

Development of the national burden of disease study: Thailand's experiences during 1999–2014 and challenges beyond

Thailand BOD Team
International Health Policy Program
15 September 2022

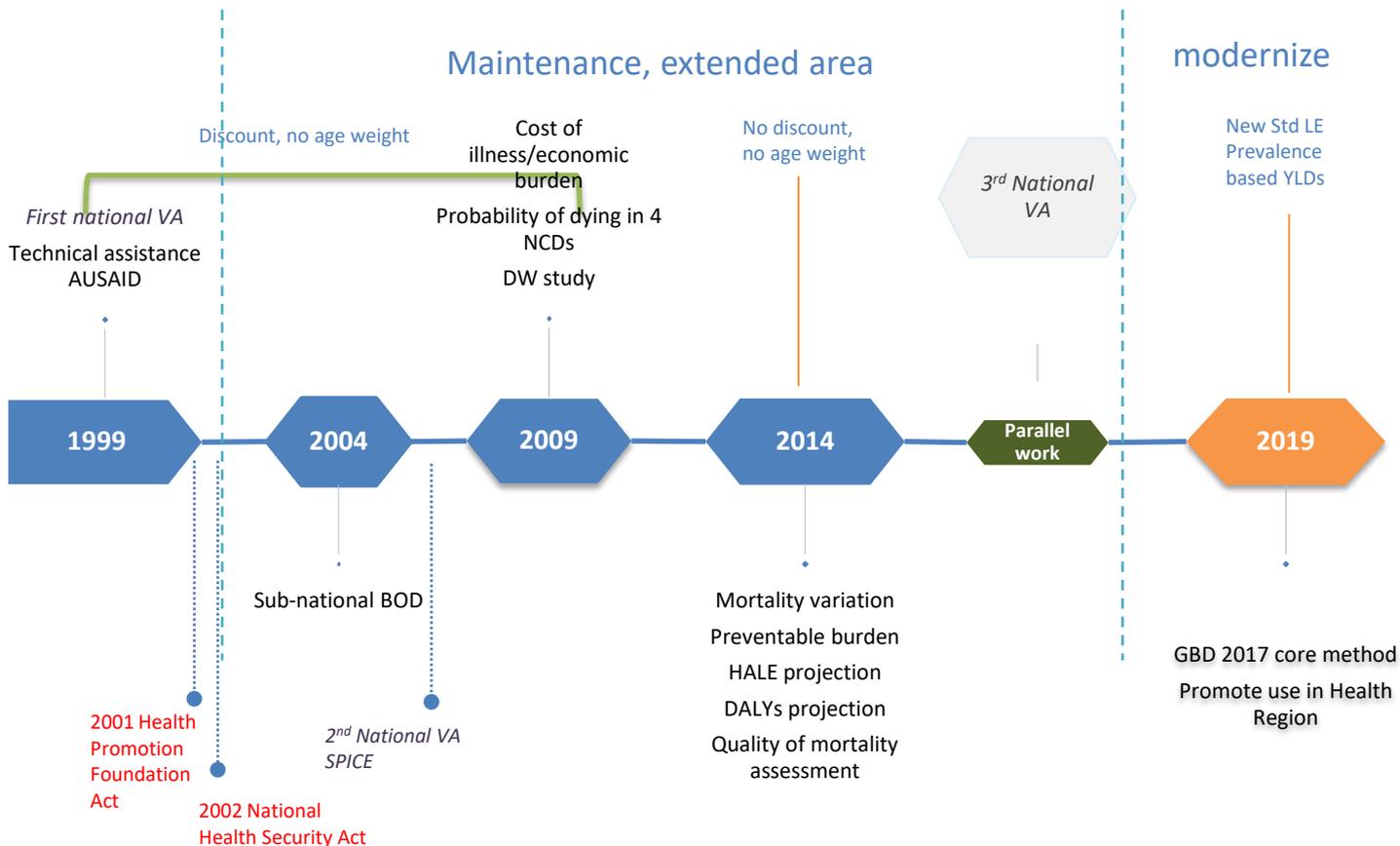
Development Timelines

initiation

ICD coding
Nationwide vital registration
Computerised VR (1995)
Identification number

