

Portugal: The Nation's Health 1990-2016

An overview of the Global Burden of Disease Study
2016 Results



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This report was prepared by the Directorate General of Health (DGS) in collaboration with Portugal's Northern Region Health Administration/Public Health Department (ARS Norte), after the GBD 2016 results were released on September 14, 2017.

Estimates from the GBD study produced by the Institute for Health Metrics and Evaluation (IHME) may differ from national statistics due to differences in data sources and methodology. The estimates are available from <https://vizhub.healthdata.org/gbd-compare/>.

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DIREÇÃO-GERAL DA SAÚDE
Alameda D. Afonso Henriques, 45
1049-005 Lisboa
Portugal
Telephone: +351 218 430 500
Fax: +351 218 430 530/1
Email: geral@dgs.min-saude.pt
<http://www.dgs.pt>

INSTITUTE FOR HEALTH METRICS AND EVALUATION
2301 Fifth Avenue, Suite 600
Seattle, WA 98121
USA
Telephone: +1-206-897-2800
Fax: +1-206-897-2899
Email: engage@healthdata.org
www.healthdata.org

Cover photo: Porto, Portugal - April 16, 2017: Azulejo (earthenware tiles) tile paintings cover the entry hall of Sao Bento railway station (1864).

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An overview of the Global Burden of Disease Study 2016 Results

Direção-Geral da Saúde
Institute for Health Metrics and Evaluation

This report explores the progress Portugal has experienced over the last 26 years, in terms of health, well-being, and development, and the new challenges it faces as its population grows and ages. This report provides information about the diseases and injuries that prevent Portuguese from living long and healthy lives. It also sheds light on risk factors that contribute to poor health.

Finally, the report presents a country view with regard to the Sustainable Development Goals in 1990 and prospectively in 2030, and compares Portugal's health performance to that of peer countries.

Cover photo: Porto, Portugal - April 16, 2017: Azulejo (earthenware tiles) tile paintings cover the entry hall of Sao Bento railway station (1864).

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Contents

- 7 About the Directorate General of Health (DGS)
- 7 About IHME
- 8 Acknowledgments
- 9 Foreword
- 11 Preface
- 12 Acronyms
- 13 Glossary of terms
- 14 Report highlights
- 19 Findings
- 41 Comparing Portugal to its SDI group country peers
- 45 Conclusion
- 46 References
- 48 Methodological notes
- 51 Sustainable Development Goals: the framework
- 53 Annex: Health-related SDG indicators for Portugal, 2016 (GBD estimates)

Figures and Tables

- 19 **Figure 1:** Life expectancy among males and females, Portugal, 1990–2016
- 22 **Figure 2:** Proportion of mortality in people under 70 years old (%), Portugal, 1990–2016
- 23 **Figure 3:** Death rate in the under-5 and under-1 age groups, Portugal, 1990–2016
- 24 **Figure 4:** Change in country life expectancy at birth by broad cause group, both sexes, 1990–2016
- 25 **Figure 5:** Leading causes of early death (YLLs) and percent change, both sexes, Portugal, 1990–2016
- 26 **Figure 6:** Percentage breakdown of total early deaths (YLLs) by age group, both sexes, Portugal, 2016
- 27 **Figure 7:** Distribution of total YLDs by cause of disability (%), both sexes, Portugal, 2016
- 28 **Figure 8:** Leading causes of disability (YLDs) and percent change, both sexes, Portugal, 1990–2016
- 30 **Figure 9:** Distribution of total DALYs by cause of disease burden (%), both sexes, Portugal, 2016
- 31 **Figure 10:** Leading causes of disease burden (DALYs) and percent change, both sexes, Portugal, 1990–2016
- 32 **Figure 11:** Percentage breakdown of total disease burden (DALYs) by age group, both sexes, Portugal, 2016
- 33 **Figure 12:** Leading risk factors contributing to early death (YLLs) and percent change, both sexes, Portugal, 1990–2016
- 35 **Figure 13:** Top risk factors for early death (YLLs) by cause, males and females, Portugal, 2016
- 37 **Figure 14:** Sustainable Development Goals: index values for 37 health-related SDG indicators, Portugal, 1990 and 2016
- 42 **Figure 15:** Leading causes of early death (YLLs) in Portugal and comparison countries, 2016
- 43 **Figure 16:** Leading causes of disease burden (DALYs) in Portugal and comparison countries, 2016
- 44 **Figure 17:** Leading risk factors contributing to early death (YLLs) in Portugal and comparison countries, 2016
- 20 **Table 1:** Life expectancy and HALE among males and females, Portugal, 1990–2016
- 21 **Table 2:** Top 35 (of 195) countries and territories with the highest life expectancy and healthy life expectancy in the world, 2016
- 53 **Annex:** Health-related SDG indicators for Portugal, 2016 (GBD estimates)

About the Directorate General of Health (DGS)

Mission

To regulate, guide, and coordinate activities to promote health and disease prevention, define the technical conditions for providing adequate health care, plan and program the national policy for quality in the health system, ensure the development and implementation of the National Health Plan, and also coordinate the international relations of the Ministry of Health.

Its main objective is to contribute to the healthy future of the Portuguese population. Its motto is “Better Information, More Health.”

Vision and values

DGS – operating through intersectoral action in a demanding political, economic, social, and environmental context, amid continuous innovation and demographic transition – considers the determinants that influence the individual, family, and collective health and emphasizes the dissemination of better information and technical knowledge in an accessible and transparent way.

DGS’s vision is to protect and improve the health and well-being of people living in Portugal, ensuring that through quality, safety, and the reduction of disparities in health, all can reach their health potential.

Its values are:

- **Universality and Equity in Access to Health** – Different economic, social, family, citizenship, religion, gender, sexual orientation, or other factors cannot restrict access to health care in Portugal.
- **Scientific Rigor and Ethical Decisions in Health** – Health decisions are made based on the best existing knowledge in scientific terms and application of knowledge, and free of any interest other than the public service in health.
- **Professionalism, Flexibility, and Collaboration** – Rigor and competence of professionals, adaptability and spirit of sharing and cooperation with all stakeholders in the health system.
- **Transparency and Accountability** – Accountability and explanation of the activities of DGS, proactively and openly.

About IHME

The Institute for Health Metrics and Evaluation (IHME) is an independent global health research center at the University of Washington focused on expanding the quantitative evidence base for health. IHME aims to provide policymakers, donors, and researchers with the highest-quality quantitative data to make decisions that achieve better health.

For more information, please visit <http://www.healthdata.org>.

Acknowledgments

Findings in this report came from the Global Burden of Disease (GBD) study coordinated by IHME, a multi-partner research enterprise from which comprehensive and comparable annual estimates of disease burden by country, age, and sex are produced for more than 330 causes of disease and injury and 84 risk factors. IHME is the coordinating center for more than 3,000 GBD experts from more than 135 countries and territories at the time of preparing this report. Data are from papers published in *The Lancet* that are part of the GBD 2016 update.

At DGS, Francisco George, Paulo Nogueira, and Carla Sofia Farinha (the National Focal Point) provided leadership in overseeing the creation of this report. At IHME, William Heisel and Meghan Mooney provided strategic guidance for launching the project. The analyses, writing, and production of this report were executed by the following team: Paulo Nogueira, Carla Sofia Farinha, Isabel Alves, Ana Paula Soares (at DGS) and Maria Neto, Manuela Mendonça Felício, Vasco Machado, Graça Lima, Luís Sousa, Rita Sá Machado and Carolina Teixeira (at ARS Norte/DSP). Joan Williams provided overarching production support and content review. Adrienne Chew edited the report, and Michelle Subart fact-checked it. Michaela Loeffler served as the report's graphic designer.

Foreword

On February 16, 2017, we signed a Memorandum of Understanding (MoU) with IHME to improve national-level Global Burden of Disease (GBD) estimates and, over time, develop local-level estimates. This momentous event took place at the V National Congress of Public Health, where the President of our Republic, Marcelo Rebelo de Sousa, declared, “We have a challenge to advance knowledge, to improve information, and to raise a spirit of cooperation so that people may have the same vision and goal despite their backgrounds or political beliefs: to improve the health of our communities.”

This partnership is important because it allows us to improve the health information going into our policy and planning, improve our health systems, and ultimately improve the health of our people.

The problem isn't having too much data, as one can never have too much data. The challenge is how to integrate all of the data. The great advantage of the “GBD approach” to health statistics is that it combines the largest catalog of health data in the worldⁱ with tailored methodology for data management, statistical analysis, and presentation to produce a comprehensive overview of mortality and health loss for a detailed list of diseases, injuries, and risk factors. This report gives an overview of these results for Portugal covering the period 1990–2016.

Using the Global Burden of Diseases, Injuries, and Risk Factors Study 2016, we drew from two widely used summary measures to monitor such changes in population health, namely disability-adjusted life years (DALYs) and healthy life expectancy (HALE). We used these measures to track trends and benchmark progress compared with expected trends based on the Socio-demographic Index (SDI).

Within the goals of the Memorandum, the nationwide collaboration is an important aim, as is the production of scientific papers and reports on the national-level burden of disease.

It is important for us to identify the country's most pressing health challenges through better measurement. IHME says that Portugal is on the verge of becoming another country that has successfully used GBD evidence to begin to improve the health of its population.

The partnership between DGS and IHME is a great example built on a shared vision: to help all people to live long and healthy lives. In comparison to some high-income countries,ⁱⁱ Portugal had the lowest life expectancy in 1990. Twenty-six years later, life expectancy for Portuguese people resembles the high-income countries' average, mainly because of a reduction in premature deaths related to cardiovascular diseases and transport injuries. During this period, there was a significant improvement in disease burden related to road injuries, stroke, and ischemic heart disease. On the other hand, Alzheimer's disease, lung cancer, colorectal cancer, sense organ diseases, low back and neck pain, and diabetes increased.

The data and analyses that come from the GBD study are relevant to the Directorate General of Health, the Portuguese health system, scientific communities, and the people living in Portugal. This is in line with the National Health Plan goals.

Going forward, the Directorate General of Health and IHME will continue to study disease burden together, possibly extending to the local level in the future, in collaboration with the Regional Health Administrations. This analysis will shed light on health disparities across communities as well as the top diseases, injuries, and risk factors that are driving these disparities. Here we want to address and be increasingly responsive to the specific needs of local communities.

Graça Freitas

Director General of Health

Lisbon, 23 October 2017

ⁱThe GHDx (IHME's data library).

ⁱⁱEU and some OECD countries.

Preface

In early 2017, the government of Portugal made a national commitment to joining the Global Burden of Disease (GBD) enterprise and using the findings from that work to improve the health of the people who live in that storied country.

The report here is a testament to the drive of our Portuguese collaborators and their willingness to put their words into action. This work provides comprehensive, comparable data on both fatal and disabling diseases and injuries. It allows for comparisons by condition and over time to identify successes and challenges. These estimates will help Portugal pinpoint the most pressing health issues and allocate resources accordingly.

Like most higher-income countries, Portugal has undergone a demographic and epidemiologic transition over the past three decades. Its population is now older on average and experiences more nonfatal but disabling health conditions. The country's national health plan aims, by 2020, to increase healthy life expectancy, reduce exposure to tobacco smoke, control childhood obesity, and reduce mortality among people under 70, all important efforts. The results of this study will help the country most effectively address health disparities, prioritize interventions, and fine-tune its health care systems to best meet its people's needs.

Christopher J.L. Murray

Director, IHME

Acronyms

ARS	Norte Northern Region Health Administration
COPD	Chronic obstructive pulmonary disease
DALYs	Disability-adjusted life years
DGS	General-Directorate of Health
EU	European Union
EU-SILC	European Union statistics on income and living conditions
GBD	Global Burden of Disease
HALE	Healthy life expectancy
IHME	Institute for Health Metrics and Evaluation
NCD	Non-communicable diseases
NHP	National Health Plan
OECD	Organisation for Economic Co-operation and Development
SDG	Sustainable Development Goals
SDI	Socio-demographic Index
UHC	Universal health coverage
YLDs	Years lived with disability
YLLs	Years of life lost

Glossary of terms

Disability-adjusted life years (DALYs)

Years of healthy life lost to premature death and suffering. DALYs are the sum of years of life lost and years lived with disability.

Expected value

The predicted indicator value based on the country's per capita income, educational attainment, and total fertility rate.

Healthy life expectancy (HALE)

The number of years that a person at a given age can expect to live in good health, taking into account mortality and disability.

Observed value

The actual indicator value for the country.

Risk factors

Potentially modifiable causes of disease and injury.

Socio-demographic Index (SDI)

A summary measure of a geography's sociodemographic development. It is based on average income per person, educational attainment, and total fertility rate (TFR). SDI contains an interpretable scale: zero represents the lowest income per capita, lowest educational attainment, and highest TFR observed across all GBD geographies; one represents the highest income per capita, highest educational attainment, and lowest TFR. Depending on their SDI, countries are classified as high, high-middle, middle, low-middle, or low SDI.

Years of life lost (YLLs)

Years of life lost due to premature mortality.

Years lived with disability (YLDs)

Years lived in less than ideal health. This includes conditions that may last for only a few days, as well as conditions that can last a lifetime.

Report highlights

Portuguese are living longer lives

- Life expectancy for Portuguese men and women continues to rise. Between 1990 and 2016, life expectancy increased by 7.1 years for males and 6.1 years for females. Accordingly, the gap between male and female life expectancy narrowed.
- Based on its Socio-demographic Index (SDI – established on a composite average of the ranking of income per capita, average educational attainment, and fertility rate), Portugal has a higher observed life expectancy than expected.
- On average, Portuguese women born in 2016 will live 72.3 years in good health. For Portuguese men, healthy life expectancy reaches 68.7 years.

Progress and challenges

- The number of years of life lost (YLLs)ⁱⁱⁱ in Portugal decreased 22.3% between 1990 and 2016. This favorable trend was mainly supported by decreases in early deaths due to neonatal disorders (decreased 84.6%), transport injuries (decreased 73.2%), and a group of other non-communicable diseases (decreased 72.7%).
- Attention must be paid to the increasing trend of years of life lost due to diabetes, urogenital, blood, and endocrine diseases (increased 24.0%) and, above all, neurological disorders (increased 74.1%).
- The leading causes of years lived with disability (YLDs) in Portugal are non-communicable diseases, mainly musculoskeletal disorders and mental and substance use disorders, but also other non-communicable diseases (like sense organ disorders and skin and subcutaneous diseases), neurological disorders, and diabetes, urogenital, blood, and endocrine diseases.
- Disability-adjusted life years (DALYs) are used to describe the disease burden. This metric takes into account early deaths and disability. Again, the non-communicable disease group largely surpasses the relative importance of the other major groups, namely injuries and communicable, maternal, neonatal, and nutritional diseases, in terms of health loss among the Portuguese population.

- Cancers and cardiovascular diseases are, as expected, the main causes of disease burden. Musculoskeletal disorders and mental and substance use disorders, although not major killers, are also important causes of health loss.

Preventing death and suffering

- Risk factors are potentially modifiable causes of health loss. The main risk factors for early deaths in Portugal in 2016 were alcohol and drug use (with a fundamental contribution from alcohol consumption), poor diet, high systolic blood pressure, tobacco consumption, and high body mass index, which encompasses obesity and overweight. In the period 1990–2016, most of the top risk factors registered decreasing trends in Portugal, particularly alcohol and drug use (with a fundamental contribution from alcohol use), dietary risks, and high systolic blood pressure.

Sustainable Development Goals (SDGs): country view

- In 2015 the United Nations established the Sustainable Development Goals (SDGs), which specify 17 universal goals, 169 targets, and 232 indicators leading up to 2030. The GBD 2016 study provides estimates for 37 health-related SDG indicators, and these indicators were used to construct the health-related SDG index, a summary measure of overall performance across the health-related SDGs. Portugal's SDG index value is increasing, although its projected value for 2030 is below 100 (best performance).
- Concerning the set of 37 health-related SDG indicators, Portugal's best performance is related to prevalence rates of stunting and wasting in children under 5; proportion of births attended by skilled health personnel; malaria incidence; prevalence of neglected tropical diseases; universal access to safe water, safe sanitation, and handwashing facilities; prevalence of household air pollution; and deaths due to conflict and terrorism.

- Attention must be paid to the following issues, identified by poor performance on health-related SDG indicators for Portugal: prevalence of overweight in children aged 2-4 years, incidence of HIV infection, deaths due to self-harm, and prevalence rates of alcohol consumption, daily smoking, and childhood sexual abuse.

Comparing Portugal to its peers

- When compared with its peer countries for premature mortality, Portugal is significantly better than the mean of the high-middle-SDI group for ischemic heart disease, stroke, lung cancer, lower respiratory infections, chronic obstructive pulmonary disease, road injuries, and chronic kidney disease, and is significantly worse for colorectal cancer, breast cancer, and alcohol-related liver disease.
- As far as the total burden of disease is concerned, Portugal is significantly better than the mean of the high-middle SDI group for ischemic heart disease, stroke, sense organ disease, diabetes mellitus, lung cancer, chronic obstructive pulmonary disease, lower respiratory infections, road injuries, and falls; it is significantly worse for low back and neck pain, depressive disorders, migraine, skin diseases, and colorectal cancer.
- Regarding the leading risk factors for premature death and compared to the mean of the high-middle-SDI group, Portugal is significantly better for dietary risks, high blood pressure, tobacco use, high body mass index, high fasting plasma glucose, high total cholesterol, impaired kidney function, air pollution, occupational risks, low physical activity, low bone mineral density, and child and maternal malnutrition. Portugal is significantly worse for unsafe sex.

