The analytical strategy of GBD

The GBD approach contains 18 distinct components, as outlined in Figure A1. The components of GBD are interconnected. For example, when new data is incorporated into the age-specific mortality rates analysis (component 2), other dependent components must also be updated, such as rescaling deaths for each cause (component 5), healthy life expectancy or HALE (component 12), YLLs (component 13), and estimation of YLLs attributable to each risk factor (component 18). The inner workings of key components are briefly described in this publication, and more detailed descriptions of each component are included in the published articles.

Estimating age- and sex-specific mortality

Researchers identified sources of under-5 and adult mortality data from vital and sample registration systems as well as from surveys that ask mothers about live births and deaths of their children and ask people about siblings and their survival. Researchers processed that data to address biases and estimated the probability of death between ages 0 and 5 and ages 15 and 60 using statistical models. Finally, researchers used these probability estimates as well as a model life table system to estimate age-specific mortality rates by sex between 1970 and 2010.

Figure A1: The 18 components of GBD and their interrelations
**Estimating years lost due to premature death**

Researchers compiled all available data on causes of death from 187 countries. Information about causes of death was derived from vital registration systems, mortality surveillance systems, censuses, surveys, hospital records, police records, mortuaries, and verbal autopsies. Verbal autopsies are surveys that collect information from individuals familiar with the deceased about the signs and symptoms the person had prior to death. GBD 2010 researchers closely examined the completeness of the data. For those countries where cause of death data were incomplete, researchers used statistical techniques to compensate for the inherent biases. They also standardized causes of death across different data sources by mapping different versions of the International Classification of Diseases coding system to the GBD cause list.

Next, researchers examined the accuracy of the data, scouring rows and rows of data for “garbage codes.” Garbage codes are misclassifications of death in the data, and researchers identified thousands of them. Some garbage codes are instances where we know the cause listed cannot possibly lead to death. Examples found in records include “abdominal rigidity,” “senility,” and “yellow nail syndrome.” To correct these, researchers drew on evidence from medical literature, expert judgment, and statistical techniques to reassign each of these to more probable causes of death.

After addressing data-quality issues, researchers used a variety of statistical models to determine the number of deaths from each cause. This approach, named Cause of Death Ensemble modeling or CODEm, was designed based on statistical tech-
niques called “ensemble modeling.” Ensemble modeling was made famous by the recipients of the Netflix Prize in 2009, BellKor’s Pragmatic Chaos, who engineered the best algorithm to predict how much a person would like a film, taking into account their movie preferences.

To ensure that the number of deaths from each cause did not exceed the total number of deaths estimated in a separate GBD demographic analysis, researchers applied a correction technique named CoDCorrect. This technique makes certain that estimates of the number of deaths from each cause do not add up to more than 100% of deaths in a given year.

After producing estimates of the number of deaths from each of the 235 fatal outcomes included in the GBD cause list, researchers then calculated years of life lost to premature death, or YLLs. For every death from a particular cause, researchers estimated the number of years lost based on the highest life expectancy in the deceased’s age group. For example, if a 20-year-old male died in a car accident in South Africa in 2010, he has 66 years of life lost, that is, the highest remaining life expectancy in 20-year-olds, as experienced by 20-year-old females in Japan.

When comparing rankings of the leading causes of death versus YLLs, YLLs place more weight on the causes of death that occur in younger age groups, as shown in Figure A2. For example, malaria represents a greater percentage of total YLLs than total deaths since it is a leading killer of children under age 5. Ischemic heart disease, by contrast, accounts for a smaller percentage of total YLLs than total deaths, as it primarily kills older people.

**Estimating years lived with disability**

Researchers estimated the prevalence of each sequela using different sources of data, including government reports of cases of infectious diseases, data from population-based disease registries for conditions such as cancers and chronic kidney diseases, antenatal clinic data, hospital discharge data, data from outpatient facilities, interview questions, and direct measurements of hearing, vision, and lung function testing from surveys and other sources.