Maintenance, extended area

modernize



Initiation phase: 1999

Quality of mortality data

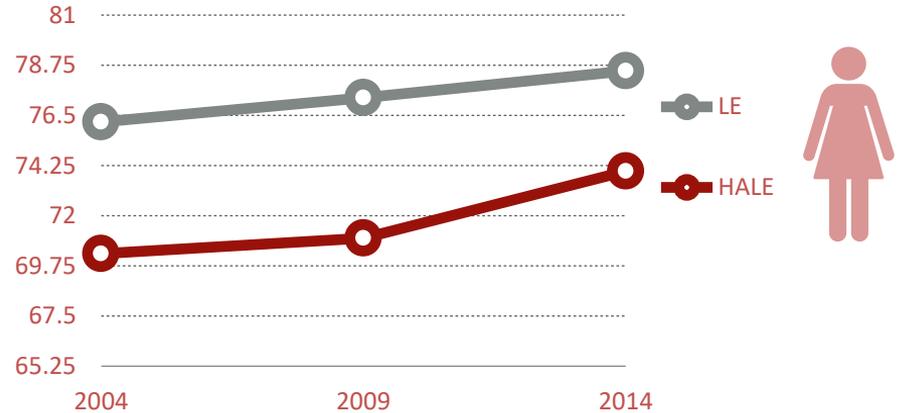
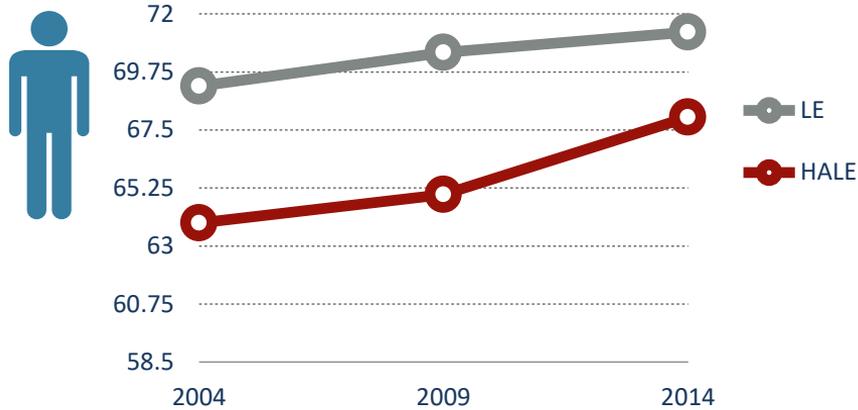
Table 1. Proportion and rank of leading cause of death (COD) from verbal autopsy (VA) study 1999³

Rank	COD from death registration	% total deaths	COD from VA and physician panel	% total deaths
1	Senility	27.1	Senility	11.0
2	Heart failure	9.9	Human immunodeficiency virus	10.0
3	No diagnosis	7.1	Stroke	9.3
4	Other chronic respiratory	5.5	Road traffic accident	5.5
5	Other infections	3.3	Diabetes	5.3
6	Ill-defined cancer	3.0	Liver cancer	5.3
7	Collapse	2.6	Chronic obstructive pulmonary disease	4.4
8	Road traffic accident	2.4	Ischaemic heart disease	4.1
9	Liver cancer	2.2	Trachea, bronchus and lung cancer	2.6
10	Shock	2.2	Tuberculosis	2.3
11	Stroke	2.1	No diagnosis	2.3
12	Human immunodeficiency virus	2.1	Cirrhosis	2.2
13	Nephritis and nephrosis	1.8	Suicide	1.9
14	Diabetes	1.7	Nephritis and nephrosis	1.9
15	Lower respiratory infections	1.7	Other infections	1.8
16	Other neurological diseases	1.7	Lower respiratory infections	1.8
17	Other digestive diseases	1.7	Violence/homicide	1.6
18	Other unintentional injuries	1.6	Drowning	1.4
19	Tuberculosis	1.3	Colorectal cancer	1.3
20	Suicide	1.3	Hypertension	1.3