ⁱⁱⁱIn the context of the GBD studies, premature deaths are considered to be those occurring before an individual reaches the highest observed value in the world for life expectancy in their age group.

Principais Destaques

Os portugueses vivem mais tempo

- A esperança de vida dos portugueses continua a aumentar. Entre 1990 e 2016, a esperança de vida aumentou 7,1 anos para os homens e 6,1 anos para as mulheres diminuindo, assim, a diferença entre sexos.
- Portugal tem uma esperança de vida superior à esperada, considerando o seu Índice Sociodemográfico (SDI – média composta do *ranking* do rendimento *per capita*, nível educacional médio e taxa de fecundidade).
- Em média, as mulheres portuguesas nascidas em 2016 viverão 72,3 anos em boa saúde. Para os homens portugueses a esperança de vida saudável atinge 68,7 anos.

Progressos e desafios

- A mortalidade prematuraⁱⁱⁱ (medida por anos de vida perdidos - YLLs) diminuiu 22,3% em Portugal, no período entre 1990 e 2016. Esta tendência favorável é, sobretudo, devidaa decréscimo das mortes prematuras por afeções no período neonatal (decrécimo de 84,6%), acidentes de transporte (decrécimo de 73,2%) e um grupo de outras doenças não transmissíveis (decrécimo de 72,7%).
- Especial atenção deve ser dada à tendência crescente dos anos de vida perdidos por diabetes, doenças do aparelho génito-urinário, doenças do sangue e doenças endócrinas (aumento de 24,0%) e, acima de tudo, por perturbações neurológicas (aumento de 74,1%).
- As principais causas de anos vividos com incapacidade (YLDs) em Portugal são as doenças não transmissíveis, principalmente, as perturbações músculo-esqueléticas, as perturbações mentais e as associadas ao consumo de substâncias, bem como outras doenças não transmissíveis (como perturbações dos órgãos dos sentidos e as doenças da pele e do tecido subcutâneo), as perturbações neurológicas, a diabetes, as doenças do aparelho génito-urinário, e do sangue, e as doenças endócrinas.
- Os anos de vida ajustados à incapacidade (DALYs) são usados para descrever a carga da doença. Esta métrica leva em conta as mortes prematuras e a incapacidade. De novo, em termos da perda de

saúde da população portuguesa, o grande grupo das doenças não transmissíveis ultrapassa largamente a importância relativa dos outros grandes grupos de causas, nomeadamente, as lesões e as doenças transmissíveis, maternas, neonatais e nutricionais.

- As neoplasias e as doenças cardiovasculares são, como esperado, as principais causas de carga da doença. As perturbações músculo-esqueléticas, as perturbações mentais e as associadas ao consumo de substâncias, apesar de não serem grandes causas de morte, também são causas importantes de perda de saúde dos portugueses.

Prevenindo morte e sofrimento

- Os fatores de risco são causas potencialmente modificáveis de perda de saúde. Os principais fatores de risco para a mortalidade prematura em Portugal em 2016 são o consumo de álcool e drogas (fundamentalmente à custa do consumo de álcool), a dieta inadequada, a pressão arterial elevada, o consumo de tabaco e o índice de massa corporal elevado, que engloba a pré-obesidade e a obesidade. No período 1990-2016, a maioria dos principais fatores de risco apresentou tendências decrescentes em Portugal. Em particular, o consumo de álcool e drogas, a dieta inadequada e a pressão arterial elevada.

Objetivos de Desenvolvimento Sustentável (SDG): uma perspectiva nacional

- Em 2015 as Nações Unidas estabeleceram os Objetivos de Desenvolvimento Sustentável (SDG), que especificam 17 objetivos universais, 169 metas e 232 indicadores a atingir até 2030. O estudo GBD 2016 produziu estimativas para os 37 indicadores SDG relacionados com a saúde. Estes indicadores foram utilizados para o cálculo do índice SDG relacionado com a saúde, uma medida síntese do desempenho global de cada país relativamente aos SDG relacionados com a saúde. Para Portugal a evolução dos valores anuais deste índice tem sido crescente e, portanto, positiva, apesar do valor projetado para o ano 2030 se encontrar abaixo de 100 (o melhor desempenho).

- No conjunto dos 37 indicadores SDG relacionados com a saúde, os melhores resultados em Portugal encontram-se relacionados com a prevalência de malnutrição crónica e aguda nas crianças abaixo dos 5 anos, a proporção de nascimentos assistidos por profissionais de saúde habilitados, a incidência de malária, a prevalência de doenças tropicais negligenciadas, o acesso universal a sistemas públicos de abastecimento de água e saneamento e a lavabos, a prevalência de poluição do ar interior e, ainda, às mortes por conflitos e terrorismo.
- Deve ser dada especial atenção aos aspetos relacionados com os piores resultados alcançados por Portugal no conjunto dos 37 indicadores: a prevalência de excesso de peso em crianças dos 2 aos 4 anos, a incidência da infeção por VIH, as mortes por lesões autoprovocadas e as prevalências de consumo de álcool, consumo diário de tabaco e abuso sexual de crianças.

Comparando Portugal com os seus pares

- A mortalidade prematura em Portugal é significativamente inferior à média dos seus pares (grupo de países de alto-médio SDI, no qual Portugal se encontra incluído) para a doença isquémica cardíaca, doença cerebrovascular, cancro do pulmão, infeções das vias respiratórias inferiores, doença pulmonar obstrutiva crónica, acidentes de transporte e doença crónica dos rins, e significativamente pior para o cancro colorretal, cancro da mama e as doenças hepáticas associadas ao álcool.
- No que respeita à carga global da doença, Portugal encontra-se significativamente melhor do que a média dos seus pares (países de elevado-médio rendimento) para a doença isquémica cardíaca, doença cerebrovascular, doenças dos órgãos dos sentidos, diabetes, cancro do pulmão, doença pulmonar obstrutiva crónica, infeções respiratórias inferiores, acidentes de transporte e quedas; encontra-se significativamente pior em relação às dores lombares (lombalgias) e do pescoço, perturbações depressivas, enxaqueca, doenças da pele e cancro colorretal.

- Quanto aos principais fatores de risco para a morte prematura e comparando com a média do grupo de países de médio-elevado SDI, Portugal encontra-se significativamente melhor para os seguintes fatores de risco: dieta inadequada, hipertensão arterial, consumo de tabaco, índice de massa corporal elevado, glicemia em jejum aumentada, colesterol total elevado, alteração da função renal, poluição do ar, riscos ocupacionais, baixa atividade física, densidade mineral óssea baixa e nutrição materna e infantil inadequada. Portugal encontra-se significativamente pior em relação ao sexo não seguro.

ⁱⁱⁱNo contexto dos estudos GBD, consideram-se mortes prematuras as que ocorrem antes do indivíduo atingir o valor mais elevado observado no mundo para a esperança de vida no seu grupo etário.

Findings

Portuguese are living longer lives

Over recent years, the lives of Portuguese people have seen noteworthy improvements in health (Figure 1). Life expectancy for men and women has risen since 1990. Life expectancy increased by 7.1 years for males (70.7 years in 1990 to 77.8 years in 2016) and 6.1 years for females (77.9 years in 1990 to 84.0 years in 2016) between 1990 and 2016. During this period, the gap between male and female life expectancy narrowed, decreasing from 7.2 years in 1990 to 6.2 years in 2016.

Though considered a high-income country, Portugal has a high-middle Socio-demographic Index (SDI – established on a composite average of the ranking of income per capita, average educational attainment, and fertility rate). Based on its SDI, Portugal had a higher observed life expectancy than expected.

For females, observed life expectancy surpassed expected values by 1.6 years in 1990 and by 5.0 years in 2016. For males, the changes were even more noteworthy: from 0.5 to 5.1 years for the same time period.

According to GBD 2016 estimates, on average, Portuguese women born in 2016 will live 72.3 years in good health, which represents 86% of female life expectancy.

Figure 1
Life expectancy among males and females, Portugal, 1990–2016

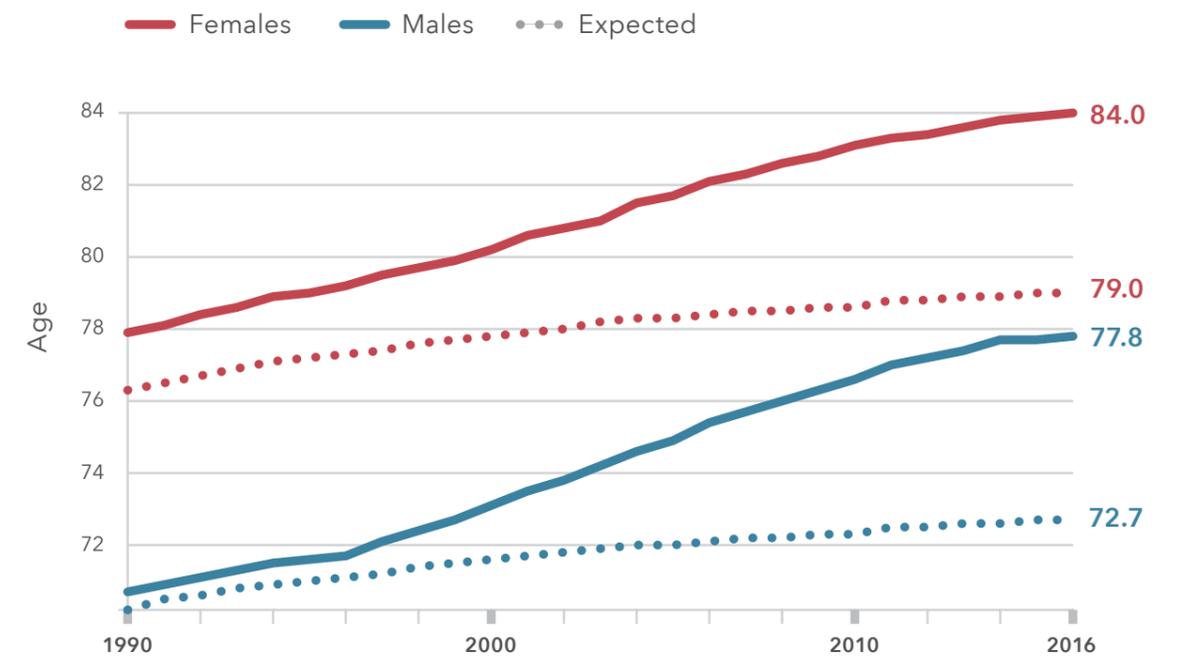


Table 1
Life expectancy and HALE among males and females, Portugal, 1990-2016

	Life expectancy (LE)		Healthy life expectancy (HALE)		Difference between LE and HALE	
	1990	2016	1990	2016	1990	2016
Females	77.9	84.0	67.2	72.3	10.7	11.7
Males	70.7	77.8	62.7	68.7	8.0	9.1

NHP goal achievements by 2020¹

Increase healthy life expectancy by at least 30%: Healthy life expectancy has increased in Portugal for both males and females.

Portuguese men born in the same year on average will live 68.7 years in good health, a slightly larger proportion of male life expectancy (88%).

Even though the Portuguese are living longer, the number of years lived in full health (healthy life expectancy, HALE) did not increase by the same proportion (Table 1). From 1990 to 2016, the gap between life expectancy and healthy life expectancy for males and females increased, being higher for females. HALE rose 6.0 years for males and 5.1 years for females between 1990 and 2016.^{iv}

In 2016, Portugal had the 13th highest life expectancy for females and the 33rd highest life expectancy for males in the world (Table 2). Life expectancy for females was higher than in other countries such as Greece, Germany, the United Kingdom (UK), and Denmark. However, Spain, France, and Italy had higher life expectancy for females than Portugal.

Comparing life expectancy for males in Portugal with other countries, Portugal ranked worse than Greece, Germany, UK, Denmark, Spain, France, and Italy.

^{iv}Consult methodological note.

National Health Plan - revision and extension to 2020¹

There are four goals for the National Health Plan – revision and extension to 2020. Portugal has a low birth rate and an aging population with multiple chronic illnesses. It has been experiencing a demographic and epidemiological transition.

The four goals defined for 2020 are:

- Reducing mortality under 70 years old;
- Increasing healthy life expectancy;
- Reducing tobacco consumption and secondhand smoke (in the population 15 years or older);
- Controlling child obesity.

Table 2
Top 35 (of 195) countries and territories with the highest life expectancy and healthy life expectancy in the world, 2016

LE, Females, 2016			HALE, Females, 2016			LE, Males, 2016			HALE, Males, 2016		
Rank	Location	Years	Rank	Location	Years	Rank	Location	Years	Rank	Location	Years
1	Japan	86.9	1	Singapore	75.2	1	Singapore	81.3	1	Singapore	72.0
2	Singapore	86.1	2	Japan	75.1	2	Switzerland	81.0	2	Spain	71.2
3	Andorra	85.8	3	Spain	74.0	3	Japan	80.8	3	Japan	71.1
4	Spain	85.6	4	France	73.4	4	Iceland	80.6	4	Switzerland	71.0
5	France	85.4	5	Andorra	73.0	5	Australia	80.5	5	Iceland	70.8
6	Switzerland	85.2	6	South Korea	73.0	6	Spain	80.3	6	Italy	70.5
7	Italy	84.6	7	Italy	72.9	7	Luxembourg	80.3	7	Australia	70.4
8	Finland	84.6	8	Switzerland	72.9	8	Sweden	80.1	8	Israel	70.4
9	Australia	84.6	9	Costa Rica	72.9	9	Norway	80.1	9	Norway	70.3
10	South Korea	84.2	10	Australia	72.7	10	Israel	80.0	10	Luxembourg	70.1
11	Israel	84.1	11	Norway	72.7	11	Kuwait	80.0	11	Sweden	70.1
12	Norway	84.1	12	Israel	72.5	12	Italy	79.9	12	Canada	70.0
13	Portugal	84.0	13	Canada	72.3	13	Canada	79.8	13	France	69.9
14	Iceland	84.0	14	Portugal	72.3	14	Netherlands	79.6	14	Netherlands	69.9
15	Sweden	84.0	15	Austria	72.2	15	New Zealand	79.5	15	New Zealand	69.8
16	Luxembourg	83.9	16	Finland	72.2	16	Andorra	79.3	16	Malta	69.7
17	Canada	83.9	17	Iceland	72.2	17	France	79.2	17	Austria	69.5
18	Austria	83.9	18	Malta	72.2	18	Austria	79.1	18	Costa Rica	69.5
19	Malta	83.8	19	Taiwan	72.1	19	Malta	79.0	19	Andorra	69.4
20	Slovenia	83.8	20	Greece	72.0	20	Qatar	79.0	20	Ireland	69.3
21	Netherlands	83.6	21	New Zealand	71.8	21	Ireland	79.0	21	Greece	69.2
22	Costa Rica	83.6	22	Chile	71.7	22	United Kingdom	78.9	22	United Kingdom	69.1
23	Greece	83.5	23	Luxembourg	71.7	23	Finland	78.9	23	Kuwait	69.0
24	New Zealand	83.4	24	Bermuda	71.7	24	Lebanon	78.8	24	Cyprus	69.0
25	Belgium	83.4	25	Sweden	71.7	25	Denmark	78.8	25	Denmark	68.9
26	Germany	83.3	26	Ireland	71.6	26	Germany	78.5	26	Germany	68.9
27	Ireland	83.3	27	Panama	71.6	27	Costa Rica	78.5	27	Finland	68.8
28	Chile	83.2	28	Netherlands	71.5	28	Greece	78.4	28	Belgium	68.8
29	United Kingdom	82.9	29	Germany	71.5	29	Belgium	78.4	29	Portugal	68.6
30	Denmark	82.8	30	Slovenia	71.5	30	Cyprus	78.1	30	Peru	68.6
31	Taiwan	82.8	31	Cyprus	71.5	31	Slovenia	77.8	31	South Korea	68.5
32	Cyprus	82.8	32	Belgium	71.4	32	Peru	77.8	32	Taiwan	68.4
33	Bermuda	82.4	33	Puerto Rico	71.3	33	Portugal	77.8	33	Maldives	68.2
34	Puerto Rico	82.4	34	Colombia	71.1	34	South Korea	77.7	34	Chile	68.0
35	Turkey	82.3	35	Peru	71.0	35	Maldives	77.6	35	Lebanon	67.9

Figure 2
Proportion of mortality in people under 70 years old (%), Portugal, 1990–2016

