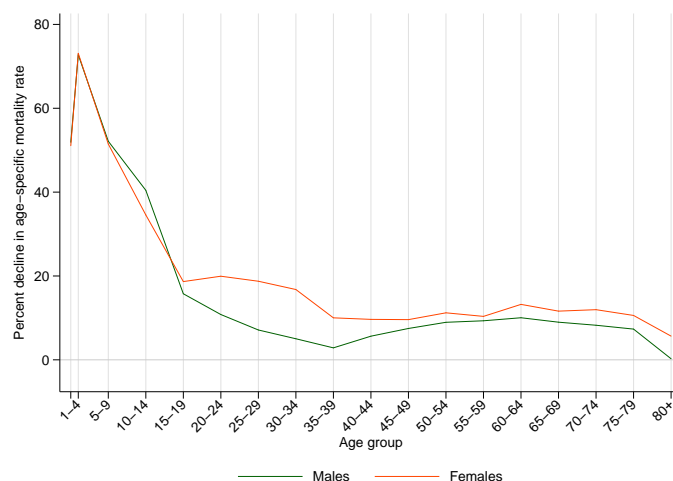
### PROFILE OVERVIEW

- In terms of the number of years of life lost (YLLs) due to premature death in Madagascar, lower respiratory infections, diarrheal diseases, and malaria 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 69% from 1990 to 2010.
- The leading risk factor in Madagascar is childhood underweight.

### 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 (73%). Males aged 80+ years saw the smallest decrease in mortality rate (0%).

