RAPID HEALTH TRANSITIONS: GBD 2010 RESULTS

In most countries in the Latin America and Caribbean region, loss of healthy life, or DALYs, from non-communicable diseases are rising while DALYs from communicable, newborn, nutritional, and maternal causes are declining. To help decision-makers establish health service priorities within countries when faced with limited resources, we will explore changes in disease burden around the globe, in the Latin America and Caribbean region, and in specific countries in this section. In another section entitled "Using GBD to assess countries' health progress," we will compare how well countries are performing in health relative to other countries in the region using a metric called age-standardized rates.

In terms of disease burden at the global level, GBD 2010 found that the leading causes of DALYs have evolved dramatically over the past 20 years. Figure 1 shows the changes in the global leading causes of DALYs in 1990 and 2010. Communicable, newborn, maternal, and nutritional causes are shown in red, non-communicable diseases appear in blue, and injuries are shown in green. Dotted lines indicate causes that have fallen in rank during this period, while solid lines signal causes that have risen in rank.

Causes associated with ill health and death in adults, such as ischemic heart disease, stroke, and low back pain, increased in rank between 1990 and 2010, while causes that primarily affect children, such as lower respiratory infections, diarrhea, preterm birth complications, and protein-energy malnutrition, decreased in rank. Unlike most of the leading communicable causes, HIV/AIDS and malaria increased by 353% and 18%, respectively. Since 2005, however, premature mortality and disability from these two causes have begun to decline. Four main trends have driven changes in the leading causes of DALYs globally: aging populations, increases in non-communicable diseases, shifts toward disabling causes and away from fatal causes, and changes in risk factors.

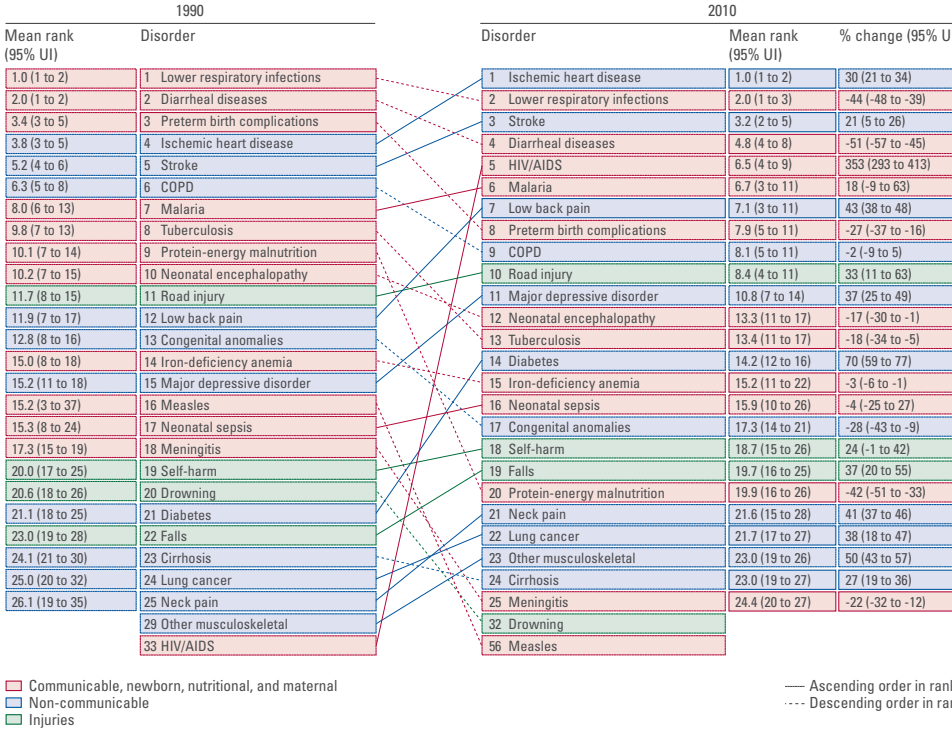
To provide a closer look at the epidemiological changes occurring at the regional level, Figure 2 shows how DALYs have changed over time in Latin America and the Caribbean. Figures showing changes in the leading causes of DALYs by country can be found in the Annex of this report.

Ischemic heart disease was the leading cause of DALYs in Latin America and the Caribbean in 2010, as it was at the global level, rising from fourth to first place between 1990 and 2010. As a result of the Haiti earthquake, injuries from forces of nature became a main cause of DALYs in this region in 2010. This cause ranked 174th in 1990. DALYs due to interpersonal violence, another type of injury, increased by 35% between 1990 and 2010 and moved up in rank from the fifth- to the third-largest

cause of DALYs. This trend reflects epidemics of violence in countries such as Brazil and Guatemala, where interpersonal violence is a top cause of health loss. As countries in Latin America and the Caribbean have become more developed, DALYs from road injuries increased by 27% and the cause rose in rank from seventh in 1990 to fourth in 2010. Road injuries were the leading cause of DALYs in Ecuador in 2010.

Most communicable, newborn, maternal, and nutritional causes of DALYs dropped in rank in Latin America and the Caribbean as many non-communicable causes rose in rank, mirroring global trends. However, the burden due to some communicable diseases remains large: DALYs due to HIV/AIDS increased 94% between 1990 and

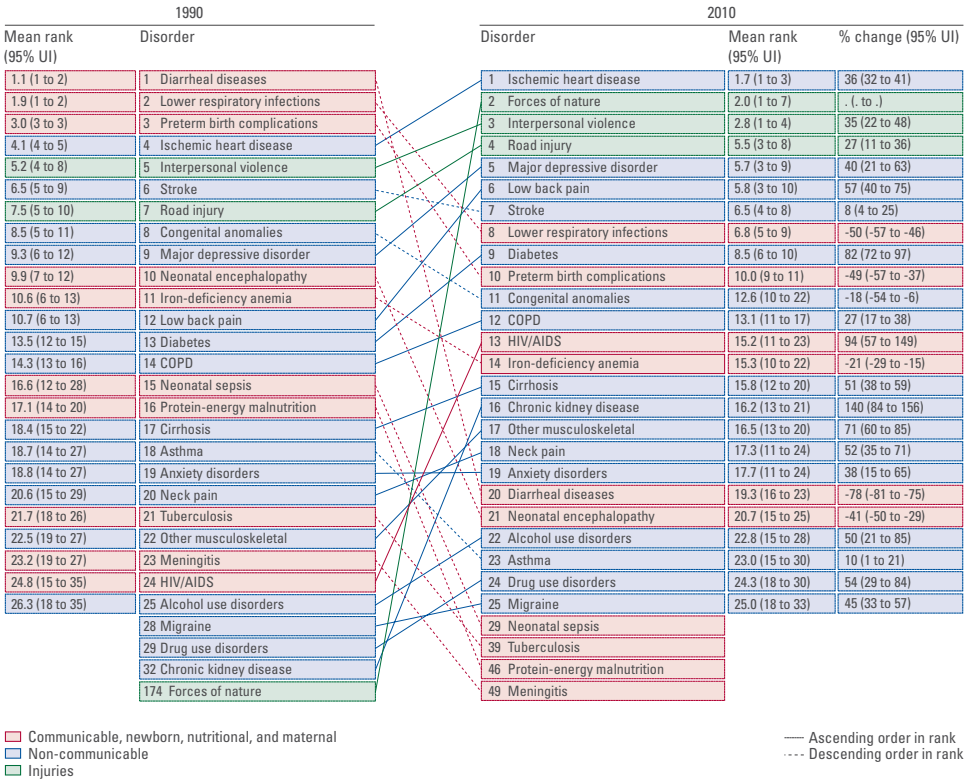
Figure 1: Global disability-adjusted life year ranks, top 25 causes, and percentage change, 1990-2010



Note: Solid lines indicate a cause that has moved up in rank or stayed the same. Broken lines indicate a cause that has moved down in rank. The causes of DALYs are color coded, with blue for non-communicable diseases, green for injuries, and red for communicable, newborn, nutritional, and maternal causes of DALYs. COPD: Chronic obstructive pulmonary disease. To view an interactive version of this figure, visit IHME's website: http://ihmeuw.org/gbdarrowdiagram.

2010, and HIV/AIDS was the leading cause of DALYs in Belize, Jamaica, and Suriname. Worldwide, the increase in HIV/AIDS was even more dramatic and rose 353% during this 20-year period. At the same time, certain non-communicable diseases were much more prominent causes of premature death and disability in Latin America and the Caribbean compared to the world as a whole. Depression was the fifth leading cause of DALYs in this region but was the 11th cause globally. At the country level, depression ranked among the five leading causes of DALYs in 13 countries in Latin America and the Caribbean. Diabetes, a leading cause of DALYs in many Caribbean countries, also ranked higher in Latin America and the Caribbean than at the global level. Chronic kidney disease was the 16th cause of health loss in the region, but was not one of the top 25 causes of DALYs at the global level. Cirrhosis also ranked higher in this region compared to the world (15th compared to 23rd), ranking as high as sixth in Mexico and 10th in Guatemala.

Figure 2: Disability-adjusted life year ranks, top 25 causes, and percentage change in Latin America and Caribbean, 1990-2010

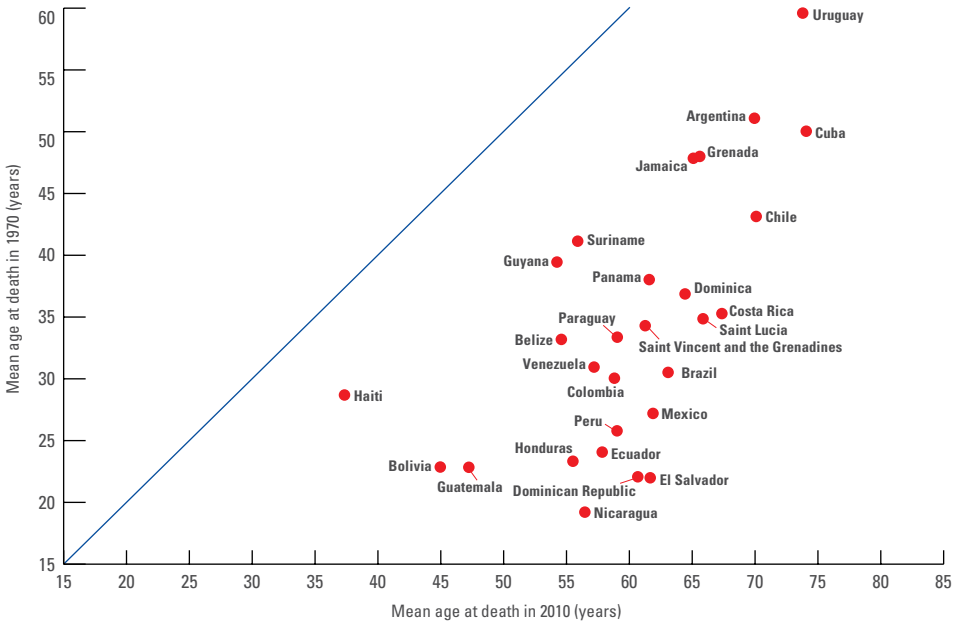


Note: Solid lines indicate a cause that has moved up in rank or stayed the same. Broken lines indicate a cause that has moved down in rank. The causes of DALYs are color coded, with blue for non-communicable diseases, green for injuries, and red for communicable, newborn, nutritional, and maternal causes.