Confronted with the challenge of data gaps in many regions and for numerous types of sequelae, they developed a statistical modeling tool named DisMod-MR (for Disease Modeling – Metaregression) to estimate prevalence using available data on incidence, prevalence, remission, duration, and extra risk of mortality due to the disease.

Researchers estimated disability weights using data collected from almost 14,000 respondents via household surveys in Bangladesh, Indonesia, Peru, Tanzania, and the United States. Disability weights measure the severity of different sequelae that result from disease and injury. Data were also used from an Internet survey of more than 16,000 people. GBD researchers presented different lay definitions of sequelae grouped into 220 unique health states to survey respondents, and respondents were then asked to rate the severity of the different health states. The results were similar.
across all surveys despite cultural and socioeconomic differences. Respondents consistently placed health states such as mild hearing loss and long-term treated fractures at the low end of the severity scale, while they ranked acute schizophrenia and severe multiple sclerosis as very severe.

Finally, years lived with disability, or YLDs, are calculated as prevalence of a sequela multiplied by the disability weight for that sequela. The number of years lived with disability for a specific disease or injury are calculated as the sum of the YLDs from each sequela arising from that cause.

**Estimating disability-adjusted life years**

Disability-adjusted life years (DALYs) were calculated by adding together YLLs and YLDs. Figure A3 compares the 10 leading diseases and injuries calculated as percentages of both regional deaths and regional DALYs. This figure also shows the top 10 risk factors attributable to deaths and DALYs in the sub-Saharan Africa region. DALYs are a powerful tool for priority setting as they measure disease burden from non-fatal, as well as fatal, conditions. Yet another reason why top causes of DALYs differ from leading causes of death is that DALYs give more weight to death in younger ages, as illustrated by the case of neonatal encephalopathy. In contrast, stroke causes a larger percentage of total deaths than DALYs, as it primarily impacts older people.

**Estimating DALYs attributable to risk factors**

To estimate the number of healthy years lost, or DALYs, attributable to potentially avoidable risk factors, researchers collected detailed data on exposure to different risk factors. The study used data from sources such as satellite data on air pollution, breastfeeding data from population surveys, and blood and bone lead levels from medical examination surveys and epidemiological surveys. Researchers then collected data on the effects of risk factors on disease outcomes through systematic reviews of epidemiological studies.

All risk factors analyzed met common criteria in four areas:

1. The likely importance of a risk factor for policymaking or disease burden.
2. Availability of sufficient data to estimate exposure to a particular risk factor.
3. Rigorous scientific evidence that specific risk factors cause certain diseases and injuries.
4. Scientific findings about the effects of different risk factors that are relevant for the general population.

To calculate the number of DALYs attributable to different risk factors, researchers compared the disease burden in a group exposed to a risk factor to the disease burden in a group that had zero exposure to that risk factor. When subjects with zero exposure were impossible to find, as in the case of high blood pressure, for example, researchers established a level of minimum exposure that leads to the best health outcomes.
Table A3: The 10 leading diseases and injuries and 10 leading risk factors based on percentage of deaths and DALYs in sub-Saharan Africa, 2010

