



Southern Nations, Nationalities, and Peoples Region
Health Atlas, 2021

**Burden of Disease Unit (BoD), National Data Management
Center (NDMC) for health, Ethiopia Public Health Institute,
Ethiopia**



ጤና ሚኒስቴር - ኢትዮጵያ
MINISTRY OF HEALTH · ETHIOPIA

የዜጎች ጤና ለሃገር ብልፅግና!
HEALTHIER CITIZENS FOR PROSPEROUS NATION!



IHME

Institute for Health Metrics
and Evaluation

Table of Contents

Abbreviations.....	4
Definitions.....	5
Acknowledgements.....	7
Executive Summary.....	8
Mortality and fertility.....	8
Causes of death and disability.....	9
Top twenty causes of YLLs and YLDs in Southern Nations, Nationalities, and Peoples..	9
Attributable morbidity and mortality.....	9
Life expectancy.....	10
Chapter one: Mortality and Fertility Dynamics.....	11
Figure 1.1: Age-standardised all-cause mortality rate, 1990–2019, Southern Nations, Nationalities, and Peoples.....	11
Figure 1.2: Trends in burden of YLLs and YLDs in Southern Nations, Nationalities, and Peoples, 1990–2019.....	12
Figure 1.3: Trends of total fertility in Southern Nations, Nationalities, and Peoples, 1950-2019.....	12
Adult mortality.....	12
Figure 1.4: Adult mortality rate, Southern Nations, Nationalities, and Peoples, 1980–2019.....	13
Figure 1.5: Difference between female and male probability of death by time, 1980--2019, ages 15-60 (female - male).....	14
Total Fertility rate (TFR).....	14
Figure 1.6: Total fertility rate in Southern Nations, Nationalities, and Peoples, 1980-2019.....	14
Socio-demographic index.....	15
Figure 1.7: Socio-demographic index in Southern Nations, Nationalities, and Peoples, 1980-2019.....	15
Figure 1.8: Socio-demographic index and child mortality in Southern Nations, Nationalities, and Peoples, 1980-2019.....	16
Figure 1.9: Socio-demographic index and adult mortality in Southern Nations, Nationalities, and Peoples, 1980-2019.....	16
Chapter two: Causes of death and disability.....	17
Causes of Death.....	17
Figure 2.1: The top twenty leading causes of death in Southern Nations, Nationalities, and Peoples, all ages, 2019.....	18

Figure 2.2: The age-standardised top twenty causes of death in Southern Nations, Nationalities, and Peoples, 2019	18
Causes of premature mortality	19
Figure 2.3: The top twenty causes of premature loss of life in Southern Nations, Nationalities, and Peoples, all ages, 2019	19
Figure 2.4: Top twenty causes of age-standardised YLLs in Southern Nations, Nationalities, and Peoples, 2019	20
Causes of disability	20
Figure 2.5: Top twenty causes of YLDs in Southern Nations, Nationalities, and Peoples, all ages, 2019.....	20
Figure 2.6: Age-standardised leading causes of YLDs in Southern Nations, Nationalities, and Peoples, 2019	21
Figure 2.7: The twenty leading causes of disability adjusted life years in Southern Nations, Nationalities, and Peoples, all ages, 2019.....	21
Figure 2.8: Leading causes of age-standardised disability adjusted life years in Southern Nations, Nationalities, and Peoples, 2019	22
Figure 2.9: The burden of death by regions in Ethiopia, 2019	22
Figure 2.10: The burden of DALYs by regions in Ethiopia, 2019, all ages.....	23
Figure 2.11: The burden of age-standardised DALYs by regions in Ethiopia, 2019.....	23
Chapter three: Attributable mortality and disability	24
Child and maternal malnutrition	24
Figure 3.1: YLLs and YLDs attributable to child and maternal malnutrition in Southern Nations, Nationalities, and Peoples, both sexes, all ages, 2019	24
Figure 3.2: DALYs attributable to child and maternal malnutrition in Southern Nations, Nationalities, and Peoples, both sexes, ages 15 to 64, 2019	25
Air pollution	26
Figure 3.3: YLLs and YLDs attributable to air pollution in Southern Nations, Nationalities, and Peoples, both sexes, all ages, 2019	27
Unsafe water, Sanitation and Handwashing.....	28
Figure 3.4: YLLs and YLDs attributable to unsafe water, sanitation, and handwashing in Southern Nations, Nationalities, and Peoples, both sexes, all ages, 2019	28
Figure 3.5: DALYs attributable to unsafe water, sanitation, and handwashing in Southern Nations, Nationalities, and Peoples, both sexes, ages 15 to 64, 2019	29
Dietary Risk.....	30
Figure 3.6: YLLs and YLDs attributable to dietary risks in Southern Nations, Nationalities, and Peoples, both sexes, all ages, 2019	30
High systolic blood pressure.....	30

Figure 3.8: YLLs and YLDs attributable to high systolic blood pressure in Southern Nations, Nationalities, and Peoples, both sexes, all ages, 2019	30
Chapter four: Life expectancy	31
Figure 4.1: Life expectancy at birth in Southern Nations, Nationalities, and Peoples, 1980-2019.....	31
Figure 4.2: Difference in life expectancy at birth 1980-2019, females-males	31
Figure 4.3: Life expectancy in Southern Nations, Nationalities, and Peoples, 2019.....	32
References	33
HSTP Indicator Annex.....	34
Full table of key HSTP indicators.....	37

Abbreviations

Abbreviation	Term
AA	Addis Ababa
DALYs	Disability-Adjusted Life Years
DHS	Demographic and Health Survey
GBD	Global Burden of Disease
HALE	Health Adjusted Life Expectancy
HSTP	Health Sector Transformation Plan
LE	Life Expectancy
TFR	Total Fertility Rate
MDG	Millennium Development Goals
TB	Tuberculosis
SDG	Sustainable Development Goals
SDI	Socio-Demographic Index
WaSH	Water, Sanitation, and Hygiene
YLDs	Years Lived with Disability
YLLs	Years of Life Lost

Definitions

Term	Definition
Disability-adjusted life years (DALYs)	Years of healthy life lost due to premature death and disability. It is the sum of years of life lost and years lived with disability.
Healthy life expectancy (HALE)	The number of years that a person at a given age can expect to live in good health, considering mortality and disability.
Life expectancy	Number of years a person is expected to live based on their present age.
Replacement rate	The total fertility rate at which a population replaces itself from generation to generation, assuming no migration, or approximately 2.05 live births per woman.
Risk factors	Potentially modifiable causes of disease and injury.
Socio-demographic Index (SDI)	A summary measure that identifies where a country or regional segment area sit on the spectrum of development. Expressed on a scale of 0 to 1, SDI is a composite average of the rankings of the incomes per capita, average educational attainment, and fertility rates of all areas in the GBD study.
Total fertility rate	The average number of children a woman would bear if she survived through the end of the reproductive age span and experienced at each age a particular set of age-specific fertility rates observed in the year of interest.
Under-5 mortality	The probability (expressed as the rate per 1,000 live births) that children born alive will die before reaching the age of 5 years.
Years lived with disability (YLDs)	Years of life lived with any short-term or long-term health loss.
Years of life lost (YLLs)	Years of life lost due to premature mortality.

Compiled by

Tezera Moshago Berheto, Burden of Disease Unit, Team leader

Yihunie Lakew, Burden of Disease Unit, Senior Demographer

Wondeson Tekilemariam, Burden of Disease Unit, Public Health Expert

Chalie Belete, Burden of Disease Unit, Geo-spatial Epidemiologist

Shewayiref Geremaw, Burden of Disease Unit, R-programmer

Dr. Awoke Misganaw, NDMC Advisor, Clinical Assistant Professor, IHME

Dr. Alemnesh Mirkuzie, NDMC Senior Researcher and former NDMC Coordinator

Dr. Fentabil Getnet, NDMC Coordinator and Public Health Researcher

Lydia Haile, IHME, Post Bachelor Fellow

Ally Walker, IHME, Engagement Officer, East and Southern Africa, Ethiopia Subnational Burden of Disease Project

Prof. Mohsen Naghavi, IHME, Director of Subnational Burden of Disease Estimation

Acknowledgements

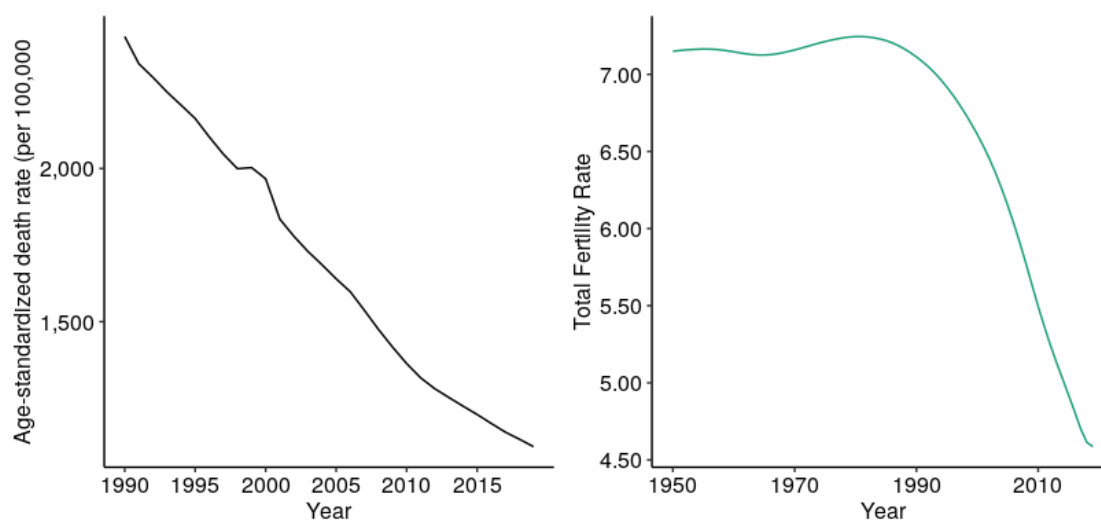
We extend our deepest appreciation to current and former leaders of Ministry of Health, Ethiopian Public Health Institute (EPHI) and Institute for Health Metrics and Evaluation (IHME) who have provided valuable guidance on our collaborative efforts. We are grateful to the staff members of National Data Management Center (NDMC) for health at EPHI and IHME and Ethiopia subnational burden of disease collaborator experts, as well as the local and international organizations who responded to our data requests and questions. We greatly appreciate their time and assistance.

The IHME and NDMC teams contributed greatly to the analysis and production of this atlas as part of GBD 2019 study. In particular, we thank Prof. Mohsen Naghavi and Dr. Awoke Misganaw for their continued leadership, Tezera Berheto, Lydia Haile and Ally Walker for producing the report, coordinating editorial guidance, and for editing and managing production, and Ally Walker for project coordination. Finally, we would like to extend our gratitude to the Bill & Melinda Gates Foundation for generously funding Ethiopia subnational burden of disease EPHI and IHME collaborative initiative and for its consistent support of this research and report.

Executive Summary

This brief presents key results from EPHI and IHME collaborative subnational burden of disease analysis as part of Global Burden of Disease 2019 Study for Southern Nations, Nationalities, and Peoples, a regional state of Ethiopia. For additional information, please refer to the [GBD Results Tool](#), the [GBD Compare visualization tool](#), and the [EPHI National Data Management Center website](#).

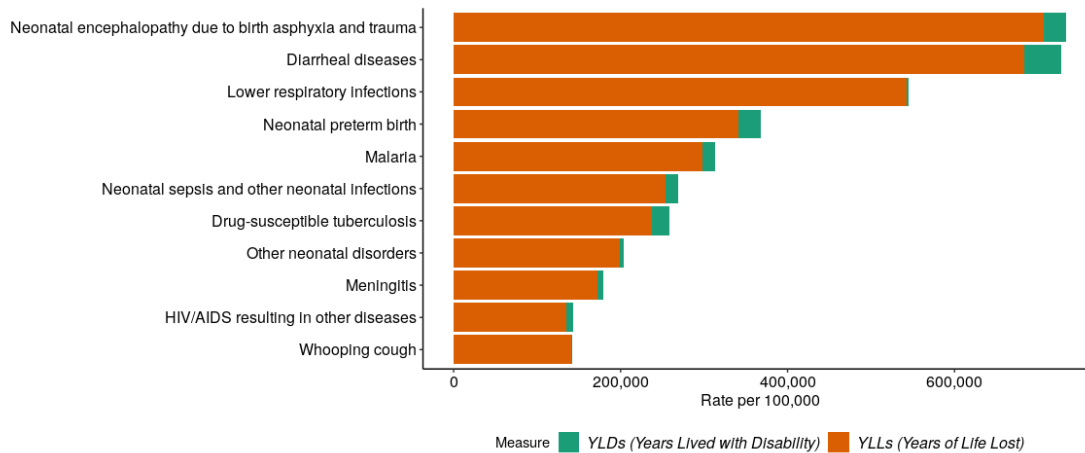
Mortality and fertility



All-cause mortality in Southern Nations, Nationalities, and Peoples reduced from about **2,430** per 100,000 persons in 1990 to about **1,090** per 100,000 persons in 2019. The number of DALYs has significantly reduced from about 14,200,000 DALYs in 1990 to 8,190,000 in 2019. Total fertility declined from **7.1** births per woman in 1990 to **4.6** births per woman in 2019, a **36%** change.

