GBD PROFILE: SINGAPORE

GLOBAL BURDEN OF DISEASES, INJURIES, AND RISK FACTORS STUDY 2010

The Global Burden of Disease Study 2010 (GBD 2010) is a collaborative project of nearly 500 researchers in 50 countries led by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington. It is the largest systematic scientific effort in history to quantify levels and trends of health loss due to diseases, injuries, and risk factors. GBD serves as a global public good to inform evidence-based policymaking and health systems design.

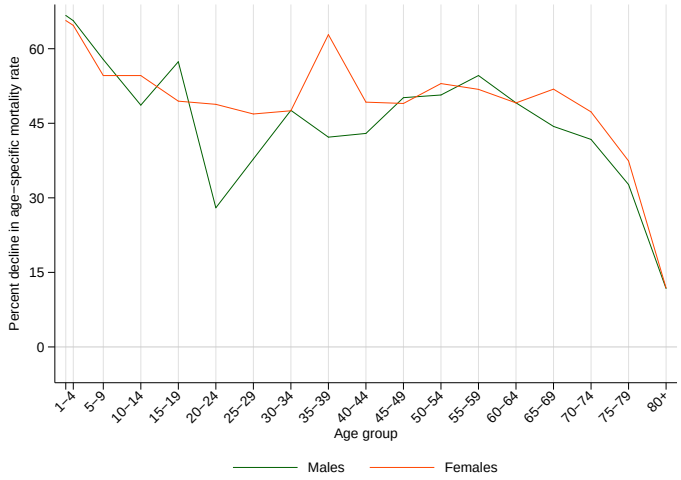
PROFILE OVERVIEW

- In terms of the number of years of life lost (YLLs) due to premature death in Singapore, ischemic heart disease, lower respiratory infections, and cerebrovascular disease were the highest ranking causes in 2010.
- Of the 25 most important causes of burden, as measured by disability-adjusted life years (DALYs), road injury showed the largest decrease, falling by 25% from 1990 to 2010.
- The leading risk factor in Singapore is dietary risks.

ALL-CAUSE MORTALITY RATE

- This chart shows the decline in mortality rate at every age range. The higher points on the chart indicate that declines in mortality rates were faster in those age groups between 1990 and 2010.
- The greatest reductions in all-cause mortality rate were experienced by males aged <1 year (67%). Males aged 80+ years saw the smallest decrease in mortality rate (12%).

Percent decline in age-specific mortality rate by sex from 1990-2010 in Singapore



CAUSES OF PREMATURE DEATH

Years of life lost (YLLs) quantify premature mortality by weighting younger deaths more than older deaths.