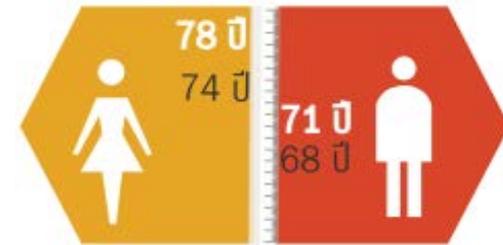
Tangcharoensathien V, Faramnuayphol P, Teokul W, Bundhamcharoen K, Wibulpholprasert S. A critical assessment of mortality statistics in Thailand: potential for improvements. Bull World Health Organ. 2006 Mar;84(3):233-8. doi: 10.2471/blt.05.026310. Epub 2006 Mar 22. PMID: 16583083; PMCID: PMC2627290.

Health Adjusted Life Expectancy (HALE)

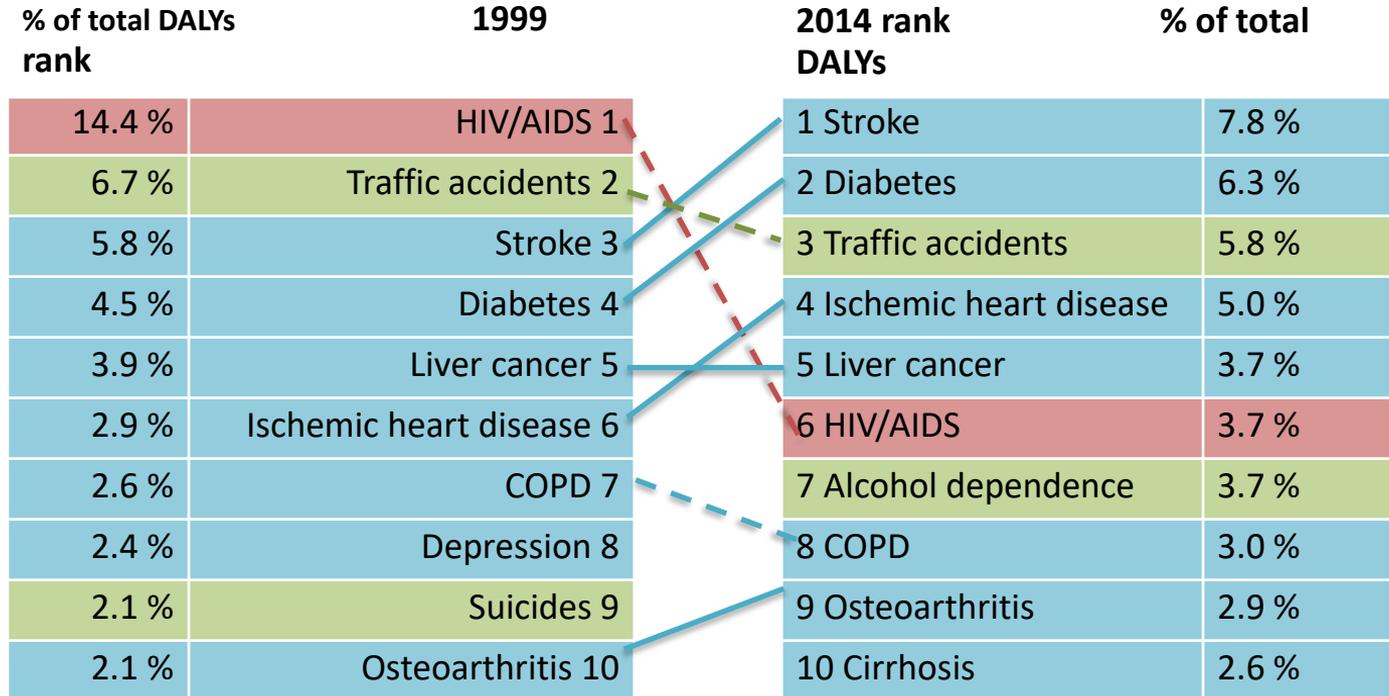
Average number of years that a person can expect to live in “full health” by taking into account years lived in less than full health due to disease and/or injury.