MOST OF THE WORLD'S POPULATION IS LIVING LONGER AND DYING AT LOWER RATES

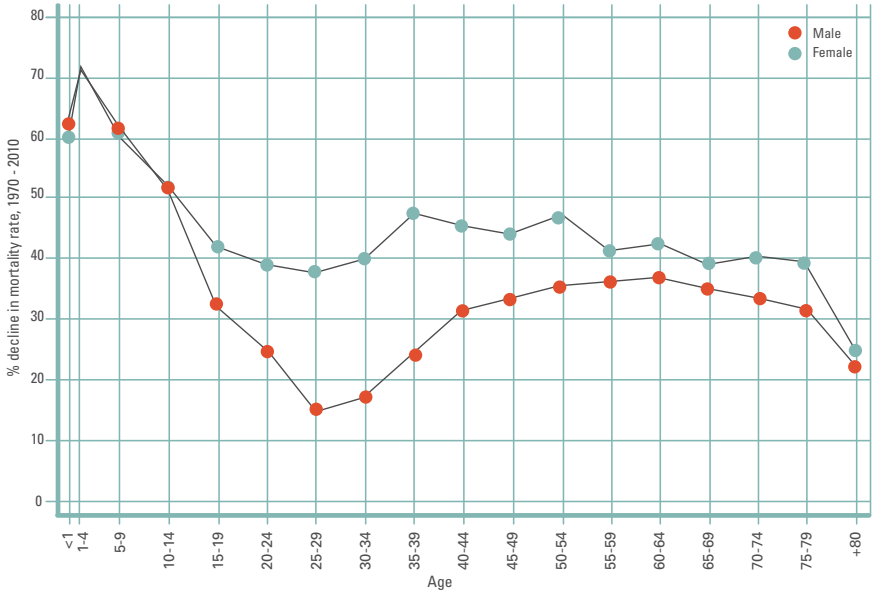
In much of the world, GBD 2010 found that people are living to older ages than ever before, and the entire population is getting older. Since 1970, the average age of death has increased 20 years globally. Dramatic changes have occurred during this period in Latin America, Asia, and the Middle East, where the average age of death increased by 30 years or more. Sub-Saharan Africa, however, has not made nearly as much progress as other developing regions, and people in this part of the world tend to die at much younger ages than in any other region. Progress in sub-Saharan Africa has in particular been held back by the HIV/AIDS epidemic, maternal deaths, and child mortality caused by infectious diseases and malnutrition, but some of these trends have begun to change in the past decade.

Figure 3: Average age of death for countries in Latin America and Caribbean, 1970 compared with 2010



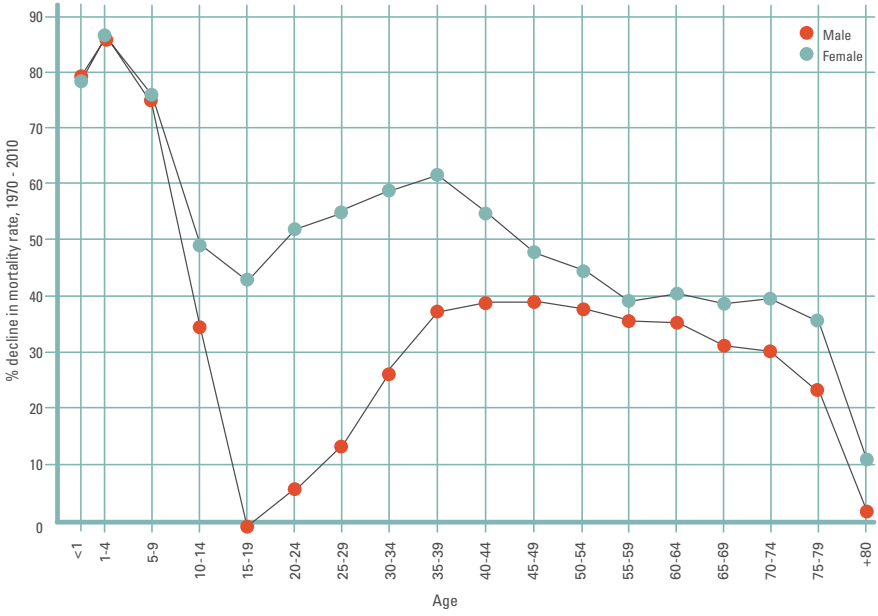
Note: Countries falling on the right side of the 45-degree-angle line had a higher average age of death in 2010 compared to 1970.

Figure 4: Global decline in age-specific mortality rate, 1970-2010



Note: Higher values indicate greater declines in mortality; lower values indicate smaller declines in mortality.

Figure 5: Decline in age-specific mortality rate in Latin America and Caribbean, 1970-2010



Note: Higher values indicate greater declines in mortality; lower values indicate smaller declines in mortality. Points below zero indicate an increase in mortality.

In the Latin America and Caribbean region, the countries that made most progress in increasing the average age at death between 1970 and 2010 were Brazil, Costa Rica, Dominican Republic, Ecuador, El Salvador, Honduras, Mexico, Nicaragua, Peru, and Saint Lucia (Figure 3). These countries achieved gains of 30 years or more. Most of the other countries in the region succeeded in extending the average age at death between 20 and 30 years. At the lower end, countries such as Guyana, Haiti, Suriname, and Uruguay increased the average age at death by 15 years or less between 1970 and 2010. On average, people in poorer countries tended to die at younger ages compared to richer countries in the region. For example, the average age of death in low-middle-income countries such as Belize, Bolivia, Guatemala, Guyana, and Honduras was 56 years and younger, but it was over 70 years in upper-middle-income countries such as Cuba, Chile, and Uruguay.

Another way to understand changes in global demographic trends is to explore reductions in mortality rates by sex and age group. Figure 4 shows how global death rates have declined in all age groups between 1970 and 2010. These changes have been most dramatic among males and females aged 0 to 9 years, whose death rates have dropped over 60% since 1970. Among age groups 15 and older, the decrease in female death rates since 1970 has been greater than the drop in male death rates. The gap in progress between men and women was largest between the ages of 15 to 54, most likely due to the persistence of higher mortality from injuries and alcohol and tobacco use among men.

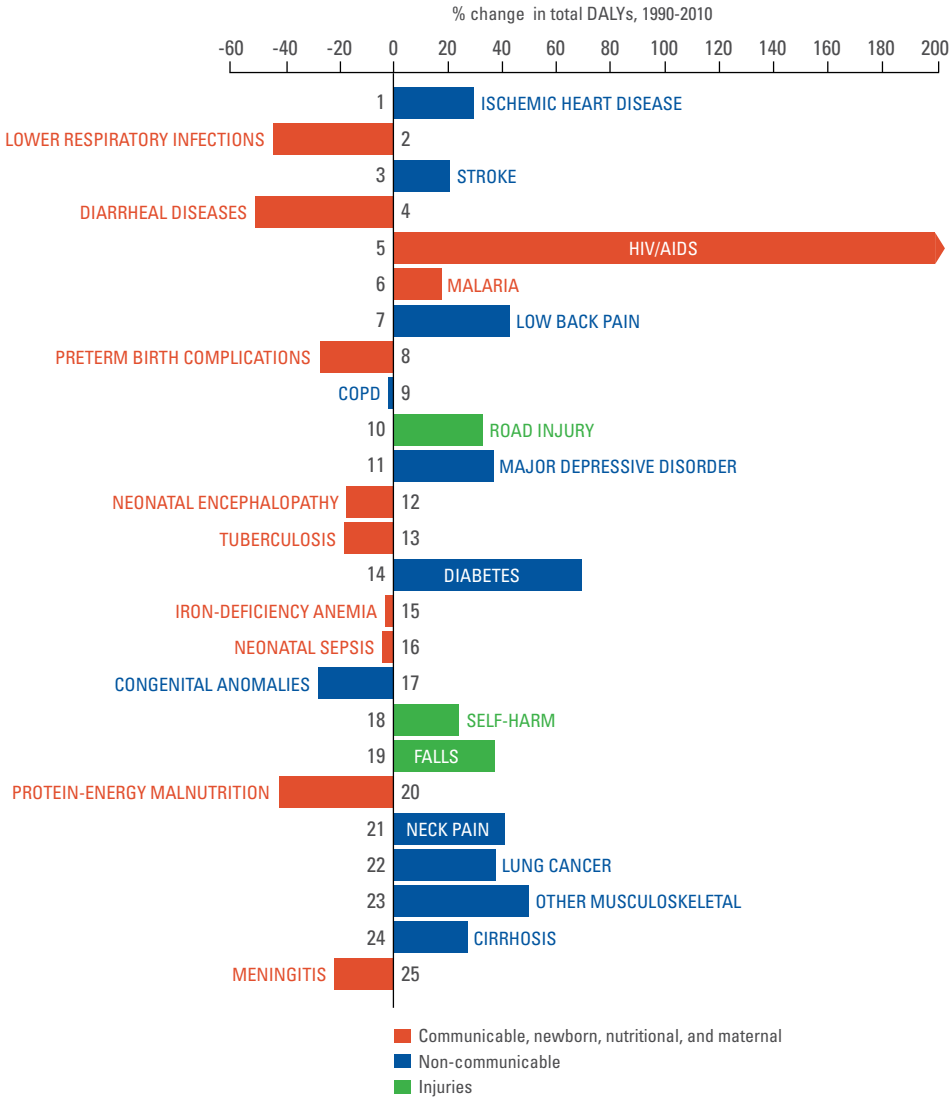
Figure 5 shows decreases in mortality rates in Latin America and the Caribbean, where death rates declined by more than 80% in both males and females aged 1 to 4 years between 1970 and 2010. As with the global results, women in nearly every age group in the region experienced greater declines in death rates than men. The most dramatic differences between males and females appeared in the age groups between 15 and 35. The mortality rate rose by 1% among males aged 15 to 19, largely due to deaths from road injuries and rising violence in the region.

LEADING CAUSES OF DEATH ARE SHIFTING TO NON-COMMUNICABLE DISEASES

In part because many people are living longer lives and the population is growing older, the leading causes of death have changed. Worldwide, the number of people dying from non-communicable diseases, such as ischemic heart disease and diabetes, has grown by 30% since 1990. To a lesser extent, overall population growth also contributed to this increase in deaths from non-communicable diseases.