Ranks for top 25 causes of YLLs 1990-2010, Singapore

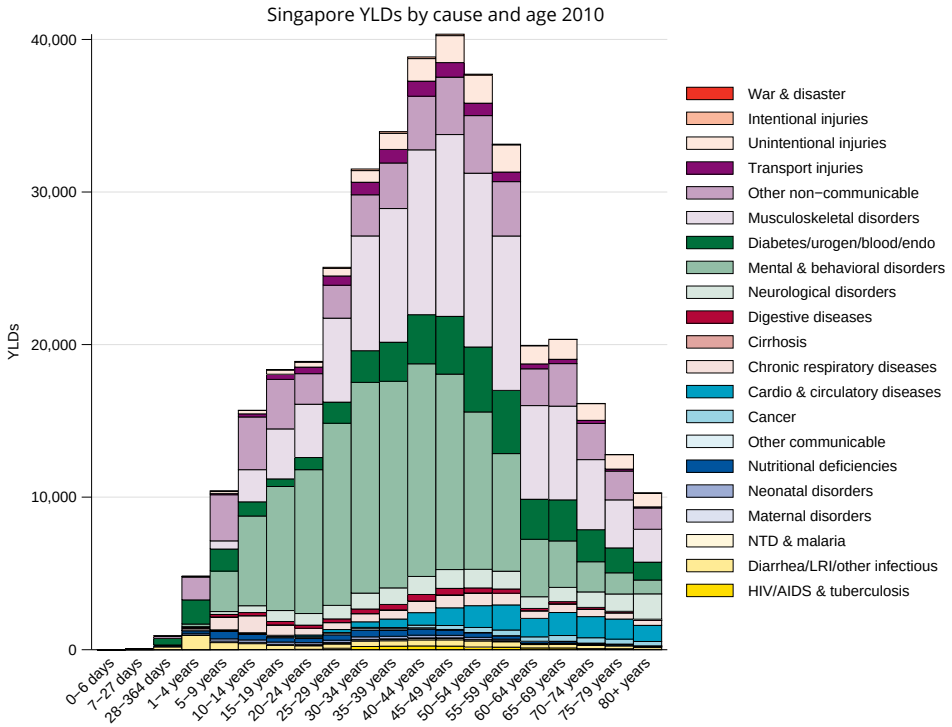
# YLLs in thousands (% of total)	Rank and disorder 1990	Rank and disorder 2010	# YLLs in thousands (% of total)	% change
53 (15.8%)	1 Ischemic heart disease	1 Ischemic heart disease	57 (18.6%)	8
29 (8.6%)	2 Stroke	2 Lower respiratory infections	27 (9.0%)	8
26 (7.7%)	3 Lower respiratory infections	3 Stroke	26 (8.5%)	-11
19 (5.7%)	4 Self-harm	4 Lung cancer	18 (6.0%)	2
17 (5.2%)	5 Lung cancer	5 Self-harm	16 (5.3%)	-16
14 (4.3%)	6 Congenital anomalies	6 Colorectal cancer	11 (3.7%)	14
12 (3.6%)	7 Road injury	7 Diabetes	8 (2.6%)	15
11 (3.4%)	8 COPD	8 COPD	8 (2.6%)	-28
10 (2.9%)	9 Colorectal cancer	9 Liver cancer	8 (2.6%)	17
9 (2.6%)	10 Stomach cancer	10 Breast cancer	8 (2.5%)	31
7 (2.1%)	11 Diabetes	11 Road injury	7 (2.2%)	-44
7 (2.1%)	12 Nasopharynx cancer	12 Nasopharynx cancer	7 (2.2%)	-4
7 (2.0%)	13 Liver cancer	13 Hypertensive heart disease	6 (2.1%)	33
7 (2.0%)	14 Preterm birth complications	14 Stomach cancer	6 (2.1%)	-29
6 (1.8%)	15 Chronic kidney disease	15 Chronic kidney disease	6 (2.0%)	5
6 (1.8%)	16 Breast cancer	16 Cirrhosis	4 (1.4%)	-7
5 (1.5%)	17 Hypertensive heart disease	17 Congenital anomalies	4 (1.3%)	-74
4 (1.3%)	18 Leukemia	18 Pancreatic cancer	4 (1.2%)	77
4 (1.3%)	19 Cirrhosis	19 Other cardio & circulatory	4 (1.2%)	-6
4 (1.2%)	20 Asthma	20 Leukemia	4 (1.2%)	-17
4 (1.2%)	21 Other cardio & circulatory	21 Falls	3 (1.1%)	0
4 (1.1%)	22 Cardiomyopathy	22 Cardiomyopathy	3 (1.0%)	-18
3 (1.0%)	23 Falls	23 Non-Hodgkin lymphoma	3 (0.9%)	33
3 (0.9%)	24 Tuberculosis	24 HIV/AIDS	3 (0.9%)	14
3 (0.9%)	25 Interpersonal violence	25 Ovarian cancer	3 (0.8%)	45
	27 HIV/AIDS	29 Preterm birth complications		
	30 Pancreatic cancer	30 Asthma		
	31 Non-Hodgkin lymphoma	33 Interpersonal violence		
	32 Ovarian cancer	34 Tuberculosis		

This chart shows the change in the top 25 causes of YLLs due to premature mortality from 1990 to 2010. Solid lines indicate a cause has moved up in rank or stayed the same. Broken lines indicate a cause has moved down in rank. The causes are color coded by blue for non-communicable diseases, green for injuries, and red for communicable, maternal, neonatal, and nutritional causes of death.