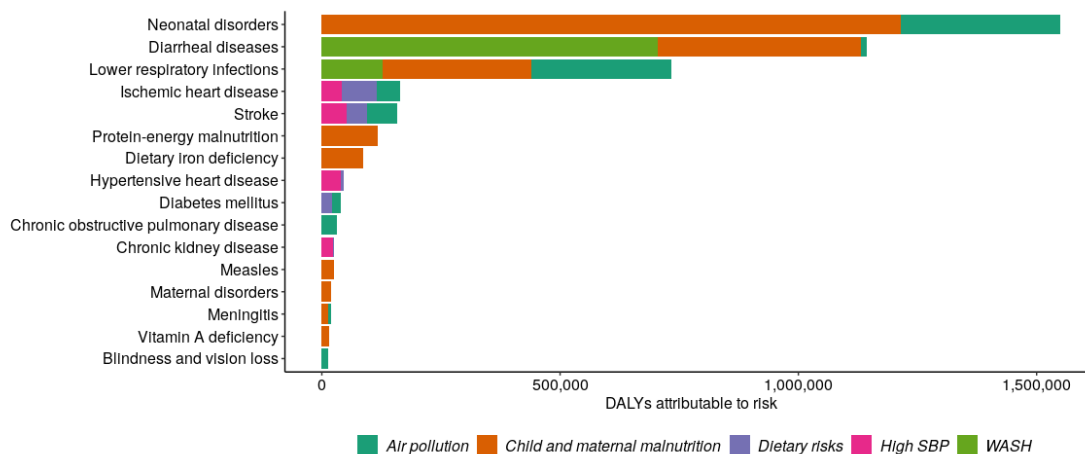
Causes of death and disability

Top twenty causes of YLLs and YLDs in Southern Nations, Nationalities, and Peoples



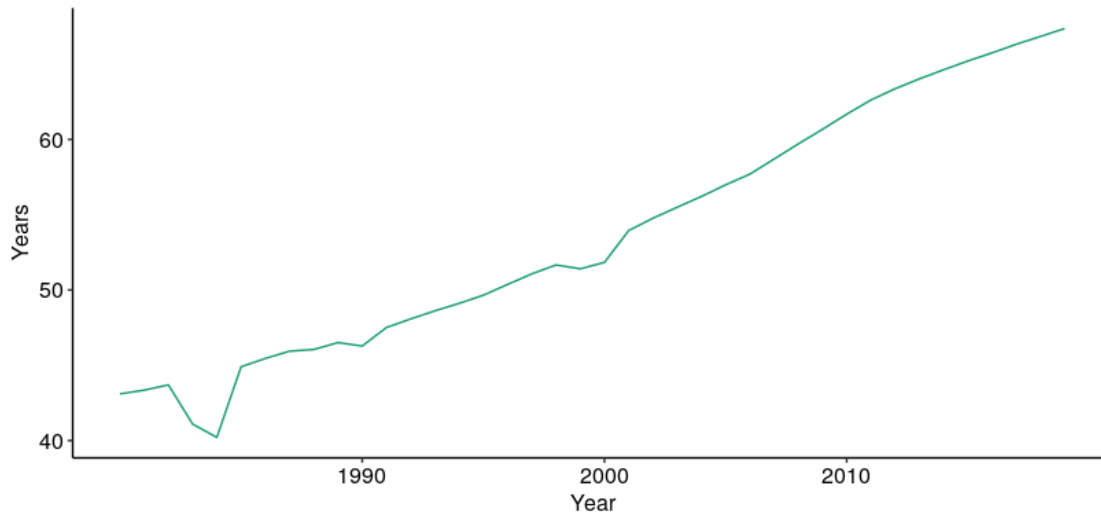
Of the twelve leading causes of YLLs and YLDs in Southern Nations, Nationalities, and Peoples in 2019, *Neonatal encephalopathy due to birth asphyxia and trauma*, *Diarrheal diseases* and *Lower respiratory infections* are the leading three causes.

Attributable morbidity and mortality



The figure above illustrates leading disease with DALYs attributable to air pollution, child and maternal malnutrition, dietary risks, high systolic blood pressure, and unsafe water, sanitation, and handwashing in Southern Nations, Nationalities, and Peoples. *Child and maternal malnutrition* is the source of the greatest number of attributable DALYs, followed by *WASH*.

Life expectancy



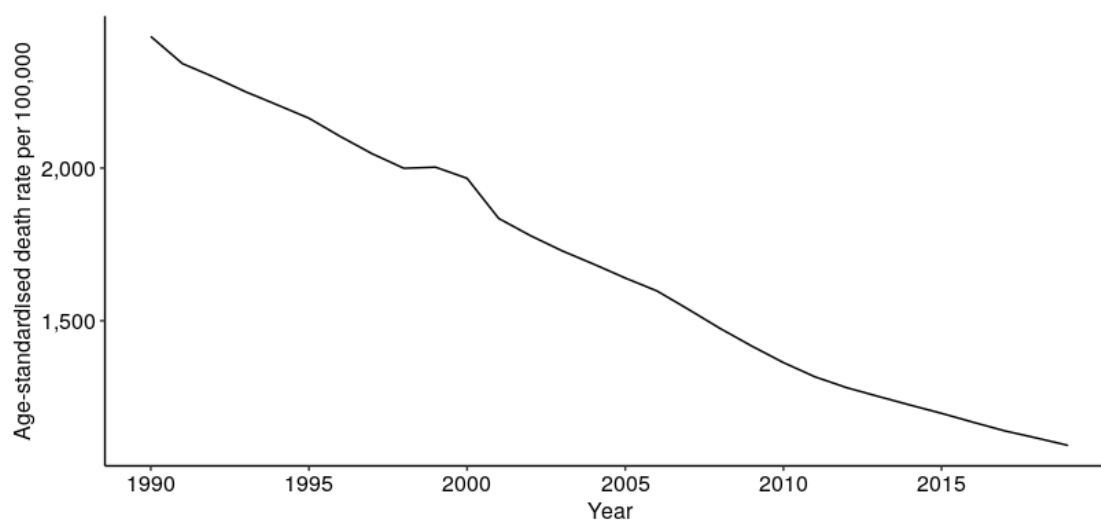
The life expectancy in Southern Nations, Nationalities, and Peoples increased from **43** years in 1980 to **67** years in 2019.

Southern Nations, Nationalities, and Peoples residents will live, on average, **59** healthy years, with **8** years lived with disability.

Chapter one: Mortality and Fertility Dynamics

This chapter contains health-related statistics for **Southern Nations, Nationalities, and Peoples**, a region state of Ethiopia. In this report, recently established Sidama and South West regions were reported under SSNP regional state. The data include the primary aspects and determinants of health such as basic demographic data, mortality, sociodemographic and regional disparities, total fertility rate, change in fertility in the last thirty years, life expectancy at birth, and socio-demographic index.

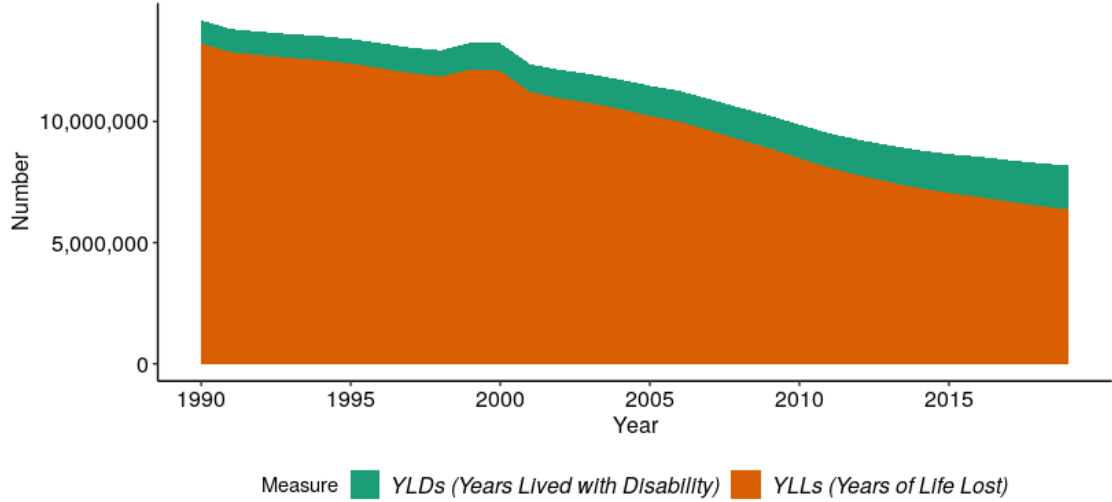
Figure 1.1: Age-standardised all-cause mortality rate, 1990–2019, Southern Nations, Nationalities, and Peoples



Death and cause-of-death data are scarce in Southern Nations, Nationalities, and Peoples due to the lack of complete death registration systems. Southern Nations, Nationalities, and Peoples has made remarkable progress in the reduction of gross mortality over the last three decades. All-cause age-standardised mortality in Southern Nations, Nationalities, and Peoples reduced from about 2,430 deaths per 100,000 persons in 1990 to about 1,090 deaths per 100,000 persons in 2019.

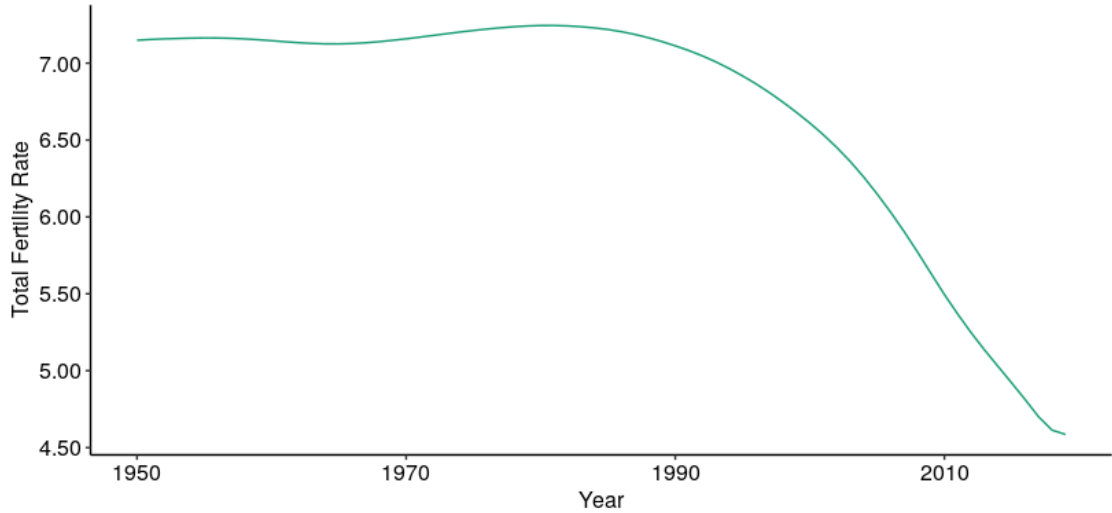
All-cause all-age mortality in Southern Nations, Nationalities, and Peoples reduced from about **1,830** per 100,000 persons in 1990 to about **497** per 100,000 persons in 2019.

Figure 1.2: Trends in burden of YLLs and YLDs in Southern Nations, Nationalities, and Peoples, 1990–2019



The number of DALYs significantly reduced from about **10,000,000** DALYs in 1990 to **8,200,000** in 2019. The pace of decline accelerated after the year 2000.

Figure 1.3: Trends of total fertility in Southern Nations, Nationalities, and Peoples, 1950-2019



The fertility rate for Southern Nations, Nationalities, and Peoples was **4.59** births per woman in 2019, a decrease from **7.15** births per woman in 1950.

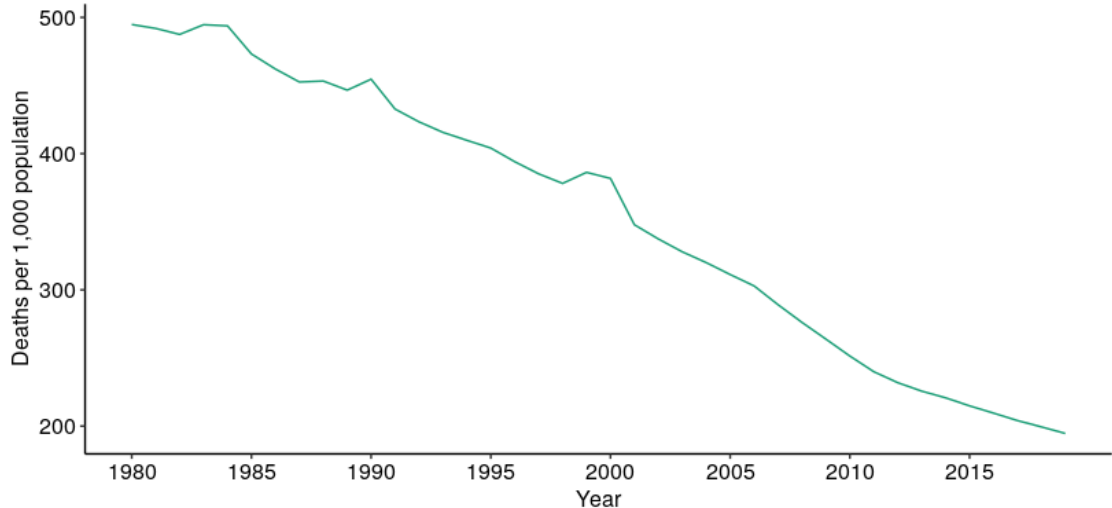
Adult mortality

This section aims to describe levels, trends, and patterns of adult mortality in Southern Nations, Nationalities, and Peoples. The **adult mortality rate** refers to the probability of a

15-year-old dying before reaching age 60, if subject to age-specific mortality rates of the specified year between those ages.

GBD results indicate that all-cause mortality has decreased at a fast pace in the last 30 years (**Figure 1.1**). According to the study, the adult mortality rate for women decreased from 249 deaths per 1,000 female adults in 2008 to 160 per 1,000 female adults and from 301 deaths per 1,000 male adults to 227 per 1,000 male adults in in 2019.