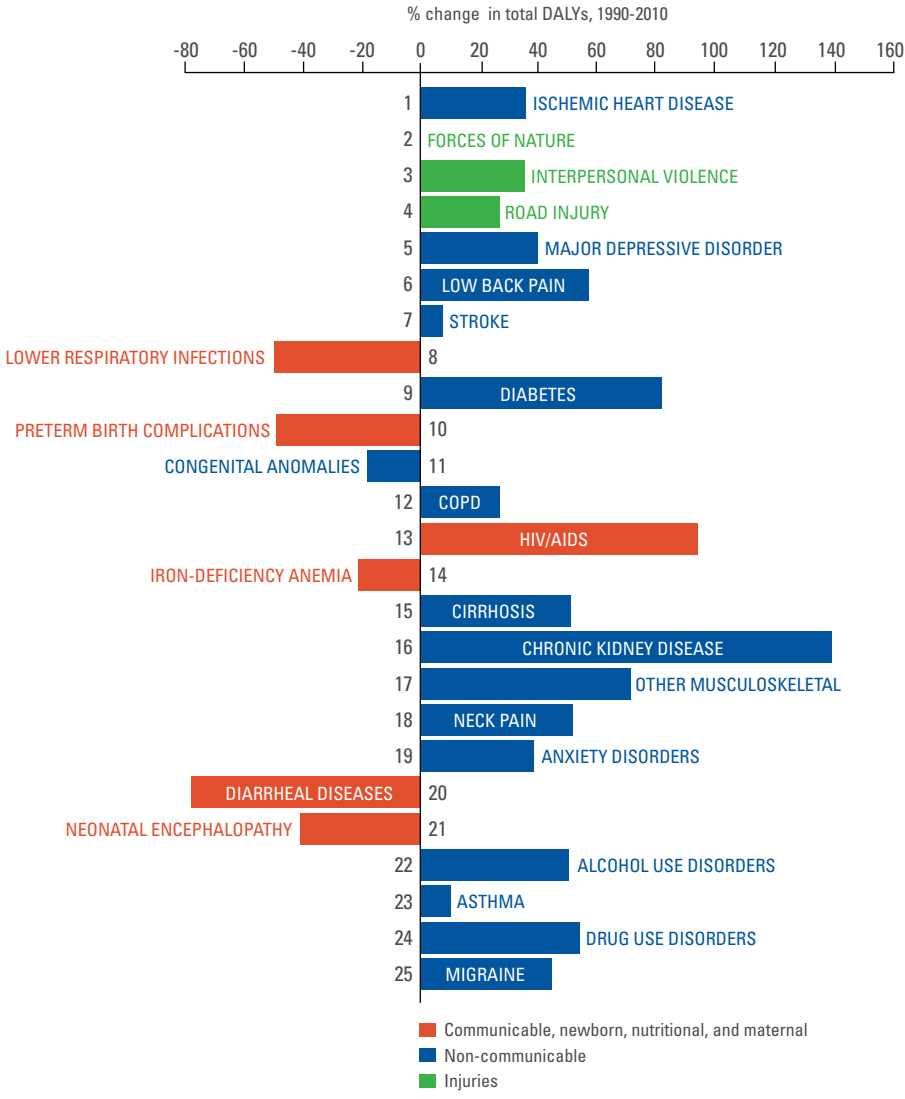
The rise in the total number of deaths from non-communicable diseases has increased the number of healthy years lost, or DALYs, from these conditions. Figure 6 shows global changes in the 25 leading causes of DALYs between 1990 and 2010 ordered from highest to lowest ranking cause from top to bottom.

Figure 6: Global shifts in leading causes of DALYs, 1990-2010



Note: The leading 25 causes of DALYs are ranked from top to bottom in order of the number of DALYs they contributed in 2010. Bars to the right of the vertical line show the percent by which DALYs have increased since 1990. Bars on the left show the percent by which DALYs have decreased. Pointed arrows indicate causes that have increased by a greater amount than shown on the x-axis.

Figure 7: Shifts in leading causes of DALYs in Latin America and Caribbean, 1990-2010



Note: The leading 25 causes of DALYs are ranked from top to bottom in order of the number of DALYs they contributed in 2010. Bars to the right of the vertical line show the percent by which DALYs have increased since 1990. Bars on the left show the percent by which DALYs have decreased. DALYs were not quantified for forces of nature in 1990.

Figure 6 shows that among non-communicable diseases, diabetes and different types of musculoskeletal disorders, such as low back and other musculoskeletal disorders, increased the most between 1990 and 2010 in the world as a whole.

Figure 7 shows the changes in the leading causes of DALYs in Latin America and the Caribbean from 1990 and 2010. Of non-communicable diseases, conditions such as low back pain, diabetes, cirrhosis, and chronic kidney disease experienced the most growth in this region.

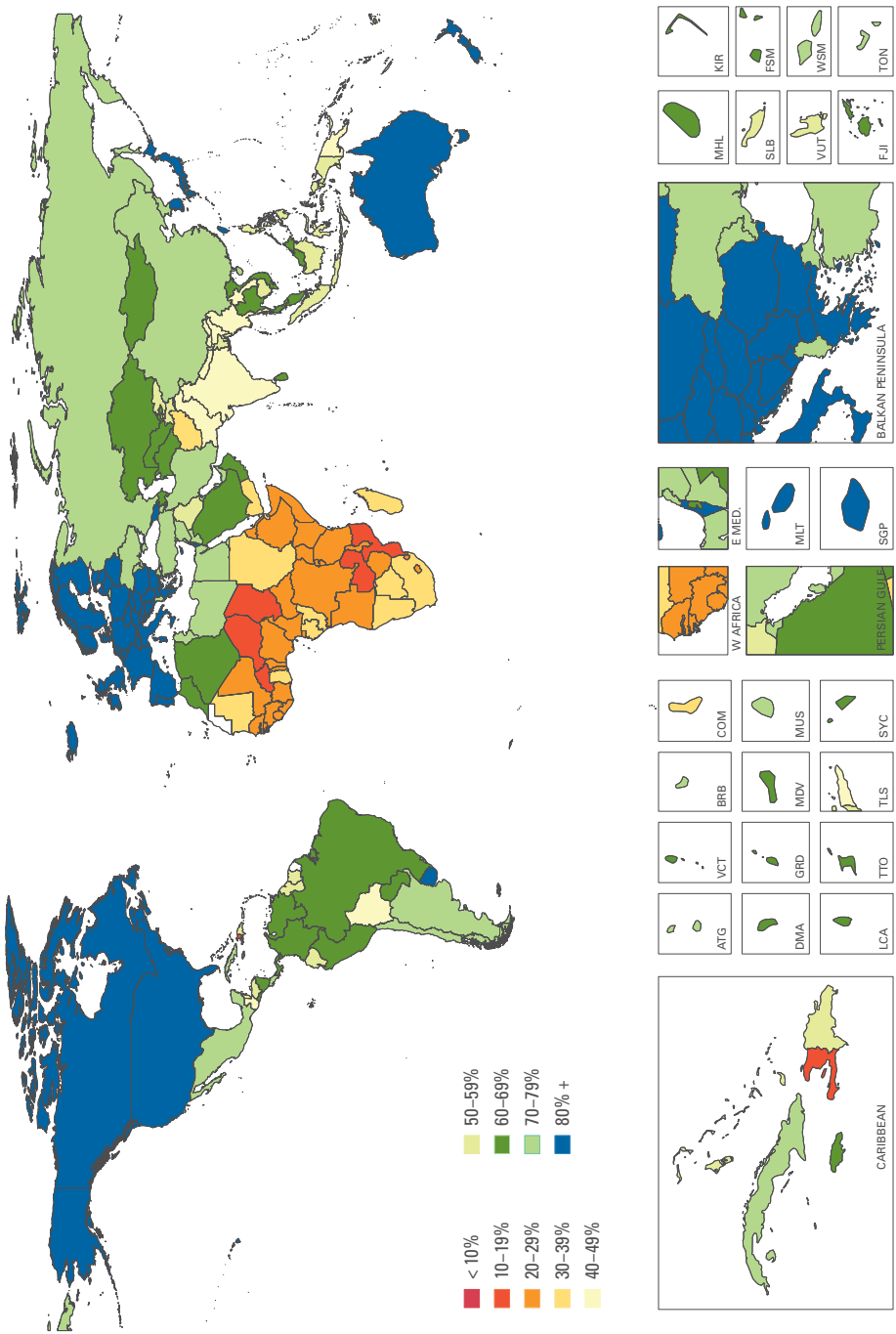
In many countries, non-communicable diseases account for the majority of DALYs. Figure 8 shows the percent of healthy years lost from this disease group by country in 2010. In most countries outside of sub-Saharan Africa, non-communicable diseases caused 50% or more of all healthy years lost, or DALYs. In Australia, Japan, and richer countries in Western Europe and North America, the percentage was greater than 80%.

Figure 8 also shows the major role played by non-communicable diseases in Latin America and the Caribbean. Uruguay had the highest percentage of DALYs due to non-communicable diseases (81%), while Haiti had the lowest percentage of DALYs from these conditions (15%).

An in-depth look at the country-level data reveals the specific diseases that are driving overall shifts from communicable to non-communicable diseases. As an example, Figure 9 displays the changes in the top 25 causes of DALYs in Mexican females between 1990 and 2010. The top causes are organized by ranking from top to bottom. Most non-communicable diseases rose over time, while communicable, newborn, nutritional, and maternal conditions have fallen during this period. Among the top five causes in 2010, chronic kidney disease increased the most (230%), followed by other musculoskeletal conditions (an 88% increase) and diabetes (a 71% increase). Among communicable, nutritional, newborn, and maternal conditions, lower respiratory infections and diarrheal diseases experienced the most dramatic declines, falling by 66% and 83%, respectively.