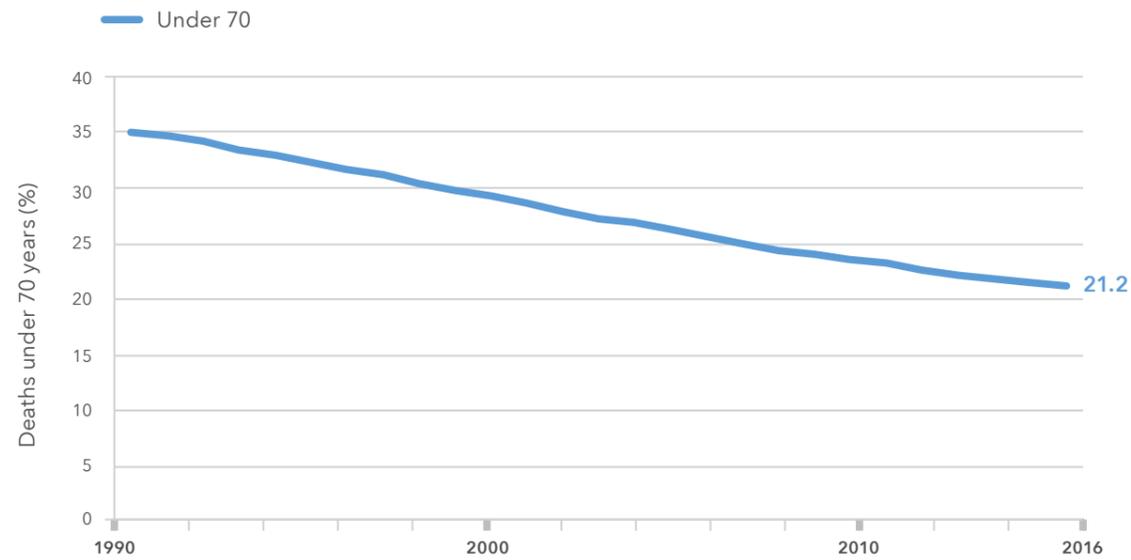
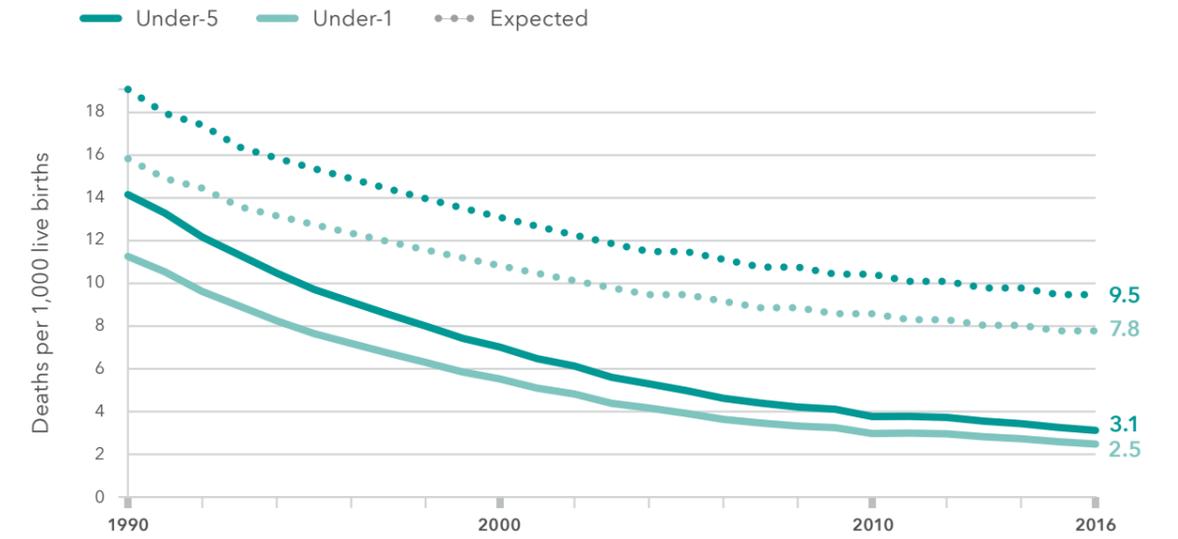


Figure 3
Death rate in the under-5 and under-1 age groups, Portugal, 1990–2016



NHP goal achievements by 2020¹

Reduce the proportion of mortality in people under 70 years old to below 20%:
In 2016 this mortality proportion reached 21.2%, following a steadily decreasing trend.

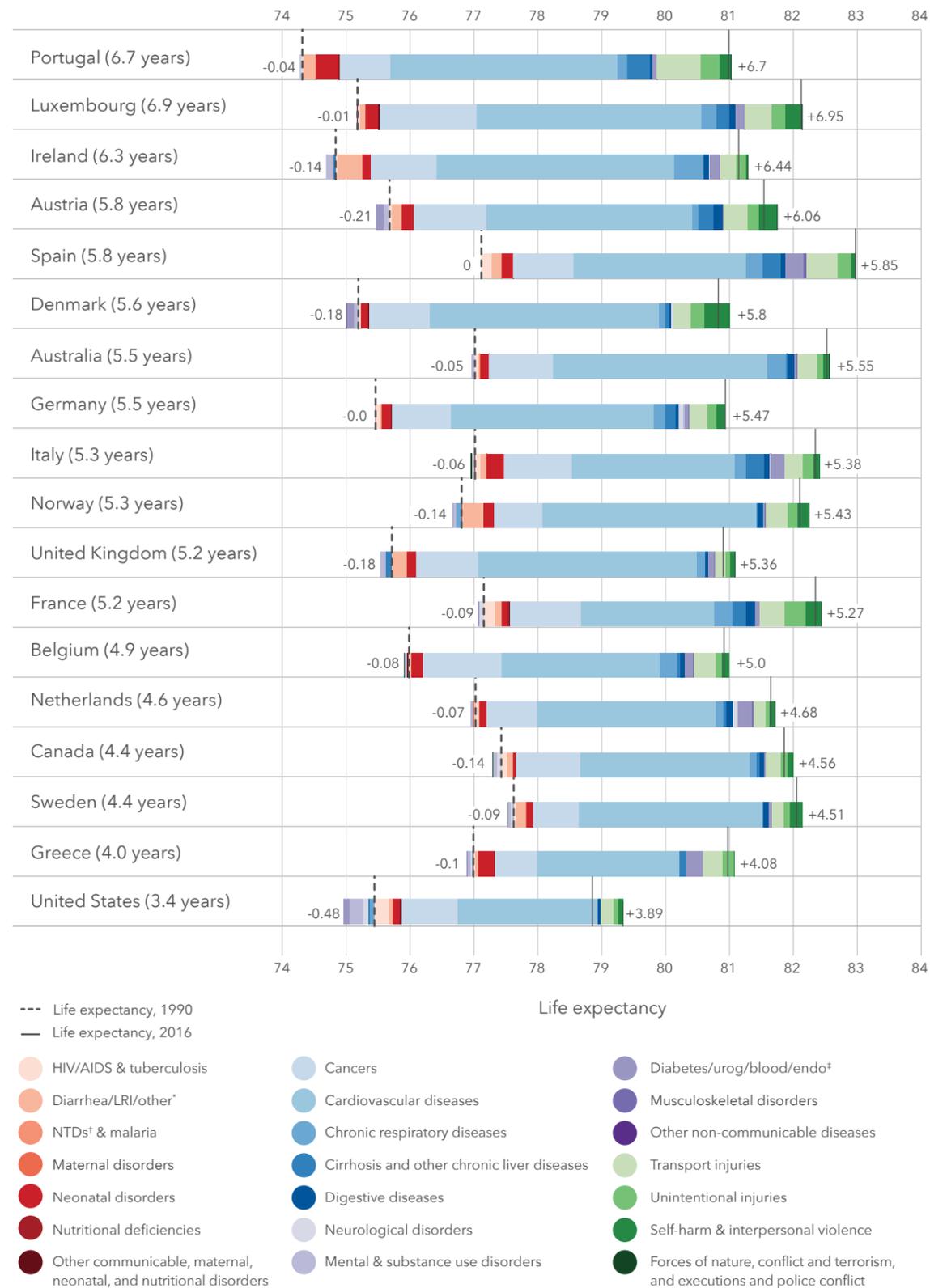
Regarding healthy life expectancy, Portugal ranked 14th for females and 29th for males in 2016.

The proportion of deaths under 70 years of the total number of deaths (all ages) showed a steady decrease over the period 1990–2016 (Figure 2).

From 1990 to 2016, Portugal saw a decrease in the number of child deaths. The under-5 mortality rate dropped from an initial value of 14.2 deaths per 1,000 live births in 1990 to 3.1 by 2016. A similar trend was observed for the infant mortality rate, which decreased from 11.3 infant deaths per 1,000 live births to 2.5 in the same period (Figure 3). The improvement in living conditions² and of child and maternal health care (mainly perinatal care organization and primary health care) are considered to be responsible for this progress.³

As is the case for life expectancy, child mortality rates in Portugal are better than expected based on the country's SDI, and the gap between expected and observed values has been increasing.

Figure 4
Change in country life expectancy at birth by broad cause group, both sexes, 1990–2016



Progress and challenges

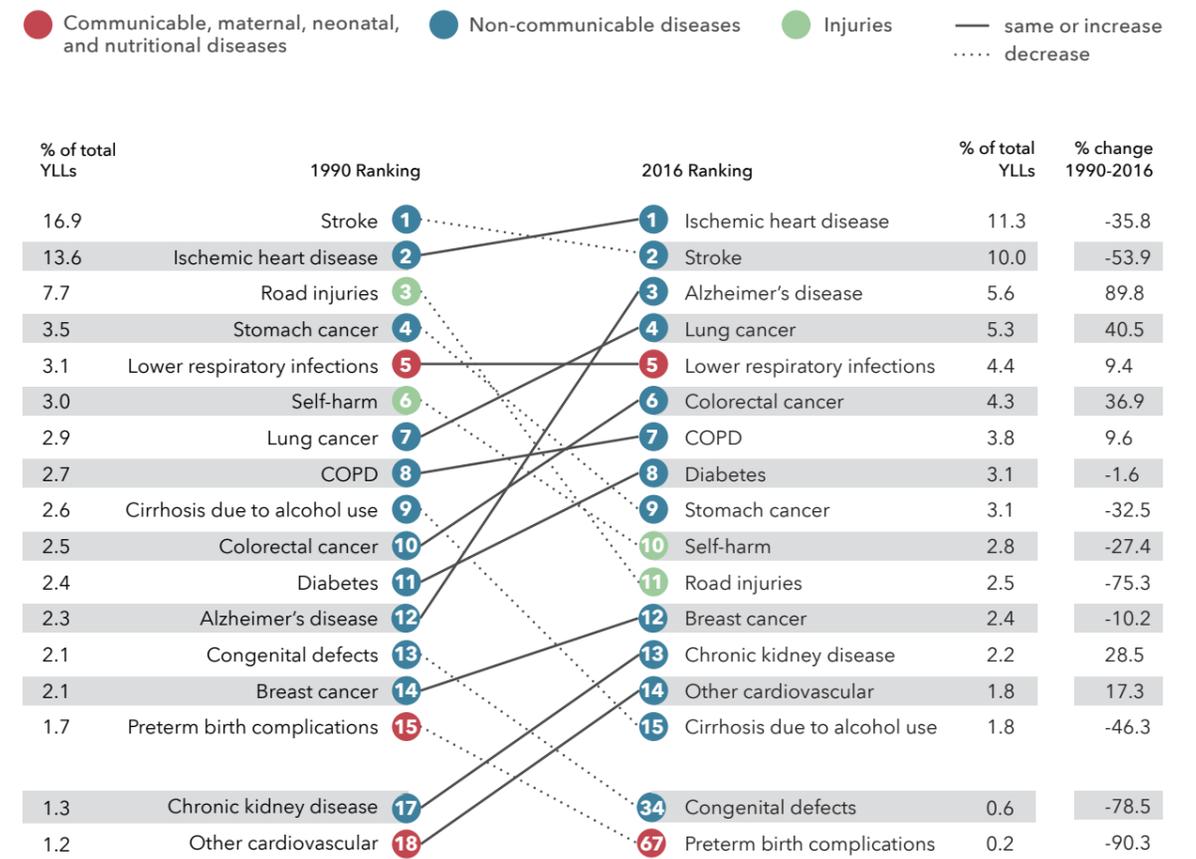
Figure 4 shows changes in country life expectancy at birth by broad cause group for both sexes between 1990 and 2016.^v

In comparison to the other high-income countries in Figure 4, Portugal had the lowest life expectancy in 1990 (74.0 years). Twenty-six years later, life expectancy for Portuguese people resembles the average in high-income countries (81.0 years), mainly because of a reduction in premature deaths due to cardiovascular diseases and transport injuries.

Premature death (measured as YLLs) in Portugal occurs largely because of stroke and ischemic heart disease (Figure 5). Between 1990 and 2016, early deaths decreased 22.3%. While in 1990 stroke was the leading cause of early death, in 2016 it ranked second. Early deaths due to this cause decreased approximately 54%. Even though ischemic heart disease shifted from second to first position in the same period of time, early deaths caused by this disease reduced by 35.8%.

^vPortugal is a member state of the European Union (EU) and the Organisation for Economic Co-operation and Development (OECD), being considered a high-income country. In this regard, for comparison, we've considered member states of both the EU and the OECD.

Figure 5
Leading causes of early death (YLLs) and percent change, both sexes, Portugal, 1990–2016



Note: COPD = chronic obstructive pulmonary disease

Due to longer life expectancies and an aging population, the proportion of early deaths from Alzheimer's disease increased considerably (89.8%) between 1990 and 2016 among males (91.2%) and females (89.1%).

The decreases in early deaths related to road injuries (75.3%), neonatal preterm birth complications (90.3%), and congenital defects (78.5%) were considered major achievements of this period.

Early deaths from cancers have also changed during this period. Regarding lung cancer, early deaths increased 40.5% overall: 34.4% for males and 68.1% for females. This difference is explained by the change in smoking habits among women.⁴ Early deaths from colorectal cancer have increased 36.9% (54.0% for males and 16.9% for females). Nevertheless, early deaths from stomach cancer decreased during this period for both males and females.

In females, early deaths caused by cancers that are included in population-based screening programs (such as breast and cervical cancers) decreased from 1990 to 2016. Early deaths from breast cancer decreased 10.5%, while early deaths caused by cervical cancer decreased 28.6%.

For males, early deaths due to prostate cancer increased 26.8% during the same period. This increase is likely due, in part, to the effects of an aging population, and screening efforts may be effective in stemming this upward trend.

Leading causes of early deaths in the Portuguese population are different according to age group. Neonatal disorders, diarrhea, lower respiratory diseases, and other common infectious diseases are the main causes of infant deaths. The post-neonatal period coincides with the increasing importance of deaths due to injuries, which peak in the 20-24 year age group. Non-communicable diseases, mainly cancers and cardiovascular diseases, are the major causes of years of life lost among the Portuguese population aged 35 or older. Early deaths due to HIV/AIDS and tuberculosis account for a higher proportion in people aged 25-49 years (Figure 6).