LE and HALE of Thai population have increased gradually. The difference between LE and HALE also decreased over time.

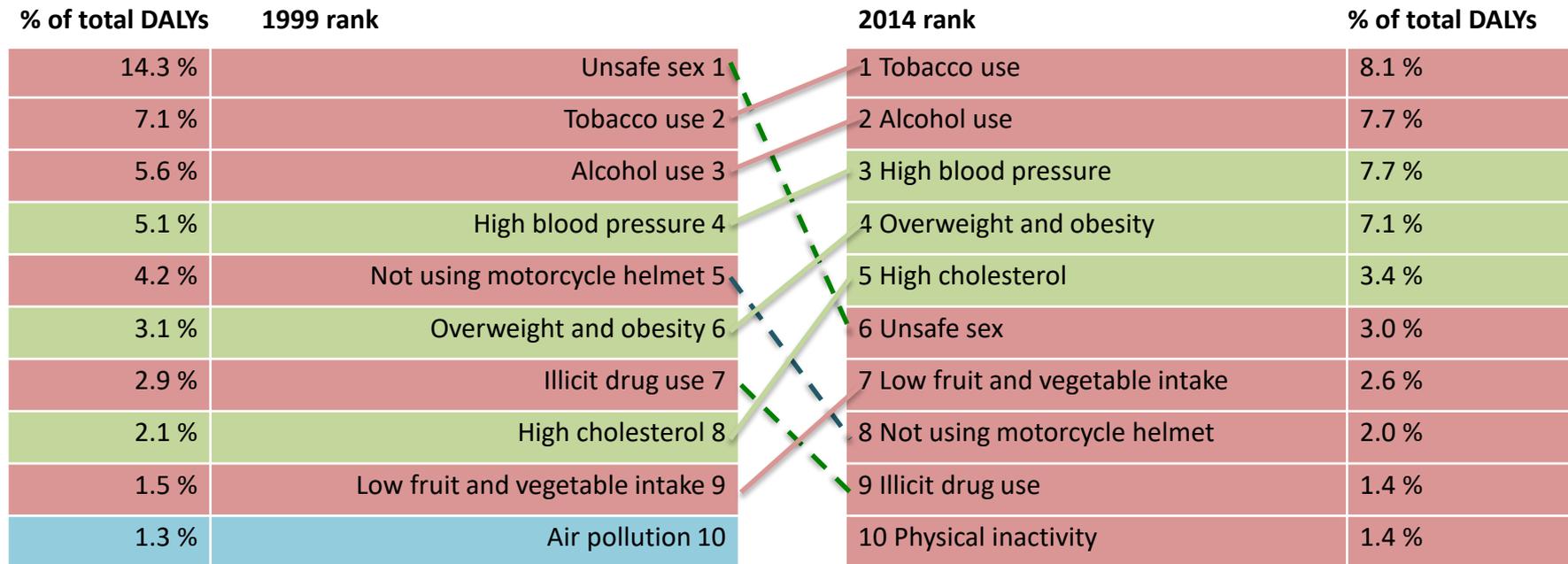


Leading cause of DALYs* , Thailand, Both sexes, 1999-2014



Note: *3% Discount rate, not age weight (3,0)