<table>
<thead>
<tr>
<th>Disease or Injury</th>
<th>Deaths (%)</th>
<th>DALYs (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>15.2</td>
<td>12.4</td>
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<tr>
<td>Road injury</td>
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<tr>
<td>High body mass index</td>
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<tr>
<td>Protein-energy malnutrition</td>
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<td>6.5</td>
</tr>
<tr>
<td>Diarrheal diseases</td>
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<td>6.3</td>
</tr>
<tr>
<td>Tuberculosis</td>
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<td>5.9</td>
</tr>
<tr>
<td>Malaria</td>
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<td>5.7</td>
</tr>
<tr>
<td>Lower respiratory infections</td>
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<td>5.5</td>
</tr>
<tr>
<td>HIV/AIDS</td>
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<td>4.7</td>
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<tr>
<td>Childhood underweight</td>
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<td>4.6</td>
</tr>
<tr>
<td>Neonatal sepsis</td>
<td>5.9</td>
<td>4.4</td>
</tr>
<tr>
<td>Preterm birth complications</td>
<td>5.6</td>
<td>4.2</td>
</tr>
<tr>
<td>Meningitis</td>
<td>5.5</td>
<td>4.1</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>5.5</td>
<td>4.1</td>
</tr>
<tr>
<td>Alcohol use</td>
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<td>3.9</td>
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<tr>
<td>High blood pressure</td>
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<tr>
<td>Household air pollution from solid fuels</td>
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<tr>
<td>Physical inactivity and low physical activity</td>
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<tr>
<td>High fasting plasma glucose</td>
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</tr>
<tr>
<td>Tobacco smoking</td>
<td>3.3</td>
<td>2.5</td>
</tr>
<tr>
<td>Suboptimal breastfeeding</td>
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<tr>
<td>Suboptimal breastfeeding</td>
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<tr>
<td>Neonatal encephalopathy</td>
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</tr>
<tr>
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<tr>
<td>Meningitis</td>
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<td>0.6</td>
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<tr>
<td>Alcohol use</td>
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<td>High blood pressure</td>
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<td>Dietary risks</td>
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<td>0.0</td>
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<tr>
<td>High fasting plasma glucose</td>
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<td>0.0</td>
</tr>
<tr>
<td>Tobacco smoking</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Note: This figure compares the percent of DALYs and deaths attributable to different diseases and injuries (shown in blue) as well as risk factors (shown in red). Certain causes, such as iron deficiency, cause more DALYs than they do deaths. DALYs are an important tool for decision-makers because they capture years of healthy life lost from both premature death and years lived with disability.
<table>
<thead>
<tr>
<th>Country</th>
<th>Age-standardized death rate (per 100,000)</th>
<th>Age-standardized YLL rate (per 100,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1990 2010</td>
<td>1990 2010</td>
</tr>
<tr>
<td>Angola</td>
<td>1,995 (1,237-2,733)</td>
<td>44,380 (63,583-76,601)</td>
</tr>
<tr>
<td>Benin</td>
<td>1,370 (1,244-1,388)</td>
<td>59,335 (56,944-62,020)</td>
</tr>
<tr>
<td>Botswana</td>
<td>85 (86-87)</td>
<td>61,889 (62,064-64,414)</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>1,521 (1,459-1,585)</td>
<td>59,507 (52,626-67,131)</td>
</tr>
<tr>
<td>Burundi</td>
<td>1,296 (1,243-1,345)</td>
<td>61,922 (61,156-62,700)</td>
</tr>
<tr>
<td>Cameroon</td>
<td>1,206 (1,133-1,277)</td>
<td>57,037 (56,068-61,919)</td>
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<td>Cape Verde</td>
<td>795 (764-827)</td>
<td>17,360 (17,432-17,359)</td>
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<tr>
<td>Central African Republic</td>
<td>858 (842-873)</td>
<td>14,649 (14,630-14,668)</td>
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<tr>
<td>Chad</td>
<td>1,508 (1,428-1,596)</td>
<td>13,745 (13,752-13,738)</td>
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<td>12,404 (12,392-12,416)</td>
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<td>Gabon</td>
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<td>Ghana</td>
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<td>Namibia</td>
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<td>Niger</td>
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<td>Nigeria</td>
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<td>Rwanda</td>
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<tr>
<td>São Tomé and Principe</td>
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<td>Senegal</td>
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<td>Seychelles</td>
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<td>Sierra Leone</td>
<td>1,662 (1,758-1,772)</td>
<td>8,640 (8,640-8,640)</td>
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<td>Somalia</td>
<td>1,728 (1,407-2,031)</td>
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<td>South Africa</td>
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<td>8,640 (8,640-8,640)</td>
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<tr>
<td>Sudan</td>
<td>1,110 (1,079-1,150)</td>
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<td>Swaziland</td>
<td>1,219 (1,219-1,219)</td>
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<tr>
<td>Tanzania</td>
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<td>Togo</td>
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<td>Zimbabwe</td>
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<td>Rate</td>
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</table>
CHANGES IN LEADING CAUSES OF DALYS BETWEEN 1990 AND 2010 FOR COUNTRIES IN SUB-SAHARAN AFRICA