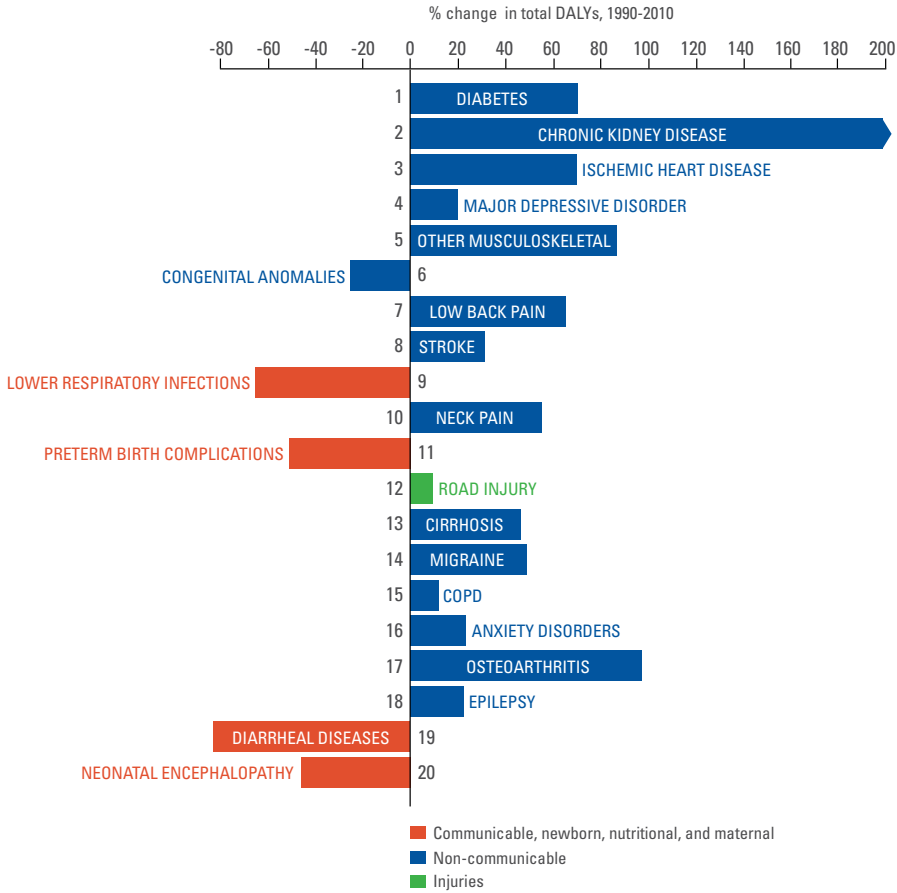
Figure 10 shows similar declines in DALYs among Mexican males from communicable, nutritional, and newborn conditions coupled with increases in non-communicable diseases between 1990 and 2010. Out of all the non-communicable diseases shown in this figure, chronic kidney disease increased the most over the period (368%). Increases were also seen in other causes such as diabetes (103%), ischemic heart disease (100%), and cirrhosis (57%). In addition to displaying the rising prominence of non-communicable diseases, this visualization shows that injuries are among the most dominant causes of health loss in men in Mexico. Overall, DALYs caused by interpersonal violence ranked the highest in 2010, while road traffic injuries ranked third.

Figure 8: Percent of global DALYs due to non-communicable diseases, 2010



Another visualization tool, GBD Compare, displays proportional changes in disease patterns over time using a treemap diagram. Figures 11a and 11b show how DALYs have changed in Paraguay between 1990 and 2010. In 1990, non-communicable diseases accounted for 50% of DALYs in both sexes, while communicable, nutritional, maternal, and newborn causes accounted for 41%. By 2010, they represented 64% and 24% of total disease burden, respectively. Premature death and disability from most communicable, nutritional, maternal, and newborn causes decreased during this period, with the exception of conditions including HIV/AIDS and iron-deficiency anemia. Diarrheal diseases were the primary cause of health loss in 1990,

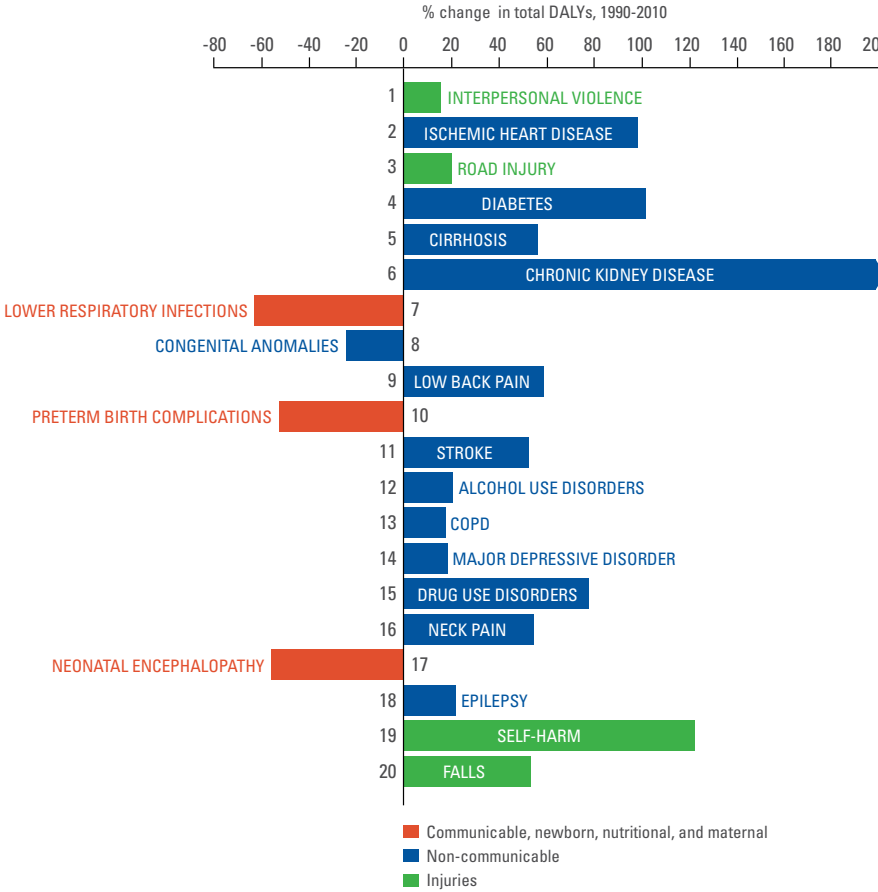
Figure 9: Shifts in leading causes of DALYs for females, Mexico, 1990-2010



Note: The leading 20 causes of DALYs are ranked from top to bottom in order of the number of DALYs they contributed in 2010. Bars to the right of the vertical line show the percent by which DALYs have increased since 1990. Bars on the left show the percent by which DALYs have decreased. Pointed arrows indicate causes that have increased by a greater amount than shown on the x-axis.

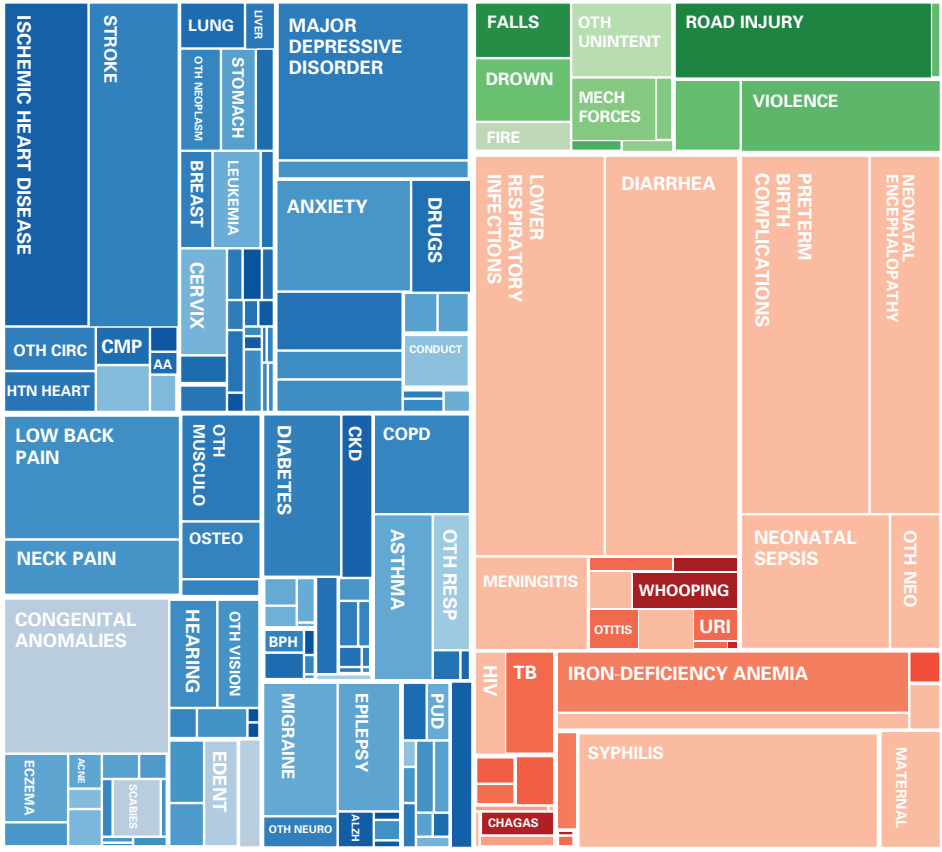
but declined by 64% to the thirteenth-highest cause. Other leading communicable and newborn causes, such as lower respiratory infections, preterm birth complications, and syphilis, also declined in importance during this period. At the same time, DALYs from many non-communicable causes rose. Increases occurred in causes such as ischemic heart disease (82%), stroke (66%), depression (64%), low back pain (77%), diabetes (199%), chronic kidney disease (230%), and neck pain (71%). Between 1990 and 2010, health loss from road traffic injuries and interpersonal violence increased 128% and 138%, respectively, while DALYs from self-harm also rose by 132%.