YEARS LIVED WITH DISABILITY (YLDs)

Years lived with disability (YLDs) are estimated by weighting the prevalence of different conditions based on severity. The top five leading causes of YLDs in Singapore are major depressive disorder, low back pain, neck pain, other musculoskeletal disorders, and anxiety disorders.

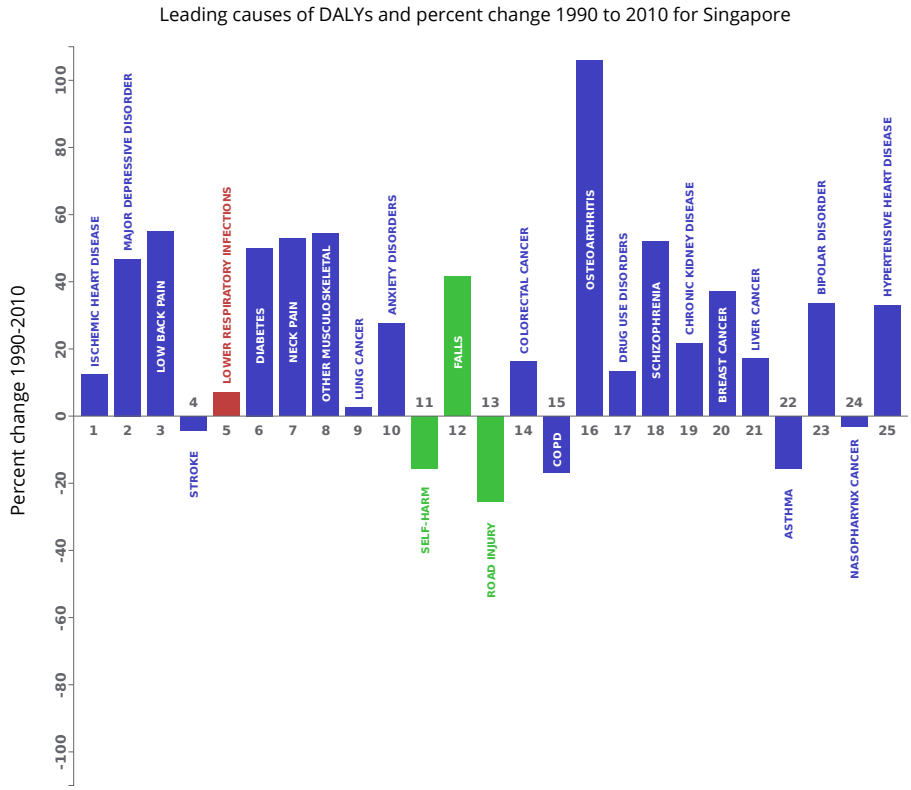
The size of the colored portion in each bar represents the number of YLDs attributable to each cause. The height of each bar shows which age groups had the most YLDs in 2010. The causes are aggregated. For example, musculoskeletal disorders include low back pain and neck pain.



DISABILITY-ADJUSTED LIFE YEARS (DALYs)

Disability-adjusted life years (DALYs) quantify both premature mortality (YLLs) and disability (YLDs) within a population. In Singapore, the top three causes of DALYs in 2010 were ischemic heart disease, major depressive disorder, and low back pain. Two causes that appeared in the 10 leading causes of DALYs in 2010 and not 1990 were other musculoskeletal disorders and anxiety disorders.