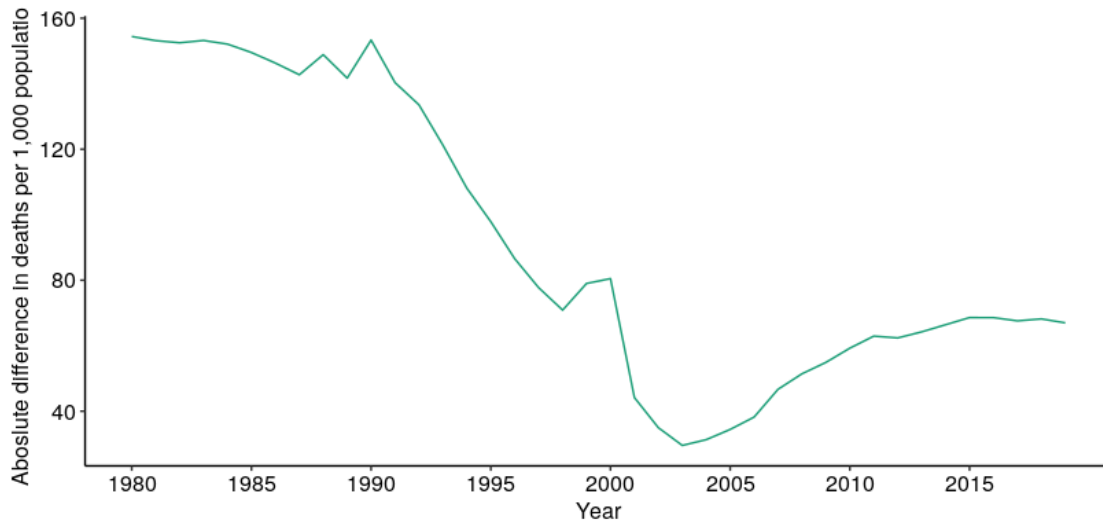
Figure 1.4: Adult mortality rate, Southern Nations, Nationalities, and Peoples, 1980–2019



Adult mortality rate was very high and stagnant before 2000, when it started to decrease steadily in Southern Nations, Nationalities, and Peoples. Southern Nations, Nationalities, and Peoples had an adult mortality rate of **195** deaths per 1,000 adults in 2019, in comparison to a rate of **455** per 1,000 in 1990.

From 1990 to 2019, Southern Nations, Nationalities, and Peoples exhibited a **57%** decrease in adult mortality.

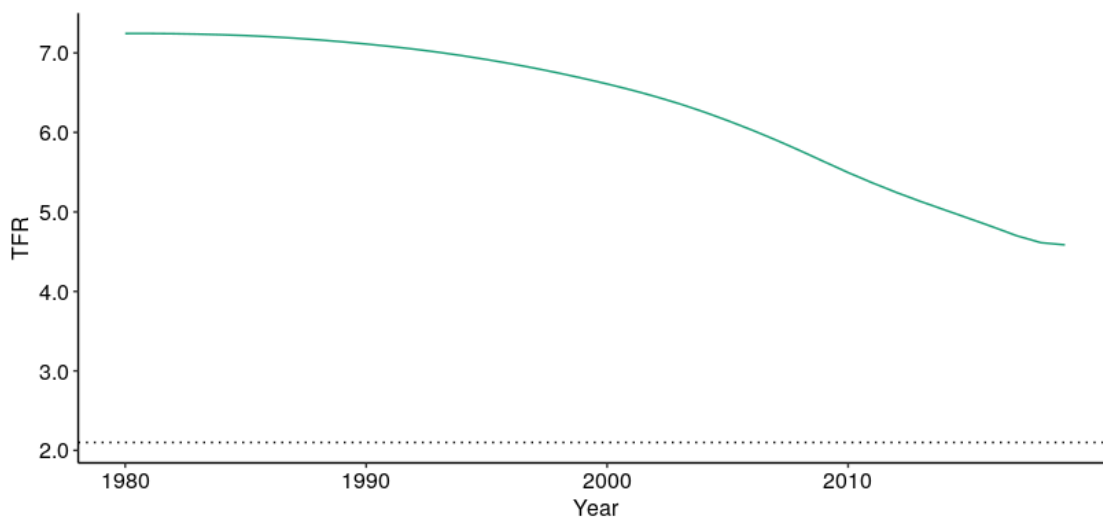
Figure 1.5: Difference between female and male probability of death by time, 1980--2019, ages 15-60 (female - male)



The GBD data indicates that adult mortality is lower in women in Southern Nations, Nationalities, and Peoples.

Total Fertility rate (TFR)

Figure 1.6: Total fertility rate in Southern Nations, Nationalities, and Peoples, 1980-2019



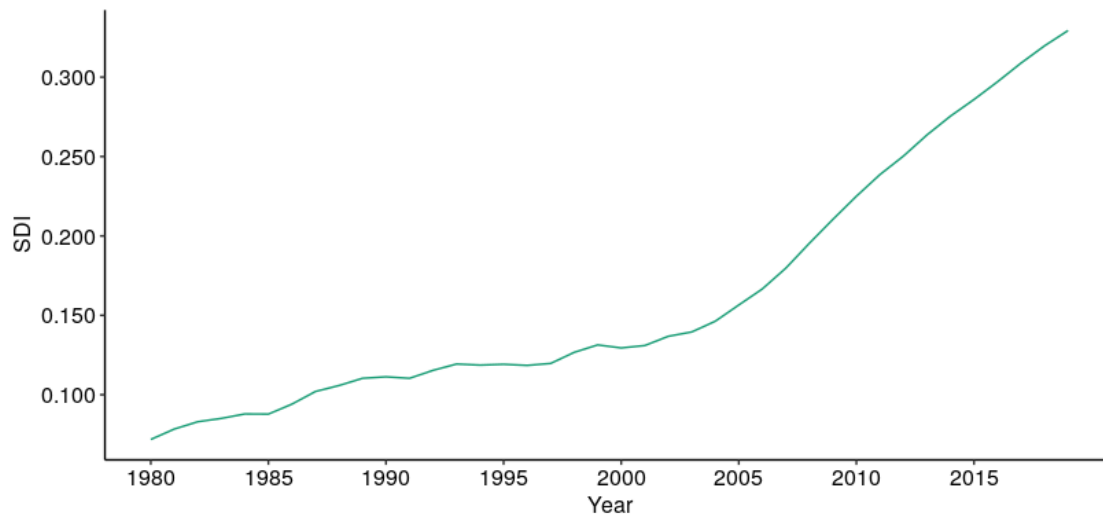
The figure above presents fertility trends and the magnitude of interregional differentials in fertility in Southern Nations, Nationalities, and Peoples. Total fertility declined from **7.2** births per woman in the 1980 to **4.6** births per woman in 2019, a **36%** change.

Socio-demographic index

The **Socio-demographic index (SDI)** is a composite measure that identifies where countries or other geographic areas are found on the spectrum of development. According to the GBD study, SDI is based on average income per person, educational attainment, and total fertility rate (*TFR*). SDI is a composite average of the rankings of the incomes per capita, average educational attainment, and fertility rates of all areas in the GBD study.

SDI contains an interpretable scale from 0 to 1, where zero represents the lowest income per capita, lowest educational attainment, and highest TFR observed across geographic areas, and one represents the highest income per capita, highest educational attainment, and lowest TFR.

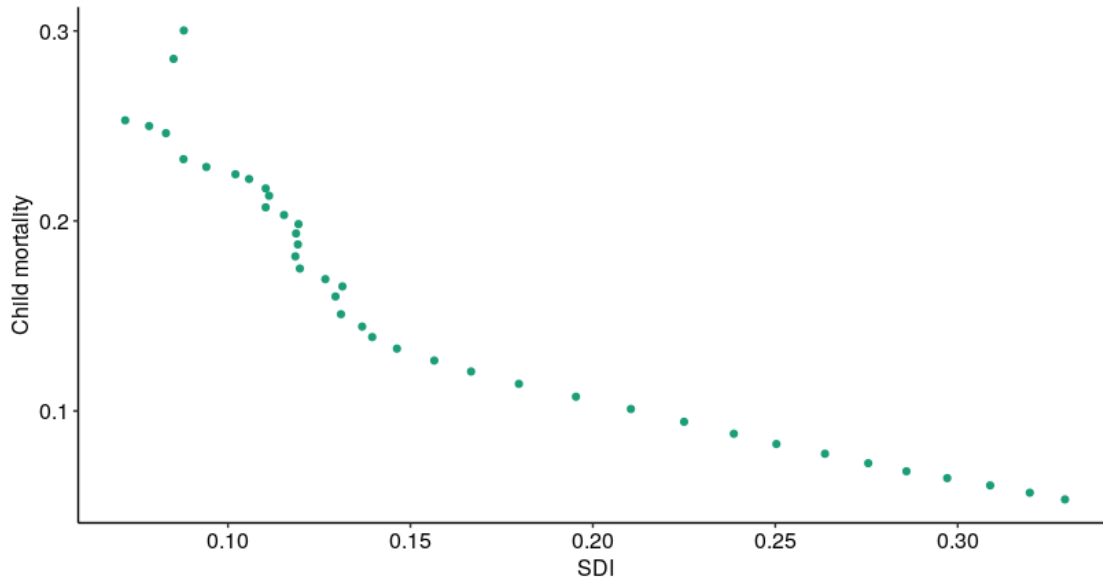
Figure 1.7: Socio-demographic index in Southern Nations, Nationalities, and Peoples, 1980-2019



SDI improved throughout the nation over the last half century. The highest incremental improvement of SDI was recorded in *Addis Ababa, Harari* and *Dire Dawa* between 1950 and 2019. The SDI of Southern Nations, Nationalities, and Peoples increased steadily from **0.07** in 1980 to **0.33** in 2019. *Somali, Afar* and *Amhara* regions had the slowest improvement in SDI.

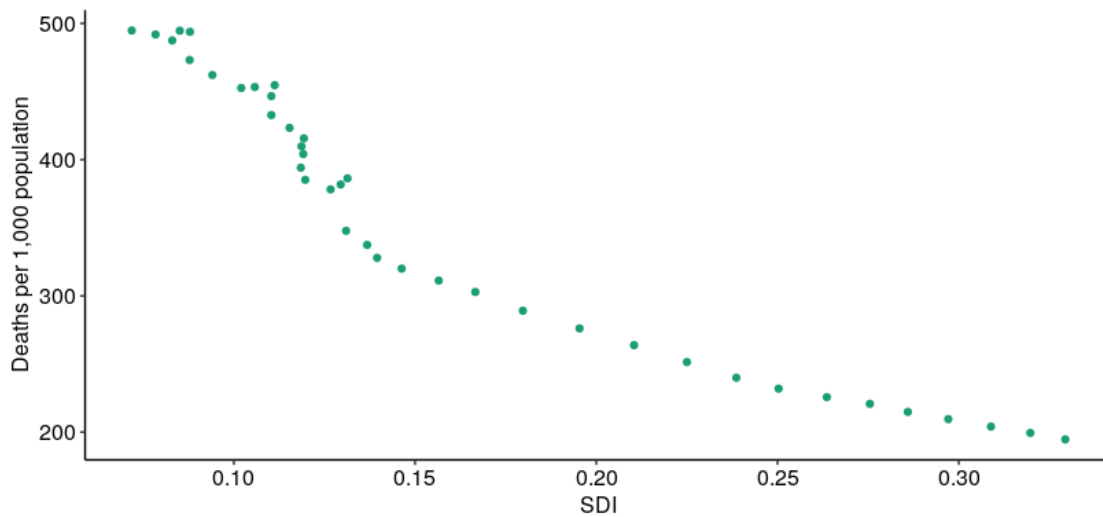
Southern Nations, Nationalities, and Peoples had an estimated SDI of **0.33** in 2019, ranking **** out of all regions in Ethiopia.

Figure 1.8: Socio-demographic index and child mortality in Southern Nations, Nationalities, and Peoples, 1980-2019



A high socio-demographic index is correlated with low child mortality in Southern Nations, Nationalities, and Peoples. As SDI improves, child mortality decreases. Regions with high SDI such as *Addis Ababa*, *Dire Dawa*, and *Harari* have relatively low child mortality rates whereas regions with low SDI such as *Somali* and *Afar* have high child mortality rates.

Figure 1.9: Socio-demographic index and adult mortality in Southern Nations, Nationalities, and Peoples, 1980-2019



As presented in **(Figure 1.9)**, adult mortality is negatively correlated with SDI.

Chapter two: Causes of death and disability

This chapter quantifies premature death and disability in terms of disability adjusted life years (*DALYs*), years of life lost (*YLLs*) and years lived with disability (*YLDs*) attributable to maternal and child malnutrition, high systolic blood pressure, air pollution and poor diet in Southern Nations, Nationalities, and Peoples.

