

Epi Data Brief

New York City Department of Health and Mental Hygiene

November 2011, No. 11

Disability-adjusted life years (DALYs) in New York City

- Historically, an important measure of disease burden has been mortality. For example, during epidemics of smallpox and cholera, the number of deaths and death rates were important to understanding the impact of these diseases.
- However, mortality measures provide only a partial picture of population health, especially for diseases that are not usually fatal but impose significant disability and suffering, such as arthritis or depression and other mental illnesses. Measures of disease burden that capture the impact of morbidity – illness and disability – are needed to fully understand the burden of illness in a population.
- Disability-adjusted life years (DALYs) are one measure that combines the impact of death and disability into a single indicator of disease burden.

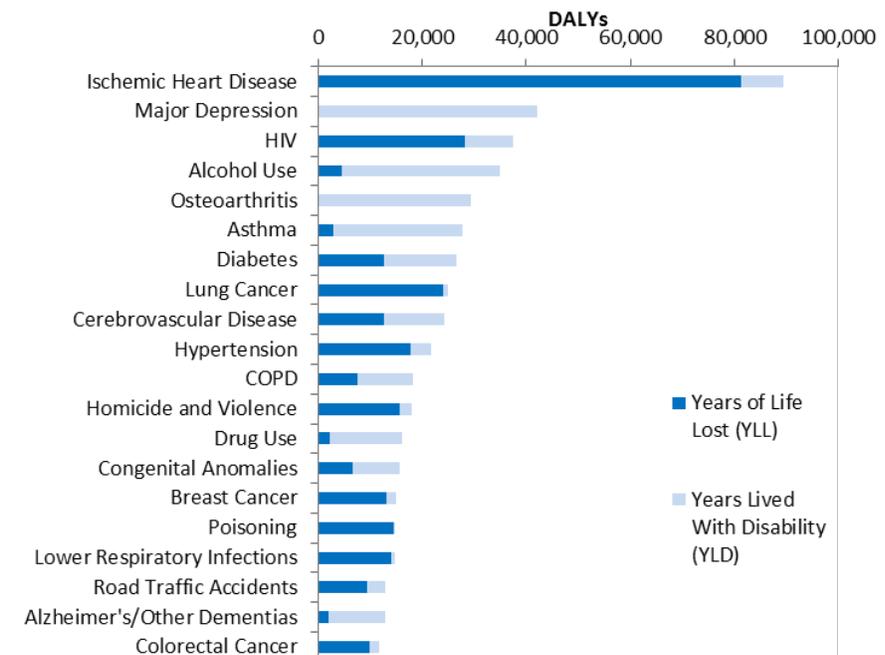
Defining DALYs

For each condition, disability-adjusted life years measures years of healthy life lost. They combine in a single measure years lost to premature death and years lived with a disability. Mortality is expressed as years of life lost (YLL), and disability as years lived with disability (YLD). People who die before an expected age can be thought of as dying early, or prematurely. Years of life lost to premature death were computed based on the difference between a standard life expectancy and age at death. Each condition is assigned a disability weight. Years lived with disability are based on the disability weight and average duration specific to each condition. The number of DALYs for any given condition is the sum of years of life lost and years lived with a disability for that condition (DALYs = YLL + YLD). The health conditions can then be ranked by the number of DALYs – showing the relative burden to New Yorkers associated with specific diseases and injuries.

Depression and other disabling chronic conditions are leading causes of DALYs

- Ischemic heart disease was the leading cause of DALYs, because it causes so much premature death – amounting to more than 80,000 years of life lost in 2005.
- Major depression was the second leading cause of DALYs, because of its high morbidity. Depression was the leading cause of years lived with disability in 2005.
- Other conditions that are not usually fatal, such as alcohol use, osteoarthritis – a degenerative joint disease – and asthma, are also leading sources of illness and disability in the city.