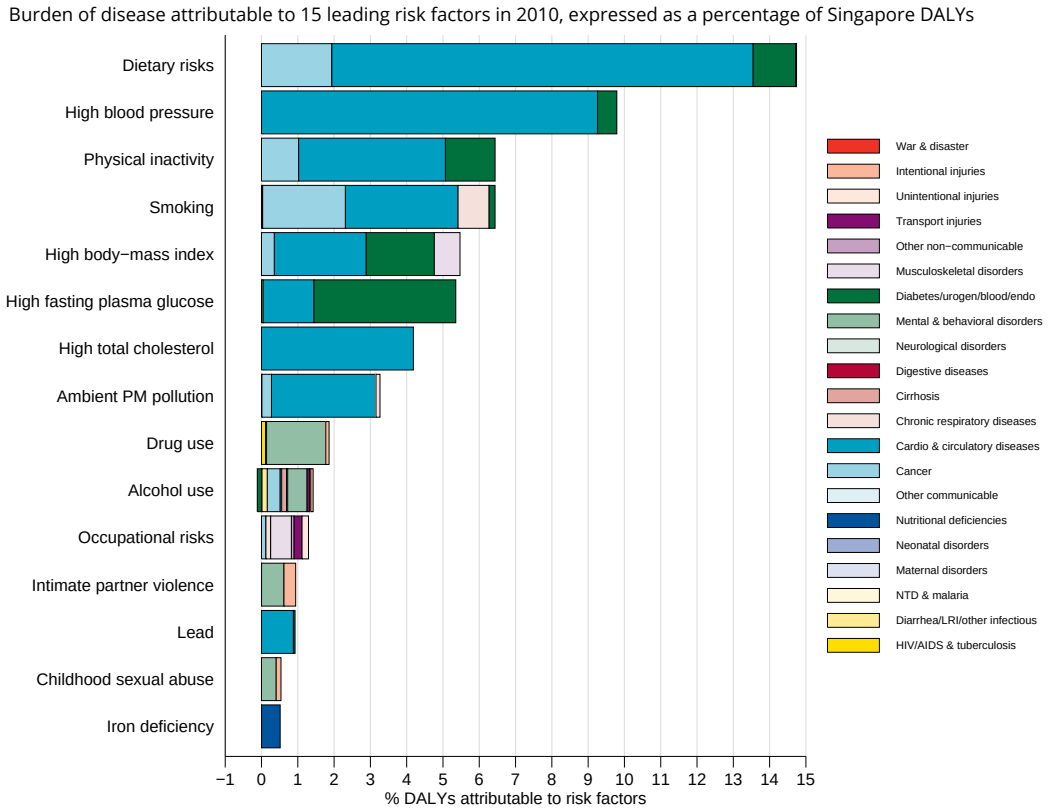
The top 25 causes of DALYs are ranked from left to right in order of the number of DALYs they contributed in 2010. Bars going up show the percent by which DALYs have increased since 1990. Bars going down show the percent by which DALYs have decreased. Globally, non-communicable diseases and injuries are generally on the rise, while communicable, maternal, neonatal, and nutritional causes of DALYs are generally on the decline.



RISK FACTORS

Overall, the three risk factors that account for the most disease burden in Singapore are dietary risks, high blood pressure, and physical inactivity and low physical activity. The leading risk factors for children under 5 and adults aged 15-49 years were childhood underweight and dietary risks, respectively, in 2010.

The graph shows the top 15 risk factors for Singapore. The colored portion of each bar represents the specific diseases attributable to that risk factor while bar size represents the percentage of DALYs linked to specific risk factors.



COUNTRY BENCHMARKING OF BURDEN OF DISEASE

Understanding the relative performance of Singapore against other comparator countries provides key insight into public health successes and areas where Singapore might be falling behind. The table identifies Singapore's rank across 14 other comparator countries, selected and ordered by income per capita, for five metrics of interest, with 1 indicating the best rank and 15 indicating the worst rank.

- Age-standardized rates are used to make meaningful comparisons across time by adjusting for changes in population size and age structure.
- Life expectancy incorporates mortality, and health-adjusted life expectancy further incorporates years lived in less than ideal health.
- In 2010, Singapore ranked 1st for age-standardized YLD rate and 7th for age-standardized YLL rate.

Age-standardized death rates, YLL rates, YLD rates, and life expectancy at birth and health-adjusted life expectancy at birth for 1990 and 2010, both sexes combined