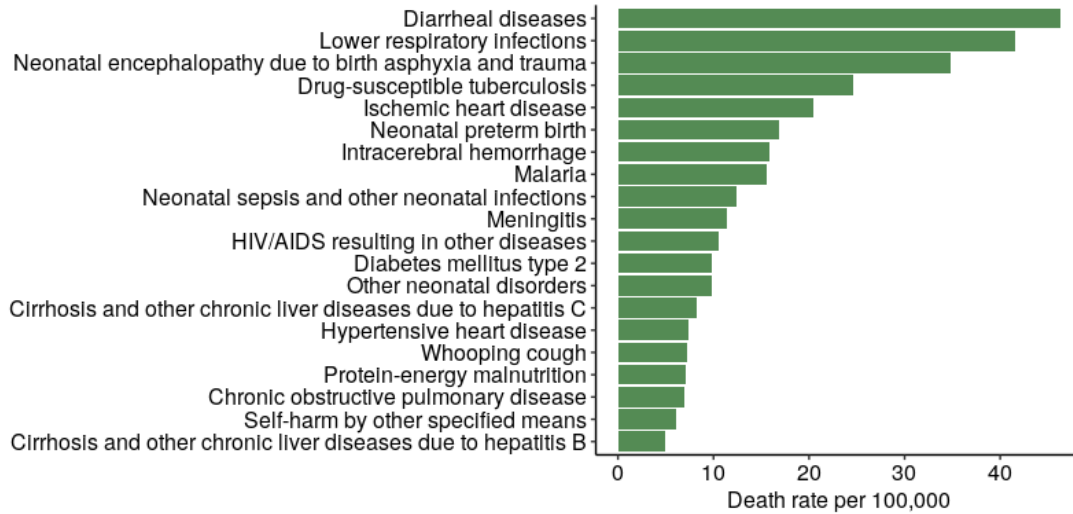
On the World Health Organization (WHO) website, it is clearly stated that mortality alone does not give a complete picture of the burden of disease borne by individuals in different population groups. *DALYs* are the summary measure used to give an indication of the overall burden of disease. One *DALY* represents the loss of the equivalent of one year of full health. Using *DALYs*, the burden of diseases that cause premature death but little disability (such as drowning or measles) can be compared to that of diseases that do not cause death but do cause disability (such as cataract causing blindness).

As a result of multi-sectoral interventions the burden of disease, stated in *DALYs* per 1000 population, has decreased in the last two decades in Africa. The continent, however, still bears the highest burden globally. Worldwide, a disproportionate proportion of *DALYs* are caused by communicable, maternal, neonatal, and nutritional causes.

Causes of Death

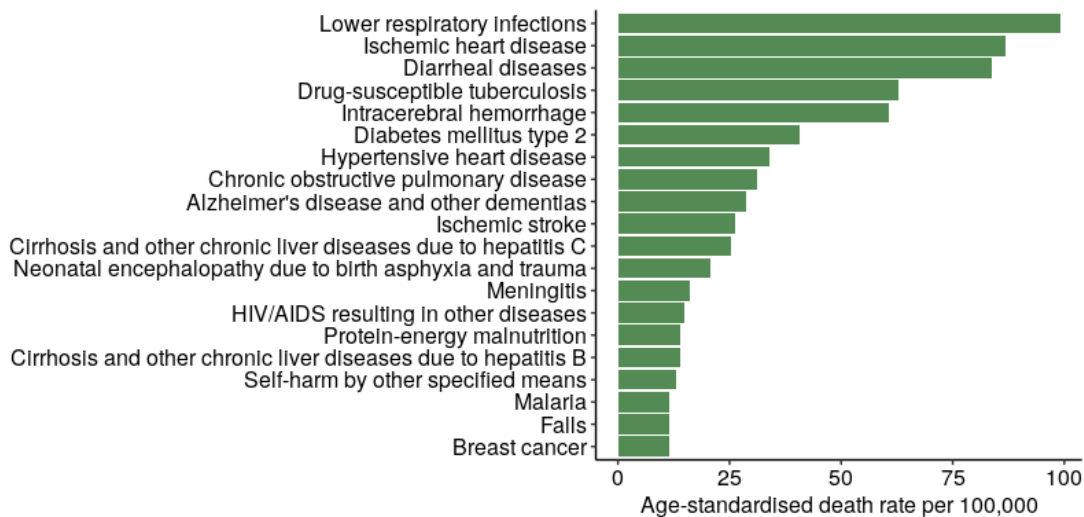
The leading causes of death, in order of total number of lives lost, are mainly associated with communicable and maternal disorders, non-communicable such as cardiovascular (*ischaemic heart disease, stroke*), respiratory (*chronic obstructive pulmonary disease, lower respiratory infections*), injuries and neonatal disorders that include *birth asphyxia, encephalopathy, and birth trauma, neonatal sepsis and infections, and preterm birth complications*.

Figure 2.1: The top twenty leading causes of death in Southern Nations, Nationalities, and Peoples, all ages, 2019



The chart presents an estimation of the top twenty specific leading causes of death regardless of age and sex in Southern Nations, Nationalities, and Peoples. *Diarrheal diseases*, *Lower respiratory infections*, and *Neonatal encephalopathy due to birth asphyxia and trauma* were the top three leading causes of death in 2019.

Figure 2.2: The age-standardised top twenty causes of death in Southern Nations, Nationalities, and Peoples, 2019

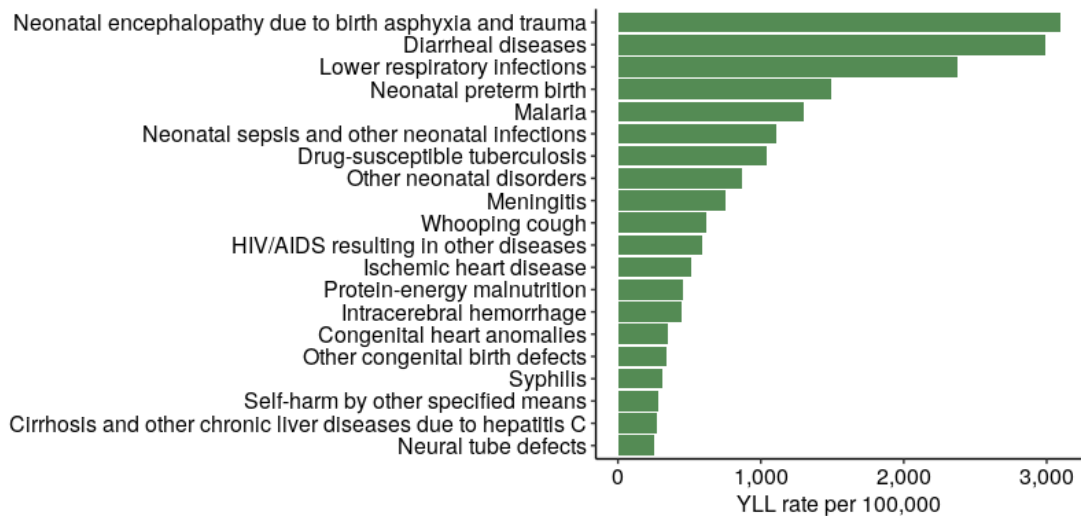


The above figure presents an estimation of the age-standardised top twenty leading causes of death regardless of sex in Southern Nations, Nationalities, and Peoples. *Lower respiratory*

infections, Ischemic heart disease and Diarrheal diseases were the leading causes of death in Southern Nations, Nationalities, and Peoples.

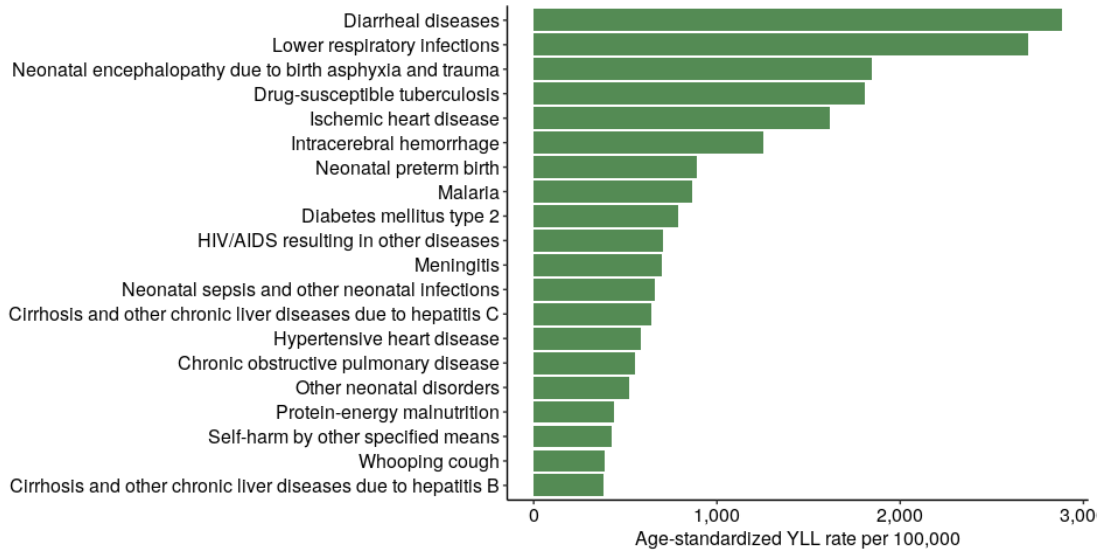
Causes of premature mortality

Figure 2.3: The top twenty causes of premature loss of life in Southern Nations, Nationalities, and Peoples, all ages, 2019



The figure above presents an estimation of the top twenty diseases that results in a year of life lost (YLL) regardless of age and sex. *Neonatal encephalopathy due to birth asphyxia and trauma, Diarrheal diseases and Lower respiratory infections* cause the most YLLs in Southern Nations, Nationalities, and Peoples.

Figure 2.4: Top twenty causes of age-standardised YLLs in Southern Nations, Nationalities, and Peoples, 2019



The chart presents an estimation of age-standardised leading causes of disease that result a premature life lost regardless of sex. *Diarrheal diseases*, *Lower respiratory infections*, and *Neonatal encephalopathy due to birth asphyxia and trauma* cause the majority of YLLs in Southern Nations, Nationalities, and Peoples.

Causes of disability

Figure 2.5: Top twenty causes of YLDs in Southern Nations, Nationalities, and Peoples, all ages, 2019

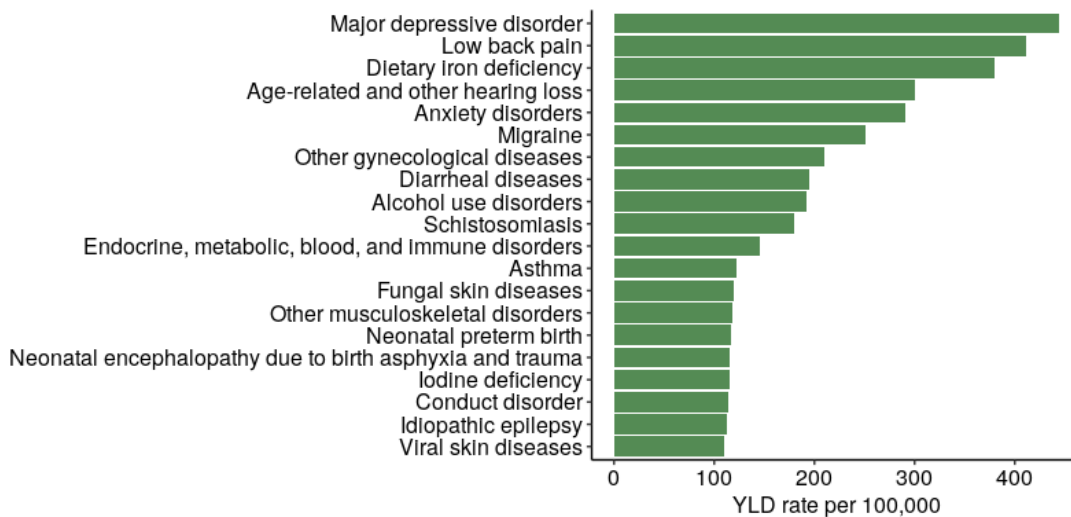
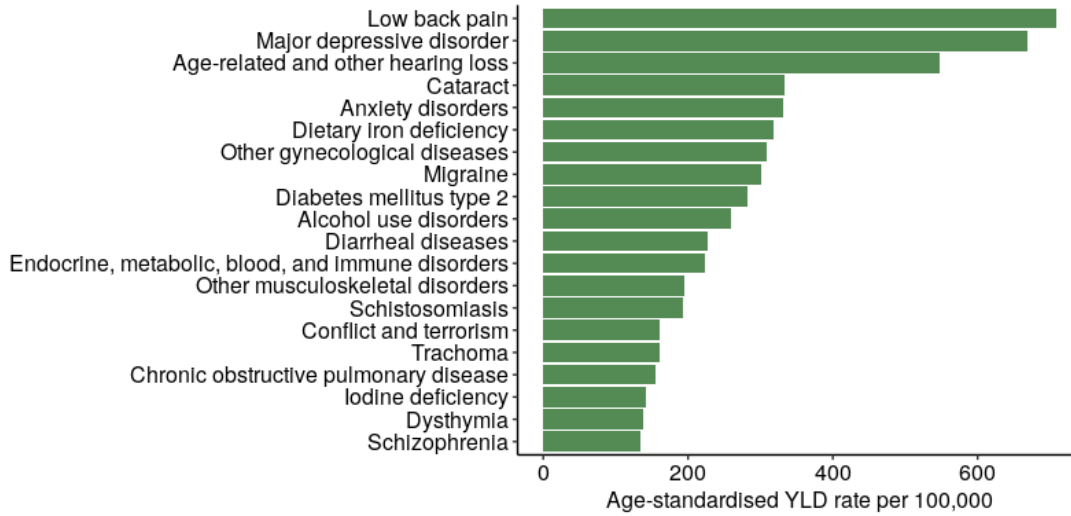
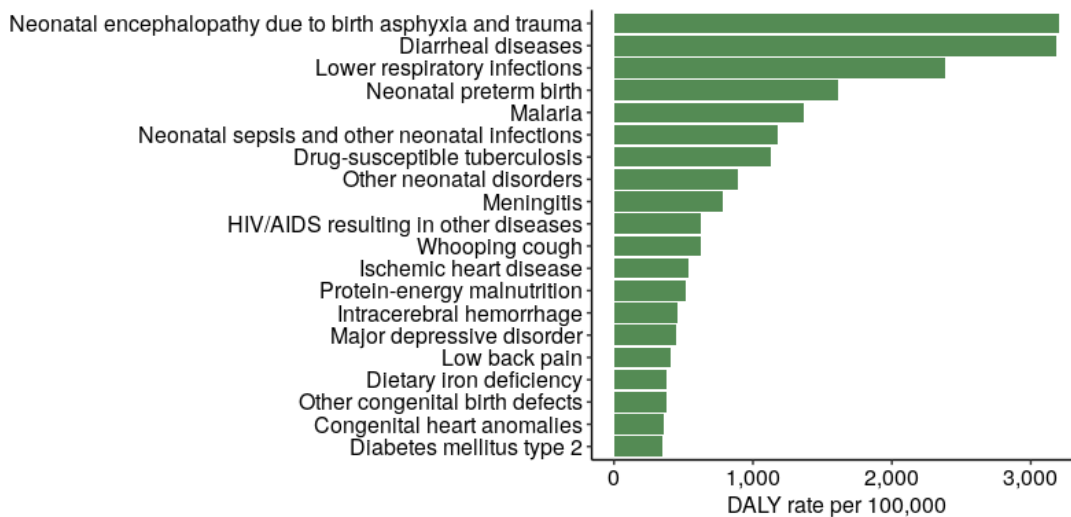


Figure 2.6: Age-standardised leading causes of YLDs in Southern Nations, Nationalities, and Peoples, 2019



These figures present the leading causes of years lived with disability (YLD) rates regardless of sex in Southern Nations, Nationalities, and Peoples. *Low back pain, Major depressive disorder* and *Age-related and other hearing loss* are the first-, second- and third-leading causes of age-standardised YLDs in Southern Nations, Nationalities, and Peoples.