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



### 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, Madagascar

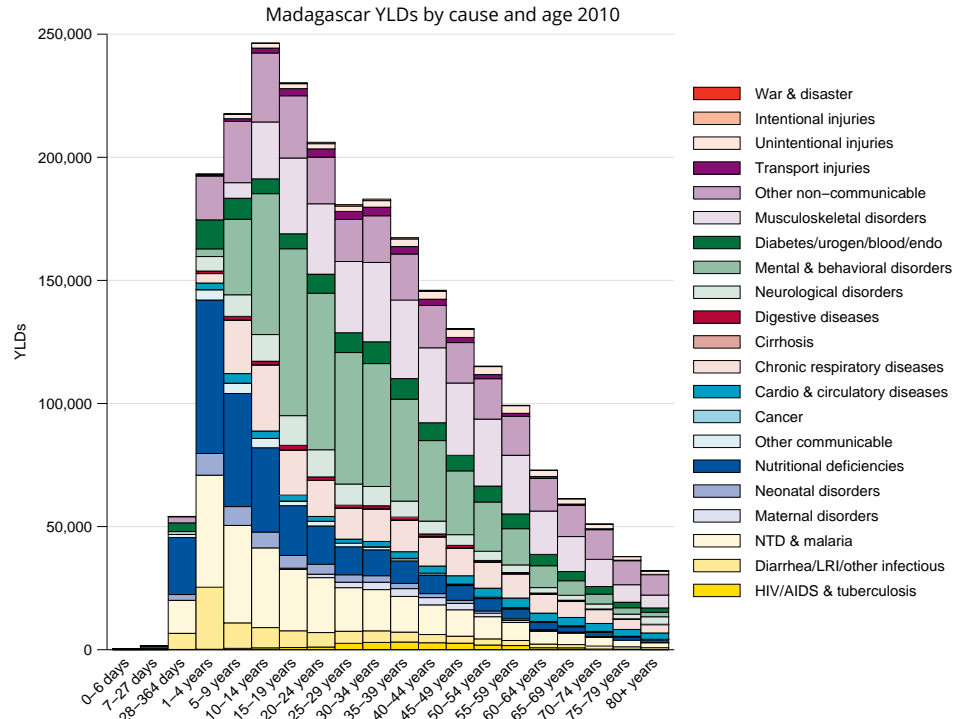
# YLLs in thousands (% of total)	Rank and disorder 1990	Rank and disorder 2010	# YLLs in thousands (% of total)	% change
1,518 (17.6%)	1 Diarrheal diseases	1 Lower respiratory infections	691 (9.2%)	-40
1,141 (13.2%)	2 Lower respiratory infections	2 Diarrheal diseases	691 (9.2%)	-55
813 (9.4%)	3 Protein-energy malnutrition	3 Malaria	714 (9.4%)	131
419 (4.9%)	4 Preterm birth complications	4 Preterm birth complications	442 (5.9%)	4
534 (6.1%)	5 Measles	5 Protein-energy malnutrition	428 (5.7%)	-49
339 (3.9%)	6 Syphilis	6 Stroke	379 (5.0%)	48
304 (3.5%)	7 Malaria	7 Neonatal sepsis	355 (4.7%)	42
256 (3.0%)	8 Stroke	8 Syphilis	332 (4.4%)	-2
256 (3.0%)	9 Neonatal sepsis	9 Ischemic heart disease	224 (3.0%)	52
228 (2.7%)	10 Congenital anomalies	10 HIV/AIDS	197 (2.6%)	474
196 (2.3%)	11 Meningitis	11 Neonatal encephalopathy	191 (2.5%)	19
156 (1.8%)	12 Neonatal encephalopathy	12 Road injury	166 (2.2%)	3
159 (1.9%)	13 Road injury	13 Tuberculosis	164 (2.2%)	16
147 (1.7%)	14 Ischemic heart disease	14 Measles	167 (2.2%)	-69
139 (1.6%)	15 Tuberculosis	15 Maternal disorders	140 (1.9%)	21
115 (1.3%)	16 Maternal disorders	16 Meningitis	131 (1.7%)	-32
84 (1.0%)	17 Fire	17 Congenital anomalies	116 (1.5%)	-54
63 (0.7%)	18 COPD	18 Interpersonal violence	114 (1.5%)	77
64 (0.7%)	19 Interpersonal violence	19 Fire	83 (1.1%)	-4
59 (0.7%)	20 Epilepsy	20 Epilepsy	81 (1.1%)	38
61 (0.7%)	21 Drowning	21 Drowning	70 (0.9%)	21
49 (0.6%)	22 Cirrhosis	22 Cirrhosis	66 (0.9%)	37
47 (0.5%)	23 Tetanus	23 COPD	57 (0.8%)	-8
45 (0.5%)	24 Poisonings	24 Self-harm	58 (0.8%)	74
38 (0.4%)	25 Rheumatic heart disease	25 Diabetes	49 (0.7%)	60
	27 Self-harm	30 Rheumatic heart disease		
	29 HIV/AIDS	32 Poisonings		
	30 Diabetes	52 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 Madagascar are iron-deficiency anemia, major depressive disorder, low back pain, schistosomiasis, and anxiety disorders.

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.