20 leading causes of disability-adjusted life years (DALYs), NYC, 2005



Source: NYC DOHMH Divisions of Epidemiology and Mental Hygiene

MORE New York City Health Data and Publications

- For complete tables of data presented in this Brief, visit www.nyc.gov/html/doh/downloads/pdf/epi/datatable11.pdf
 - Visit EpiQuery – the Health Department’s online, interactive health data system at www.nyc.gov/health/EpiQuery
- My Community’s Health: Data and Statistics at www.nyc.gov/health/nycommunityhealth.**

Leading causes of DALYs differ between men and women

- While ischemic heart disease was the leading cause of DALYs for all New Yorkers, disease burden differs between men and women for other leading causes.
- Major depression was the second leading cause of DALYs for women in the city, but fifth for men.
- Alcohol use caused twice as many DALYs among men than women.
- Homicide and violence caused more DALYs in NYC men – the eighth leading cause – than among women.

Leading causes of DALYs by sex, NYC 2005

Males		Females	
Rank	Cause	Rank	Cause
1	Ischemic Heart Disease	1	Ischemic Heart Disease
2	Alcohol Use	2	Major Depression
3	HIV	3	Osteoarthritis
4	Asthma	4	HIV
5	Major Depression	5	Breast Cancer
6	Lung Cancer	6	Asthma
7	Diabetes	7	Cerebrovascular Disease
8	Homicide and Violence	8	Diabetes
9	Osteoarthritis	9	Alcohol Use
10	Drug Use	10	Lung Cancer
11	Hypertension	11	Hypertension
12	Poisoning	12	Chronic Obstructive Pulmonary Disease
13	Cerebrovascular Disease	13	Alzheimer's Disease/Other Dementias
14	Road Traffic Accidents	14	Lower Respiratory Infections
15	Chronic Obstructive Pulmonary Disease	15	Congenital Anomalies
16	Congenital Anomalies	16	Colorectal Cancer
17	Lower Respiratory Infections	17	Post-traumatic Stress Disorder
18	Self-inflicted Injury/Suicide	18	Panic Disorder
19	Falls	19	Homicide and Violence
20	Bipolar Disorder	20	Bipolar Disorder

Source: NYC DOHMH Divisions of Epidemiology and Mental Hygiene

Authored by: Sharon Perlman, Cynthia Driver, on behalf of the DALYs Working Group

Acknowledgements: DALYs Working Group (Catherine Corey, Carolyn Greene, Adam Karpati, Bonnie Kerker, Ann Madsen, Denise Paone, Meredith Slopen); Carolyn Olson, Lorna Thorpe

Related References

Murray CJL, et al. The Global Burden of Disease: a comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. 1st edition. Cambridge, Harvard University Press; 1996.

Michaud CM, et al. The burden of disease and injury in the United States 1996. *Population Health Metrics* 2006;4:11.

Kominski GF, et al. Assessing the burden of disease and injury in Los Angeles County using disability-adjusted life years. *Public Health Reports* 2002;117:185-191.

Data Sources & Methods

This study was based on the methodology from a national study by Michaud et al. (see related references below).

Years of life lost (YLL) were calculated using 2005 mortality data for NYC from the National Center for Health Statistics that had been adjusted by national researchers as described in Murray et al (see data tables for more information). Data were stratified by sex, age group and race.

Life expectancy estimates from the national study based on the life expectancy in Japan (82.5 years for women and 80.0 years for men) were used for calculation of YLL.

For the national study, YLD calculations took into account the severity and duration of each condition. For NYC YLD, U.S. Census Bureau population estimates for New York City in 2005 by sex were used to calculate years lived with disability (YLD) by applying national YLD rates and ratios from the Michaud et al. study. If the national YLL:YLD ratio was less than 10, then NYC YLD was equal to the national YLD:YLL ratio multiplied by NYC YLL. If the national YLD:YLL ratio was greater than or equal to 10 (producing unreliable City estimates), then NYC YLD was equal to the national YLD rate multiplied by the NYC population. Results were weighted for age and discounted to be consistent with national and global studies.

Limitations

Data from the national study are from 1996 and patterns of disease and disability may have changed since then. In addition, misclassification of cause of death on death certificates can affect results (e.g. cardiovascular disease over-reporting).