As Portuguese live longer lives, they increasingly suffer from disabling conditions, which contribute to YLDs. The most recent GBD estimates for Portugal confirm previous results pointing to non-com-

Figure 6
Percentage breakdown of total early deaths (YLLs) by age group, both sexes, Portugal, 2016

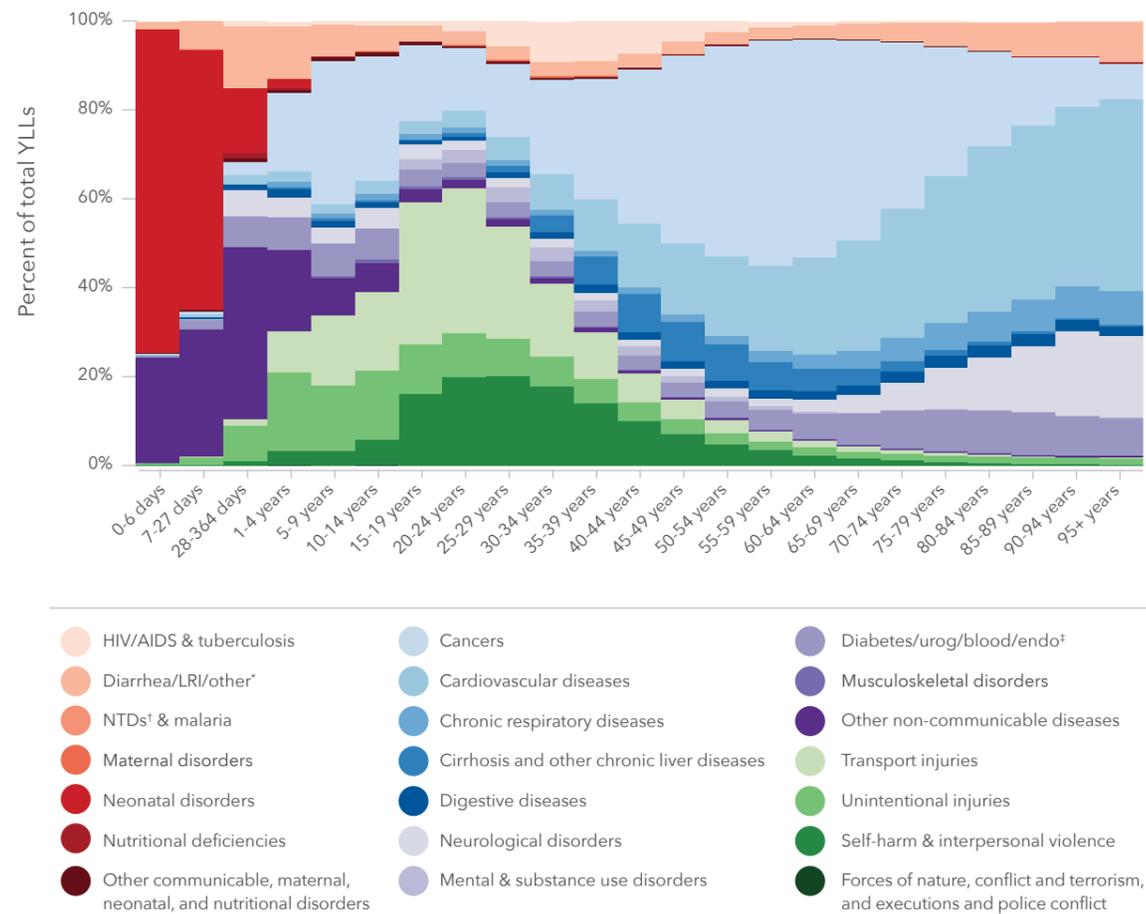
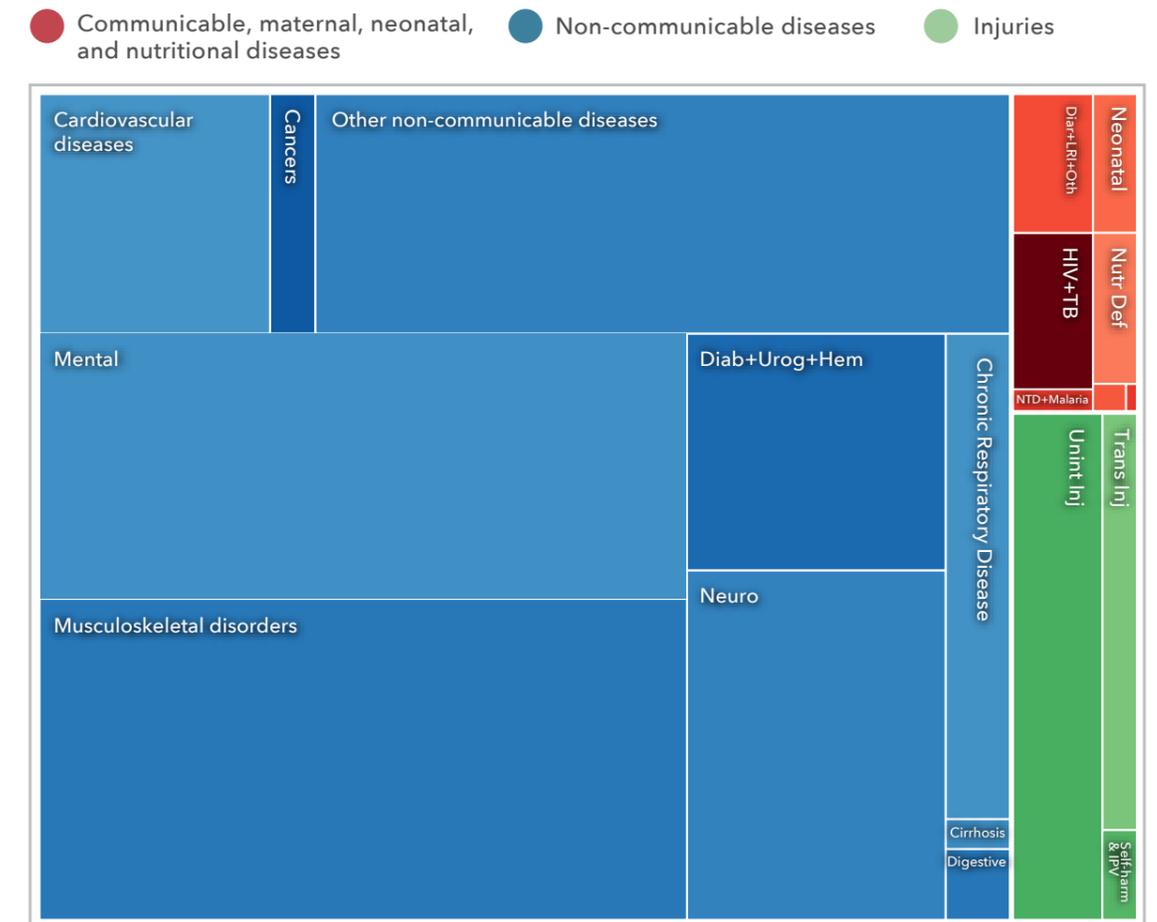


Figure 7
Distribution of total YLDs by cause of disability (%), both sexes, Portugal, 2016



Diar+LRI+Oth: Diarrheal, lower respiratory, and other common infectious diseases
 Self-harm & IPV: Self-harm and interpersonal violence
 Nutr Def: Nutritional deficiencies
 Diab+Urog+Hem: Diabetes, urogenital, blood, and endocrine diseases
 NTD: Neglected tropical diseases

municable diseases as the leading cause of years lived with disability (88.5% of total YLDs). Other major groups of conditions account for 7.1% (injuries) and 4.5% (communicable, maternal, neonatal, and nutritional diseases) of total YLDs.

Drilling down in these major groups (Figure 7) reveals the high proportion of musculoskeletal disorders and mental and substance use disorders in the total number of years Portuguese spent living with disability: 23.0% and 19.0%, respectively.

Neurological disorders (10.0%), diabetes, urogenital, blood, and endocrine diseases (6.8%), and other NCDs (18.3%) complete the top five causes of disability at this level of analysis. Conditions responsible for most deaths, like cardiovascular diseases, chronic respiratory diseases, and cancers, do not stand out as major causes of disability in the Portuguese population.

Deepening the level of analysis makes it possible to identify sense organ diseases (8.0%) and skin and subcutaneous diseases (6.1%) as principal contributors to the “other NCD” group mentioned above.

Some similarities and differences arise when comparing 1990 and 2016 rankings of causes of disability for Portuguese people (Figure 8). Low back and neck pain remains as the most common cause of disability, with increasing importance in total YLDs (15.9% in 1990 to 16.7% by 2016, a percentage change of 22.8%). Disability has also risen for sense organ diseases (37.4%), other musculoskeletal diseases (40.9%), osteoarthritis (59.8%), and Alzheimer’s disease (94.2%). Disability from diabetes increased 52.2% in this period.

Years lived with disability decreased for falls (3.7%), asthma (3.7%), other cardiovascular diseases (12.1%), and road injuries (25.1%) in the 1990–2016 time period.

Between 1990 and 2016, years lived with disability for males increased 35.9% for sense organ diseases, 62.3% for diabetes, and 31.4% for oral disorders. Disability caused by HIV/AIDS increased 794.3%, ranking as the 10th leading cause of disability in 2016. It should be noted that in 1990 the prevalence of HIV/AIDS in Portugal was still very low.

Between 1990 and 2016, disability for females increased 33.3% for oral disorders, 43.7% for diabetes, and 60.4% for osteoarthritis. Years lived with disability due to Alzheimer’s disease increased 94.4% in the same period. It should be remarked that in 1990 Alzheimer’s disease prevalence was not known⁵ and it most probably was under- or misdiagnosed.^{vi}

Disability-adjusted life years (DALYs), which describe the disease burden, provide a fuller understanding of health problems. This metric takes into account early deaths and disability.

Again, the major group of NCDs largely surpasses the relative importance of injuries and communicable, maternal, neonatal, and nutritional diseases in terms of health loss in the Portuguese population due to premature death or disability. The most recent GBD results indicate that NCDs accounted for 86.5% of total DALYs, injuries contributed 7.7%, and the remaining conditions contributed 5.8%. Based on Portugal’s level of development (measured by its SDI), the expected distribution of causes of disease burden was slightly different from the observed distribution, with less contribution of NCDs (81.3% of total DALYs) and higher levels of injuries (11.9%) and communicable, maternal, neonatal, and nutritional diseases (6.9%).

Cancers and cardiovascular diseases were, as expected, the main individual causes of disease burden, with 17.7% and 17.0% of total DALYs, respectively. Musculoskeletal disorders and mental and substance use disorders, although not major killers, were responsible for 10.9% and 9.2%, respectively, of the total disease burden of Portuguese people (Figure 9). This finding is not surprising given that they were also the top two causes of YLDs.

^{vi}It is only since 2011 that there is a National Guideline for the diagnosis of dementias (Guideline #53 - Abordagem Terapêutica das Alterações Cognitivas) <http://www.dgs.pt/ms/8/paginaRegisto.aspx?back=1&id=21604>

Figure 8
Leading causes of disability (YLDs) and percent change, both sexes, Portugal, 1990–2016

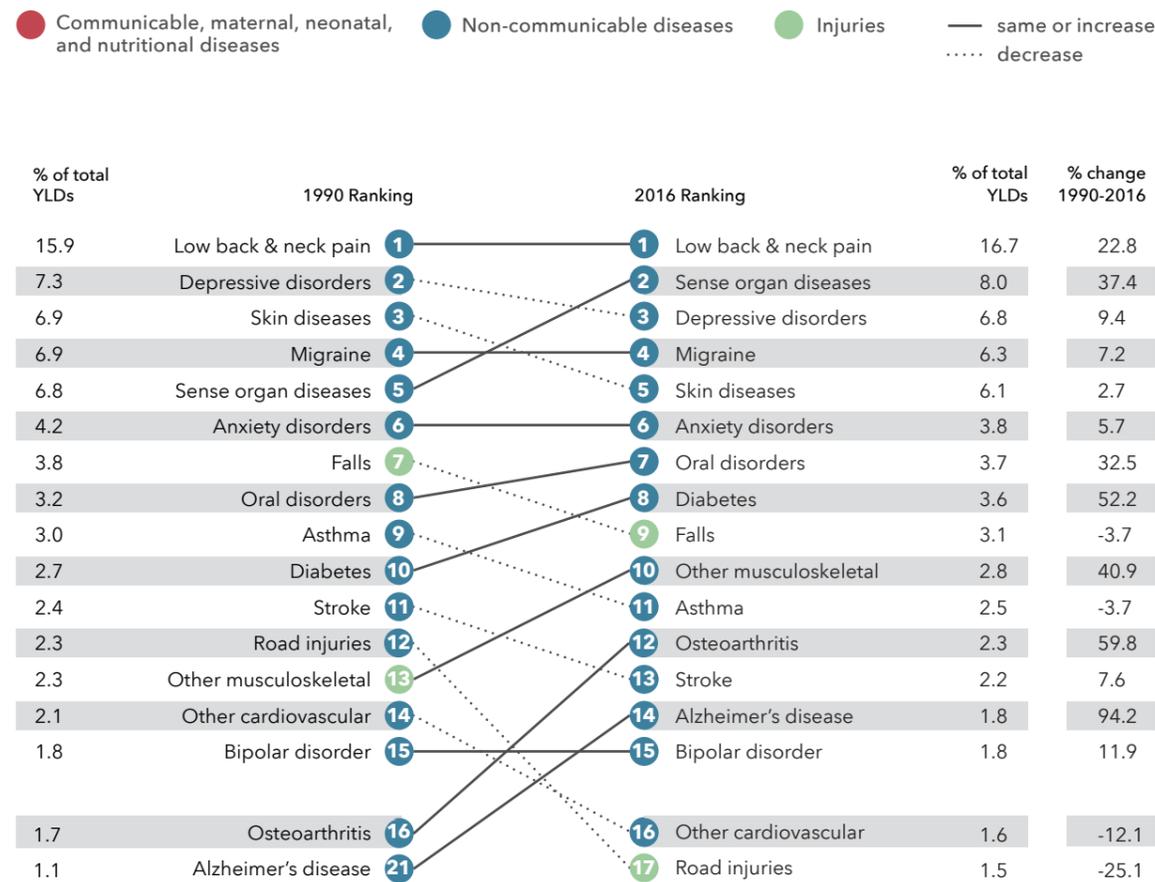
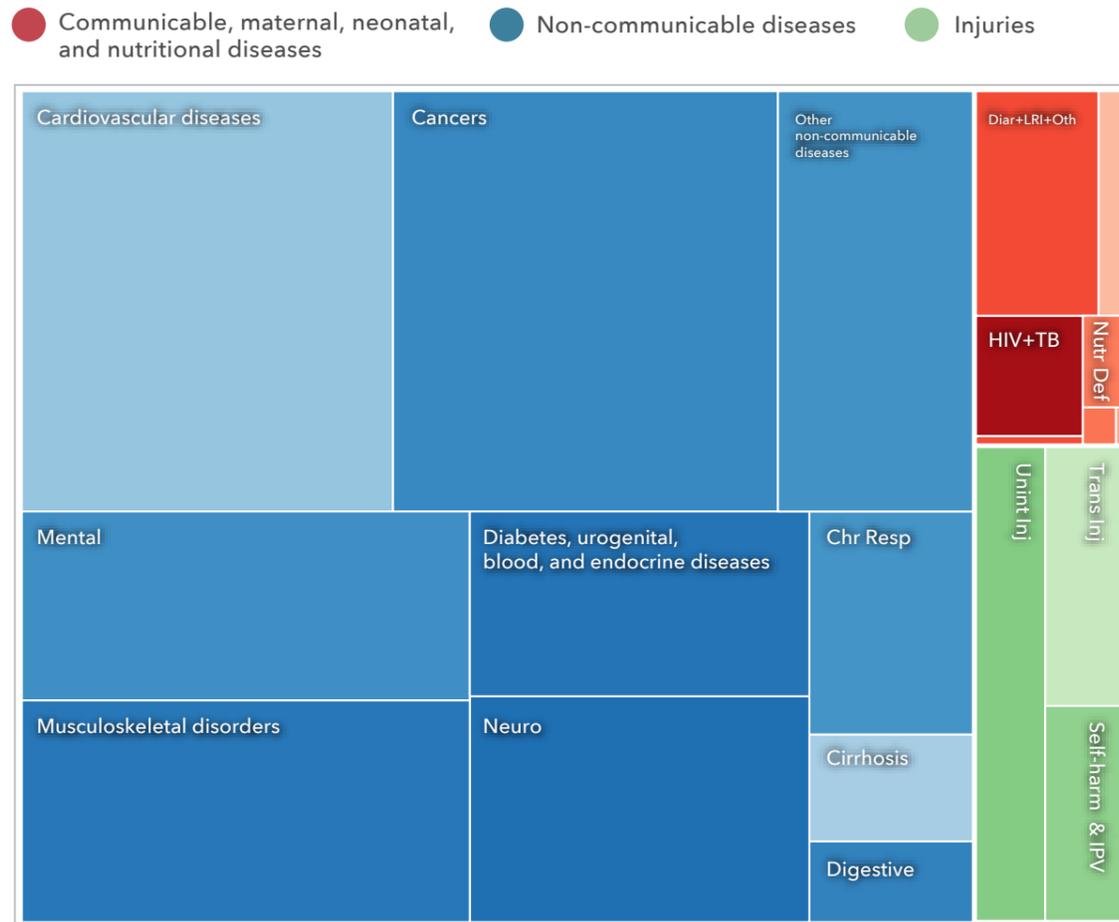


Figure 9
Distribution of total DALYs by cause of disease burden (%), both sexes, Portugal, 2016



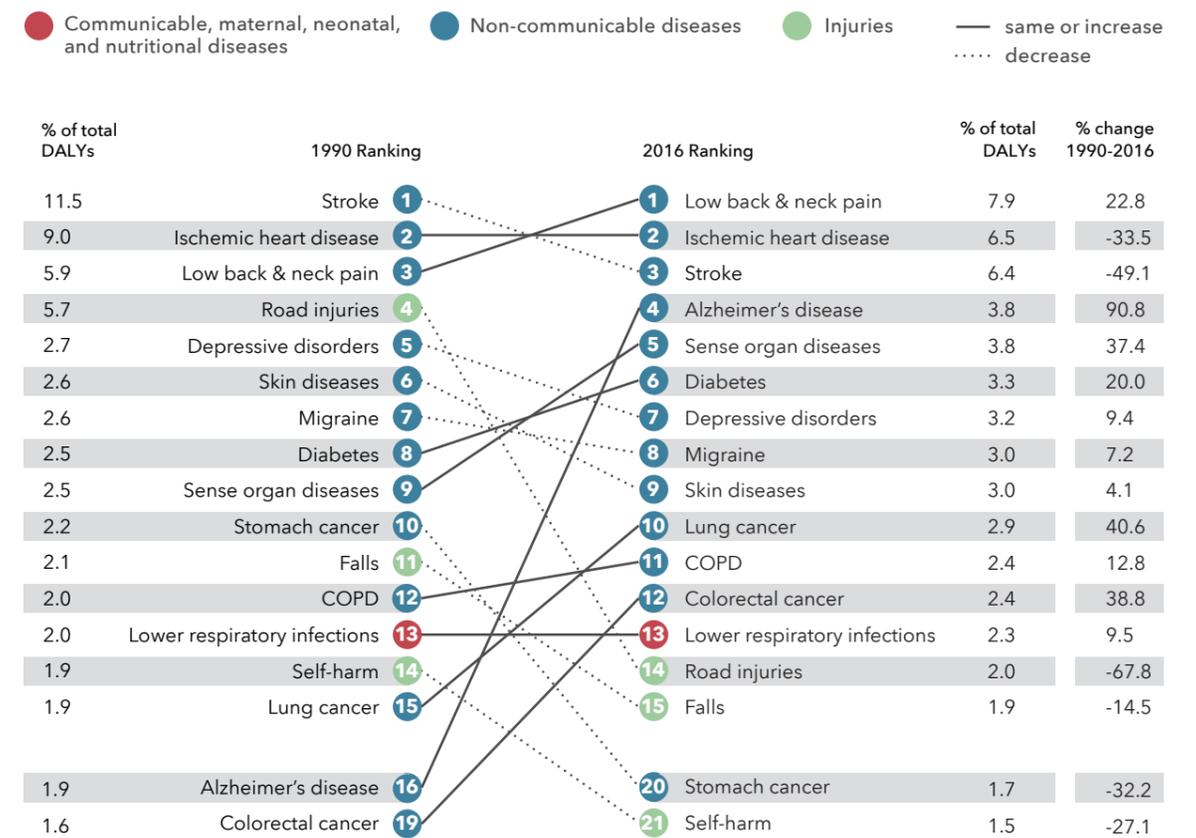
Diar+LRI+Oth: Diarrheal, lower respiratory, and other common infectious diseases
 Self-harm & IPV: Self-harm and interpersonal violence
 Nutr Def: Nutritional deficiencies
 Chr Resp: Chronic respiratory disease
 NTD: Neglected tropical diseases

In 1990, the leading causes of disease burden in both sexes were stroke, ischemic heart disease, low back and neck pain, road injuries, and depressive disorders. For 2016, low back and neck pain was the leading cause, followed by ischemic heart disease, stroke, Alzheimer's disease, and sense organ diseases (Figure 10).

