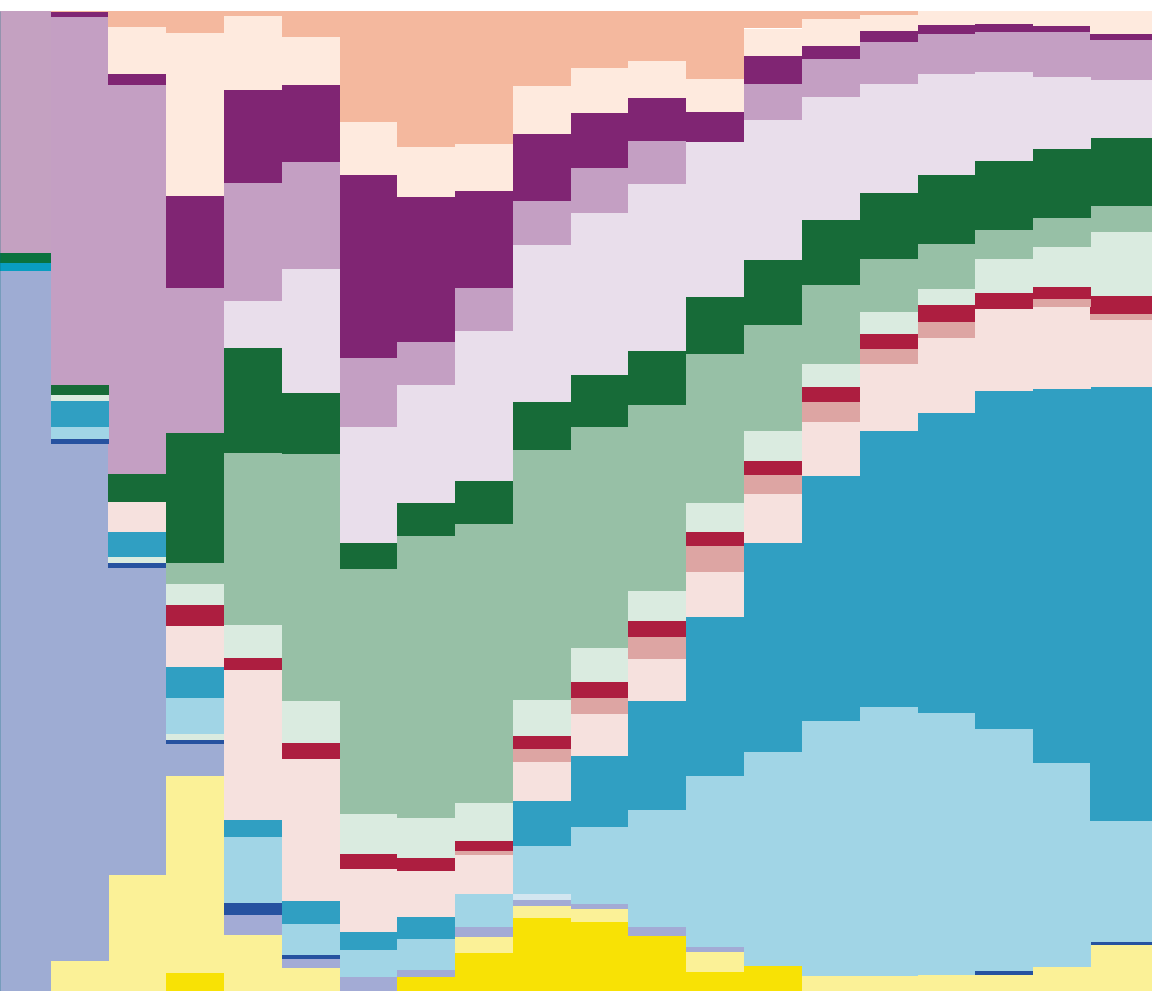


THE GLOBAL BURDEN OF DISEASE: GENERATING EVIDENCE, GUIDING POLICY

EAST ASIA AND PACIFIC REGIONAL EDITION

INSTITUTE FOR HEALTH METRICS AND EVALUATION
UNIVERSITY OF WASHINGTON

HUMAN DEVELOPMENT NETWORK
THE WORLD BANK

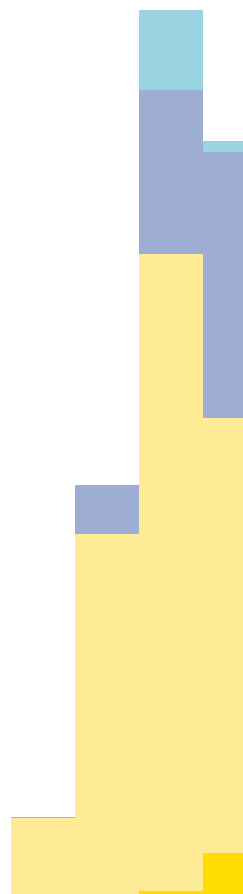


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This report was prepared by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington and the Human Development Network at the World Bank based on seven papers for the Global Burden of Disease Study 2010 (GBD 2010) published in *The Lancet* (2012 Dec 13; 380). GBD 2010 had 488 co-authors from 303 institutions in 50 countries. The work was made possible through core funding from the Bill & Melinda Gates Foundation. The views expressed are those of the authors.

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GBD

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ABOUT IHME

The Institute for Health Metrics and Evaluation (IHME) is an independent global health research center at the University of Washington that provides rigorous and comparable measurement of the world's most important health problems and evaluates the strategies used to address them. IHME makes this information freely available so that policymakers have the evidence they need to make informed decisions about how to allocate resources to best improve population health.

To express interest in collaborating, participating in GBD training workshops, or receiving updates of GBD or copies of this publication, please contact IHME at:

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ABOUT THE HUMAN DEVELOPMENT NETWORK AT THE WORLD BANK GROUP

The World Bank Group is one of the world's largest sources of funding and knowledge for developing countries. It comprises five closely associated institutions: the International Bank for Reconstruction and Development and the International Development Association (IDA), which together form the World Bank; the International Finance Corporation (IFC); the Multilateral Investment Guarantee Agency (MIGA); and the International Centre for Settlement of Investment Disputes (ICSID). Each institution plays a distinct role in the mission to end extreme poverty and build shared prosperity in the developing world.

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to deliver country-tailored solutions. HDN's work helps support the most effective policies, tools, and instruments to make a real difference toward the broader goal of ending extreme poverty and building shared prosperity.

For more information, go to www.worldbank.org/health.

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GLOSSARY

Years of life lost (YLLs): Years of life lost due to premature mortality.