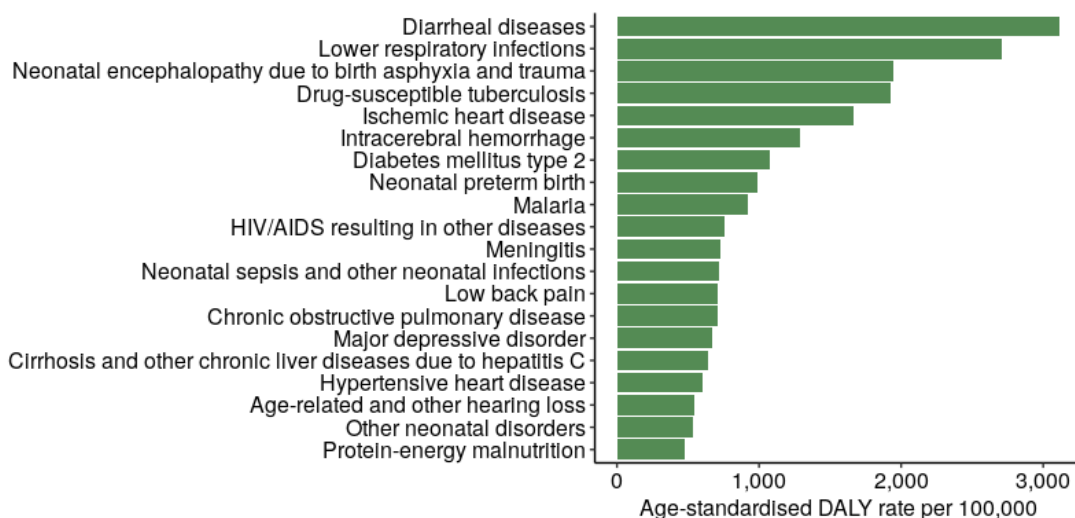
Figure 2.7: The twenty leading causes of disability adjusted life years in Southern Nations, Nationalities, and Peoples, all ages, 2019



The graph presents the twenty most important drivers of increasing burden in number of disability adjusted life year (DALYs) regardless of sex in Southern Nations, Nationalities, and Peoples. In 2019, *Neonatal encephalopathy due to birth asphyxia and trauma, Diarrheal*

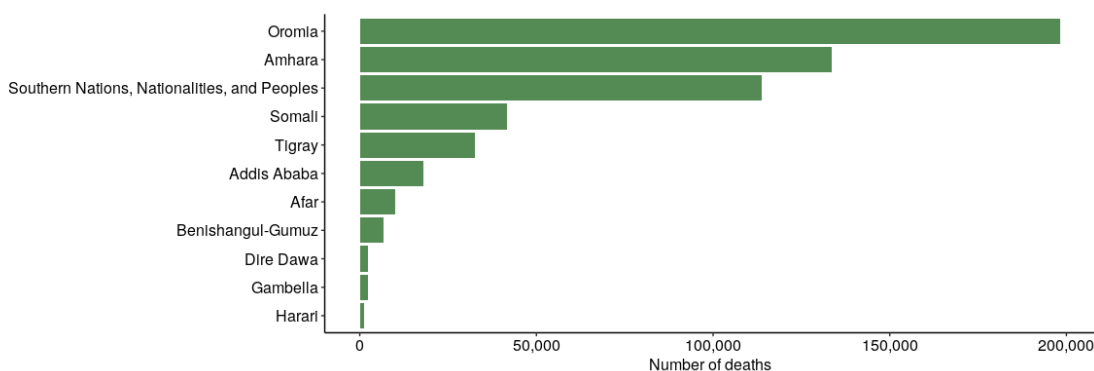
diseases, and *Lower respiratory infections* were the top three drivers of DALYs in Southern Nations, Nationalities, and Peoples.

Figure 2.8: Leading causes of age-standardised disability adjusted life years in Southern Nations, Nationalities, and Peoples, 2019



The figure shows the age-standardised twenty leading drivers of increasing burden in number of disability adjusted life year (*DALYs*) in Southern Nations, Nationalities, and Peoples. In 2019, *Diarrheal diseases*, *Lower respiratory infections*, and *Neonatal encephalopathy due to birth asphyxia and trauma* were the top three drivers of age-standardised DALYs in Southern Nations, Nationalities, and Peoples.

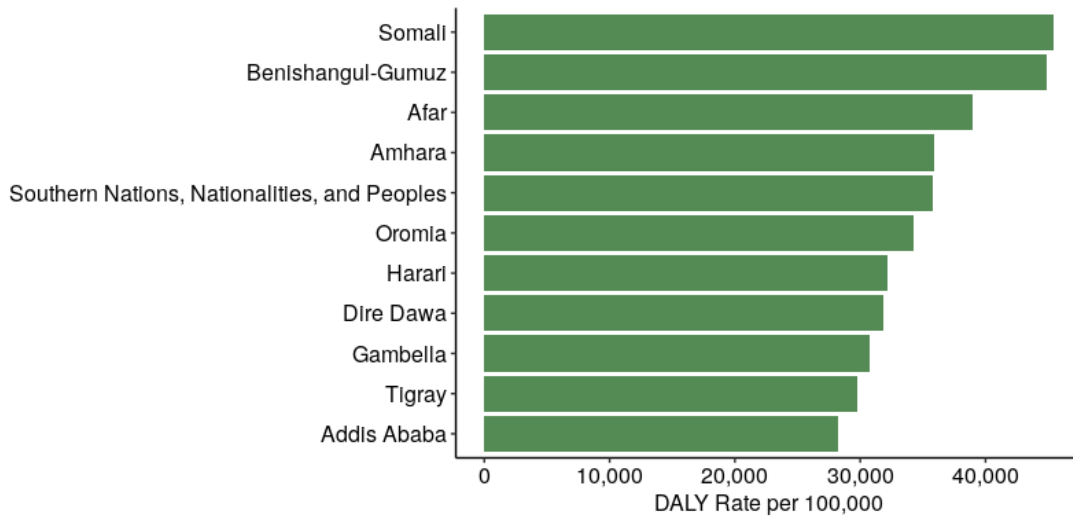
Figure 2.9: The burden of death by regions in Ethiopia, 2019



All-age and sex death counts show that *Oromia*, *Amhara* and *Southern Nations, Nationalities, and Peoples* regions have the highest number of deaths in the country.

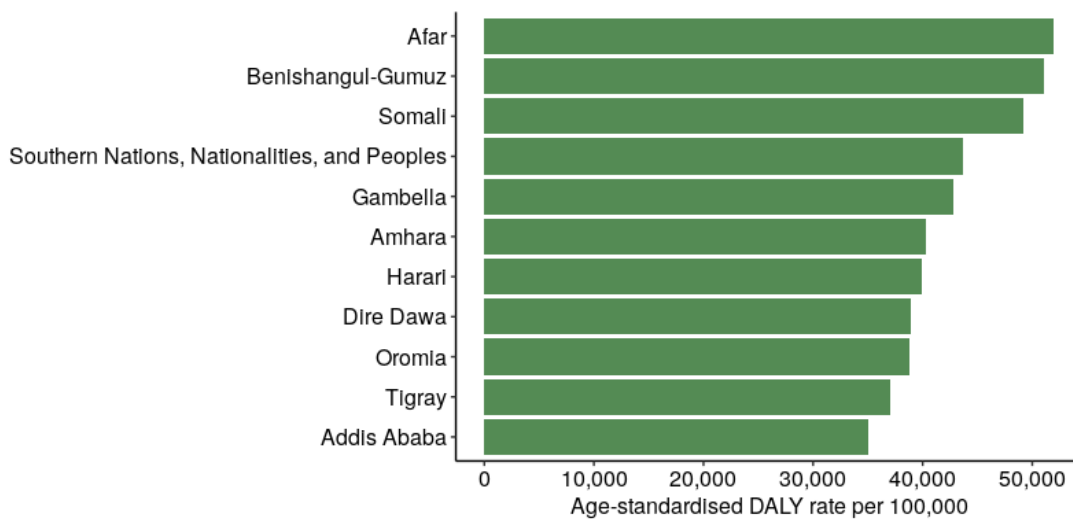
Southern Nations, Nationalities, and Peoples ranks **3** in the number of deaths estimated nationally.

Figure 2.10: The burden of DALYs by regions in Ethiopia, 2019, all ages



All-age and both sexes combined DALY rates per 100,000 individuals for all causes in Southern Nations, Nationalities, and Peoples show that *Somali*, *Benishangul-Gumuz* and *Afar* regions have the highest DALY rates. Southern Nations, Nationalities, and Peoples ranks **5** in DALY rates nationally.

Figure 2.11: The burden of age-standardised DALYs by regions in Ethiopia, 2019



The figure above illustrates Southern Nations, Nationalities, and Peoples show that *Afar*, *Benishangul-Gumuz* and *Somali* regions have the highest age-standardised DALY rates.

Southern Nations, Nationalities, and Peoples ranks **4** in age-standardised DALY rates nationally.

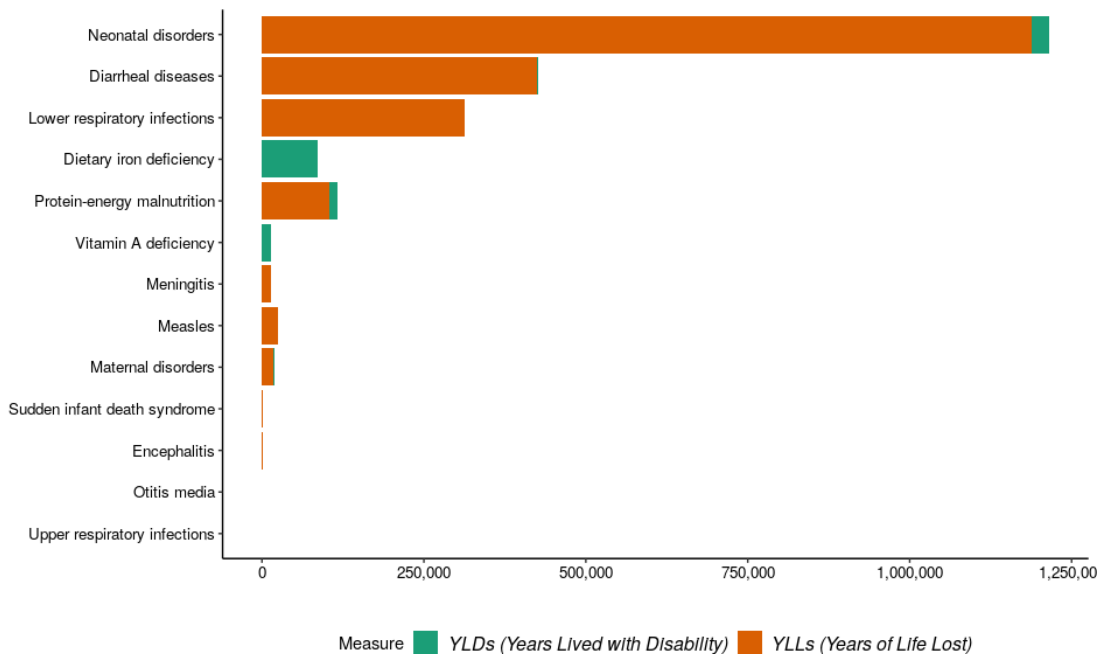
Chapter three: Attributable mortality and disability

Attributable risk (AR) is the portion of the outcome rate attributable to the exposure factor in an epidemiologic context. In the clinical context, it is the portion of the correct diagnosis rate attributable to a positive result or the portion of beneficial outcome rate attributable to a treatment. It allows us to quantify the added risk imposed by a factor that a particular population is exposed to and improves our understanding of public health by identifying the main drivers of poor health.

This chapter quantifies premature death and disability in terms of *DALYs*, *YLLs* and *YLDs* attributable to maternal and child malnutrition, high systolic blood pressure, and air pollution and poor diet in Southern Nations, Nationalities, and Peoples.