Between 1990 and 2016, there was a strong decrease in disease burden related to road injuries (67.8%), stroke (49.1%), and ischemic heart disease (33.5%). However, during the same time period, there was an increase in disease burden related to Alzheimer's disease (90.8%), lung cancer (40.6%), colorectal cancer (38.8%), sense organ diseases (37.4%), low back and neck pain (22.8%), and diabetes (20.0%).

Looking at differences among males and females, disease burden due to colorectal cancer increased 56.0% for males between 1990 and 2016, while it increased only 18.6% for females in the same period.

Figure 10
Leading causes of disease burden (DALYs) and percent change, both sexes, Portugal, 1990-2016



Males had an increase of 220.4% in the disease burden associated with HIV/AIDS between 1990 and 2016. As mentioned before, in 1990 HIV/AIDS prevalence in Portugal was very low.

Stomach cancer disease burden decreased in the same period for both males (28.6%) and females (38.0%).

Breakdown of total disease burden by age group in Portugal reveals that in the first year of life the leading causes of health loss are neonatal disorders, other NCDs (mainly congenital birth defects), and diarrhea, lower respiratory infections, and other common infectious diseases. The main causes of disease burden for children aged 1-4 years are other NCDs (mainly skin and subcutaneous diseases); diarrhea, lower respiratory infections, and other common infectious diseases; and unintentional injuries. Mental and substance use disorders are the second leading cause of disease burden (following other NCDs) in age groups 5-9 and 10-14 years, rising to the top position for people aged 15 to 39 years. For young adults (20-39 years), musculoskeletal disorders are an important cause of health loss. After 40 years of life, much of the disease burden is caused by cancers, but also by musculoskeletal disor-

ders and mental and substance use disorders. Cardiovascular diseases become increasingly important for Portuguese after 55 years of life. For the older population (80+ years) neurological disorders are also a main cause of disease burden (Figure 11).

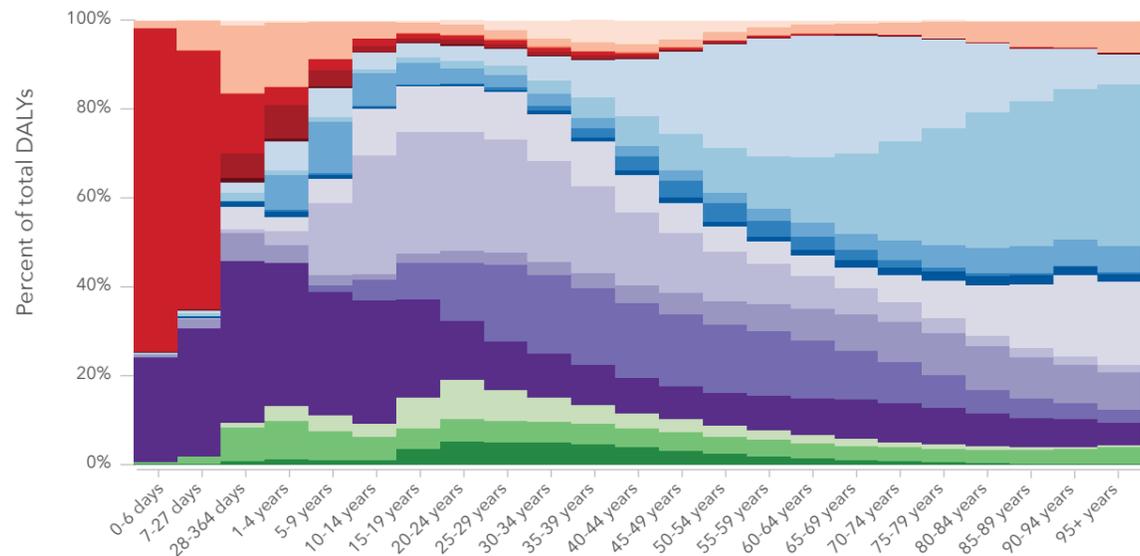
Preventing death and suffering

Risk factors represent potentially modifiable causes of the diseases and injuries that contribute to ill health. Therefore, addressing them could drastically reduce Portugal's burden of disease.

GBD classifies risk factors into three categories: behavioral, metabolic, and environmental and occupational.

In 2016, roughly 41% of all years of life lost prematurely in Portugal could have potentially been avoided by addressing all behavioral risk factors. Removing the detrimental effects of metabolic risk factors alone could have prevented 28% of years lost due to early death.

Figure 11
Percentage breakdown of total disease burden (DALYs) by age group, both sexes, Portugal, 2016



*Diarrhea, lower respiratory, and other common infectious diseases
†Neglected tropical diseases
‡Diabetes, urogenital, blood, and endocrine diseases

The main risk factor for early mortality in Portugal in 2016 was alcohol and drug use (Figure 12), with a major contribution from alcohol consumption. Overall, approximately 242,307 years of life could be gained if alcohol consumption in Portugal was dramatically reduced.

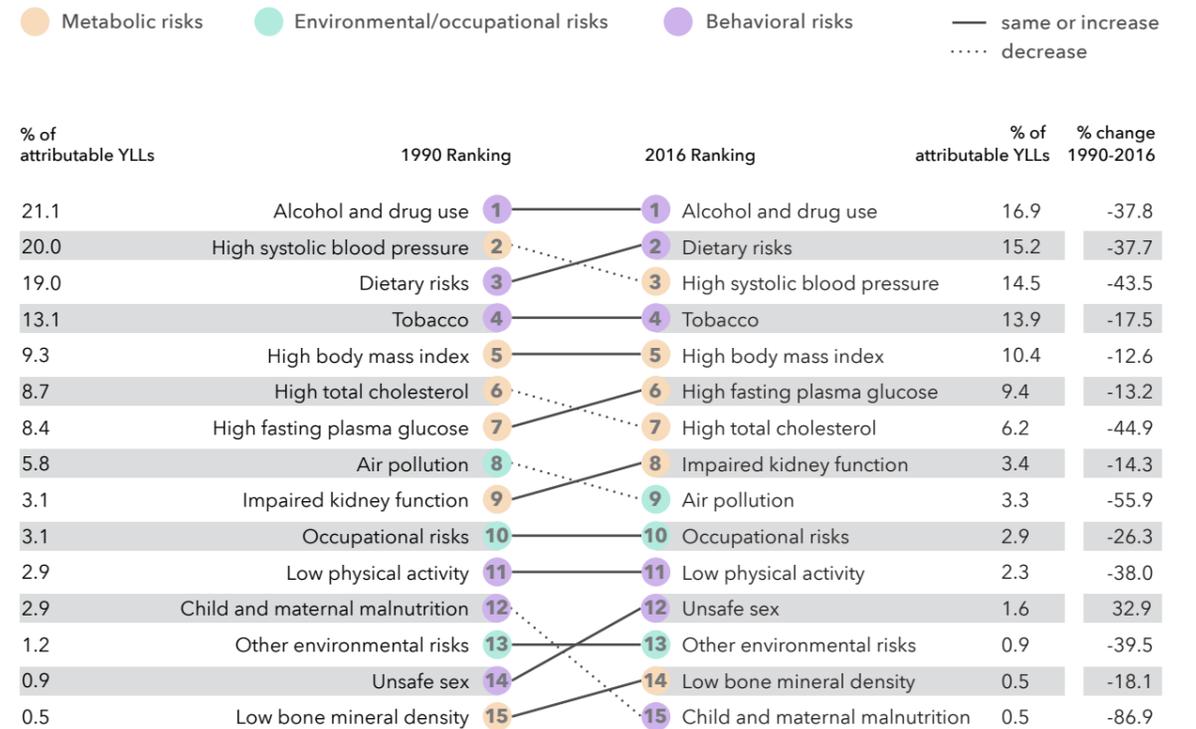
The main diseases related to alcohol and drug use included cardiovascular diseases (74,374 YLLs), cancers (67,573 YLLs), and cirrhosis and other chronic liver diseases (39,541 YLLs).

The second most important risk factor in 2016 was poor diet. Just over 237,000 years of life could be saved if Portuguese people improved their eating habits. As with alcohol consumption, this behavioral risk factor contributed to early death mostly through cardiovascular diseases (180,624 YLLs) and cancers (39,216 YLLs).

The third-leading risk factor was metabolic: high systolic blood pressure. Roughly 226,000 years of life were lost in 2016 due to elevated blood pressure levels. It was an essential contributor to early deaths from cardiovascular diseases (207,067 YLLs) and diabetes, urogenital, and endocrinological conditions (19,071 YLLs).

Fourth, tobacco consumption was an important risk factor, contributing to premature mortality from several diseases, such as cancers (117,906 YLLs), cardiovascular diseases (47,351 YLLs), and chronic respiratory diseases (32,570 YLLs).

Figure 12
Leading risk factors contributing to early death (YLLs) and percent change, both sexes, Portugal, 1990-2016



Overall, if tobacco consumption was greatly reduced, Portugal could gain up to 216,000 years of life.

The fifth most important risk factor was also metabolic. High body mass index, which encompasses obesity and overweight, was responsible for just over 162,000 years of life lost prematurely. It was also a main contributor to cardiovascular diseases (82,849 YLLs), diabetes and other endocrinological conditions (34,477 YLLs), and cancers (28,180 YLLs).

Looking at the most important changes and trends between 1990 and 2016 in Portugal, several messages are noteworthy.

On one hand, most of the top risk factors, either metabolic or behavioral, registered decreasing trends during this period, particularly alcohol and drug use (down 37.8%), dietary risks (down 37.7%), and high systolic blood pressure (down 43.5%). Additionally, the contribution of air pollution to premature mortality has decreased considerably (down 55.9%). While there have been slight decreases in ambient particulate matter exposure, the majority of the decrease in attributable premature mortality was due to changes in the outcomes themselves. Between 1990 and 2016, Portugal has seen positive changes in premature mortality due to many NCDs. Two outcomes tied to air pollution that decreased substantially during this period were stroke and ischemic heart disease (from 339,000 and 273,000 YLLs in 1990 to 156,000 and 176,000 in 2016, respectively).

On the other hand, unsafe sex has registered an upward trend (32.9%), probably resulting from changing sexual habits and practices. In the risk factor estimates, 100% of the burden of cervical cancer and sexually transmitted diseases (excluding HIV) was attributed to unsafe sex. Then, the proportion of HIV that was transmitted sexually was modeled. Most of the sources for HIV transmission report HIV transmission modes for all ages and both sexes combined, but for GBD 2016 those data were split for the first time according to an estimated age-pattern. This likely accounts for some of the change in the unsafe sex burden between GBD 2015 and GBD 2016, especially for particular age groups.

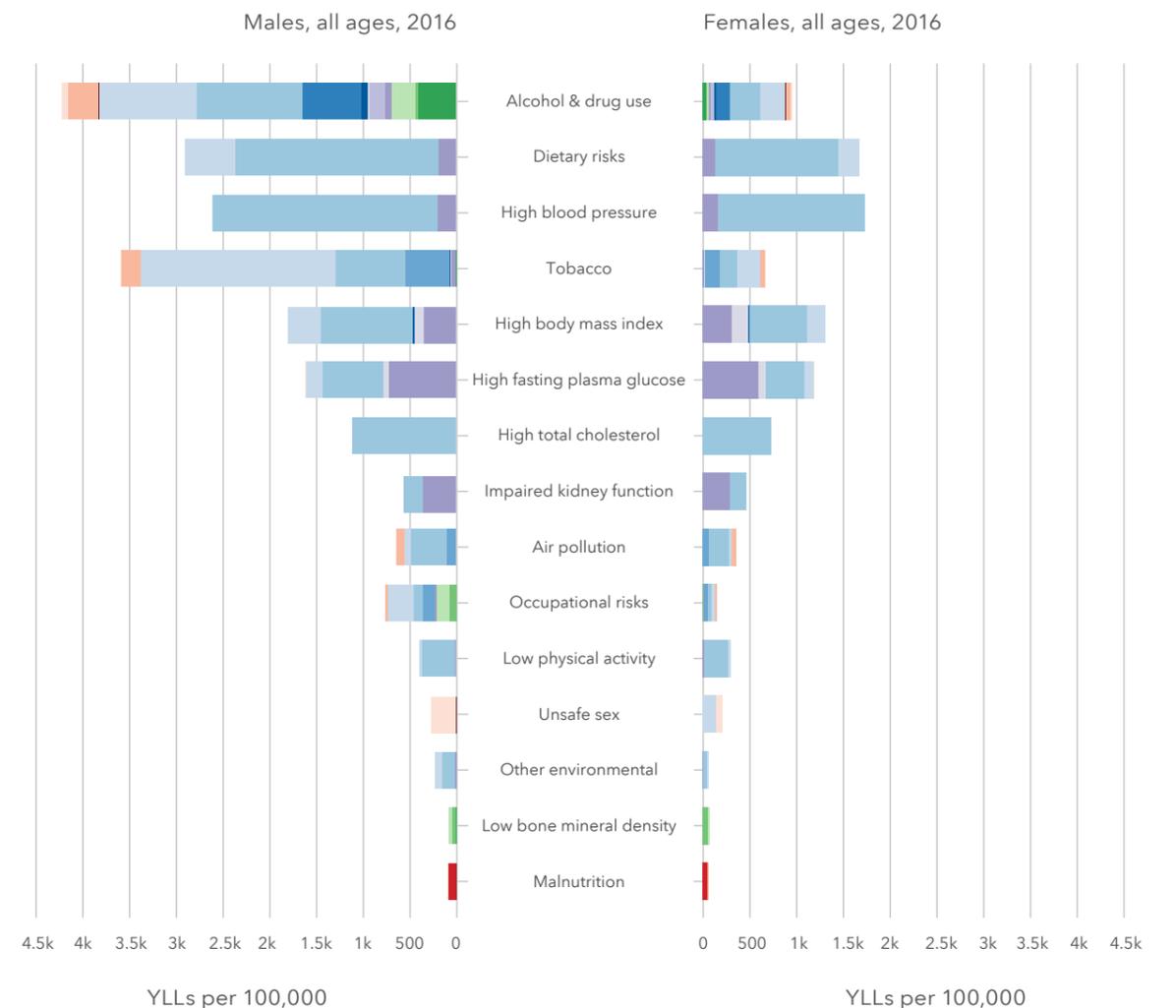
Most of the change in burden attributable to unsafe sex was due to a change in the underlying HIV burden estimates between GBD 2015 and GBD 2016 (the HIV burden for Portugal increased by 25%, from 289 to 362 DALYs per 100,000). Since the majority of the estimated unsafe sex burden comes from HIV, this shift made a noticeable difference. While comparing 1990 burden to 2016 burden does seem to indicate an alarming trend, it is misleading to do so, as the burden from unsafe sex actually peaked in 2000 and has been declining since.

In Figure 13 we can observe differences between risk factors for males and females.

While for males, alcohol and drug use and tobacco consumption are the main drivers of premature mortality, for females these are dietary risks and elevated blood pressure. For both sexes, these top risk factors mainly contributed to early deaths through cardiovascular and neoplastic disorders.