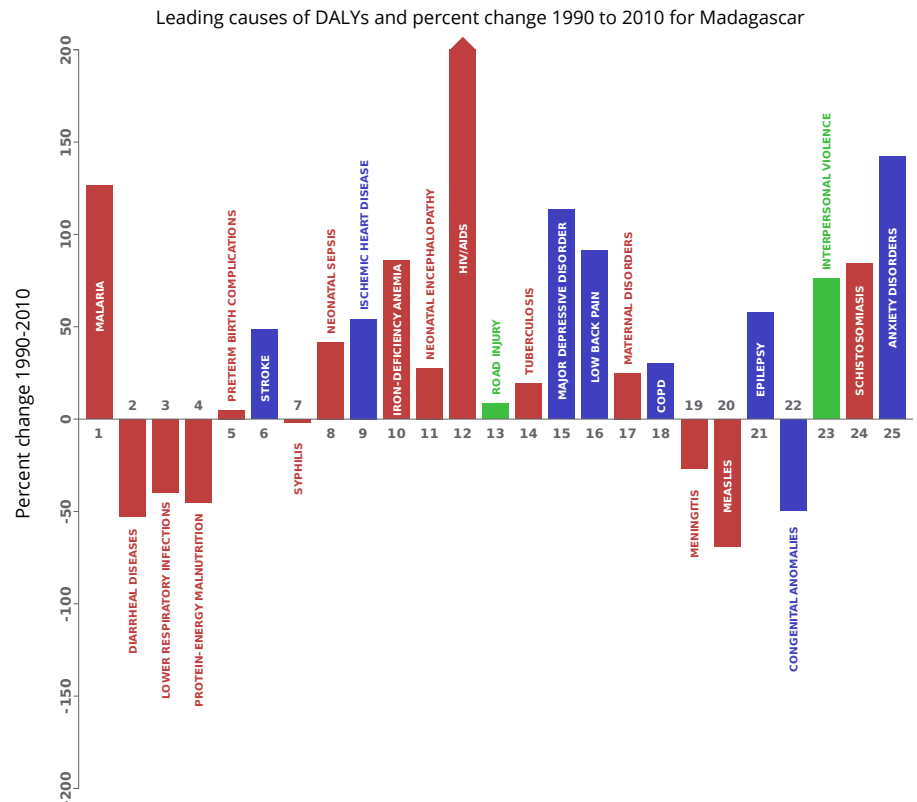


## DISABILITY-ADJUSTED LIFE YEARS (DALYs)

Disability-adjusted life years (DALYs) quantify both premature mortality (YLLs) and disability (YLDs) within a population. In Madagascar, the top three causes of DALYs in 2010 were malaria, diarrheal diseases, and lower respiratory infections. Two causes that appeared in the 10 leading causes of DALYs in 2010 and not 1990 were ischemic heart disease and iron-deficiency anemia.