Child and maternal malnutrition

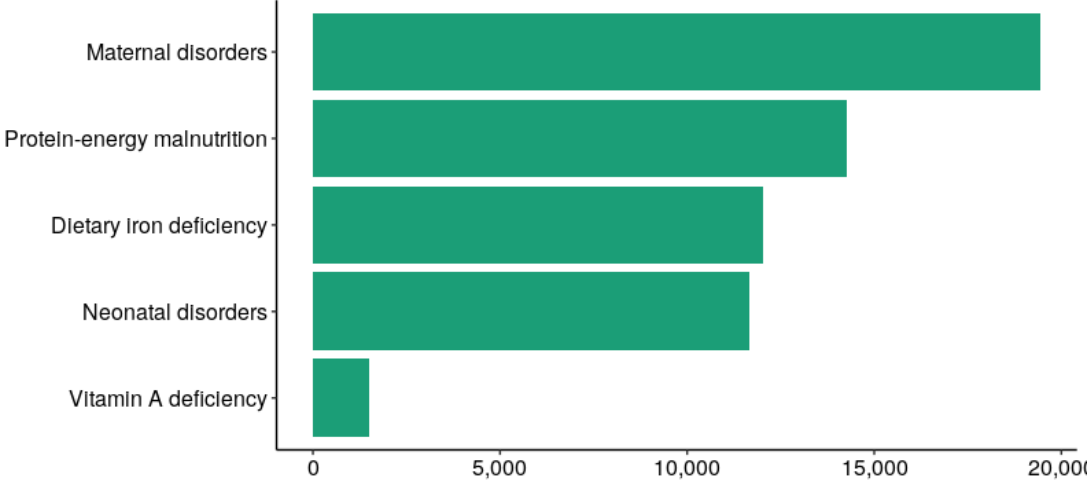
Figure 3.1: YLLs and YLDs attributable to child and maternal malnutrition in Southern Nations, Nationalities, and Peoples, both sexes, all ages, 2019



The chart shows the thirteen leading diseases attributable years of life lost (YLLs) and years lived with disability (YLDs) due to child and maternal malnutrition in Southern Nations, Nationalities, and Peoples both sexes, all ages, 2019. *Dietary iron deficiency*, *Neonatal disorders* and *Vitamin A deficiency* are the top three leading causes of YLDs due to child and maternal malnutrition in Southern Nations, Nationalities, and Peoples, whereas *Neonatal disorders*, *Diarrheal diseases* and *Lower respiratory infections* are the leading causes of YLLs due to child and maternal malnutrition in Southern Nations, Nationalities, and Peoples.

Estimated attributable disability-adjusted life-years (DALYs), deaths, YLDs and YLLs for risk factors of child and maternal malnutrition in Southern Nations, Nationalities, and Peoples are considerably high. About **27%** of total DALYs, **21%** of deaths, and **33%** of YLLs in Southern Nations, Nationalities, and Peoples are attributable to child and maternal malnutrition. Child and maternal malnutrition caused a total of 2,230,000 DALYs, 24,200 deaths, 2,090,000 YLLs and 146,000 YLDs.

Figure 3.2: DALYs attributable to child and maternal malnutrition in Southern Nations, Nationalities, and Peoples, both sexes, ages 15 to 64, 2019



Of the thirteen leading diseases with DALYs attributable to child and maternal malnutrition in Southern Nations, Nationalities, and Peoples for both sexes, ages 15 to 64 in 2019, *Maternal disorders*, *Protein-energy malnutrition*, *Dietary iron deficiency*, and *Neonatal disorders* are the leading causes.

DALYs attributable to child and maternal malnutrition bore a significant burden of death and disability in Southern Nations, Nationalities, and Peoples. The child and maternal malnutrition risk factors in GBD comprise low birth weight and short gestation, child growth failure, suboptimal breastfeeding, and micronutrient deficiencies. The *low birth weight and short gestation* category includes low birth weight for gestation and short gestation for birth weight. *Child growth failure* includes child stunting, child wasting, and child underweight. *Suboptimal breastfeeding* includes non-exclusive breastfeeding and discontinued breastfeeding, and *micronutrient deficiencies* include iron, vitamin A, and zinc deficiencies. Reducing child and maternal mortality and improving maternal and child health is a top priority of the Ethiopian health system.

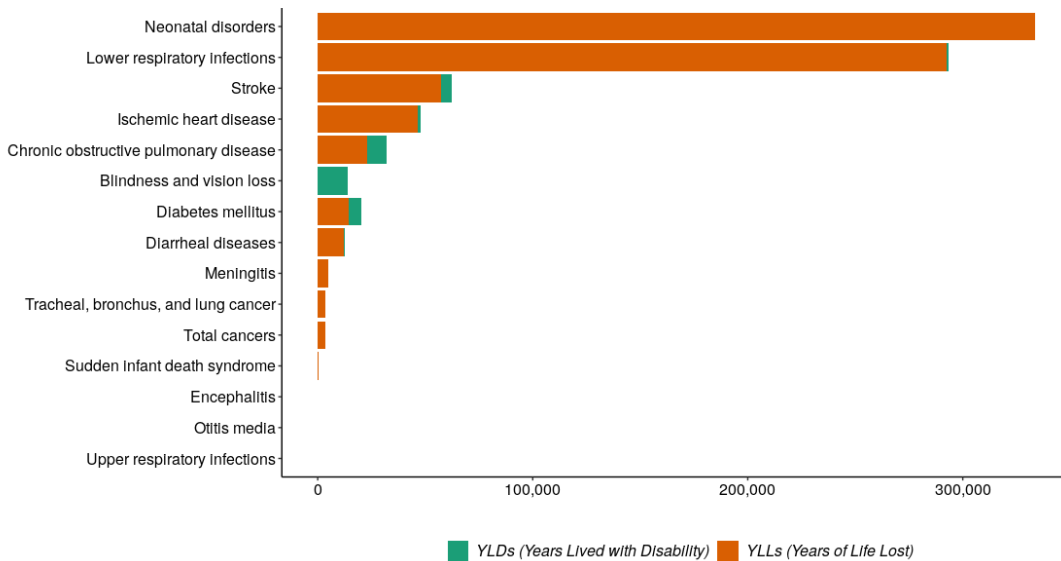
The present data indicates that majority of the causes of child death such as neonatal disorders, diarrheal diseases, lower respiratory infection are attributable to maternal and child malnutrition. About **27%** of all DALYs and **21%** deaths are attributable to child and maternal nutrition in Southern Nations, Nationalities, and Peoples.

Innovative nutritional intervention is needed to prevent stunting, promote proper growth of the mother from conception through infancy to adulthood, prevent adverse outcomes of pregnancy, and improve child survival [1, 2].

Air pollution

Estimated attributable DALYs, deaths, YLDs and YLLs for risk factors of air pollution in Southern Nations, Nationalities, and Peoples are very high. About **10%** of DALYs, **13%** of deaths, and **12%** of YLLs in Southern Nations, Nationalities, and Peoples are attributable to air pollution. Air pollution causes 826,000 DALYs, 14,700 deaths, 37,200 YLDs and 788,000 YLLs in Southern Nations, Nationalities, and Peoples.

Figure 3.3: YLLs and YLDs attributable to air pollution in Southern Nations, Nationalities, and Peoples, both sexes, all ages, 2019



Of the fourteen leading diseases with DALYs attributable to air pollution in Southern Nations, Nationalities, and Peoples for both sexes and all ages in 2019, *Neonatal disorders*, *Lower respiratory infections* and *Stroke* are the leading contributors to YLLs. In contrast, *Blindness and vision loss*, *Chronic obstructive pulmonary disease* and *Diabetes mellitus* lead in YLDs attributable to air pollution.

Air pollution mainly includes ambient particulate matter pollution and household air pollution [3-6]. Coal burning, industry emissions, construction activity, transport vehicles, waste burning, and diesel generators are the major sources of air pollution [3-5].

According to a study conducted by Sanbata et al, an estimated **95%** of the population in Ethiopia uses traditional biomass fuels, such as wood, dung, charcoal, or crop residues, to meet household energy needs [7]. In line with this, the Ethiopian Demographic and Health Survey revealed that only **8%** of rural households have electricity access in Ethiopia [8]. As a result of the harmful smoke emitted from the combustion of biomass fuels, indoor air pollution is responsible for more than 50,000 deaths annually and causes nearly 5% of the burden of disease in Ethiopia [7].

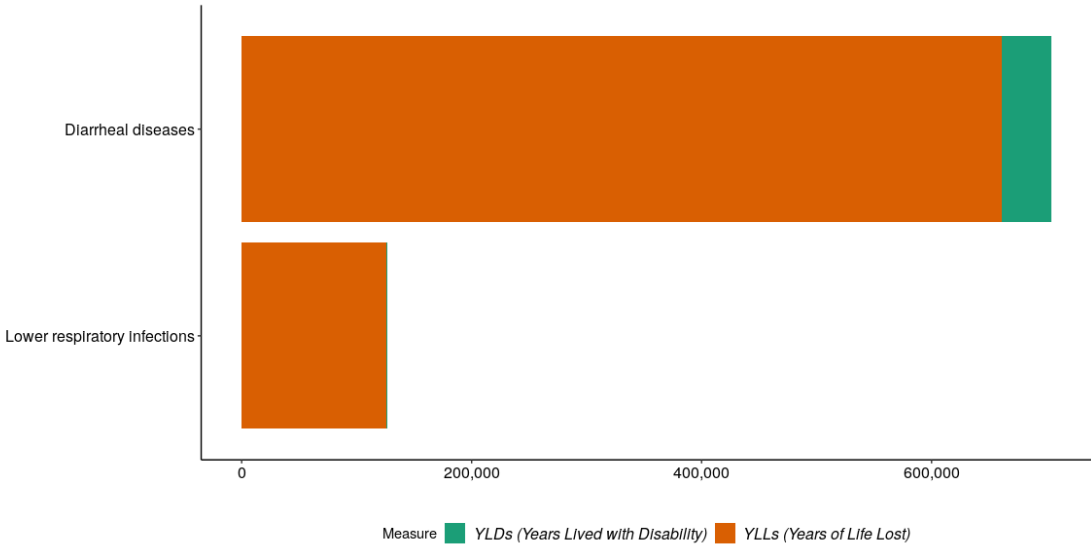
The present data reveals that **10%** of DALYs and **13%** of deaths from all causes are attributable to air pollution in Southern Nations, Nationalities, and Peoples. In Southern

Nations, Nationalities, and Peoples, substantial progress has been made to improve access to electricity, but thus far the majority of Southern Nations, Nationalities, and Peoples households use firewood or charcoal for household fuel.

Unsafe water, Sanitation and Handwashing

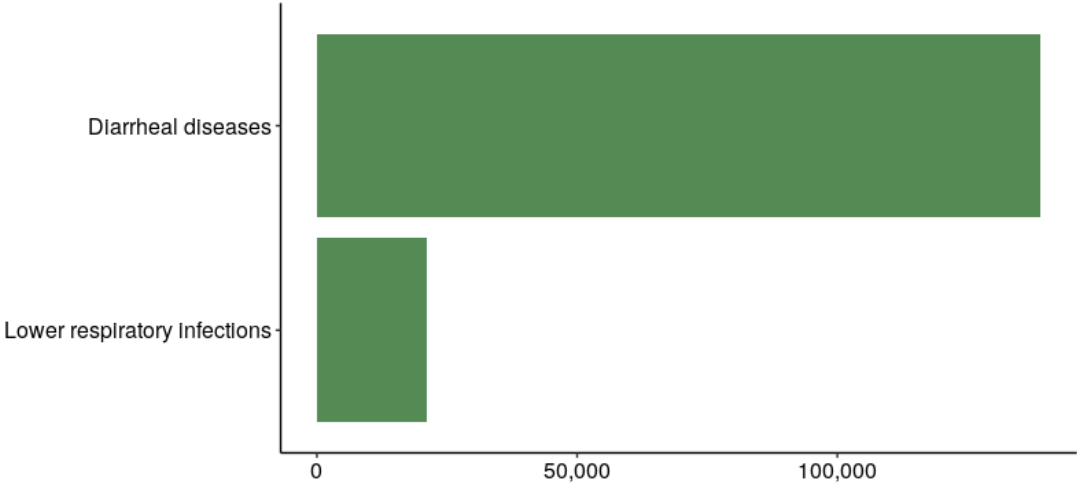
About **10%** of DALYs, **11%** of deaths, and **12%** of YLLs in Southern Nations, Nationalities, and Peoples are attributable to unsafe water, sanitation, and hand washing practice. Unsafe water, sanitation and poor handwashing practices cause about 3,760,000 DALYs, 59,700 deaths, 201,000 YLDs and 3,560,000 of YLLs in Southern Nations, Nationalities, and Peoples.

Figure 3.4: YLLs and YLDs attributable to unsafe water, sanitation, and handwashing in Southern Nations, Nationalities, and Peoples, both sexes, all ages, 2019



About 661,000 and 126,000 years of life lost attributable to unsafe water, sanitation, and handwashing are due to diarrheal diseases and lower respiratory infections, respectively.