In the following figures, pointed arrows indicate causes that have increased by a greater amount than shown on the x-axis. For more country data, explore IHME’s data visualization tools online: www.ihmeuw.org/GBDcountryviz.

Shifts in leading causes of DALYs in Angola, 1990-2010
**Shifts in leading causes of DALYs in Benin, 1990-2010**

1. MALARIA
2. LOWER RESPIRATORY INFECTIONS
3. PRETERM BIRTH COMPLICATIONS
4. NEONATAL SEPSIS
5. DIARRHEAL DISEASES
6. MENINGITIS
7. PROTEIN-ENERGY MALNUTRITION
8. NEONATAL ENCEPHALOPATHY
9. IRON-DEFICIENCY ANEMIA
10. HIV/AIDS
11. ROAD INJURY
12. STROKE
13. TUBERCULOSIS
14. EPILEPSY
15. ISCHEMIC HEART DISEASE
16. CONGENITAL ANOMALIES
17. LOW BACK PAIN
18. MATERNAL DISORDERS
19. MAJOR DEPRESSIVE DISORDER
20. COPD

**Shifts in leading causes of DALYs in Botswana, 1990-2010**

1. HIV/AIDS
2. MAJOR DEPRESSIVE DISORDER
3. TUBERCULOSIS
4. DIARRHEAL DISEASES
5. INTERPERSONAL VIOLENCE
6. ROAD INJURY
7. LOW BACK PAIN
8. COPD
9. STROKE
10. MATERNAL DISORDERS
11. MECHANICAL FORCES
12. ISCHEMIC HEART DISEASE
13. DIABETES
14. ANXIETY DISORDERS
15. EPILEPSY
16. NECK PAIN
Shifts in leading causes of DALYs in Burkina Faso, 1990-2010

- Malaria
- Diarrheal diseases
- Lower respiratory infections
- Meningitis
- Protein-energy malnutrition
- Preterm birth complications
- HIV/AIDS
- Road injury
- Neonatal sepsis
- Iron-deficiency anemia
- Neonatal encephalopathy
- Congenital anomalies
- Tuberculosis
- Epilepsy
- Fire
- Stroke
- Falls
- COPD
- Maternal disorders
- Low back pain

Shifts in leading causes of DALYs in Burundi, 1990-2010

- Malaria
- Diarrheal diseases
- Lower respiratory infections
- Tuberculosis
- Protein-energy malnutrition
- Preterm birth complications
- Neonatal encephalopathy
- Road injury
- Stroke
- Major depressive disorder
- Iron-deficiency anemia
- Ischemic heart disease
- Epilepsy
- Low back pain
- COPD
- Congenital anomalies
Shifts in leading causes of DALYs in Cameroon, 1990-2010

1. MALARIA
2. HIV/AIDS
3. LOWER RESPIRATORY INFECTIONS
4. NEONATAL SEPSIS
5. MENINGITIS
6. PRETERM BIRTH COMPLICATIONS
7. ROAD INJURY
8. NEONATAL ENCEPHALOPATHY
9. IRON-DEFICIENCY ANEMIA
10. STROKE
11. MATERNAL DISORDERS
12. EPILEPSY
13. CONGENITAL ANOMALIES
14. ISCHEMIC HEART DISEASE
15. TUBERCULOSIS
16. LOW BACK PAIN
17. MAJOR DEPRESSIVE DISORDER
18. CIRRHOSIS