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

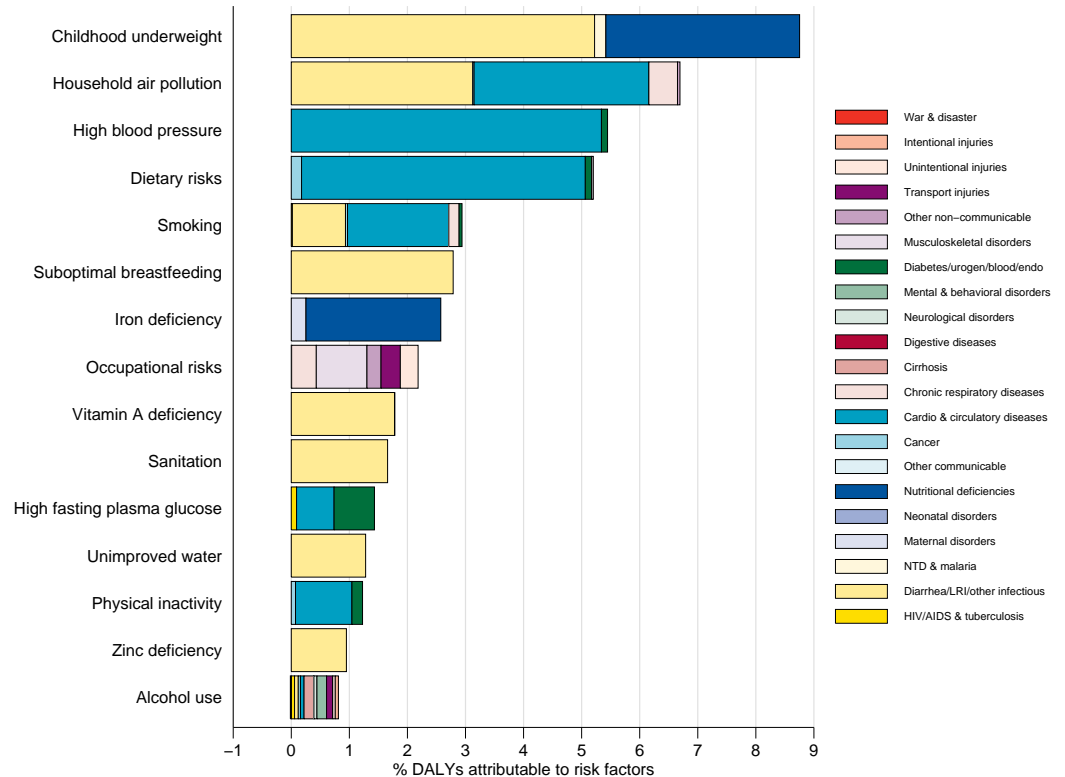


## RISK FACTORS

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

The graph shows the top 15 risk factors for Madagascar. 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 Madagascar DALYs



## COUNTRY BENCHMARKING OF BURDEN OF DISEASE

Understanding the relative performance of Madagascar against other comparator countries provides key insight into public health successes and areas where Madagascar might be falling behind. The table identifies Madagascar'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, Madagascar ranked 2nd for age-standardized death 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
Uganda	1,658	6	1,290	6	75,253	9	45,587	6	15,596	13	13,882	3	50.4	8	60.3	6	42.2	9	51.5	5
Mali	1,726	9	1,331	8	78,963	12	53,703	11	14,609	5	13,991	6	48.7	13	57.3	11	41.1	11	48.6	10
Guinea	1,508	3	1,233	5	69,094	6	48,350	8	14,811	7	14,194	9	52.1	5	59.4	8	43.7	5	50.2	8
Myanmar	1,640	5	1,185	3	55,134	2	36,251	2	13,542	1	11,974	1	56.5	2	63.9	2	48.6	2	55.6	1
Rwanda	2,000	13	1,062	1	76,083	10	35,591	1	15,064	8	13,895	4	49.7	10	64.6	1	42.3	8	54.8	2
Guinea-Bissau	1,603	4	1,391	11	72,398	7	55,214	12	14,670	6	14,148	8	50.8	7	56.6	12	42.8	6	48	11
Afghanistan	1,931	12	1,668	12	68,958	5	52,078	10	17,727	15	17,252	15	51.9	6	57.7	10	42.4	7	47.3	12
<b>Madagascar</b>	<b>1,451</b>	<b>2</b>	<b>1,156</b>	<b>2</b>	<b>56,586</b>	<b>3</b>	<b>37,200</b>	<b>3</b>	<b>14,116</b>	<b>3</b>	<b>14,145</b>	<b>7</b>	<b>56.1</b>	<b>3</b>	<b>63.6</b>	<b>3</b>	<b>47.6</b>	<b>3</b>	<b>53.8</b>	<b>3</b>
Togo	1,282	1	1,199	4	51,184	1	46,594	7	14,577	4	13,973	5	58.3	1	60.2	7	49.1	1	51	7
Mozambique	1,659	7	1,725	13	74,370	8	67,547	14	15,342	11	14,841	12	50	9	52.5	14	41.9	10	44.5	14
Sierra Leone	1,682	8	1,347	9	78,271	11	49,641	9	15,322	10	15,221	14	48.9	11	58.6	9	40.9	13	49.1	9
Ethiopia	2,152	15	1,292	7	86,420	15	43,719	4	13,713	2	12,723	2	46.7	15	60.9	4	40.2	15	52.5	4
Malawi	1,768	10	1,730	14	79,007	13	66,486	13	15,082	9	14,549	10	48.7	12	52.9	13	41	12	45	13
Central African Republic	2,131	14	2,408	15	81,026	14	90,581	15	15,696	14	15,022	13	48.3	14	46.2	15	40.8	14	39.5	15
Eritrea	1,807	11	1,353	10	67,111	4	44,346	5	15,508	12	14,614	11	52.4	4	60.6	5	44	4	51.2	6

## COUNTRY BENCHMARKING OF BURDEN OF DISEASE, CONTINUED

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