Figure 3.5: DALYs attributable to unsafe water, sanitation, and handwashing in Southern Nations, Nationalities, and Peoples, both sexes, ages 15 to 64, 2019



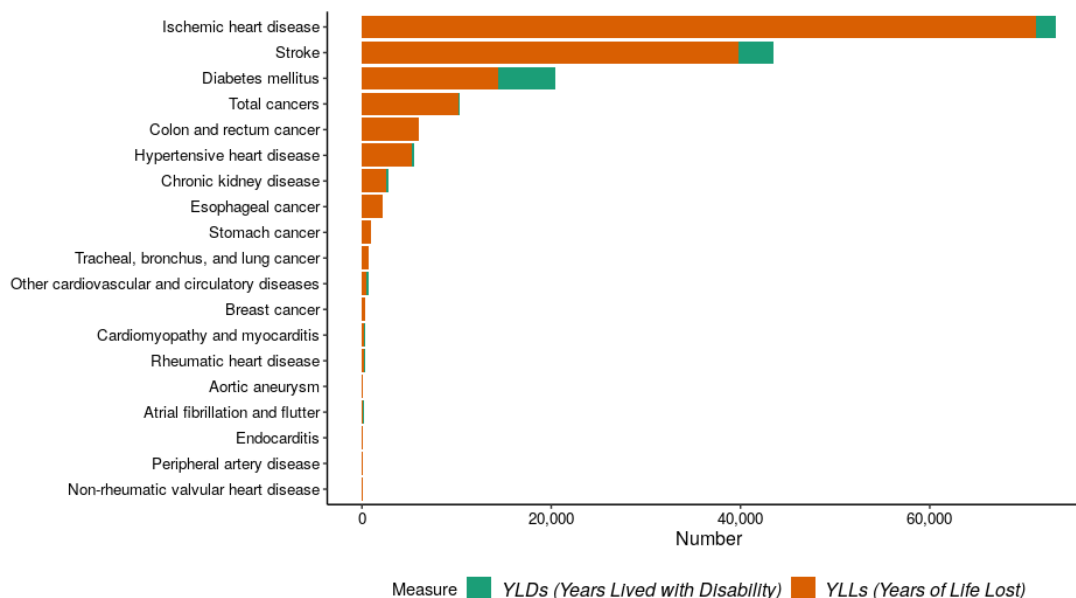
About 139,000 and 21,200 of DALYs attributable to unsafe water, sanitation, and handwashing are caused by diarrheal diseases and lower respiratory infections, respectively.

Every year notable deaths occur due to diarrheal and other infectious disease as result of inadequate water, sanitation, and hygiene; this disease burden can be reduced by increasing access to safe water and sanitation and promoting basic hygiene practices. The total burden from schistosomiasis, trachoma, ascariasis, trichuriasis and hookworm disease are highly attributable to unsafe WaSH. Unsafe WaSH is an important determinant in several additional diseases, such as malaria, yellow fever, filariasis, dengue, hepatitis A and hepatitis E, typhoid fever, and fluorosis.

A well-targeted and well-executed intervention to improve water or sanitation can reduce the prevalence of diarrheal disease by **75%**. The provision of clean water and soap enables and encourages people to wash their hands, reducing the likelihood of disease transmission. Safely managed sanitation can control flies and other insects that spread disease, and prevent contact with infectious organisms shed in faeces, such as helminth ova and diarrheagenic pathogens. An adequate and continuous supply of safe drinking-water on-premises can interrupt waterborne disease transmission. Collectively, these factors reduce rates of diarrhoea and malnutrition leading causes of death in poor countries.

Dietary Risk

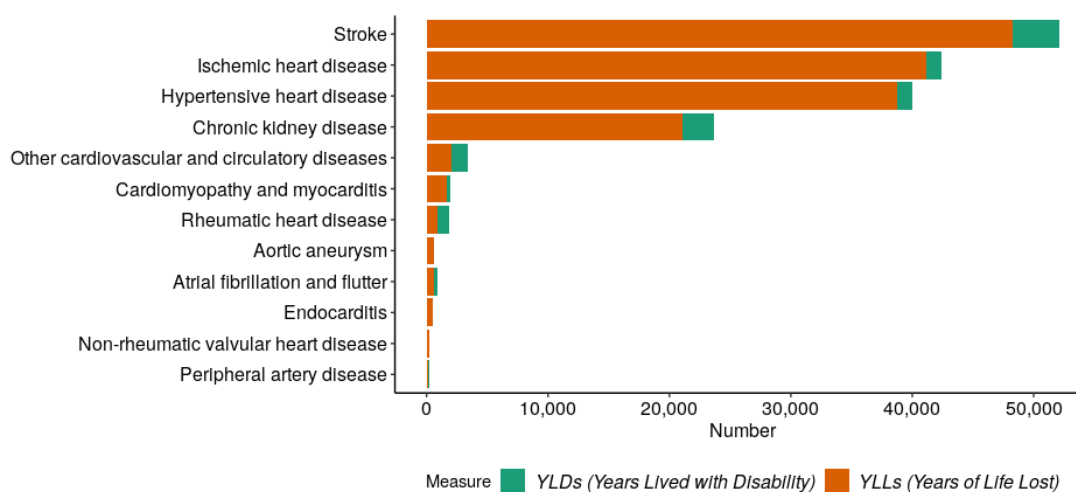
Figure 3.6: YLLs and YLDs attributable to dietary risks in Southern Nations, Nationalities, and Peoples, both sexes, all ages, 2019



Of the eighteen leading diseases with DALYs attributable to dietary risks in Southern Nations, Nationalities, and Peoples in 2019, *Ischemic heart disease*, *Stroke* and *Diabetes mellitus* are the top three causes.

High systolic blood pressure

Figure 3.8: YLLs and YLDs attributable to high systolic blood pressure in Southern Nations, Nationalities, and Peoples, both sexes, all ages, 2019

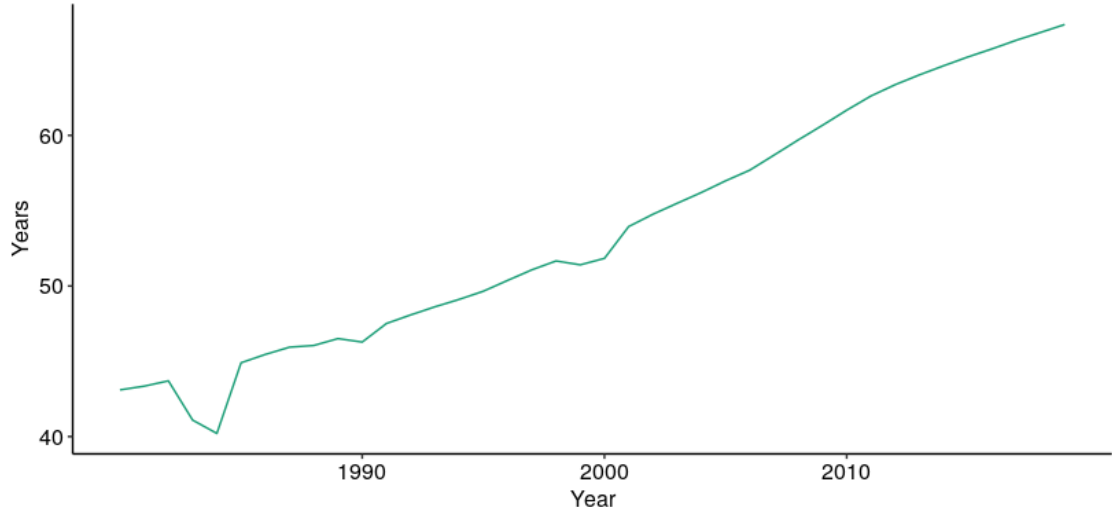


Of the twelve leading causes of YLLs and YLDs attributable to high systolic blood pressure in Southern Nations, Nationalities, and Peoples in 2019, *Stroke, Ischemic heart disease* and *Hypertensive heart disease* are the leading three causes.

Chapter four: Life expectancy

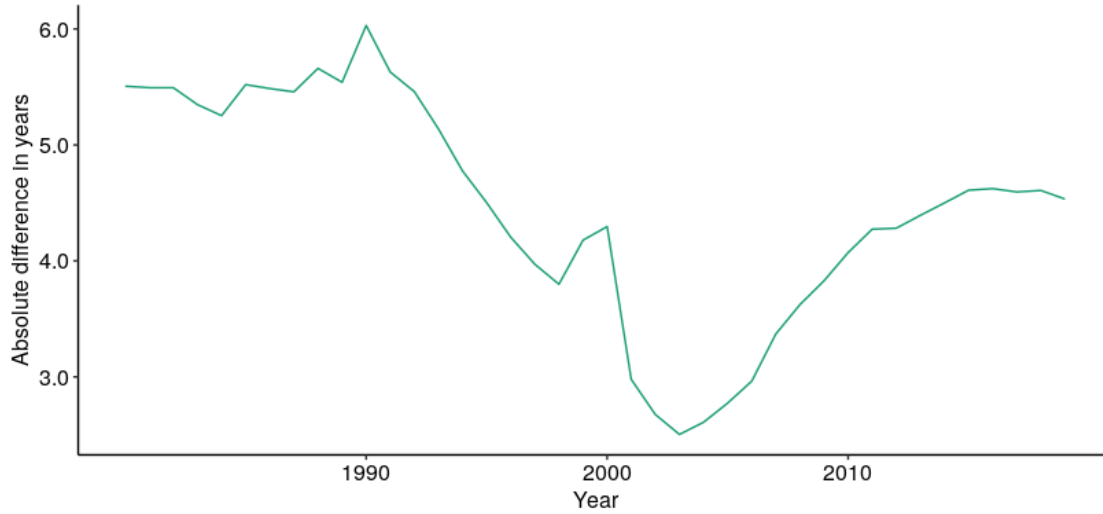
Life expectancy is a numerical measure of the median time a person is expected to live, based on their year of birth, current age, and other demographic factors including gender.

Figure 4.1: Life expectancy at birth in Southern Nations, Nationalities, and Peoples, 1980-2019



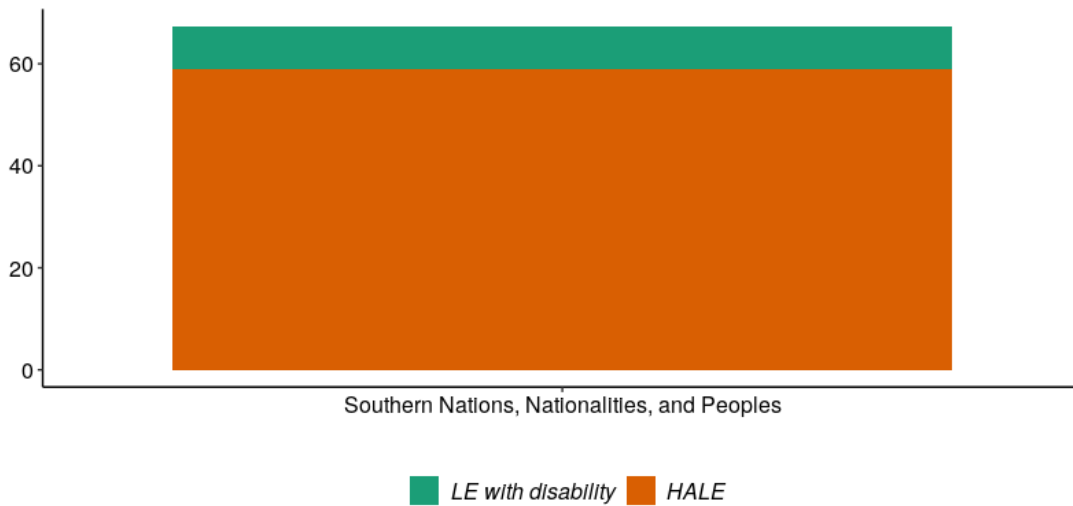
The life expectancy in Southern Nations, Nationalities, and Peoples is 67.363881 years. Through 1990 to 2019, life expectancy has changed by **46%** in Southern Nations, Nationalities, and Peoples. The lowest percentage change was recorded in *Somali* and *Addis Ababa* while the highest percentage change was in *Benishangul-Gumuz* and *Afar*.

Figure 4.2: Difference in life expectancy at birth 1980-2019, females-males



There is no single absolute difference in life expectancy at birth 1980-2019 between males and females in Southern Nations, Nationalities, and Peoples. Generally, women do better in Southern Nations, Nationalities, and Peoples.

Figure 4.3: Life expectancy in Southern Nations, Nationalities, and Peoples, 2019



Southern Nations, Nationalities, and Peoples region population will live, on average, **59** healthy years, with **8** years lived with disability.

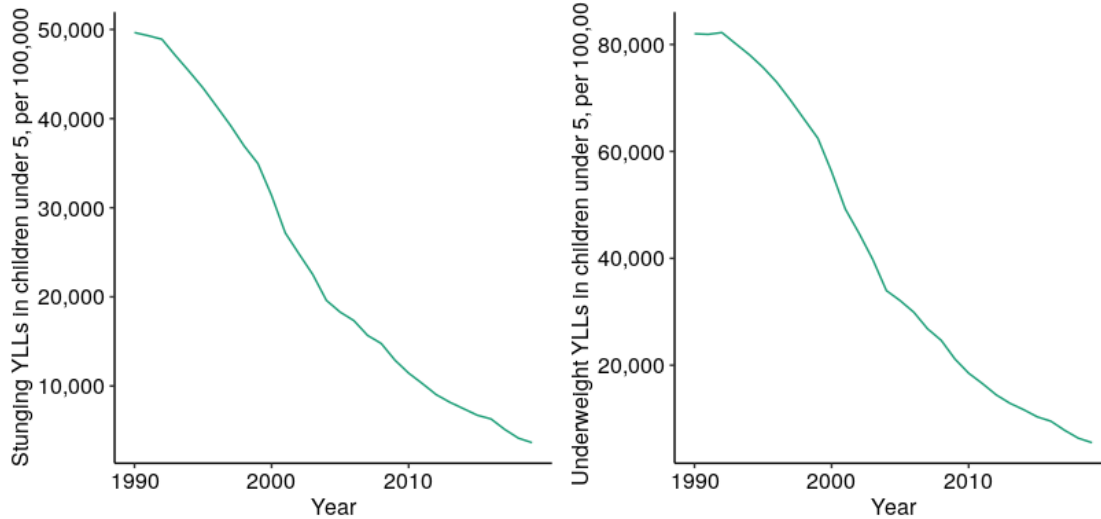
References

1. Victora, C.G., et al., Maternal and child undernutrition: consequences for adult health and human capital. *Lancet*, 2008. 371(9609): p. 340-57.
2. Nnam, N.M., Improving maternal nutrition for better pregnancy outcomes. *Proc Nutr Soc*, 2015. 74(4): p. 454-9.
3. Boogaard, H., K. Walker, and A.J. Cohen, Air pollution: the emergence of a major global health risk factor. *Int Health*, 2019. 11(6): p. 417-421.
4. Cissé, A.-M., et al., High level of treatment failure and drug resistance to first-line antiretroviral therapies among HIV-infected children receiving decentralized care in Senegal. *BMC pediatrics*, 2019. 19(1): p. 47-47.
5. Guan, W.J., et al., Impact of air pollution on the burden of chronic respiratory diseases in China: time for urgent action. *Lancet*, 2016. 388(10054): p. 1939-1951.
6. Rajagopalan, S., S.G. Al-Kindi, and R.D. Brook, Air Pollution and Cardiovascular Disease: JACC State-of-the-Art Review. *J Am Coll Cardiol*, 2018. 72(17): p. 2054-2070.
7. Sanbata, H., A. Asfaw, and A. Kumie, Indoor air pollution in slum neighbourhoods of Addis Ababa, Ethiopia. *Atmospheric Environment*, 2014. 89: p. 230-234.
8. CSA, E., Ethiopia Demographic and Health Survey: Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ICF international. 2019.