Years lived with disability (YLDs): Years of life lived with any short-term or long-term health loss, adjusted for severity.

Disability-adjusted life years (DALYs): The sum of years lost due to premature death (YLLs) and years lived with disability (YLDs). DALYs are also defined as years of healthy life lost.

Healthy life expectancy, or health-adjusted 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.

Sequelae: Consequences of diseases and injuries.

Health states: Groupings of sequelae that reflect key differences in symptoms and functioning.

Disability weights: Number on a scale from 0 to 1 that represents the severity of health loss associated with a health state.

Risk factors: Potentially modifiable causes of disease and injury.

Uncertainty intervals: A range of values that is likely to include the correct estimate of health loss for a given cause. Narrow uncertainty intervals indicate that evidence is strong, while wide uncertainty intervals show that evidence is weaker.

INTRODUCTION

The Global Burden of Disease (GBD) approach is a systematic, scientific effort to quantify the comparative magnitude of health loss due to diseases, injuries, and risk factors by age, sex, and geography for specific points in time. Box 1 describes the history of GBD. The latest iteration of that effort, the Global Burden of Diseases, Injuries, and Risk Factors Study 2010 (GBD 2010), was published in *The Lancet* in December 2012. The intent is to create a global public good that will be useful for informing the design of health systems and the creation of public health policy. It estimates premature death and disability due to 291 diseases and injuries, 1,160 sequelae (direct consequences of disease and injury), and 67 risk factors for 20 age groups and both sexes in 1990, 2005, and 2010. GBD 2010 produced estimates for 187 countries and 21 regions. In total, the study generated over 1 billion estimates of health outcomes.

GBD 2010 was a collaborative effort among 488 researchers from 50 countries and 303 institutions. The Institute for Health Metrics and Evaluation (IHME) acted as the coordinating center for the study. The collaboration strengthened both the data-gathering effort and the quantitative analysis by bringing together some of the foremost minds from a wide range of disciplines. Our intention is to build on this collaboration by enlarging the network in the years to come. Similarly, IHME and its collaborators hope to expand the list of diseases, injuries, and risk factors included in GBD and routinely update the GBD estimates. Continual updates will ensure that the international community can have access to high-quality estimates in the timeliest fashion. Through sound measurement, we can provide the foundational evidence that will lead to improved population health.