Shifts in leading causes of DALYs in Cape Verde, 1990-2010

1. STROKE
2. HIV/AIDS
3. IRON-DEFICIENCY ANEMIA
4. MAJOR DEPRESSIVE DISORDER
5. LOW BACK PAIN
6. ISCHEMIC HEART DISEASE
7. COPD
8. ROAD INJURY
9. NEONATAL SEPSIS
10. EPILEPSY
11. DIABETES
12. NECK PAIN
13. ASThma
14. OTHER MUSCULOSKELETAL
15. MIGRAINE
16. FALLS
Shifts in leading causes of DALYs in the Central African Republic, 1990-2010

1. MALARIA
2. DIARRHEAL DISEASES
3. HIV/AIDS
4. LOWER RESPIRATORY INFECTIONS
5. PROTEIN-ENERGY MALNUTRITION
6. MENINGITIS
7. TUBERCULOSIS
8. MATERNAL DISORDERS
9. PRETERM BIRTH COMPLICATIONS
10. ROAD INJURY
11. CONGENITAL ANOMALIES
12. SYPHILIS
13. IRON-DEFICIENCY ANEMIA
14. NEONATAL ENCEPHALOPATHY
15. STROKE
16. TRYPANOSOMIASIS
17. ISCHEMIC HEART DISEASE
18. COPD
19. NEONATAL SEPSIS
20. MAJOR DEPRESSIVE DISORDER

Shifts in leading causes of DALYs in Chad, 1990-2010

1. DIARRHEAL DISEASES
2. LOWER RESPIRATORY INFECTIONS
3. MALARIA
4. PROTEIN-ENERGY MALNUTRITION
5. HIV/AIDS
6. MENINGITIS
7. NEONATAL SEPSIS
8. PRETERM BIRTH COMPLICATIONS
9. IRON-DEFICIENCY ANEMIA
10. NEONATAL ENCEPHALOPATHY
11. SYPHILIS
12. TUBERCULOSIS
13. ROAD INJURY
14. MATERNAL DISORDERS
15. CONGENITAL ANOMALIES
16. EPILEPSY
17. LOW BACK PAIN
18. STROKE
19. MAJOR DEPRESSIVE DISORDER
Shifts in leading causes of DALYs in Comoros, 1990-2010

Shifts in leading causes of DALYs in Congo, 1990-2010
Shifts in leading causes of DALYs in Côte d’Ivoire, 1990-2010

1. MALARIA
2. DIARRHEAL DISEASES
3. LOWER RESPIRATORY INFECTIONS
4. HIV/AIDS
5. PRETERM BIRTH COMPLICATIONS
6. NEONATAL SEPSIS
7. MENINGITIS
8. PROTEIN-ENERGY MALNUTRITION
9. NEONATAL ENCEPHALOPATHY
10. ROAD INJURY
11. STROKE
12. TUBERCULOSIS
13. IRON-DEFICIENCY ANEMIA
14. ISCHEMIC HEART DISEASE
15. CONGENITAL ANOMALIES
16. EPILEPSY
17. MAJOR DEPRESSIVE DISORDER
18. MATERNAL DISORDERS
19. CIRRHOSIS
20. COPD

Shifts in leading causes of DALYs in Democratic Republic of the Congo, 1990-2010

1. MALARIA
2. DIARRHEAL DISEASES
3. PROTEIN-ENERGY MALNUTRITION
4. LOWER RESPIRATORY INFECTIONS
5. HIV/AIDS
6. PRETERM BIRTH COMPLICATIONS
7. TUBERCULOSIS
8. CONGENITAL ANOMALIES
9. MENINGITIS
10. NEONATAL ENCEPHALOPATHY
11. IRON-DEFICIENCY ANEMIA
12. NEONATAL SEPSIS
13. STROKE
14. INTERPERSONAL VIOLENCE
15. MAJOR DEPRESSIVE DISORDER
16. SICKLE CELL
17. ROAD INJURY
18. MATERNAL DISORDERS
19. SYPHILIS
20. ISCHEMIC HEART DISEASE
Shifts in leading causes of DALYs in Eritrea, 1990-2010