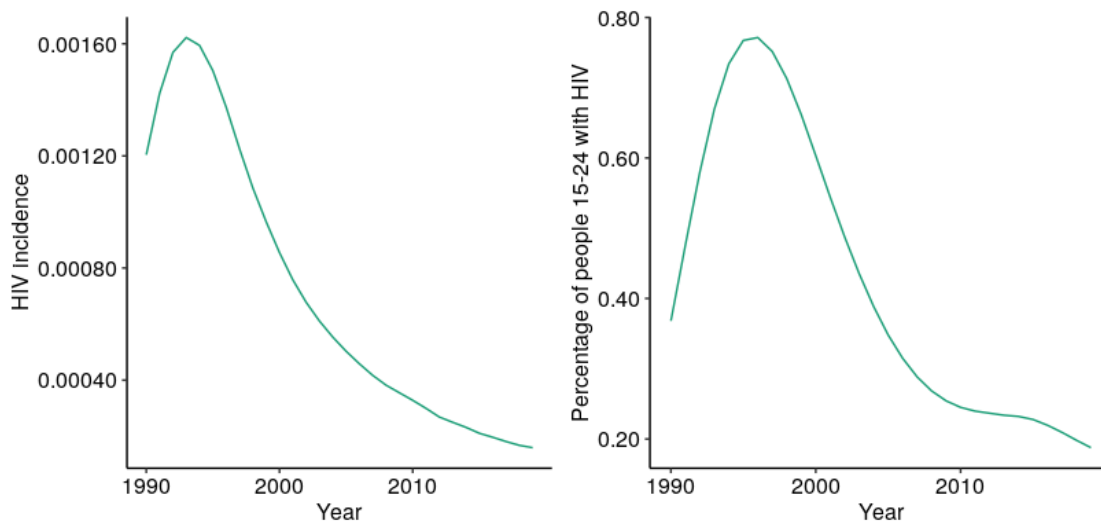
HSTP Indicator Annex

This annex contains information on Health Sector Transformation Plans for Southern Nations, Nationalities, and Peoples that can be assessed by the Global Burden of Disease (GBD) study. The full list of HSTP-II indicators can be found [here](#).

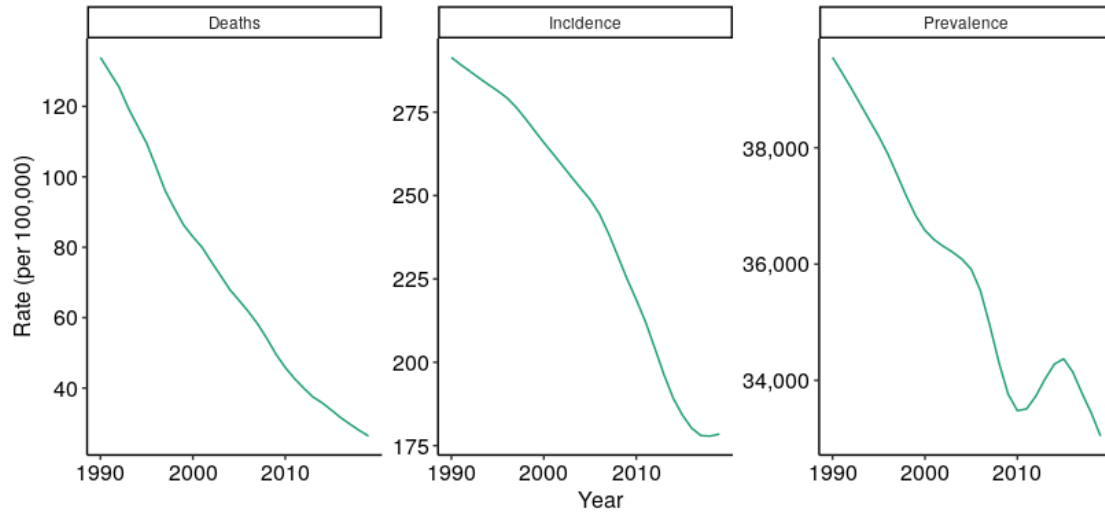
Stunting and Underweight YLLs in children aged less than 5 years, per 100,000



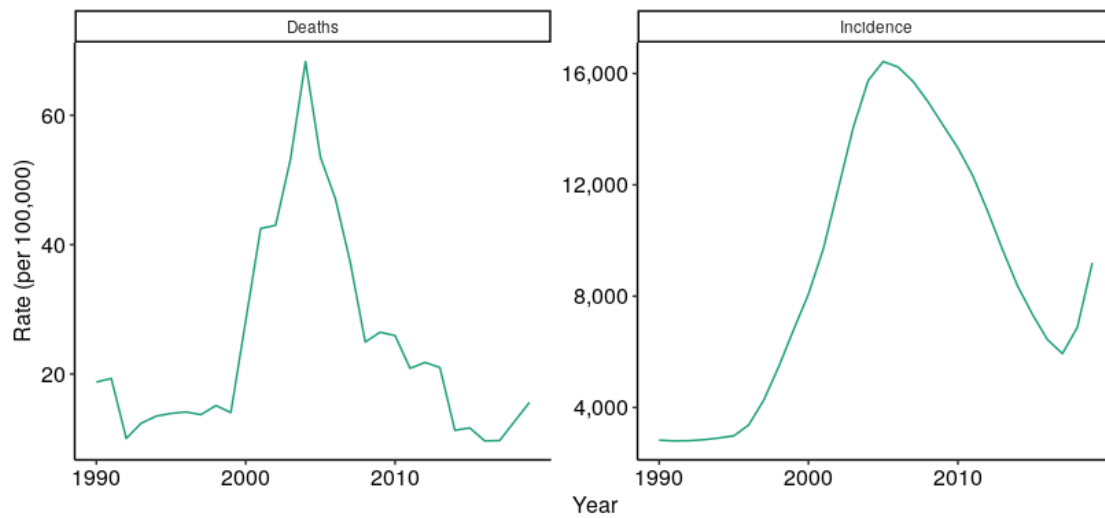
HIV incidence in Southern Nations, Nationalities, and Peoples and percentage of young people aged 15-24 who are living with HIV



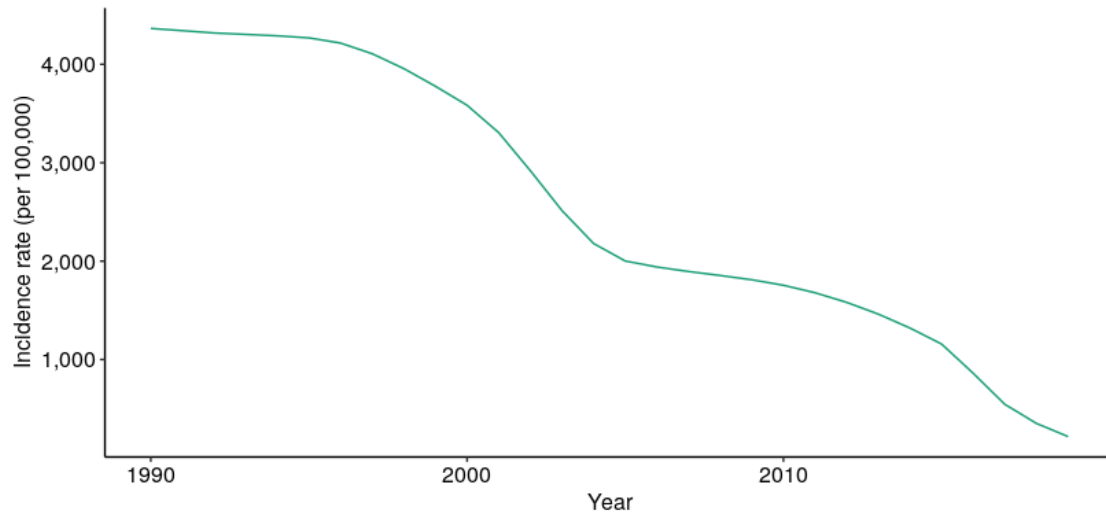
Tuberculosis prevalence, incidence, and mortality rate, per 100,000, all ages



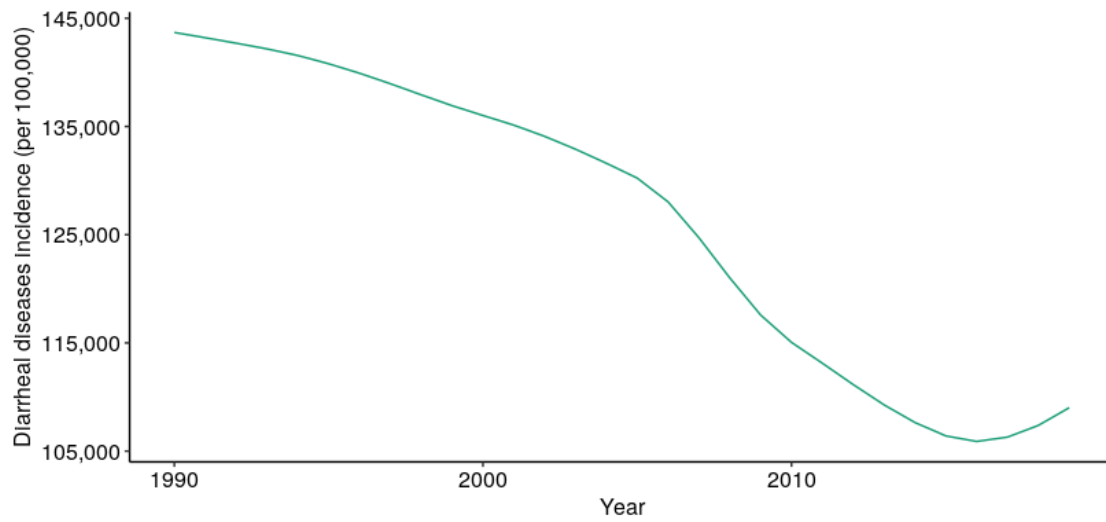
Malaria incidence and mortality per 100,000, all ages



Measles incidence



Diarrheal diseases incidence



Full table of key HSTP indicators

HSTP Indicator	GBD 2019 Estimate
Stunting YLLs in children aged less than 5 years per 100,000	3,638.37
Underweight YLLs in children aged less than 5 years per 100,000	5,509.58
HIV incidence, all ages, per 100,000	15.92
Percentage of young people aged 15-24 who are living with HIV	0.19
Tuberculosis prevalence rate (per 100,000 populations)	33,043.25
Tuberculosis incidence rate (per 100,000 populations)	178.47
Tuberculosis mortality rate (per 100,000 populations)	26.38
Malaria deaths (per 100,000)	15.62
Malaria incidence (per 100,000)	9,195.31
Measles incidence rate (per 100,000)	216.81
Diarrheal diseases incidence rate (per 100,000)	109,016.96
Neonatal sepsis incidence rate per 100,000	661.08
Neonatal encephalopathy incidence rate per 100,000	79.38
Viral hepatitis prevalence rate per 100,000	458.58
Prevalence of trachomatous trichiasis (TT) per 1,000	7.06
TF prevalence in 1-9 years old, %	0.00
Prevalence of schistosomiasis among children 5-14 years of age, %	0.00
Mortality rate due to all NCDs per 100,000	178.91
Diabetes prevalence rate (per 100,000)	1,262.61
Diabetes mortality rate (per 100,000)	10.87
Hypertensive heart disease prevalence rate (per 100,000)	65.45
Cancer incidence rate (per 100,000)	47.04
Cervical cancer incidence rate (per 100,000)	27.38

HSTP Indicator	GBD 2019 Estimate
Cancer mortality rate (per 100,000)	33.81
Depression prevalence rate (per 100,000)	3,153.35
Substance abuse prevalence rate (per 100,000)	2,186.15
Alcohol use disorders prevalence rate (per 100,000)	1,916.11
Bipolar disorder prevalence rate (per 100,000)	492.25
Epilepsy prevalence rate (per 100,000)	277.28
Cardiovascular disease mortality rate (per 100,000)	55.37
COPD mortality rate (per 100,000)	7.00
Tobacco DALY rate (per 100,000)	268.68
High alcohol consumption DALY rate (per 100,000)	974.04
Low physical activity DALY rate (per 100,000)	13.79
Low fruit consumption DALY rate (per 100,000)	187.22
Road accidents DALY rate (per 100,000)	627.22
Injury mortality rate (per 100,000)	51.29
Road traffic injury mortality rate (per 100,000)	9.63