Despite improvements in reducing exposure, a segment of the population in Portugal has a high alcohol consumption level, based on sales data and surveys. The ranking of alcohol and drug use as the country's top risk factor in terms of DALYs is reflective of the increased risk associated with alcohol, compared to GBD 2015, which was established this past year through a new meta-analysis.

Figure 13
Top risk factors for early death (YLLs) by cause, males and females, Portugal, 2016



- HIV/AIDS & tuberculosis
- Cancers
- Diabetes/urog/blood/endo*
- Diarrhea/LRI/other*
- Cardiovascular diseases
- Musculoskeletal disorders
- NTDs† & malaria
- Chronic respiratory diseases
- Other non-communicable diseases
- Maternal disorders
- Cirrhosis and other chronic liver diseases
- Transport injuries
- Neonatal disorders
- Digestive diseases
- Unintentional injuries
- Nutritional deficiencies
- Neurological disorders
- Self-harm & interpersonal violence
- Other communicable, maternal, neonatal, and nutritional disorders
- Mental & substance use disorders
- Forces of nature, conflict and terrorism, and executions and police conflict

*Diarrhea, lower respiratory, and other common infectious diseases

†Neglected tropical diseases

‡Diabetes, urogenital, blood, and endocrine diseases

NHP goal achievements by 2020⁶⁻¹⁸

Control child obesity:

Available data for Portugal show high and increasing prevalence of child overweight and obesity over time. However, more recent studies appear to show that the prevalence of overweight and obesity among Portuguese children is stabilizing.

Most of the other large risk factors, like smoking and high blood pressure, also decreased more than alcohol use, contributing to its continued position as the number-one risk.

Top risk factors contributing to premature deaths (YLLs) as well as to total disease burden (DALYs) in the Portuguese population have been identified and addressed in national health policies such as the National Health Plan¹ and associated Priority Health Programs.¹ Reducing tobacco consumption and secondhand smoke along with controlling childhood obesity are main goals of the NHP.

Sustainable Development Goals: country view

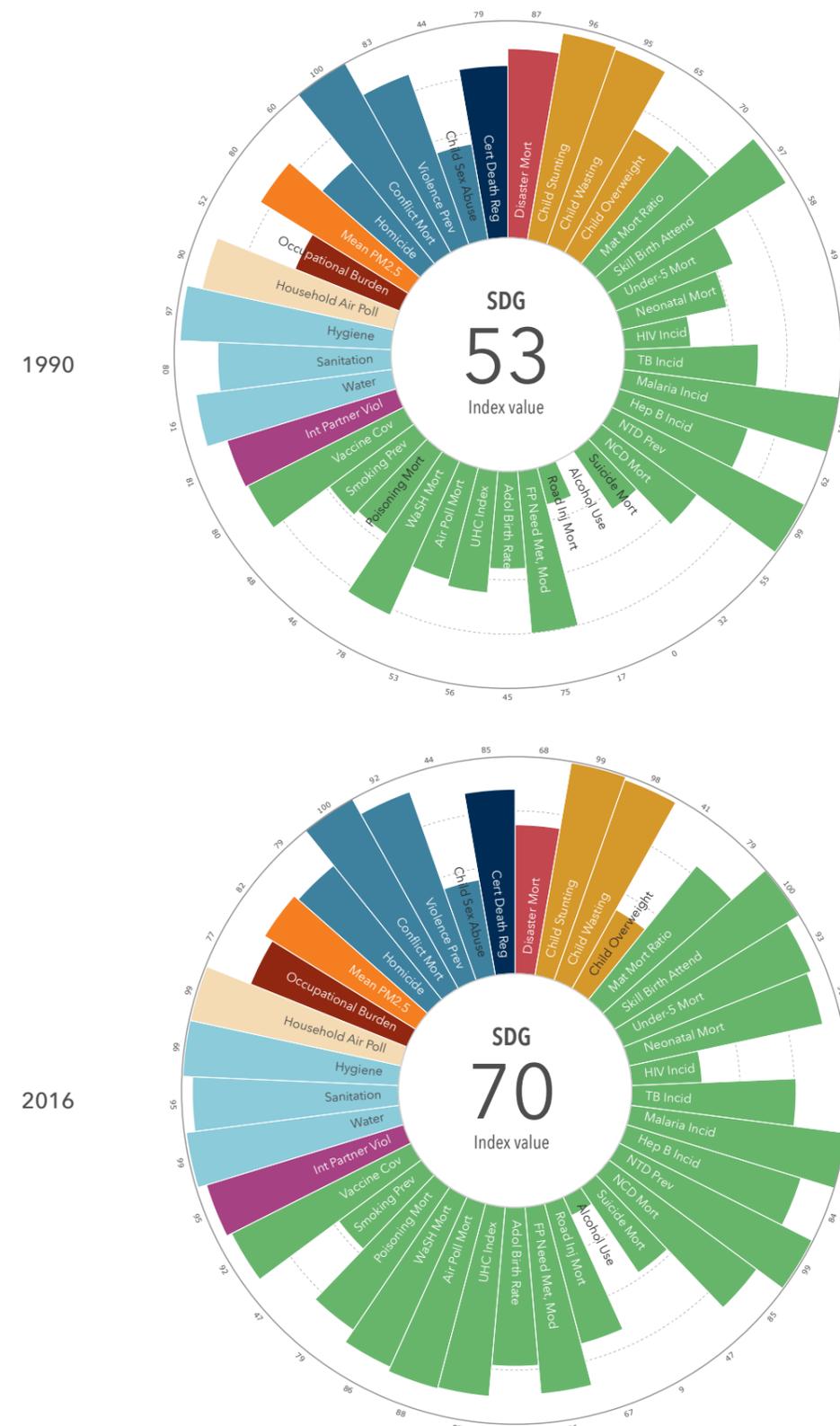
Between 1990 and 2016, Portugal achieved notable gains on most of the 37 health-related Sustainable Development Goals indicators (Figure 14). From an initial SDG index value of 53 for 1990, it is expected, on the basis of past trends, that the SDG index for Portugal will reach 78 by 2030 after having reached 70 in 2016 (see Methodological notes regarding the framework of Sustainable Development Goals and how to interpret Figure 14).

The health-related indicator associated with SDG 1 (“End poverty in all its forms everywhere”) is the death rate due to exposure to forces of nature (per 100,000 population). Portugal can be considered a country with low natural disaster mortality, although according to GBD 2016 estimates, the death rate due to exposure to forces of nature rose from 0.005 to 0.03 per 100,000 population in the period 1990–2016, an unfavorable trend.

Three health-related indicators are associated with SDG 2 (“End hunger, achieve food security and improved nutrition, and promote sustainable agriculture”). Portugal made progress in prevalence of stunting and prevalence of wasting in children under 5. GBD estimates for the period 1990–2016 show decreases of 51.2% and 32.3%, respectively. Of concern is the increase in prevalence of overweight in children aged 2–4 years, the third health-related indicator of Goal 2. Between 1990 and 2016, prevalence of overweight in this age group rose from 20.7% to 31.7%, according to GBD 2016 estimates for Portugal.

SDG 3, which aims to “ensure healthy lives and promote wellbeing for all at all ages,” encompasses 21 health-related indicators that exist within 11 health-related targets. Portugal has already reached 2030 targets for indicators “Age-standardized rate of malaria cases” and “Proportion of births attended by skilled health personnel.” Indicator “Age-standardized prevalence of the sum of 15 neglected tropical diseases” is also very close to its target for 2030 (index value of 99 estimated for 2016). Indicators related to neonatal mortality and under-5 mortality have been declining steadily in Portugal, and their estimates for 2016 are well below 2030 targets. Vaccine coverage in target populations reached 95.1% (which corresponds to an index value of 92) by 2016. Most of the other health-related indicators associated with SDG 3 have index values above 75 and have been improving since 1990. It is worth mentioning the universal health coverage (UHC) index, which measures progress toward SDG target 3.8 (“achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality, and affordable essential medicines and vaccines for all”). Results for Portugal show that the UHC index rose from 59.7 to 76.9 in the period 1990–2016, an increase of 28.9%.

Figure 14
Sustainable Development Goals: index values for 37 health-related SDG indicators, Portugal, 1990 and 2016



The set of health-related indicators associated with SDG 3 (“Ensure healthy lives and promote well-being for all at all ages”) on which Portugal performed worst (index values for 2016 below 50) were risk-weighted prevalence of alcohol consumption as measured by the summary exposure value for alcohol use, age-standardized rate of new HIV infections, age-standardized prevalence of daily smoking in populations aged 10 and older, and age-standardized death rate due to self-harm.

The health-related indicator associated with SDG 5 (“Achieve gender equality and empower all women and girls”) is the age-standardized prevalence of women aged 15 years and older who experienced physical or sexual violence by an intimate partner in the last 12 months. In Portugal this prevalence decreased from 20.3% to 14.2% in the period 1990–2016.

SDG 6 aims to “ensure availability and sustainable management of water and sanitation for all.” Its health-related indicators are risk-weighted prevalence of populations using unsafe or unimproved water sources, risk-weighted prevalence of populations using unsafe or unimproved sanitation, and risk-weighted prevalence of populations without access to a handwashing facility. Portugal performs well regarding universal access to safe water, safe sanitation, and handwashing facilities, with index values equal to or above 95 for all three indicators.

Progress toward SDG 7 (“Ensure access to affordable, reliable, and sustainable modern energy for all”) and health-related target 7.1 (“By 2030, ensure universal access to affordable, reliable and modern energy services”) is measured by the indicator risk-weighted prevalence of household air pollution. Again, estimates for Portugal indicate progress: prevalence values decreased from 7.3% by 1990 to 0.6% by 2016.

SDG 8 aims to “promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.” Age-standardized all-cause disability-adjusted life year (DALY) rates attributable to occupational risks is the indicator chosen to measure progress toward health-related target 8.8 (“Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment”). Although this indicator shows a decreasing trend in Portugal, the most recent estimate (for 2016) reached 746.8 DALYs per 100,000, corresponding to an index value of 78.

“Make cities and human settlements inclusive, safe, resilient, and sustainable” is the ambition of SDG 11. The health-related indicator associated with SDG 11 is population-weighted mean levels of fine particulate matter smaller than 2.5 microns in diameter (PM_{2.5}). According to GBD 2016 estimates, Portugal made little progress in terms of improving air quality in the period 1990–2016: PM_{2.5} decreased only minimally, from 10.0 to 9.5 µg per cubic meter.

SDG 16 aims to “promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels.” Three health-related indicators are associated with target 16.1 (“Significantly reduce all forms of violence and related death rates everywhere”) and estimates for age-standardized death rate due to interpersonal violence, death rate due to conflict and terrorism, and age-standardized prevalence of physical or sexual violence experienced by populations during the previous 12 months in Portugal show low values and decreasing trends in the study period. Progress toward target 16.2 (“End abuse,

exploitations, trafficking and all forms of violence against and torture of children”) is measured by the indicator age-standardized prevalence of women and men aged 18–29 years who experienced sexual violence by age 18. Portugal made no progress in terms of prevalence of childhood sexual abuse, with a value of 11.2% throughout the period 1990–2016, well above the indicator target for 2030 (equal to or less than 0.5%).

In relation to SDG 17 (“Strengthen the means of implementation and revitalize the global partnership for sustainable development”), Portugal shows an increasing trend for the health-related indicator associated with this goal: percentage of well-certified deaths by a vital registration system among a country’s total population. The 2016 estimate (79.3%) is very close to this indicator’s target for 2030 (equal to or greater than 80%).

The estimates for Portugal and for 2016 are detailed in Annex 1. This table presents each unscaled value associated with its SDG Goal, Target, Indicator description, and Indicator target.

Comparing Portugal to its SDI group country peers

SDI is a summary measure of a location's sociodemographic development and is based on income, education, and fertility rate. Portugal was classified as a high-middle-SDI country and, for comparison purposes, we've considered the same peer countries used in the GBD country profiles found at www.healthdata.org/country-profiles. The comparison group was chosen based on the GBD regional classifications, known trade partnerships, and sociodemographic indicators. For the identification of statistical significance, the estimate for the high-middle-SDI group was chosen as the reference point.

When compared with its peer countries for premature mortality (YLLs), Portugal did significantly better than the mean of the high-middle-SDI group in 2016 for ischemic heart disease, stroke, lung cancer, lower respiratory infections, COPD, road injuries, and chronic kidney disease. For colorectal cancer, breast cancer, and alcohol-related liver diseases, Portugal did significantly worse than the mean of the high-middle-SDI group.

In comparison to a subset of 11 peer countries of the high-middle-SDI group, Portugal presented the second highest risk of early deaths from colorectal cancer and ranked fourth for self-harm and alcohol-related liver disease. Among countries with the lowest risk, Portugal ranked 10th for ischemic heart disease, diabetes mellitus, and chronic kidney disease, and ninth for chronic obstructive pulmonary disease and road injuries.

As far as the total burden of disease is concerned (DALYs), Portugal did significantly better than the mean of the high-middle-SDI group in 2016 for ischemic heart disease, stroke, sense organ diseases, diabetes mellitus, lung cancer, chronic obstructive pulmonary disease, lower respiratory infections, road injuries, and falls. For low back and neck pain, depressive disorders, migraine, skin diseases, and colorectal cancer, Portugal did significantly worse than the mean of the high-middle-SDI group.

Among the subset of 11 countries in the high-middle-SDI group, Portugal performed better than its peers for sense organ diseases, and ranked 10th for ischemic heart disease and ninth for diabetes mellitus. On the other hand, Portugal performed worse for depressive disorders and ranked second for low back and neck pain, migraine, and colorectal cancer.

Figure 15
Leading causes of early death (YLLs) in Portugal and comparison countries, 2016

	Ischemic heart disease	Stroke	Alzheimer's disease	Lung cancer	Lower respiratory infections	Colorectal cancer	COPD	Diabetes mellitus	Stomach cancer	Self-harm	Road injuries	Breast cancer	Chronic kidney disease	Other cardiov.	Cirrhosis/alcohol
1	Azerbaijan (6026.6)	Georgia (2366.4)	Malaysia (497.8)	Armenia (708.3)	Azerbaijan (1866.6)	Barbados (400.5)	Argentina (488.9)	Mauritius (2753.1)	Azerbaijan (415.9)	Argentina (505.6)	UAE (1786.9)	Barbados (435.6)	Mauritius (1383.0)	Barbados (302.2)	Azerbaijan (249.9)
2	Georgia (4247.7)	Azerbaijan (1877.0)	UAE (459.4)	Georgia (571.5)	Malaysia (1386.1)	Portugal (367.3)	UAE (467.6)	Barbados (1039.7)	Chile (356.9)	Chile (480.1)	Malaysia (859.9)	Armenia (343.6)	UAE (699.0)	Argentina (276.4)	Chile (217.8)
3	Armenia (3830.1)	UAE (1548.1)	Mauritius (421.3)	Spain (567.4)	Argentina (935.9)	Argentina (356.9)	Malaysia (431.9)	UAE (768.4)	Georgia (304.4)	Mauritius (393.7)	Georgia (769.8)	Argentina (308.5)	Barbados (446.7)	Malaysia (195.9)	Georgia (198.6)
4	UAE (3727.1)	Malaysia (1309.3)	Spain (392.5)	Argentina (529.3)	Barbados (769.5)	Spain (306.2)	Georgia (425.5)	Armenia (689.4)	Armenia (287.5)	Portugal (360.6)	Argentina (646.0)	Georgia (294.4)	Argentina (373.7)	Georgia (187.0)	Portugal (180.5)
5	Malaysia (3283.1)	Mauritius (1121.0)	Portugal (351.1)	Portugal (489.0)	Armenia (614.2)	Armenia (274.8)	Azerbaijan (418.8)	Azerbaijan (498.5)	Portugal (270.9)	Malaysia (292.8)	Chile (496.5)	Mauritius (262.4)	Azerbaijan (362.0)	Portugal (147.6)	Armenia (160.1)
6	Mauritius (2588.4)	Barbados (1024.4)	Barbados (288.5)	Azerbaijan (468.7)	Mauritius (490.2)	Malaysia (271.1)	Armenia (389.7)	Malaysia (450.9)	Argentina (223.6)	Armenia (290.5)	Mauritius (466.4)	Malaysia (231.9)	Malaysia (351.7)	Spain (133.4)	Argentina (142.4)
7	Argentina (1801.6)	Armenia (1014.7)	Georgia (254.1)	Malaysia (464.8)	UAE (395.2)	Mauritius (218.0)	Mauritius (328.6)	Georgia (407.5)	Barbados (169.3)	Georgia (280.5)	Barbados (431.9)	Portugal (228.3)	Georgia (293.0)	Mauritius (118.4)	Spain (131.0)
8	Barbados (1239.2)	Argentina (786.3)	Chile (252.3)	Chile (314.1)	Georgia (376.6)	Chile (215.8)	Spain (281.6)	Argentina (361.6)	Mauritius (151.1)	Spain (230.1)	Armenia (385.4)	Azerbaijan (195.4)	Chile (290.1)	Chile (95.8)	Barbados (114.7)
9	Chile (938.1)	Portugal (741.2)	Azerbaijan (252.1)	UAE (296.2)	Portugal (351.1)	UAE (201.4)	Portugal (267.3)	Chile (249.6)	Spain (145.1)	Barbados (214.3)	Portugal (378.0)	Spain (190.7)	Armenia (203.3)	UAE (94.0)	Mauritius (113.6)
10	Portugal (855.8)	Chile (699.1)	Armenia (251.7)	Mauritius (249.0)	Chile (311.4)	Georgia (196.7)	Chile (240.0)	Portugal (231.1)	UAE (134.1)	Azerbaijan (185.6)	Azerbaijan (377.2)	Chile (161.3)	Portugal (162.9)	Azerbaijan (92.9)	Malaysia (48.1)
11	Spain (777.7)	Spain (336.0)	Argentina (251.1)	Barbados (211.4)	Spain (136.8)	Azerbaijan (191.8)	Barbados (111.4)	Spain (104.0)	Malaysia (117.1)	UAE (170.9)	Spain (209.4)	UAE (111.7)	Spain (106.9)	Armenia (78.0)	UAE (25.4)

Color key ■ Rate significantly less than SDI group mean ■ Rate insignificantly different from SDI group mean ■ Rate significantly greater than SDI group mean

Notes: Data presented are age-standardized YLL rates per 100,000. Causes are ordered by crude rates. The comparison group is high-middle SDI.