Figure 10: Shifts in leading causes of DALYs for males, Mexico, 1990-2010



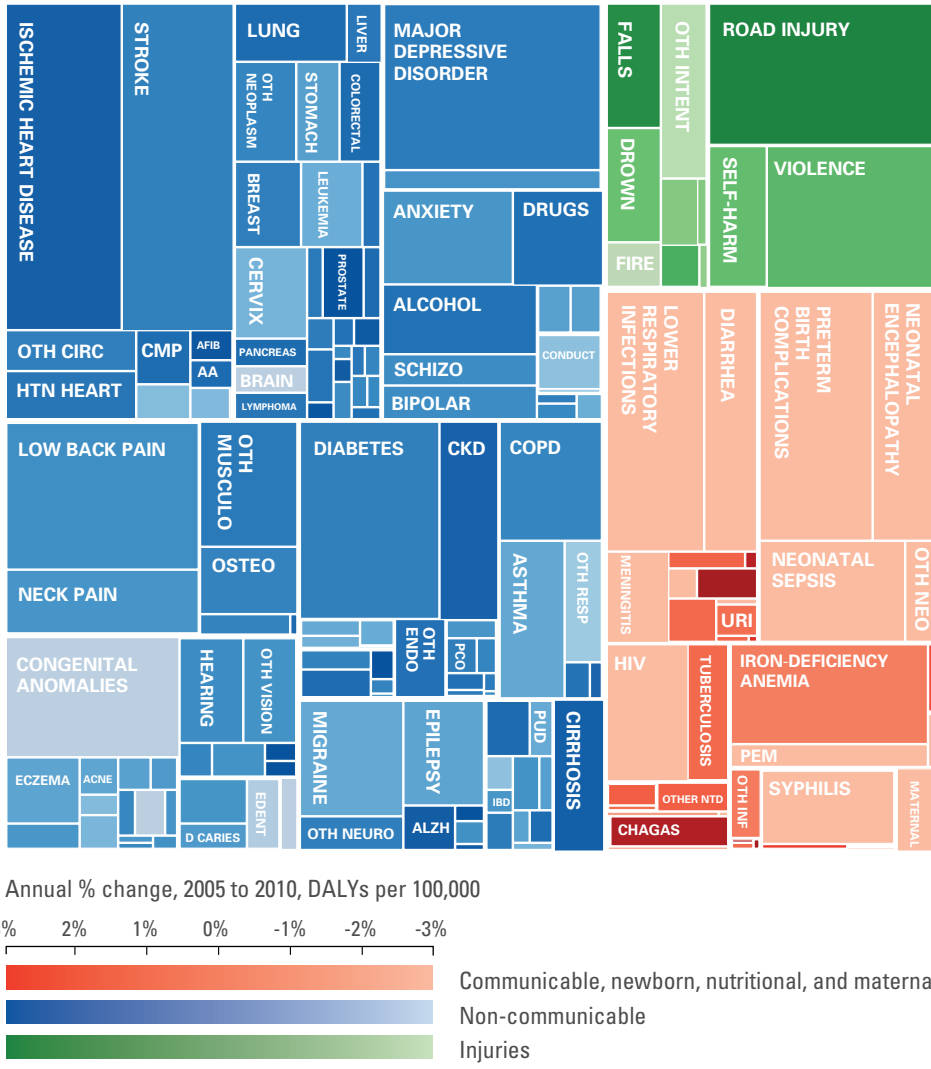
Note: The leading 20 causes of DALYs are ranked from top to bottom in order of the number of DALYs they contributed in 2010. Bars to the right of the vertical line show the percent by which DALYs have increased since 1990. Bars on the left show the percent by which DALYs have decreased. Pointed arrows indicate causes that have increased by a greater amount than shown on the x-axis.

Figure 11a: Causes of DALYs, both sexes, all ages, Paraguay, 1990



Note: The size of each box in this square pie chart represents the percentage of total DALYs caused by a particular disease or injury. To view an interactive version of this figure, visit IHME's website: http://ihmeuw.org/gbdcompare.

Figure 11b: Causes of DALYs, both sexes, all ages, Paraguay, 2010



Note: The size of each box in this square pie chart represents the percentage of total DALYs caused by a particular disease or injury. To view an interactive version of this figure, visit IHME's website: http://ihmeuw.org/gbdcompare.

DISABILITY INCREASES IN MIDDLE- AND HIGH-INCOME COUNTRIES

Most countries in the world have succeeded in reducing deaths early in life. To a growing extent, longer lives are redefining "old age" in many countries, and people in all age groups are dying at lower rates than in the past. Little progress has been made in reducing the prevalence of disability, so people are living to an older age but experiencing more ill health. Many people suffer from different forms of disability throughout their lives, such as mental and behavioral health problems starting in their teens and musculoskeletal disorders beginning in middle age. These findings have far-reaching implications for health systems. DALYs, or healthy years lost, are calculated by adding together years lived with disability (YLDs) and years of life lost (YLLs), also known as years lost to premature death.

Between 1990 and 2010, YLDs increased as a percentage of total DALYs in all areas of the world except Eastern Europe, southern sub-Saharan Africa, and the Caribbean. This disability transition has been most dramatic in parts of Latin America, the Middle East, North Africa, and many areas in Asia. The percentage of burden from YLDs also increased in sub-Saharan Africa with the exception of the southern part of the region.

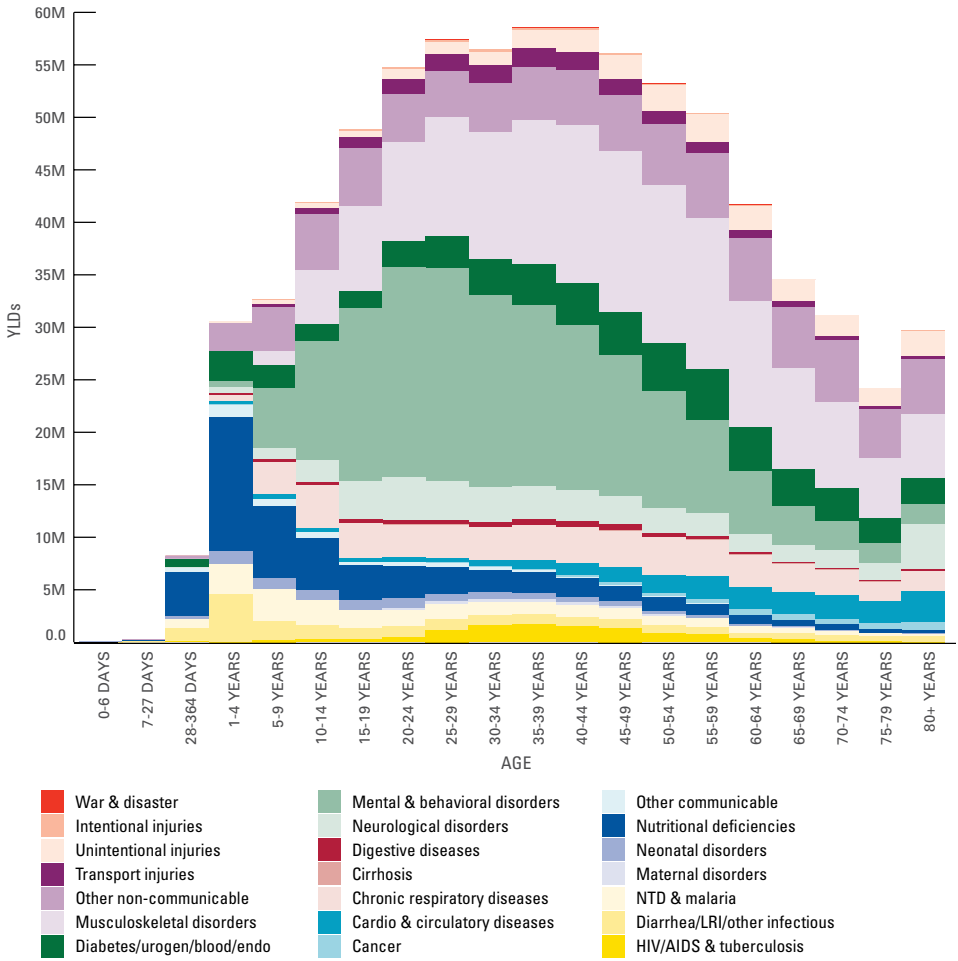
Figure 12 tells a detailed story about the different conditions that cause disability globally. It is important to keep in mind that these estimates reflect both how many individuals suffer from a particular condition as well as the severity of that condition. Mental and behavioral disorders, such as depression, anxiety, and drug use, are the primary drivers of disability worldwide and caused over 40 million years of disability in 20 to 29 year olds. Musculoskeletal conditions, which include low back pain and neck pain, accounted for the next largest number of years lived with disability. People aged 45 to 54 were most impacted by these conditions, as musculoskeletal disorders caused over 30 million years of disability in each of these age groups.

Figure 13 shows disability patterns in Latin America and the Caribbean for 2010. Mental and behavioral and musculoskeletal disorders are the dominant causes of disability in this region, as they are globally. Compared to the world as a whole, however, disability due to nutritional deficiencies in 1 to 4 year olds is lower in Latin America and the Caribbean.

Another way to view the world's health challenges is by comparing how different conditions rank. Figure 14 ranks the leading causes of disability globally and for each of the six World Bank regions. The colors indicate how high a condition ranks in a region. Depression is a major cause of disability across regions and is one of the top three causes of disability in every region. This disorder can cause fatigue, decreased ability to work or attend school, and suicide. Anxiety, a different type of mental disorder, is one of the top 10 causes of disability in all regions, but ranks highest in Latin America and the Caribbean and the Middle East and North Africa. Additionally, two other mental disorders, schizophrenia and bipolar disorder, appear among the top 20 causes of disability in many regions.

Musculoskeletal disorders play a large role in causing disability worldwide. Low back pain causes the most disability in East Asia and the Pacific, Europe and Central Asia, and the Middle East and North Africa. This condition can inhibit people's ability to perform different types of work both inside and outside the home and impair their mobility. In addition to low back pain, neck pain and other musculoskeletal disorders rank in the top 10 causes of disability in most regions. Another musculoskeletal disorder, osteoarthritis, appears in the top 20 causes of disability in every region.

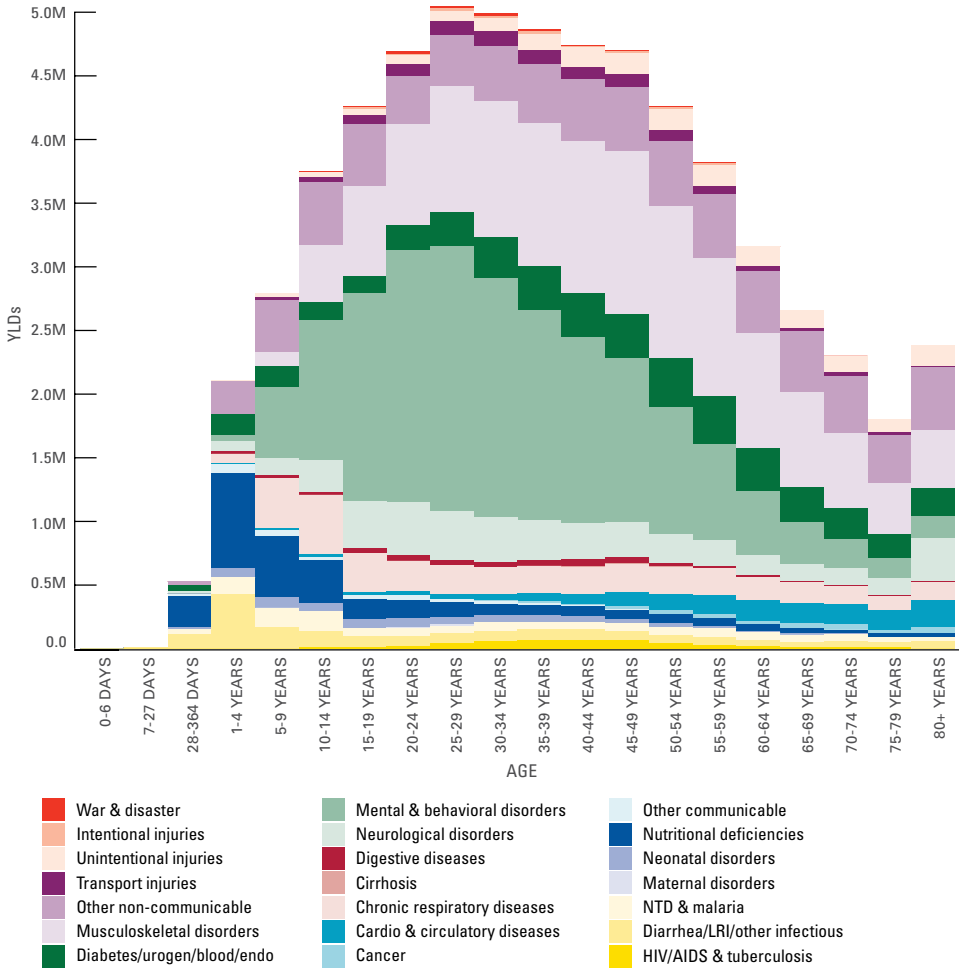
Figure 12: Global disability patterns by broad cause group and age, 2010



Note: The size of the colored portion in each bar represents the number of YLDs attributable to each cause for a given age group. The height of each bar shows total YLDs for a given age group in 2010. The causes are aggregated. For example, musculoskeletal disorders include low back pain and neck pain. To view an interactive version of this figure, visit IHME's website: http://ihmeuw.org/gbdcausepattern.