- LOWER RESPIRATORY INFECTIONS
- DIARRHEAL DISEASES
- PROTEIN-ENERGY MALNUTRITION
- MALARIA
- TUBERCULOSIS
- PRETERM BIRTH COMPLICATIONS
- MENINGITIS
- IRON-DEFICIENCY ANEMIA
- HIV/AIDS
- NEONATAL SEPSIS
- NEONATAL ENCEPHALOPATHY
- MATERNAL DISORDERS
- ROAD INJURY
- MAJOR DEPRESSIVE DISORDER
- STROKE
- EPILEPSY
- LOW BACK PAIN
- ISCHEMIC HEART DISEASE
- FIRE
- COPD

Shifts in leading causes of DALYs in Ethiopia, 1990-2010

- LOWER RESPIRATORY INFECTIONS
- DIARRHEAL DISEASES
- MALARIA
- PRETERM BIRTH COMPLICATIONS
- TUBERCULOSIS
- PROTEIN-ENERGY MALNUTRITION
- MENINGITIS
- HIV/AIDS
- ROADMENONAL SEPSIS
- NEONATAL ENCEPHALOPATHY
- MEASLES
- STROKE
- COPD
- MATERNAL DISORDERS
- INTERPERSONAL VIOLENCE
- MAJOR DEPRESSIVE DISORDER
- LOW BACK PAIN
- EPILEPSY
Shifts in leading causes of DALYs in Gabon, 1990-2010

Shifts in leading causes of DALYs in The Gambia, 1990-2010
Shifts in leading causes of DALYs in Ghana, 1990-2010

Shifts in leading causes of DALYs in Guinea, 1990-2010
Shifts in leading causes of DALYs in Guinea-Bissau, 1990-2010

Shifts in leading causes of DALYs in Kenya, 1990-2010
Shifts in leading causes of DALYs in Liberia, 1990-2010

Shifts in leading causes of DALYs in Lesotho, 1990-2010
Shifts in leading causes of DALYs in Madagascar, 1990-2010

Shifts in leading causes of DALYs in Malawi, 1990-2010
Shifts in leading causes of DALYs in Mali, 1990-2010

- MALARIA
- LOWER RESPIRATORY INFECTIONS
- PROTEIN-ENERGY MALNUTRITION
- DIARRHEAL DISEASES
- NEONATAL SEPSIS
- PRETERM BIRTH COMPLICATIONS
- MENINGITIS
- NEONATAL ENCEPHALOPATHY
- IRON-DEFICIENCY ANEMIA
- HIV/AIDS
- ROAD INJURY
- TUBERCULOSIS
- MATERNAL DISORDERS
- STROKE
- SYMPHILIS
- EPILEPSY
- MAJOR DEPRESSIVE DISORDER
- COPD
- MEASLES

Shifts in leading causes of DALYs in Mauritania, 1990-2010

- MALARIA
- LOWER RESPIRATORY INFECTIONS
- PROTEIN-ENERGY MALNUTRITION
- DIARRHEAL DISEASES
- NEONATAL SEPSIS
- PRETERM BIRTH COMPLICATIONS
- MENINGITIS
- NEONATAL ENCEPHALOPATHY
- IRON-DEFICIENCY ANEMIA
- HIV/AIDS
- ROAD INJURY
- TUBERCULOSIS
- MATERNAL DISORDERS
- STROKE
- SYMPHILIS
- EPILEPSY
- MAJOR DEPRESSIVE DISORDER
- COPD
- MEASLES
Shifts in leading causes of DALYs in Mauritius, 1990-2010