Country	Age-standardized death rate (per 100,000)				Age-standardized YLL rate (per 100,000)				Age-standardized YLD rate (per 100,000)				Life expectancy at birth				Health-adjusted life expectancy at birth			
	1990		2010		1990		2010		1990		2010		1990		2010		1990		2010	
	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	LE	Rank	LE	Rank	HALE	Rank	HALE	Rank
Qatar	586	9	443	10	13,854	9	9,355	11	12,806	15	12,639	15	76.2	9	79.8	11	64	14	66.7	13
Luxembourg	641	11	432	9	14,255	10	8,484	8	11,370	10	11,683	10	75.3	10	80.2	9	65.2	11	68.4	8
Andorra	443	1	369	2	9,206	1	6,832	2	11,769	11	11,724	11	80.3	1	82.6	1	68.7	1	70.3	3
Norway	580	8	422	6	12,291	7	7,904	5	12,365	14	12,329	14	76.8	8	80.8	6	65.2	12	68	10
Brunei	705	14	576	14	15,283	14	11,525	13	10,711	4	10,502	2	74.4	14	77.2	14	64.9	13	67.3	12
Singapore	**665**	**12**	**425**	**7**	**14,747**	**12**	**8,192**	**7**	**10,079**	**1**	**9,827**	**1**	**75.3**	**11**	**81**	**5**	**66.4**	**5**	**71.1**	**1**
United Arab Emirates	795	15	615	15	18,366	15	13,157	15	12,272	13	11,951	13	72.7	15	76.3	15	62.2	15	65.1	15
Kuwait	489	2	511	12	11,796	3	12,133	14	12,022	12	11,867	12	77.8	2	77.4	13	66.1	7	65.9	14
United States	639	10	516	13	15,130	13	11,447	12	10,503	2	10,509	3	75.2	12	78.2	12	65.6	8	67.9	11
Switzerland	532	3	369	3	11,825	4	7,071	3	10,663	3	10,807	4	77.5	4	82.2	3	67.5	2	70.8	2
Netherlands	572	7	426	8	11,847	5	7,988	6	11,355	9	11,492	9	77	6	80.6	8	66.5	4	69.1	6
Ireland	692	13	453	11	14,298	11	8,764	10	11,024	7	11,138	8	74.8	13	79.9	10	65.2	10	68.9	7
Iceland	548	4	365	1	11,310	2	6,675	1	10,763	5	11,108	7	77.6	3	82.2	2	65.5	9	68.4	9
Australia	568	6	389	4	12,381	8	7,722	4	11,153	8	10,979	6	76.9	7	81.5	4	66.4	6	70.1	4
Canada	558	5	422	5	12,079	6	8,546	9	10,806	6	10,845	5	77.2	5	80.6	7	67	3	69.6	5

COUNTRY BENCHMARKING OF BURDEN OF DISEASE, CONTINUED

This figure shows the rank of Singapore relative to the same comparator countries for the leading causes of DALYs in 1990 (top) and 2010 (bottom).

- The columns are ordered by the absolute number of DALYs in Singapore for that particular year, with greatest burden on the left.
- The numbers indicate the rank across countries for each cause in terms of age-standardized DALY rates, with 1 as the best performance and 15 as the worst.

Ranking of leading age-standardized rates of disability-adjusted life years (DALYs) relative to comparator countries in 1990

Country	Ischemic heart disease	Major depressive disorder	Stroke	Lower respiratory infections	Low back pain	Self-harm	Road injury	Lung cancer	Diabetes	Neck pain	Other musculoskeletal	Congenital anomalies	COPD	Anxiety disorders	Falls	Colorectal cancer	Drug use disorders	Stomach cancer	Asthma	Chronic kidney disease	Preterm birth complications	Nasopharynx cancer	Liver cancer	Schizophrenia	Breast cancer
Qatar	13	14	11	7	8	3	13	2	14	1	2	15	5	14	4	2	13	3	7	13	15	8	13	7	2
Luxembourg	4	8	12	2	13	14	14	12	6	10	5	2	7	6	14	12	10	10	2	6	2	2	12	9	12
Andorra	1	11	7	3	12	5	2	4	3	13	6	3	4	13	11	6	6	6	6	9	6	4	5	2	6
Norway	10	9	8	9	15	13	4	6	10	9	8	7	3	15	13	11	11	9	10	1	3	5	1	3	7
Brunei	3	6	14	13	5	4	10	5	15	4	11	13	13	7	12	4	5	14	14	15	7	12	15	12	4
Singapore	**9**	**10**	**13**	**15**	**1**	**12**	**1**	**11**	**11**	**6**	**12**	**9**	**8**	**8**	**3**	**15**	**3**	**15**	**5**	**14**	**4**	**15**	**14**	**13**	**5**
United Arab Emirates	15	15	15	14	4	2	15	3	12	2	1	10	15	5	9	3	15	8	13	7	14	14	11	8	1
Kuwait	11	13	10	11	3	1	12	1	13	3	3	14	1	11	5	1	2	1	9	12	12	13	9	6	3
United States	12	5	3	8	2	8	11	15	9	15	15	6	12	12	1	8	12	2	8	11	13	7	7	14	9
Switzerland	2	7	4	5	6	15	8	7	7	12	7	11	11	3	15	7	7	7	4	2	1	9	10	5	11
Netherlands	5	12	6	4	9	6	3	14	5	8	10	8	9	10	6	10	1	11	1	4	8	6	2	1	15
Ireland	14	1	9	12	14	7	6	10	4	11	9	12	14	4	10	14	4	12	12	10	10	3	8	4	13
Iceland	8	4	2	10	11	10	5	9	1	14	4	1	2	1	8	5	8	13	3	3	5	1	3	10	14
Australia	7	2	5	1	7	9	9	8	2	5	13	4	10	9	7	13	14	5	15	5	11	11	4	11	8
Canada	6	3	1	6	10	11	7	13	8	7	14	5	6	2	2	9	9	4	11	8	9	10	6	15	10