COPD = chronic obstructive pulmonary disease; UAE = United Arab Emirates

Looking at the leading risk factors contributing to premature death and comparing with the mean of the high-middle-SDI group, Portugal did significantly better for dietary risks, high blood pressure, tobacco use, high body mass index, high fasting plasma glucose, high total cholesterol, impaired kidney function, air pollution, occupational risks, low physical activity, low bone mineral density, and child and maternal malnutrition. Portugal did significantly worse for unsafe sex.

Among the 11 peer countries of the high-middle-SDI group selected, Portugal was third, with higher levels of alcohol and drug use (with a substantial contribution from alcohol consumption) and ranked fifth in unsafe sex. Meanwhile, Portugal ranked 10th, only behind Spain and Chile, for dietary risks, high systolic blood pressure, tobacco consumption, high body mass index, high fasting plasma glucose, and high total cholesterol.

Figure 16
Leading causes of disease burden (DALYs) in Portugal and comparison countries, 2016

	Low back and neck pain	Ischemic heart disease	Stroke	Alzheimer's disease	Sense organ diseases	Diabetes mellitus	Depressive disorders	Migraine	Skin diseases	Lung cancer	COPD	Colon and rectum cancer	Lower respiratory infections	Road injuries	Falls
1	Chile (1709.6)	Azerbaijan (6196.1)	Georgia (2634.1)	Malaysia (637.6)	UAE (1030.6)	Mauritius (3540.1)	Portugal (771.3)	Spain (814.7)	Barbados (1011.2)	Armenia (715.3)	Malaysia (793.9)	Barbados (415.1)	Azerbaijan (1876.3)	UAE (2001.4)	Georgia (594.7)
2	Portugal (1705.7)	Georgia (4407.2)	Azerbaijan (2112.1)	UAE (584.5)	Georgia (1028.4)	Barbados (1745.9)	Chile (668.8)	Portugal (792.6)	Malaysia (976.0)	Georgia (576.7)	UAE (648.6)	Portugal (381.6)	Malaysia (1395.1)	Malaysia (1028.2)	Azerbaijan (553.9)
3	Argentina (1570.5)	Armenia (4003.2)	UAE (1761.5)	Mauritius (542.2)	Armenia (1022.9)	UAE (1652.6)	Argentina (588.2)	Armenia (677.1)	Chile (939.2)	Spain (575.1)	Mauritius (641.6)	Argentina (367.1)	Argentina (941.8)	Georgia (909.4)	Armenia (528.8)
4	Spain (1426.8)	UAE (3873.1)	Malaysia (1512.4)	Spain (509.4)	Mauritius (1016.4)	Malaysia (1055.7)	Spain (585.6)	Argentina (670.7)	Argentina (906.3)	Argentina (534.8)	Argentina (547.7)	Spain (321.3)	Barbados (782.5)	Argentina (736.1)	Spain (420.1)
5	Armenia (1380.0)	Malaysia (3424.8)	Mauritius (1296.9)	Portugal (453.4)	Azerbaijan (1009.8)	Armenia (1033.0)	Malaysia (572.8)	Georgia (667.7)	Portugal (884.0)	Portugal (494.0)	Georgia (498.3)	Armenia (281.4)	Armenia (622.9)	Mauritius (580.8)	UAE (413.6)
6	Azerbaijan (1332.3)	Mauritius (2707.7)	Armenia (1222.0)	Barbados (366.0)	Barbados (798.3)	Azerbaijan (816.0)	Mauritius (562.1)	Azerbaijan (664.8)	Mauritius (869.7)	Azerbaijan (473.2)	Azerbaijan (496.0)	Malaysia (280.1)	Mauritius (495.6)	Chile (570.6)	Portugal (384.4)
7	UAE (1330.1)	Argentina (1870.3)	Barbados (1127.6)	Georgia (325.0)	Malaysia (759.1)	Argentina (696.9)	Barbados (542.8)	UAE (658.9)	Spain (852.3)	Malaysia (470.1)	Armenia (459.9)	Mauritius (224.4)	UAE (401.4)	Portugal (520.7)	Chile (338.8)
8	Georgia (1311.8)	Barbados (1347.2)	Argentina (934.5)	Chile (324.7)	Chile (742.0)	Georgia (685.0)	UAE (504.7)	Barbados (658.5)	UAE (759.4)	Chile (317.8)	Portugal (333.6)	Chile (223.1)	Georgia (382.5)	Barbados (516.6)	Argentina (306.9)
9	Mauritius (1122.9)	Chile (1008.6)	Portugal (894.4)	Argentina (322.9)	Argentina (723.5)	Portugal (516.0)	Georgia (469.6)	Chile (656.9)	Armenia (673.2)	UAE (299.5)	Spain (329.3)	UAE (207.1)	Portugal (354.8)	Armenia (497.2)	Barbados (258.7)
10	Malaysia (1072.9)	Portugal (941.0)	Chile (855.0)	Azerbaijan (322.8)	Spain (674.0)	Chile (511.9)	Armenia (465.1)	Mauritius (504.2)	Georgia (660.2)	Mauritius (251.7)	Chile (283.8)	Georgia (201.1)	Chile (315.0)	Azerbaijan (488.0)	Mauritius (241.4)
11	Barbados (929.7)	Spain (861.5)	Spain (442.5)	Armenia (322.6)	Portugal (657.4)	Spain (330.9)	Azerbaijan (427.0)	Malaysia (498.7)	Azerbaijan (653.2)	Barbados (213.7)	Barbados (153.4)	Azerbaijan (196.3)	Spain (138.5)	Spain (359.7)	Malaysia (182.4)

Color key ■ Rate significantly less than SDI group mean ■ Rate insignificantly different from SDI group mean ■ Rate significantly greater than SDI group mean

Notes: Data presented are age-standardized DALYs per 100,000. Causes are ordered by crude rates. The comparison group is high-middle SDI.

COPD = chronic obstructive pulmonary disease; UAE = United Arab Emirates

Figure 17
Leading risk factors contributing to early death (YLLs) in Portugal and comparison countries, 2016

	Alcohol and drug use	Dietary risks	High systolic blood pressure	Tobacco	High body mass index	High fasting plasma glucose	High total cholesterol	Impaired kidney function	Air pollution	Occupational risks	Low physical activity	Unsafe sex	Other environmental risks	Low bone mineral density	Child and maternal malnutrition
1	Azerbaijan (1780.2)	Azerbaijan (5761.5)	Azerbaijan (5244.6)	Azerbaijan (3567.6)	Mauritius (3393.4)	Mauritius (5375.1)	Azerbaijan (2977.7)	Mauritius (1772.3)	Azerbaijan (2457.9)	UAE (724.5)	Azerbaijan (670.5)	Barbados (395.9)	UAE (240.8)	UAE (140.3)	Azerbaijan (2925)
2	Georgia (1746.9)	Georgia (5063.6)	Georgia (5123.0)	Georgia (3142.8)	UAE (2896.5)	UAE (3277.1)	UAE (2156.8)	Azerbaijan (1274.9)	Georgia (2075.1)	Argentina (666.1)	UAE (641.8)	Argentina (315.2)	Armenia (128.7)	Malaysia (79.6)	Georgia (1253.6)
3	Portugal (1640.5)	Armenia (3841.2)	Armenia (3707.6)	Armenia (3071.9)	Azerbaijan (2775.0)	Barbados (2099.0)	Georgia (1954.4)	UAE (1248.6)	UAE (1878.3)	Malaysia (518.0)	Georgia (494.7)	Mauritius (254.5)	Azerbaijan (111.8)	Chile (52.3)	Barbados (1225.7)
4	Chile (1159.7)	UAE (3583.3)	Malaysia (3544.6)	Malaysia (2590.3)	Georgia (2601.9)	Malaysia (1884.6)	Malaysia (1928.0)	Georgia (1039.5)	Armenia (1399.5)	Azerbaijan (488.5)	Armenia (468.2)	Chile (202.2)	Georgia (108.7)	Argentina (46.0)	Mauritius (1102.2)
5	Argentina (1123.8)	Mauritius (3556.0)	UAE (3498.9)	Argentina (2065.7)	Armenia (1953.5)	Azerbaijan (1839.6)	Armenia (1898.6)	Armenia (762.0)	Malaysia (1019.4)	Armenia (461.5)	Malaysia (457.2)	Portugal (188.0)	Malaysia (93.0)	Mauritius (44.5)	Armenia (833.3)
6	Barbados (1103.5)	Malaysia (3333.6)	Mauritius (3478.4)	Mauritius (1891.0)	Barbados (1840.3)	Armenia (1615.4)	Mauritius (1466.7)	Malaysia (688.2)	Mauritius (670.8)	Georgia (445.3)	Mauritius (409.0)	Armenia (141.2)	Spain (91.0)	Georgia (40.4)	Argentina (800.7)
7	Spain (1043.7)	Argentina (2085.7)	Argentina (2199.2)	UAE (1777.3)	Malaysia (1832.3)	Georgia (1484.4)	Argentina (939.0)	Barbados (640.8)	Argentina (612.3)	Mauritius (365.5)	Barbados (251.4)	Georgia (135.1)	Argentina (81.8)	Portugal (37.8)	Chile (443.0)
8	Mauritius (1029.9)	Barbados (1657.5)	Barbados (1925.0)	Spain (1294.0)	Argentina (1654.3)	Argentina (1106.8)	Barbados (677.8)	Argentina (588.7)	Barbados (469.8)	Chile (327.4)	Argentina (213.7)	Malaysia (129.9)	Portugal (73.7)	Barbados (35.6)	Malaysia (342.1)
9	UAE (909.8)	Chile (1377.4)	Chile (1345.4)	Portugal (1268.9)	Chile (1180.4)	Chile (720.9)	Chile (515.2)	Chile (421.6)	Chile (424.0)	Barbados (313.3)	Portugal (171.5)	UAE (87.8)	Barbados (68.8)	Spain (31.4)	UAE (268.7)
10	Armenia (908.7)	Portugal (1232.6)	Portugal (1115.3)	Chile (1080.1)	Portugal (864.2)	Portugal (696.8)	Portugal (490.3)	Portugal (254.5)	Portugal (264.4)	Portugal (302.4)	Chile (152.1)	Azerbaijan (86.3)	Mauritius (51.3)	Armenia (26.7)	Spain (173.8)
11	Malaysia (850.7)	Spain (857.0)	Spain (878.4)	Barbados (542.9)	Spain (696.3)	Spain (422.1)	Spain (414.1)	Spain (195.0)	Spain (217.6)	Spain (270.5)	Spain (124.6)	Spain (73.9)	Chile (10.0)	Azerbaijan (21.2)	Portugal (168.7)

Color key ■ Rate significantly less than SDI group mean ■ Rate insignificantly different from SDI group mean ■ Rate significantly greater than SDI group mean

Notes: Data presented are age-standardized YLLs per 100,000. Risk factors are ordered by crude rates. The comparison group is high-middle SDI.

UAE = United Arab Emirates

Conclusion

In comparison to a group of high-income countries,^{vii} Portugal had the lowest life expectancy in 1990. Twenty-six years later, life expectancy for Portuguese people is similar to the average for these countries, mainly due to a reduction in premature deaths from cardiovascular diseases and road injuries.

But even though Portuguese live longer, the number of years lived in full health did not increase in the same proportion.

Early deaths – as measured by YLLs – in Portugal between 1990 and 2016 decreased 25.3%, largely because of reductions in stroke and ischemic heart disease, which occurred through improved quality and access to the national health services network, especially prehospital emergency care (the programs “Via verde do AVC” and “Via verde da doença coronária”).¹⁹

The decrease in early deaths (YLLs) from road injuries and neonatal disorders was considered a major achievement of this period. Road injuries decreased 75.3%, neonatal preterm birth complications 90.3%, and congenital defects 78.5%. The reduction in road injuries may be due to the improvements in the road network, particularly in the number of motorways available, better vehicle safety, and more stringent regulations and law enforcement. The decrease in preterm birth complications and congenital defects is likely due to a reduction in birth rates and better care for preterm infants.

As measured by the number of YLLs, early deaths from lung cancer increased substantially more for females (68.1%) than for males (34.4%), although cancer YLLs overall were much higher for males, ranging from 3.7 times greater in 2016 to five times greater in 1996. The uptick in female lung cancer YLLs is explained by a change of smoking habits in women and demands a differentiated intervention.

Early deaths from colorectal cancer, again measured by the number of YLLs, have also increased. The change is likely attributable to the effects of an aging population, and it does support the need to invest in population-based screening programs. As a result of this kind of investment,¹⁵ mainly since 2007, YLLs from breast cancer in females and cervical cancer have decreased 10.5% and 28.6%, respectively, over the past 26 years.

The estimated main risk factor for early mortality in Portugal in 2016 was alcohol and drug use, with a fundamental contribution from alcohol consumption. The other most important risk factors were poor diet, high systolic blood pressure, tobacco consumption, and high body mass index, which encompasses obesity and overweight. Health gains could be obtained by expanding efforts to promote healthy diets and reduce smoking and alcohol consumption. In the coming years, we will probably see the impact of the tobacco law²⁰ implemented in recent years in Portugal.

As Portuguese live longer lives, they increasingly suffer from disabling conditions. Low back and neck pain was the most common cause of disability, and disability has also risen from osteoarthritis, Alzheimer's disease, and diabetes. Again, the effect of an aging population is likely at play here, as rates have stayed relatively flat or declined when age structure is made homogeneous through age-standardization. The documented effectiveness of treatments for mental disorders and low back and neck pain is much lower than the documented effectiveness of treatments for other conditions.²¹ Nevertheless, Portugal could learn from approaches that have worked well in other countries.

Going forward, the Directorate General of Health and IHME will continue to study disease burden together, with the possibility of future analysis at the local level. This analysis will bring light to health disparities across communities as well as the top diseases, injuries, and risk factors that are driving these disparities.

^{vii}Some EU and OECD countries.

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Methodological notes

Healthy life expectancy measure: comparing GBD and Eurostat approaches

To estimate the number of years lived with disability for the Portuguese population, GBD studies take into account the prevalence of diseases and injuries. These values are weighted by their specific disability weights, which reflect the severity of the different conditions. These disability weights are developed through international surveys of the general public.

Healthy life expectancy (HALE) is a summary measure that adjusts overall life expectancy by the amount of time lived in less than perfect health. This is calculated by subtracting a proportion of healthy time lost in a life table based on the average rate of YLDs by age. This is a more sophisticated method of adjusting life expectancy for nonfatal loss than the Healthy Life Expectancy (HLE) approach. This approach is based on a survey question of self-perceived longstanding activity limitations in usual activities due to health problems from a European health module that is integrated within the data collection of EU statistics on income and living conditions (EU-SILC). The HLE calculation assumes the proportion above the threshold does not contribute life years to the HLE measure.

Description of Eurostat's approach to obtain HLE indicators is relevant to this report. This is because Portugal's Ministry of Health adopted the Eurostat indicator Healthy Life Years to measure progress toward the NHP goal of increasing the healthy life expectancy of the Portuguese population. Due to the use of self-reported data, Eurostat's HLE indicator is, to a certain extent, affected by respondents' subjective perception as well as by their social and cultural background.

Another major methodological difference between GBD and Eurostat approaches is the reference population for disability data. GBD uses prevalence values for total population, whereas Eurostat excludes people living in collective households (the general coverage of EU-SILC is all private households and their members).