While mental and musculoskeletal disorders rank high among causes of disability across regions, Figure 14 also reveals substantial regional variation among other causes. Iron-deficiency anemia is the leading cause of disability in sub-Saharan Africa and South Asia but is less important as a cause of disability in the other regions. The substantial burden in these two regions contributed to iron-deficiency anemia's ranking as the third leading cause of disability at the global level. Iron-deficiency anemia can lead to fatigue and lowered ability to fight infection and may decrease cognitive ability.

Figure 13: Disability patterns by broad cause group and age in Latin America and Caribbean, 2010

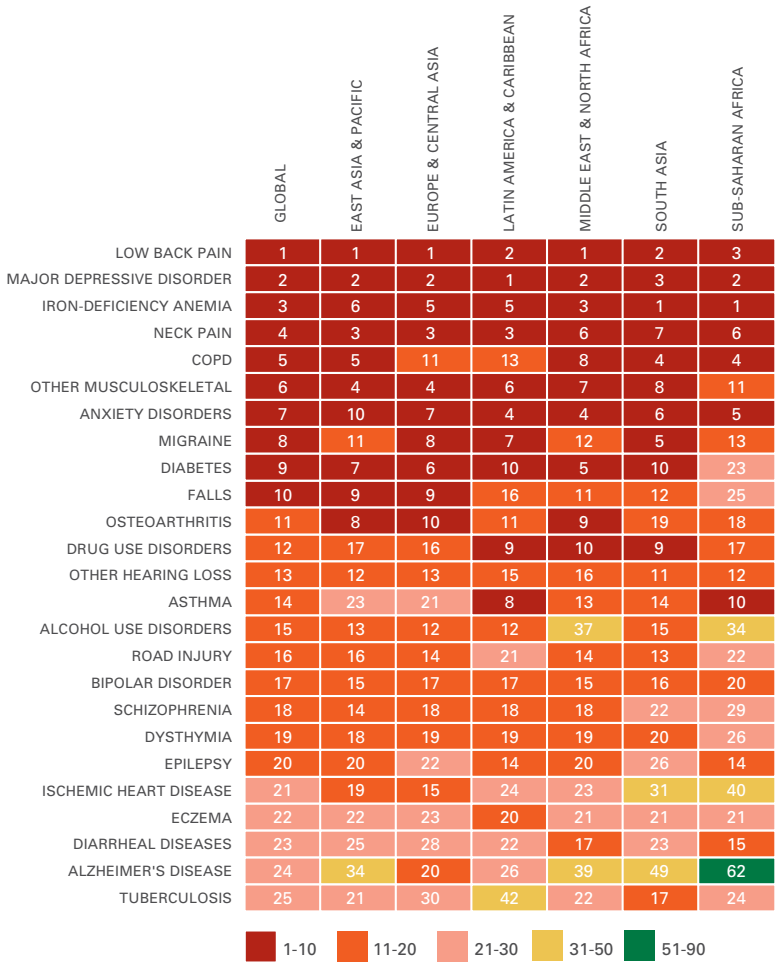


Note: The size of the colored portion in each bar represents the number of YLDs attributable to each cause for a given age group. The height of each bar shows total YLDs for a given age group in 2010. The causes are aggregated. For example, musculoskeletal disorders include low back pain and neck pain.

Chronic obstructive pulmonary disease (COPD), a term used to describe emphysema and other chronic respiratory diseases, is among the top five causes of disability in East Asia and Pacific, South Asia, and sub-Saharan Africa, and is the eighth-leading cause of disability in the Middle East and North Africa.

In Latin America and the Caribbean, many of the leading causes of disability are similar to global rankings, but there are key differences between the region and the rest of the world. Certain causes were less prominent in Latin America and the Caribbean than they were at the global level. Iron-deficiency anemia, for example, was the third-leading cause of disability worldwide but the fifth in Latin America and the Caribbean. While COPD ranked as the fifth-leading cause of disability worldwide,

Figure 14: Rankings of leading causes of disability by region, 2010



Note: In this figure, shading is used to indicate the ranking of each cause of disability in a particular region.

it ranked much lower (13th) in Latin America and the Caribbean. In this region, falls ranked 16th but ranked 10th globally.

Other causes of disability rank higher in Latin America and the Caribbean than at the global level. Asthma was the 14th cause of disability globally, but it ranked eighth in Latin America and the the Caribbean. Drug and alcohol use disorders also ranked higher in this region compared to the world as a whole. Drug use disorders were the 12th-leading cause of disability globally, but ranked ninth in Latin America and the Caribbean. Alcohol use disorders ranked 15th globally, but 12th in the region.

Using GBD tools to identify leading causes of disability, such as mental and behavioral disorders and musculoskeletal disorders, can help guide health system planning and medical education. Decision-makers can use GBD's findings to ensure that health care systems are designed to address the primary drivers of disability in a cost effective way.

THE GLOBAL RISK FACTOR TRANSITION

Data on potentially avoidable causes of health loss, or risk factors, can help policymakers and donors prioritize prevention strategies to achieve maximum health gains. GBD tools estimate the number of deaths, premature deaths, years lived with disability, and DALYs attributable to 67 risk factors worldwide. This study benefited from the availability of new data, such as newly available epidemiologic evidence about the health impacts of different risk factors; population, nutrition, health, and medical examination surveys; and high-resolution satellite data on air pollution.

Figure 15 shows changes in the 15 leading global risk factors for premature death and disability, or DALYs, between 1990 and 2010. Over this period, many risk factors that primarily cause communicable diseases in children declined. Examples of these risk factors are childhood underweight and suboptimal breastfeeding, which dropped by 61% and 57% from 1990 to 2010, respectively. Childhood underweight is commonly used to measure malnutrition, and was formerly the leading risk factor for DALYs in 1990, but ranked eighth in 2010. DALYs attributable to household air pollution, which contributes to lower respiratory tract infections in children, dropped by 37% between 1990 and 2010. Unlike other risk factors that primarily cause DALYs from communicable diseases, progress in reducing premature death and disability from iron deficiency was much lower, declining by just 7% between 1990 and 2010. Slow progress in reducing iron deficiency helps explain why iron-deficiency anemia ranks as the third-leading cause of disability globally.

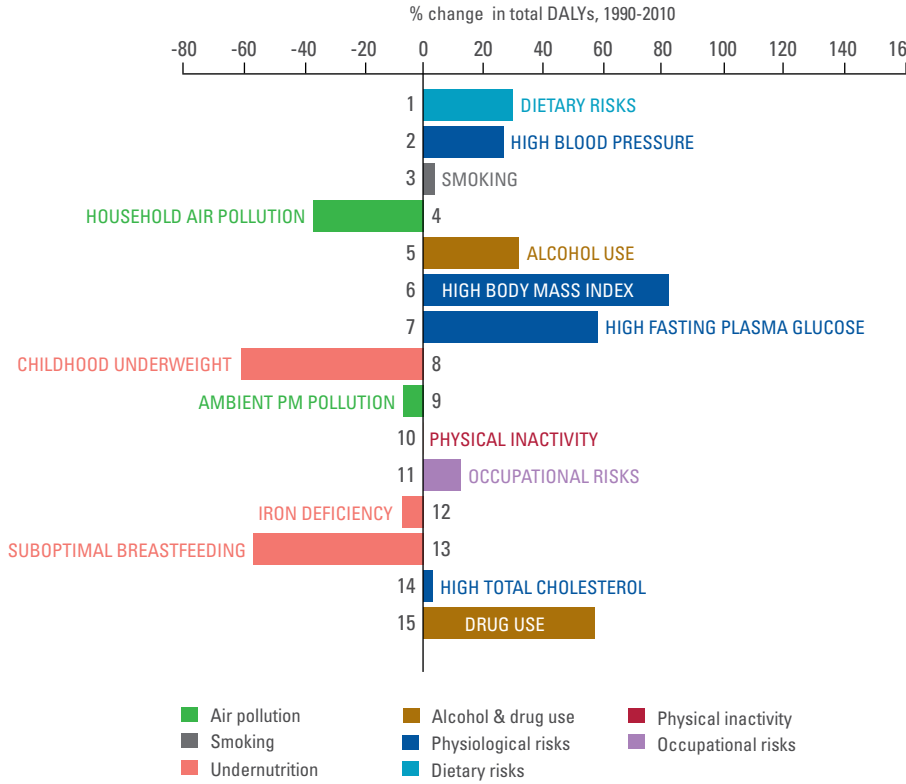
As most risk factors for communicable diseases in children have declined, many risks associated with non-communicable diseases have grown. As the leading global risk factor for premature death and disability, or DALYs, in 2010, dietary risks increased 30% between 1990 and 2010. Dietary risks include components such as high sodium intake and lack of fruit, nuts and seeds, and whole grain intake. GBD found the main diseases linked to dietary risks and physical inactivity are primarily

cardiovascular diseases as well as cancer and diabetes. While many public health messages about diet have stressed the importance of eating less saturated fat, the findings of GBD 2010 indicate that these messages should emphasize a broader range of dietary components.

GBD 2010 used the most recent data available on the effects of different dietary risk factors. It is important to note that these data are constantly evolving as new studies on diet are conducted. Compared to data on the negative health impacts of smoking, which have been well understood for decades, the scientific evidence surrounding dietary risk factors is much newer. Future updates of GBD will incorporate new data on risk factors as they emerge.