1. ISCHEMIC HEART DISEASE
2. DIABETES
3. HIV/AIDS
4. STROKE
5. CHRONIC KIDNEY DISEASE
6. MAJOR DEPRESSIVE DISORDER
7. LOW BACK PAIN
8. COPD
9. CIRRHOSIS
10. ROAD INJURY
11. PRETERM BIRTH COMPLICATIONS
12. LOWER RESPIRATORY INFECTIONS
13. ALCOHOL USE DISORDERS
14. NECK PAIN
15. ASTHMA
16. OTHER MUSCULOSKELETAL
17. MIGRAINE
18. HYPERTENSIVE HEART DISEASE
19. FALLS
20. CONGENITAL ANOMALIES

Shifts in leading causes of DALYs in Mozambique, 1990-2010

1. HIV/AIDS
2. MALARIA
3. DIARRHEAL DISEASES
4. NEONATAL SEPSIS
5. NEONATAL ENCEPHALOPATHY
6. PRETERM BIRTH COMPLICATIONS
7. TUBERCULOSIS
8. MENINGITIS
9. SYPHILIS
10. ROAD INJURY
11. PROTEIN-ENERGY MALNUTRITION
12. IRON-DEFICIENCY ANEMIA
13. MATERNAL DISORDERS
14. EPILEPSY
15. STROKE
16. MAJOR DEPRESSIVE DISORDER
17. LOW BACK PAIN
18. COPD
19. CONGENITAL ANOMALIES
Shifts in leading causes of DALYs in Namibia, 1990-2010

- HIV/AIDS
- Lower Respiratory Infections
- Tuberculosis
- Interpersonal Violence
- Stroke
- Iron-Deficiency Anemia
- COPD
- Major Depressive Disorder
- Malaria
- Diabetes
- Neonatal Encephalopathy
- Ischemic Heart Disease
- Mechanical Forces
- Low Back Pain
- Congenital Anomalies
- Road Injury
- Epilepsy
- Hypertensive Heart Disease

Shifts in leading causes of DALYs in Niger, 1990-2010

- Diarrheal Diseases
- Malaria
- Protein-Energy Malnutrition
- Meningitis
- Neonatal Sepsis
- Preterm Birth Complications
- Iron-Deficiency Anemia
- Tuberculosis
- Neonatal Encephalopathy
- HIV/AIDS
- Measles
- Maternal Disorders
- Congenital Anomalies
- Epilepsy
- Road Injury
- Stroke
- Fire
- Tetanus
Shifts in leading causes of DALYs in Nigeria, 1990-2010

Shifts in leading causes of DALYs in Rwanda, 1990-2010
Shifts in leading causes of DALYs in São Tomé and Príncipe, 1990-2010

1. MALARIA
2. LOWER RESPIRATORY INFECTIONS
3. DIARRHEAL DISEASES
4. NEONATAL SEPSIS
5. HIV/AIDS
6. PRETERM BIRTH COMPLICATIONS
7. STROKE
8. NEONATAL ENCEPHALOPATHY
9. IRON-DEFICIENCY ANEMIA
10. PROTEIN-ENERGY MALNUTRITION
11. CONGENITAL ANOMALIES
12. LOW BACK PAIN
13. ISCHEMIC HEART DISEASE
14. COPD
15. EPILEPSY
16. ROAD INJURY
17. MENINGITIS
18. ANXIETY DISORDERS
19. NECK PAIN

Shifts in leading causes of DALYs in Senegal, 1990-2010

1. MALARIA
2. DIARRHEAL DISEASES
3. LOWER RESPIRATORY INFECTIONS
4. NEONATAL SEPSIS
5. PRETERM BIRTH COMPLICATIONS
6. IRON-DEFICIENCY ANEMIA
7. NEONATAL ENCEPHALOPATHY
8. TUBERCULOSIS
9. HIV/AIDS
10. EPILEPSY
11. MAJOR DEPRESSIVE DISORDER
12. MATERNAL DISORDERS
13. MEASLES
14. LOW BACK PAIN
15. STROKE
16. DIABETES
17. COPD
18. ISCHEMIC HEART DISEASE
19. FALLS
Shifts in leading causes of DALYs in Seychelles, 1990-2010