Over the last two decades, the global health landscape has undergone rapid transformation. People around the world are living longer than ever before, and the population is getting older. The number of people in the world is growing. Many countries have made remarkable progress in preventing child deaths. As a result, disease burden is increasingly defined by disability instead of premature mortality. The leading causes of death and disability have changed from communicable diseases in children to non-communicable diseases in adults. Eating too much has overtaken hunger as a leading risk factor for illness. While there are clear trends at the global level, there is substantial variation across regions and countries. Nowhere is this contrast more striking than in sub-Saharan Africa, where communicable, maternal, nutritional, and newborn diseases continue to dominate.

In the East Asia and Pacific region, many of the leading causes of health loss were non-communicable diseases. Similar to global trends, most communicable, newborn, nutritional, and maternal causes are becoming less important in this region as non-communicable diseases kill more people prematurely and cause increasing disability. However, the burden from HIV/AIDS increased in certain countries between 2005 and 2010, but decreased during this same period in other countries.

HIV/AIDS was one of the five leading causes of disease burden in Malaysia, Myanmar, and Thailand in 2010. Ischemic heart disease and diabetes are on the rise in most countries in the region. The area has also experienced significant growth in the burden of disease from injuries stemming from road injuries. Risk factors such as dietary risks, high blood pressure, smoking, household and ambient particulate matter (PM) air pollution, high fasting plasma glucose (an indicator of diabetes), alcohol use, and high body mass index (BMI) contributed to the rise of burden from non-communicable diseases in the East Asia and Pacific region, while risks related to illness in children remained prominent in countries such as Cambodia, Laos, and Timor-Leste.

Although demographic changes such as population growth and increasing average age have caused growth in burden from non-communicable diseases in East Asia and Pacific, GBD found that multiple countries are making progress in some of these conditions. This progress can be seen when using measurements called age-standardized rates, which remove the effects of demographic changes to isolate health improvements. Age-standardized rates of non-communicable diseases such as stroke and cirrhosis declined over time in China and Vietnam, and age-standardized rates of cervical cancer declined in Thailand between 2005 and 2010. At the same time, age-standardized rates of ischemic heart disease and lung cancer are rising in many countries, underscoring the region's mixed success in combatting different non-communicable diseases.

This publication summarizes the global GBD 2010 findings as well as the regional findings for East Asia and Pacific. It also explores intraregional differences in diseases, injuries, and risk factors. The overall findings for the region are summarized in the next section.

MAIN FINDINGS FOR EAST ASIA AND PACIFIC:

- The East Asia and Pacific region has made dramatic progress in reducing mortality and prolonging life since 1970. The countries that made the most progress in increasing the average age at death between 1970 and 2010 were China, Indonesia, Micronesia, North Korea, Samoa, and Thailand.
- Over the last 20 years, the region has succeeded in decreasing premature death and disability from most communicable, newborn, nutritional, and maternal causes, but HIV/AIDS remains a persistent challenge. For some countries in the region, there have been reductions in the burden from HIV/AIDS since 2005, but HIV/AIDS has risen in other countries during this period. HIV/AIDS ranked among the five leading causes of disability-adjusted life years, or DALYs, in Malaysia, Myanmar, and Thailand.
- Despite improvements, substantial burdens of communicable, newborn, nutritional, and maternal causes persisted in low- and lower-middle-income countries in East Asia and Pacific such as Cambodia, Indonesia, Laos, Myanmar, Papua New Guinea, Timor-Leste, and Vanuatu.

Box 1: History of the Global Burden of Disease and innovations in GBD 2010

The first GBD study was published as part of the *World Development Report 1993*. This original study generated estimates for 107 diseases, 483 sequelae (non-fatal health consequences), eight regions, and five age groups.

The authors' inspiration for the study came from the realization that policymakers lacked comprehensive and standardized data on diseases, injuries, and potentially preventable risk factors for decision-making. A second source of inspiration was the fact that disease-specific advocates' estimates of the number of deaths caused by their diseases of interest far exceeded the total number of global deaths in any given year. GBD authors chose to pursue a holistic approach to analyzing disease burden to produce scientifically sound estimates that were independent of the influence of advocates.

The GBD 1990 study had a profound impact on health policy as it exposed the hidden burden of mental illness around the world. It also shed light on neglected health areas such as the premature death and disability caused by road traffic injuries. Work from this study has been cited over 4,000 times since 1993.