The second-leading global risk factor, high blood pressure, increased by 27% as a cause of DALYs between 1990 and 2010. High blood pressure is a major risk factor for cardiovascular and circulatory diseases. DALYs attributable to another risk

Figure 15: Global shifts in rankings of DALYs for top 15 risk factors, 1990-2010

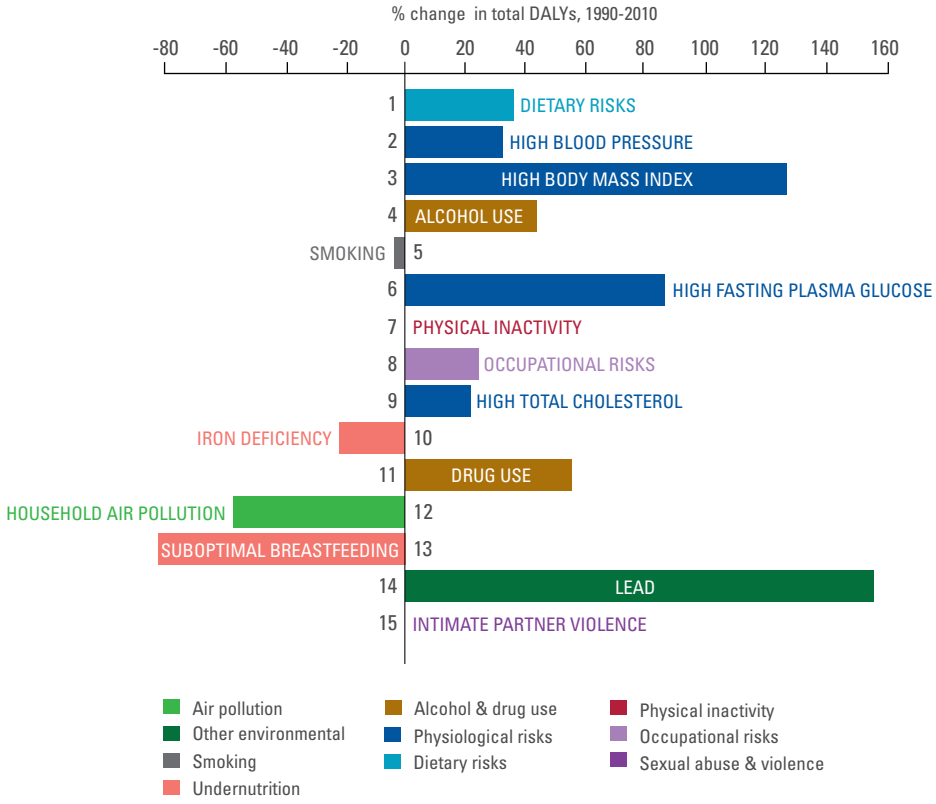


Note: The leading 15 risk factors are ranked from top to bottom in order of the number of DALYs they contributed in 2010. Bars to the right of the vertical line show the percent by which DALYs attributable to different risk factors have increased since 1990. Bars on the left show the percent by which DALYs attributable to different risk factors have decreased. Attributable DALYs were not quantified for physical inactivity for 1990.

factor for non-communicable diseases, tobacco smoking, increased slightly by 3% between 1990 and 2010 and was the third-leading risk factor worldwide. Smoking increases the risk of chronic respiratory diseases, cardiovascular and circulatory diseases, and cancer. DALYs attributable to the use of another substance, alcohol, increased 32% during this period. Alcohol use contributes to cardiovascular and circulatory diseases, cirrhosis, and cancer. In addition to being a contributor to non-communicable diseases, alcohol consumption increases the risk of injuries.

High body mass index (BMI), used as an indicator of overweight and obesity, was another major contributor to DALYs in 2010 and was the sixth-leading risk factor for premature death and disability. It increased by 82% over the period 1990 to 2010. High BMI is a leading risk factor for cardiovascular and circulatory diseases as well as diabetes. It is striking that high BMI was a more important cause of poor health worldwide than childhood underweight in 2010, whereas childhood underweight was a much more prominent risk factor than high BMI in 1990.

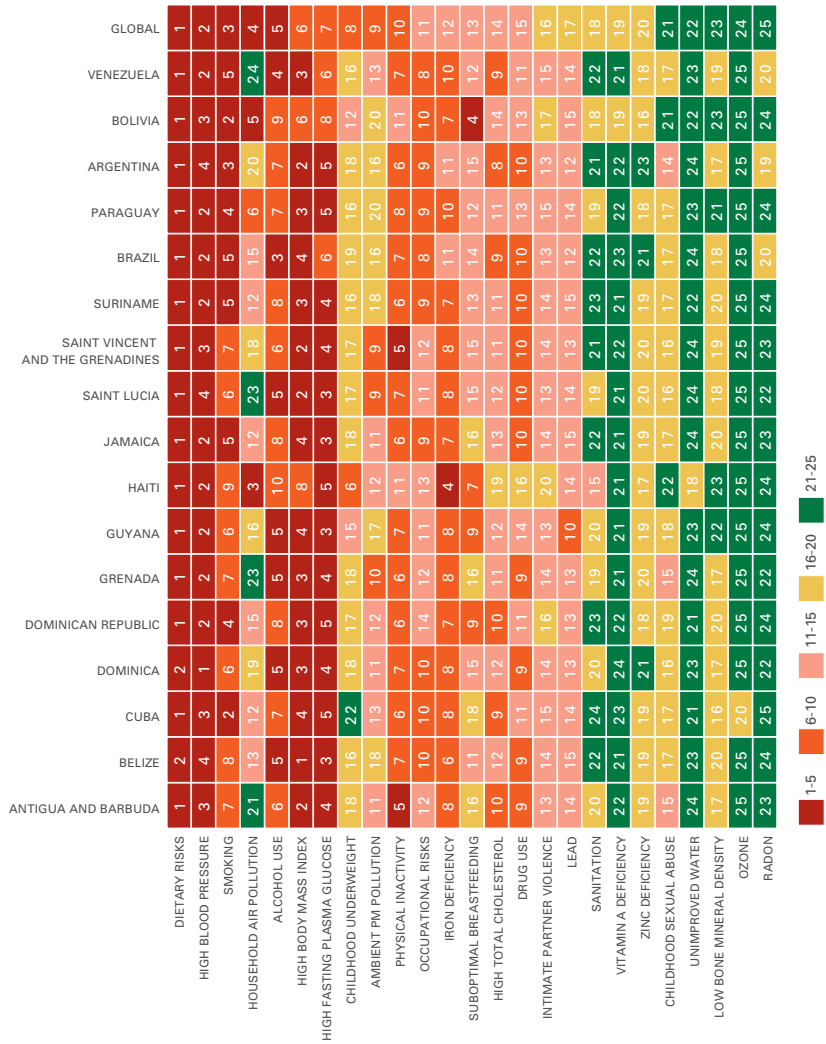
Figure 16: Shifts in rankings of DALYs in Latin America and Caribbean for top 15 risk factors, 1990-2010



Note: The leading 15 risk factors are ranked from top to bottom in order of the number of DALYs they contributed in 2010. Bars to the right of the vertical line show the percent by which DALYs attributable to different risk factors have increased since 1990. Bars on the left show the percent by which DALYs attributable to different risk factors have decreased. Attributable DALYs were not quantified for physical inactivity and intimate partner violence for 1990.

Figure 16 shows changes in leading risk factors for Latin America and the Caribbean, where many risk factors for communicable diseases declined between 1990 and 2010, as they did globally. In comparison to the world overall, DALYs attributable to risk factors for non-communicable diseases such as dietary risks, high blood pressure, high BMI, high fasting plasma glucose, high total cholesterol, and alcohol use increased by greater amounts in Latin America and the Caribbean. For example, high BMI rose by 82% worldwide between 1990 and 2010, but it increased by 127% in Latin America and the Caribbean. High fasting plasma glucose increased 58% at

Figure 17: Rankings of DALYs attributable to leading risk factors across select countries in Latin American and Caribbean, 2010

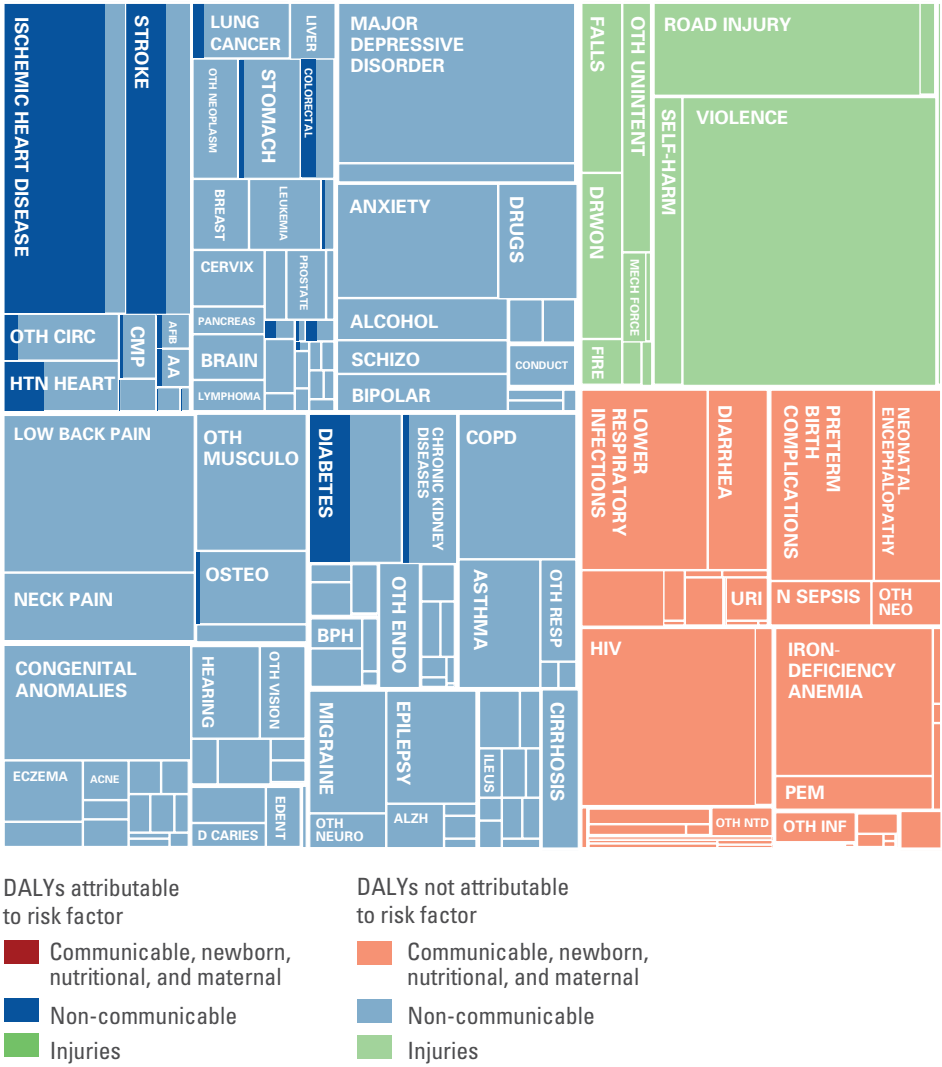


Note: In this figure, shading is used to indicate the ranking of each risk factor in a particular region. Palestine is the GBD equivalent of the West Bank and Gaza in the World Bank classification system. To view an interactive version of this figure, visit IHME's website: http://ihmeuw.org/gbdheatmap.

the global level but increased by 87% in the region. Alcohol use rose by 35% in the world as a whole and by 50% in the region. In contrast, smoking increased slightly worldwide, but it declined by 4% in Latin America and the Caribbean.