Input data used in GBD 2016 to generate estimates for Portugal for alcohol use

Year Start	Year End	Citation
2011	2011	Börsch-Supan, A. (2013). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 4. Release version: 1.1.1. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w4.111
2002	2002	European Commission (2012): Eurobarometer 57.20VR (Apr-Jun 2002). European Opinion Research Group (EORG), Brussels. GESIS Data Archive, Cologne. ZA3641 Data file Version 1.0.1, doi:10.4232/1.10951
2003	2003	European Commission (2012): Eurobarometer 59.0 (Jan-Feb 2003). European Opinion Research Group (EORG), Brussels. GESIS Data Archive, Cologne. ZA3903 Data file Version 1.0.1, doi:10.4232/1.11352
2006	2006	European Commission (2012): Eurobarometer 66.2 (Oct-Nov 2006). TNS OPINION & SOCIAL, Brussels [Producer]. GESIS Data Archive, Cologne. ZA4527 Data file Version 1.0.1, doi:10.4232/1.10981
2009	2009	European Commission (2012): Eurobarometer 72.3 (Oct 2009). TNS OPINION & SOCIAL, Brussels [Producer]. GESIS Data Archive, Cologne. ZA4977 Data file Version 2.0.0, doi:10.4232/1.11140

Input data used in GBD 2016 to generate estimates for Portugal for drug use

Year Start	Year End	Citation
2005	2005	EMCDDA. European Monitoring Centre for Drugs and Drug Addiction Statistical Bulletin 2009. Lisbon, Portugal: European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)
2012	2012	EMCDDA. European Monitoring Centre for Drugs and Drug Addiction Statistical Bulletin 2016. Lisbon, Portugal: European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), 2016

Input data used in GBD 2016 to generate estimates for Portugal for unsafe sex

Year Start	Year End	Citation
2006	2012	ECDC, WHO/Europe. HIV/AIDS Surveillance in Europe 2012. Stockholm, Sweden: European Centre for Disease Prevention and Control, 2013
2013	2013	ECDC, WHO/Europe. HIV/AIDS Surveillance in Europe 2013. Stockholm, Sweden: European Centre for Disease Prevention and Control, 2014
2014	2014	ECDC, WHO/Europe. HIV/AIDS Surveillance in Europe 2014. Stockholm, Sweden: European Centre for Disease Prevention and Control, 2015

Sustainable Development Goals: the framework

The United Nations established, in September 2015, the Sustainable Development Goals (SDGs), which specify 17 universal goals, 169 targets, and 232 indicators leading up to 2030. The GBD 2016 study provides estimates for 37 health-related SDG indicators for 188 countries from 1990 to 2016, as well as projections, based on past trends, from 2017 to 2030. These 37 SDG indicators were used to construct the health-related SDG index, a summary measure of overall performance across the health-related SDGs.

Health-related indicators are indicators that directly involve health services, health outcomes, and risk factors with well-established causal connections to health.

The aster plot in Figure 14 shows, for a given country and year, each of the 37 health-related SDG indicators as individual arms, color-coded by SDG target. The number in the middle of this diagram is the health-related SDG index value. The numbers associated with each arm of the sunburst are “index values” (on a scale of 0 to 100) for a given health-related SDG indicator, identified by abbreviated descriptions. The relative length of each sunburst arm represents a given indicator’s “index value,” such that a longer arm reflects a value closer to 100 (best performance) and a shorter arm reflects a value closer to 0 (worst performance).

These indices are based on individual health-related SDG indicators that are scaled to provide an easy way to directly compare overall performance across geographies, over time, and by index type. GBD 2016 also includes estimates or unscaled values, i.e., the underlying indicator values – deaths per 100,000, proportion of children under 5 who are overweight, cases per 1,000, and so on.

Annex: Health-related SDG indicators for Portugal, 2016 (GBD estimates)

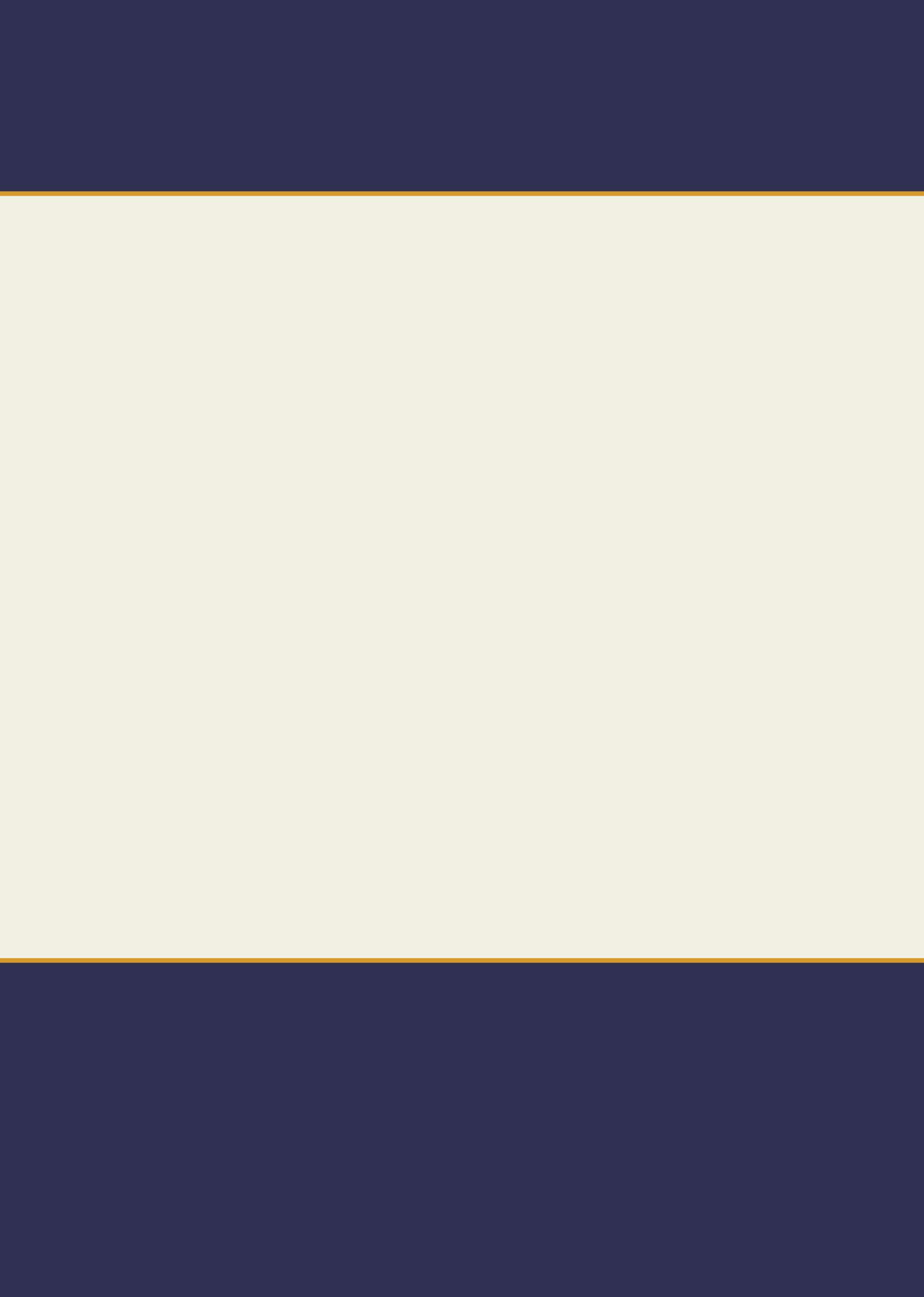
Goal, Target, and Indicator Descriptions	Indicator outline	Indicator unit	Indicator target	Unscaled value
Goal 1: End poverty in all its forms everywhere.	1			
Target 1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.	1.5			
Indicator 1.5.1: Death rate due to exposure to forces of nature (per 100,000 population)	1.5.1	Deaths per 100,000	Target undefined or unavailable	0.03
Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.	2			
Target 2.2: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.	2.2			
Indicator 2.2.1: Prevalence of stunting among children under 5 years of age	2.2.1	Percent (%)	Equal to or less than 0.5% by 2030	1.5
Indicator 2.2.2a: Prevalence of wasting among children under 5 years of age	2.2.2a	Percent (%)	Equal to or less than 0.5% by 2030	1.1
Indicator 2.2.2b: Prevalence of overweight among children aged 2 to 4 years	2.2.2b	Percent (%)	Equal to or less than 0.5% by 2030	31.7
Goal 3: Ensure healthy lives and promote well-being for all at all ages	3			
Target 3.1: By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births.	3.1			
Indicator 3.1.1: Maternal mortality ratio (maternal deaths per 100,000 live births) in women aged 10-54 years	3.1.1	Deaths per 100,000 live births	Less than 70 deaths per 100,000 live births by 2030	10.2
Indicator 3.1.2: Proportion of births attended by skilled health personnel (doctors, nurses, midwives, or country-specific medical staff [e.g., clinical officers])	3.1.2	Percent (%)	Equal to or greater than 99% by 2030	99.5
Target 3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under 5 mortality to at least as low as 25 per 1,000 live births.	3.2			
Indicator 3.2.1: Under 5 mortality rate (probability of dying before the age of 5 per 1,000 live births)	3.2.1	Deaths per 1,000 live births	Equal to or less than 25 deaths per 1,000 live births by 2030	3.1
Indicator 3.2.2: Neonatal mortality rate (probability of dying during the first 28 days of life per 1,000 live births)	3.2.2	Deaths per 1,000 live births	Equal to or less than 12 deaths per 1,000 live births by 2030	1.6
Target 3.3: By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.	3.3			
Indicator 3.3.1: Age-standardized rate of new HIV infections (per 1,000 population)	3.3.1	Cases per 1,000	Equal to or less than 0.005 per 1,000 by 2030	0.6
Indicator 3.3.2: Age-standardized rate of tuberculosis cases (per 100,000 population)	3.3.2	Cases per 100,000	Equal to or less than 0.5 per 100,000 by 2030	18.0

Goal, Target, and Indicator Descriptions	Indicator outline	Indicator unit	Indicator target	Unscaled value
Indicator 3.3.3: Age-standardized rate of malaria cases (per 1,000 population)	3.3.3	Cases per 1,000	Equal to or less than 0.005 per 1,000 by 2030	0.0
Indicator 3.3.4: Age-standardized rate of hepatitis B incidence (per 100,000 population)	3.3.4	Cases per 100,000	Target undefined or unavailable	163.0
Indicator 3.3.5: Age-standardized prevalence of the sum of 15 neglected tropical diseases (NTDs)	3.3.5	Percent (%)	Equal to or less than 0.5% by 2030	0.9
Target 3.4: By 2030, reduce by one third premature mortality from NCDs through prevention and treatment and promote mental health and well-being.	3.4			
Indicator 3.4.1: Age-standardized death rate due to cardiovascular disease, cancers, diabetes, and chronic respiratory disease among populations aged 30 to 70 (per 100,000 population)	3.4.1	Deaths per 100,000	Reduce by one-third by 2030	232.8
Indicator 3.4.2: Age-standardized death rate due to self-harm (per 100,000 population)	3.4.2	Deaths per 100,000	Reduce by one-third by 2030	9.7
Target 3.5: Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol.	3.5			
Indicator 3.5.2: Risk-weighted prevalence of alcohol consumption, as measured by the summary exposure value (SEV) for alcohol use	3.5.2	Percent (%)	Target undefined or unavailable	25.4
Target 3.6: By 2020, halve the number of global deaths and injuries from road traffic accidents.	3.6			
Indicator 3.6.1: Age-standardized death rate due to road injuries (per 100,000 population)	3.6.1	Deaths per 100,000	Reduce by 50% by 2020	8.5
Target 3.7: By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programs.	3.7			
Indicator 3.7.1: Proportion of women of reproductive age (15 to 49 years) who have their need for family planning satisfied with modern contraception methods	3.7.1	Percent (%)	Equal to or greater than 99% by 2030	79.3
Indicator 3.7.2: Number of live births per 1,000 women aged 10 to 14 years and women aged 15 to 19 years	3.7.2	Live births per 1,000 women	Target undefined or unavailable	4.1
Target 3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.	3.8			
Indicator 3.8.1: Coverage of essential health services, as defined by a UHC index of the coverage of 9 tracer interventions and risk-standardized death rates from 32 causes amenable to personal healthcare	3.8.1	Index value (0-100)	Equal to or greater than 99% by 2030	77.0
Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.	3.9			
Indicator 3.9.1: Age-standardized death rate attributable to household air pollution and ambient air pollution (per 100,000 population)	3.9.1	Deaths per 100,000	Target undefined or unavailable	17.5
Indicator 3.9.2: Age-standardized death rate attributable to unsafe water, sanitation, and hygiene (WASH) (per 100,000 population)	3.9.2	Deaths per 100,000	Target undefined or unavailable	0.4
Indicator 3.9.3: Age-standardized death rate due to unintentional poisonings (per 100,000 population)	3.9.3	Deaths per 100,000	Target undefined or unavailable	0.2
Target 3.a: Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate.	3.a			
Indicator 3.a.1: Age-standardized prevalence of daily smoking among populations aged 10 and older	3.a.1	Percent (%)	Target undefined or unavailable	18.4
Target 3.b: Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all.	3.b			
Indicator 3.b.1: Coverage of eight vaccines, conditional on inclusion in national vaccine schedules, in target populations	3.b.1	Percent (%)	Equal to or greater than 99% by 2030	95.1

Goal, Target, and Indicator Descriptions	Indicator outline	Indicator unit	Indicator target	Unscaled value
Goal 5: Achieve gender equality and empower all women and girls.	5			
Target 5.2: Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation.	5.2			
Indicator 5.2.1: Age-standardized prevalence of women aged 15 years and older who experienced physical or sexual violence by an intimate partner in the last 12 months	5.2.1	Percent (%)	Equal to or less than 0.5% by 2030	14.3
Goal 6: Ensure availability and sustainable management of water and sanitation for all.	6			
Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all.	6.1			
Indicator 6.1.1: Risk-weighted prevalence of populations using unsafe or unimproved water sources, as measured by the summary exposure value (SEV) for unsafe water	6.1.1	Percent (%)	Equal to or less than 1% by 2030	1.1
Target 6.2: By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.	6.2			
Indicator 6.2.1a: Risk-weighted prevalence of populations using unsafe or unimproved sanitation, as measured by the summary exposure value (SEV) for unsafe sanitation	6.2.1a	Percent (%)	Equal to or less than 1% by 2030	5.7
Indicator 6.2.2b: Risk-weighted prevalence of populations without access to a handwashing facility, as measured by the summary exposure value (SEV) for unsafe hygiene	6.2.2b	Percent (%)	Equal to or less than 1% by 2030	4.0
Goal 7: Ensure access to affordable, reliable, and sustainable modern energy for all.	7			
Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services.	7.1			
Indicator 7.1.2: Risk-weighted prevalence of household air pollution, as measured by the summary exposure value (SEV) for household air pollution	7.1.2	Percent (%)	Equal to or less than 1% by 2030	0.6
Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	8			
Target 8.8: Protect labor rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.	8.8			
Indicator 8.8.1: Age-standardized all-cause disability-adjusted life year (DALY) rates attributable to occupational risks (per 100,000 population)	8.8.1	DALYs per 100,000	Target undefined or unavailable	746.8
Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable.	11			
Target 11.5: By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.	11.5			
Target 11.6: By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.	11.6			
Indicator 11.6.2: Population-weighted mean levels of fine particulate matter smaller than 2.5 microns (PM _{2.5})	11.6.2	Micrograms per cubic meter	Target undefined or unavailable	9.5
Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels.	16			
Target 16.1: Significantly reduce all forms of violence and related death rates everywhere	16.1			
Indicator 16.1.1: Age-standardized death rate due to interpersonal violence (per 100,000 population)	16.1.1	Deaths per 100,000	Target undefined or unavailable	1.3
Indicator 16.1.2: Death rate due to conflict and terrorism (per 100,000 population)	16.1.2	Deaths per 100,000	Target undefined or unavailable	0.0

Goal, Target, and Indicator Descriptions	Indicator outline	Indicator unit	Indicator target	Unscaled value
Indicator 16.1.3: Age-standardized prevalence of physical or sexual violence experienced by populations in the last 12 months	16.1.3	Percent (%)	Target undefined or unavailable	5.0
Indicator 16.2.3: Age-standardized prevalence of women and men aged 18-29 years who experienced sexual violence by age 18	16.2.3	Percent (%)	Equal to or less than 0.5% by 2030	11.2
Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development.	17			
Target 17.19: By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries.	17.19			
Indicator 17.19.2c: Percentage of well-certified deaths by a vital registration (VR) system among a country's total population	17.19.2c	Percent (%)	Equal to or greater than 80% by 2030	79.3

Source: Institute for Health Metrics and Evaluation (IHME). Health-related SDGs. Seattle, WA: IHME, University of Washington, 2017. Available from <http://vizhub.healthdata.org/sdg>. (Accessed 25 September 2017)



DIREÇÃO-GERAL DA SAÚDE
Alameda D. Afonso Henriques, 45
1049-005 Lisboa
Portugal

Telephone: +351 218 430 500
Fax: +351 218 430 530/1
Email: geral@dgs.min-saude.pt
<http://www.dgs.pt>

INSTITUTE FOR HEALTH METRICS AND EVALUATION
2301 Fifth Avenue, Suite 600
Seattle, WA 98121
USA

Telephone: +1-206-897-2800
Fax: +1-206-897-2899
Email: engage@healthdata.org
www.healthdata.org