Ranking of leading age-standardized rates of disability-adjusted life years (DALYs) relative to comparator countries in 2010

Country	Ischemic heart disease	Major depressive disorder	Low back pain	Stroke	Lower respiratory infections	Diabetes	Neck pain	Other musculoskeletal	Lung cancer	Anxiety disorders	Self-harm	Falls	Road injury	Colorectal cancer	COPD	Osteoarthritis	Drug use disorders	Schizophrenia	Chronic kidney disease	Breast cancer	Liver cancer	Asthma	Bipolar disorder	Nasopharynx cancer	Hypertensive heart disease
Qatar	9	13	8	4	7	15	1	1	1	14	4	8	13	1	2	14	13	8	13	1	13	4	11	11	7
Luxembourg	6	11	14	10	4	3	13	7	12	11	7	14	9	11	7	6	9	6	6	10	11	2	3	6	10
Andorra	8	10	12	11	5	6	11	8	4	10	5	11	3	10	5	4	6	2	9	6	5	12	8	3	9
Norway	5	8	15	6	8	9	8	6	9	15	11	13	5	14	8	1	11	5	1	8	1	8	1	4	4
Brunei	13	4	5	14	14	14	4	13	6	5	3	4	11	6	12	11	3	12	14	3	15	9	7	12	11
Singapore	**11**	**7**	**1**	**12**	**15**	**11**	**5**	**11**	**8**	**6**	**9**	**3**	**1**	**9**	**1**	**12**	**1**	**13**	**10**	**5**	**14**	**1**	**10**	**15**	**13**
United Arab Emirates	15	15	4	15	12	12	2	2	3	4	2	5	15	3	14	15	14	10	12	2	10	6	12	14	14
Kuwait	14	12	3	13	13	13	3	3	2	9	1	7	14	2	4	13	5	7	15	4	12	11	13	13	15
United States	12	5	2	9	10	10	15	15	14	13	12	2	12	7	15	9	15	14	11	11	9	10	14	7	12
Switzerland	2	9	6	3	2	7	14	4	7	2	15	15	7	5	13	7	4	4	2	12	8	7	9	10	5
Netherlands	1	14	10	7	9	2	7	9	15	7	6	10	4	15	11	2	2	1	4	15	3	3	4	5	6
Ireland	10	2	13	8	11	5	10	10	11	3	13	12	8	13	10	5	8	3	7	14	6	13	5	2	8
Iceland	4	6	11	1	3	1	12	5	10	12	8	9	2	4	3	8	7	9	3	7	2	5	2	1	3
Australia	3	1	7	2	1	4	6	12	5	8	10	6	10	12	9	3	12	11	5	9	7	15	6	8	2
Canada	7	3	9	5	6	8	9	14	13	1	14	1	6	8	6	10	10	15	8	13	4	14	15	9	1

Ranking Legend		1 - 3		4 - 7		8 - 11		12 - 15

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