Global and regional rankings of risk factors mask important differences across countries. Figure 17 shows the leading risk factors for DALYs in select Latin American and Caribbean countries in 2010. Risks for non-communicable diseases such as dietary

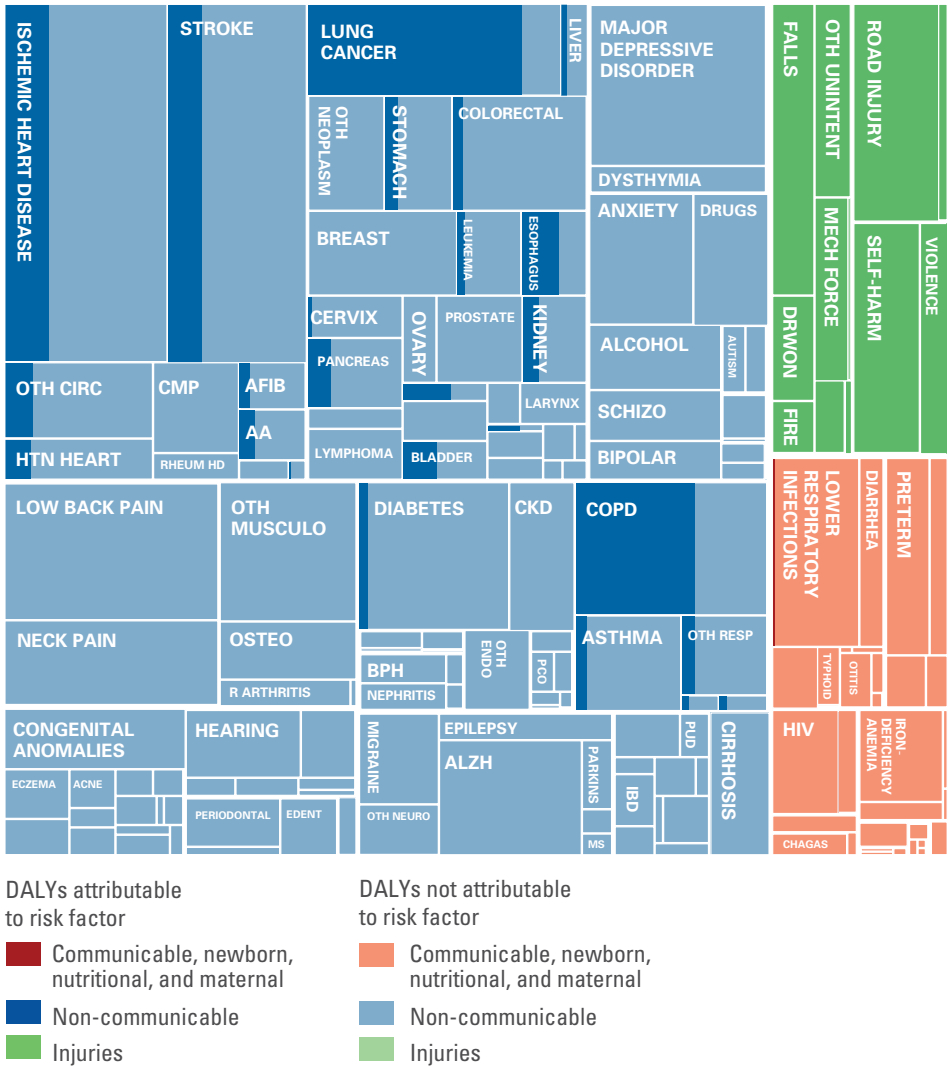
Figure 18: DALYs attributable to dietary risks, both sexes, all ages, Colombia, 2010



Note: The size of each box represents the percentage of total DALYs caused by a particular disease or injury, and the proportion of each cause attributable to the risk factor is shaded. To view an interactive version of this figure, visit IHME's website: http://ihmeuw.org/gbdcompare.

risks, high BMI, high blood pressure, and high fasting plasma glucose (an indicator of diabetes) are among the top five risk factors for most countries in this region. In nearly all of these countries, other non-communicable disease risk factors, including physical inactivity, alcohol use, and smoking, are some of the top 10 leading risk factors. Alcohol use ranked particularly high as a risk factor in Brazil and Venezuela, where it was the third- and fourth-leading contributor to DALYs, respectively.

Figure 19: DALYs attributable to tobacco smoking and second-hand smoke, both sexes, all ages, Uruguay, 2010



Note: The size of each box represents the percentage of total DALYs caused by a particular disease or injury, and the proportion of each cause attributable to the risk factor is shaded. To view an interactive version of this figure, visit IHME's website: http://ihmeuw.org/gbdcompare.

Bolivia, Cuba, and Argentina stand out as countries where smoking is a particularly large public health problem. Smoking was the second-leading risk factor contributing to DALYs in Bolivia and Cuba in 2010 and was the third-leading risk factor for Argentina. In Bolivia and Haiti, unlike in most countries shown in Figure 17, risk factors for illness in children, such as household air pollution, suboptimal breastfeeding, and iron deficiency, remained among the top risk factors.

In addition to allowing users to explore how different risk factors rank across countries, GBD visualization tools show how many DALYs could potentially be averted by addressing different risk factors. Figure 18 shows the number of DALYs attributable to dietary risks that contribute to different diseases in Colombia. The percentage of DALYs that could be averted by reducing dietary risk factors is shaded in a darker color.

Dietary risks include elements such as low consumption of fruit, nuts and seeds, and whole grains and high salt intake. The figure indicates how improving people's diets could prevent substantial amounts of health loss from ischemic heart disease and stroke, as indicated by the portion of these causes that are shaded in dark blue. Reduction of dietary risks could also reduce DALYs from diabetes and colon and rectal cancers.

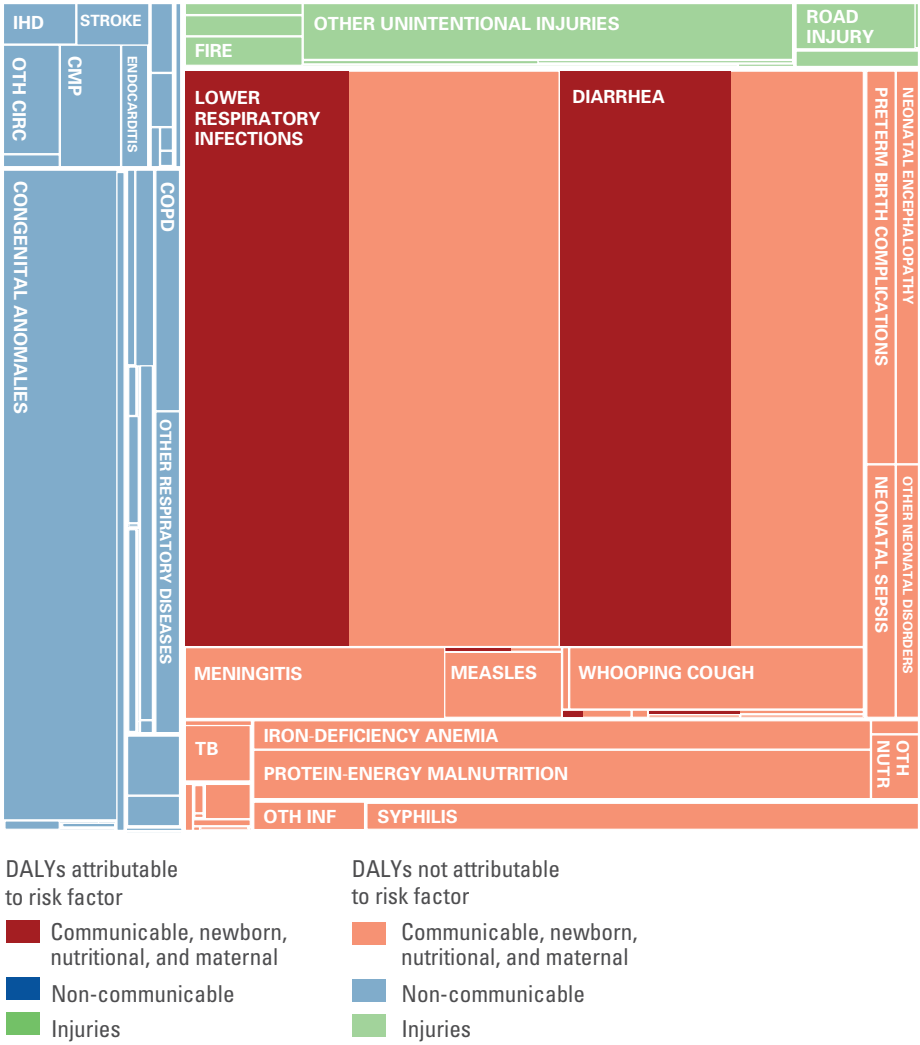
Figure 19 shows how, in Uruguay, many DALYs could be averted by eliminating tobacco smoking, including second-hand smoke.

Most COPD and lung cancer is caused by tobacco smoking and second-hand smoke, as indicated by the dark blue portion of the boxes representing these causes. Substantial numbers of healthy years lost from ischemic heart disease, stroke, and esophageal cancer could be prevented by reducing exposure to these risk factors.

Figure 20 shows the number of DALYs attributable to suboptimal breastfeeding in children aged 1 to 11 months in Bolivia.

This figure can be used to understand the number of years of healthy life that could potentially be gained by ensuring that all Bolivian children in this age group are adequately breastfed. Adequate breastfeeding is defined as exclusive breastfeeding of children for the first six months of life, and continued breastfeeding from the age of 6 months to 2 years. Adequate breastfeeding could prevent nearly 60% of the DALYs attributable to diarrhea, as indicated by the dark shading in the box representing this cause. Adequate breastfeeding would also greatly reduce illness from lower respiratory infections among these children.

Figure 20: DALYs attributable to suboptimal breastfeeding, both sexes, ages 1-11 months, Bolivia, 2010



Note: The size of each box represents the percentage of total DALYs caused by a particular disease or injury, and the proportion of each cause attributable to the risk factor is shaded. To view an interactive version of this figure, visit IHME's website: http://ihmeuw.org/gbdcompare.