1. ISCHEMIC HEART DISEASE
2. LOWER RESPIRATORY INFECTIONS
3. STROKE
4. MAJOR DEPRESSIVE DISORDER
5. ROAD INJURY
6. DROWNING
7. HYPERTENSIVE HEART DISEASE
8. CHRONIC KIDNEY DISEASE
9. LOW BACK PAIN
10. COPD
11. CIRRHOSIS
12. INTERPERSONAL VIOLENCE
13. HIV/AIDS
14. CONGENITAL ANOMALIES
15. SELF-HARM
16. DIABETES
17. FALLS
18. DRUG USE DISORDERS
19. EPILEPSY
20. PRETERM BIRTH COMPLICATIONS

Shifts in leading causes of DALYs in Sierra Leone, 1990-2010

1. MALARIA
2. PROTEIN-ENERGY MALNUTRITION
3. LOWER RESPIRATORY INFECTIONS
4. PRETERM BIRTH COMPLICATIONS
5. DIARRHEAL DISEASES
6. MENINGITIS
7. HIV/AIDS
8. NEONATAL ENCEPHALOPATHY
9. IRON-DEFICIENCY ANEMIA
10. TUBERCULOSIS
11. NEONATAL SEPSIS
12. ROAD INJURY
13. MATERNAL DISORDERS
14. STROKE
15. MAJOR DEPRESSIVE DISORDER
16. EPILEPSY
17. CONGENITAL ANOMALIES
18. ISCHEMIC HEART DISEASE
19. LOW BACK PAIN
20. CIRRHOSIS
Shifts in leading causes of DALYs in Somalia, 1990-2010

Shifts in leading causes of DALYs in South Africa, 1990-2010
Shifts in leading causes of DALYs in Sudan, 1990-2010

Shifts in leading causes of DALYs in Swaziland, 1990-2010
Shifts in leading causes of DALYs in Tanzania, 1990-2010

Shifts in leading causes of DALYs in Togo, 1990-2010
Shifts in leading causes of DALYs in Uganda, 1990-2010

- HIV/AIDS
- Malaria
- Lower Respiratory Infections
- Meningitis
- Tuberculosis
- Neonatal Encephalopathy
- Preterm Birth Complications
- Neonatal Sepsis
- Diarrheal Diseases
- Iron-Deficiency Anemia
- Road Injury
- Major Depressive Disorder
- Syphilis
- Maternal Disorders
- Epilepsy
- Low Back Pain
- Stroke
- Congenital Anomalies
- Fire

Shifts in leading causes of DALYs in Zambia, 1990-2010

- HIV/AIDS
- Malaria
- Lower Respiratory Infections
- Diarrheal Diseases
- Protein-Energy Malnutrition
- Meningitis
- Neonatal Encephalopathy
- Tuberculosis
- Syphilis
- Preterm Birth Complications
- Neonatal Sepsis
- Road Injury
- Iron-Deficiency Anemia
- Stroke
- Major Depressive Disorder
- Epilepsy
- Fire
- Falls
- Congenital Anomalies
- Ischemic Heart Disease
Shifts in leading causes of DALYs in Zimbabwe, 1990-2010

1. HIV/AIDS
2. LOWER RESPIRATORY INFECTIONS
3. DIARRHEAL DISEASES
4. TUBERCULOSIS
5. MALARIA
6. PRETERM BIRTH COMPLICATIONS
7. ROAD INJURY
8. IRON-DEFICIENCY ANEMIA
9. SELF-HARM
10. NEONATAL ENCEPHALOPATHY
11. STROKE
12. PROTEIN-ENERGY MALNUTRITION
13. MAJOR DEPRESSIVE DISORDER
14. COPD
15. CONGENITAL ANOMALIES
16. MENINGITIS
17. INTERPERSONAL VIOLENCE
18. MATERNAL DISORDERS
19. LOW BACK PAIN
20. ISCHEMIC HEART DISEASE