The study also sparked substantial controversy. Many disease-specific advocates argued that the original GBD underestimated burden from the causes they cared about most. The use of age weighting and discounting also caused extensive debates. Age weighting assumed that a year of life increased in value until age 22, and then decreased steadily. Discounting counted years of healthy life saved in the present as more valuable than years of life saved in the future. Also controversial was the use of expert judgment to estimate disability weights (estimations of the severity of non-fatal conditions). As a result of this feedback and consultation with a network of philosophers, ethicists, and economists, GBD no longer uses age weighting and discounting. Also, GBD 2010 updated its methods for determining disability weights and used data gathered from thousands of respondents from different countries around the world.

GBD 2010 shares many of the founding principles of the original GBD 1990 study, such as using all available data on diseases, injuries, and risk factors; using comparable metrics to estimate the impact of death and disability on society; and ensuring that the science of disease burden estimation is not influenced by advocacy.

Despite these similarities, GBD 2010 is broader in scope and involved a larger number of collaborators than any previous GBD study. While the original study had the participation of 100 collaborators worldwide, GBD 2010 had 488 co-authors. Thanks to that network, the study includes vast amounts of data on health outcomes and risk factors. Researchers also made substantial improvements to the GBD methodology, summarized in Box 2 and described in detail in the Annex of this report and in the published studies. Among these improvements, highlights include using data collected via population surveys to estimate disability weights for the first time, greatly expanding the list of causes and risk factors analyzed in the study, detailed analysis of the effect of different components of diet on health outcomes, and reporting of uncertainty intervals for all metrics. GBD 2010 researchers reported uncertainty intervals to provide full transparency about the weaknesses and strengths of the analysis. Narrow uncertainty intervals indicate that evidence is strong, while wide uncertainty intervals show that evidence is weaker.

- China is the most epidemiologically advanced country in the region. Similar to developed countries, disease burden in China was dominated by non-communicable diseases and injuries. The health progress made by lower-middle-income Vietnam was comparable to upper-middle-income countries in the region.
- Between 1990 and 2010, demographic changes contributed to rising disease burden from many non-communicable causes, especially from stroke, mental disorders such as major depressive disorders and anxiety, musculoskeletal disorders including low back pain and neck pain, diabetes, and trachea, bronchus, and lung cancers. Today, diabetes disorders are causing more early death and disability in East Asia and Pacific than two decades ago. Removing the effect of demographic changes on disease patterns by using age-standardized rates, however, reveals that China and Vietnam made progress in reducing stroke and cirrhosis and Thailand successfully reduced age-standardized rates of cervical cancer between 2005 and 2010. At the same time, age-standardized rates of ischemic heart disease and lung cancer are rising in many countries in the region.
- As countries in East Asia and Pacific have become more developed, road injuries have taken a growing toll on human health. For example, in Indonesia, Thailand, and Vietnam, road injuries were among the five leading causes of DALYs.
- The leading causes of disability in the region largely mirrored global trends. Low back pain, neck pain, and other musculoskeletal disorders, as well as mental disorders such as depression, were dominant causes of disability in East Asia and Pacific. In contrast to global trends, however, osteoarthritis and diabetes were higher ranking causes of disability in East Asia and Pacific, while drug use disorders, asthma, and Alzheimer's disease all rank lower in the region as a cause of years lived with disability compared to the world as a whole.
- Risk factors such as dietary risks, high blood pressure, smoking, household and ambient particulate matter air pollution, high fasting plasma glucose, alcohol use, and high BMI were leading risk factors for premature death and disability in East Asia and Pacific. Ambient particulate matter air pollution was a more important cause of disease burden than it was in the world as a whole, largely due to China's high levels of this risk factor. Risk factors that primarily cause illness in children, such as household air pollution, childhood underweight, iron deficiency, and suboptimal breastfeeding, were important in Cambodia, Laos, and Timor-Leste.

Box 2: Global Burden of Disease methodology

GBD uses thousands of data sources from around the world to estimate disease burden. As a first step, GBD researchers estimate child and adult mortality using data sources such as vital and sample registration systems, censuses, and household surveys. Years lost due to premature death from different causes are calculated using data from vital registration with medical certification of causes of death when available and sources such as verbal autopsies in countries where medical certification of causes of death is lacking. Years lived with disability are estimated using sources such as cancer registries, data from outpatient and inpatient facilities, and direct measurements of hearing, vision, and lung function testing. Once they have estimated years lost due to premature death and years lived with disability, GBD researchers sum the two estimates to obtain disability-adjusted life years. Finally, researchers quantify the amount of premature death and disability attributable to different risk factors using data on exposure to, and the effects of, the different risk factors. For more information about the GBD methods, see the Annex of this report as well as the published papers.