Leading risk factors contributing to DALYs*, Thailand, both sexes, 1999-2017

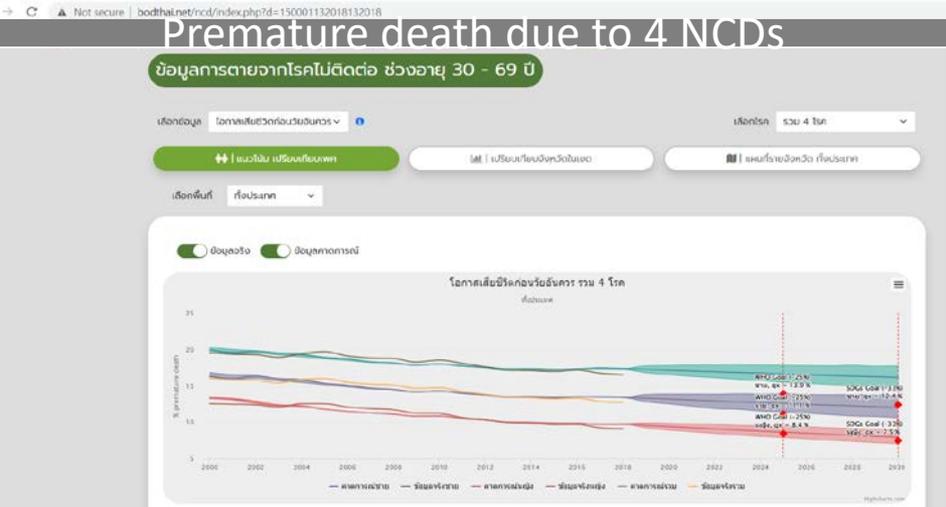
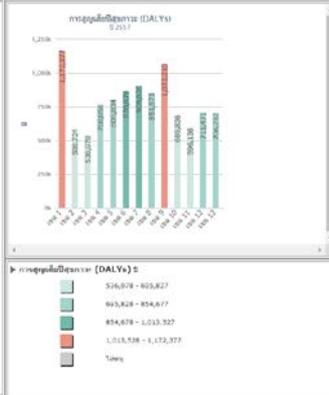
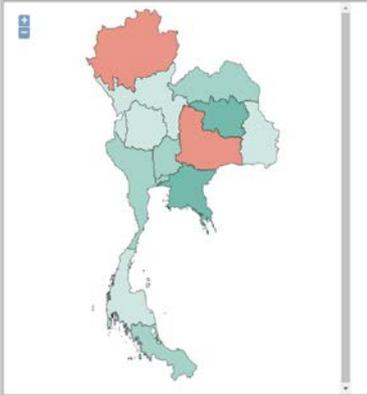


Note: *3% Discount rate, no age weight (3,0)



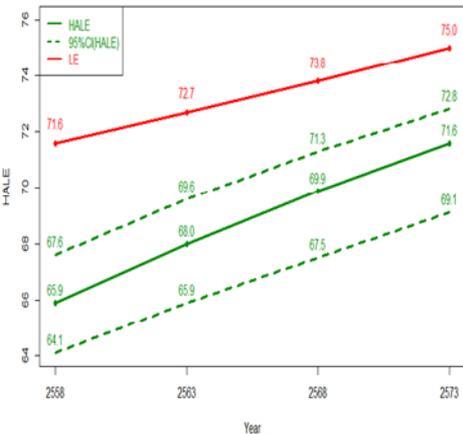
Subnational BOD

BOD Burden of disease Thailand

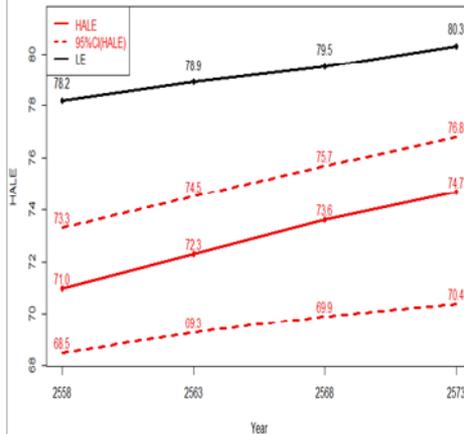


HALE&LE prediction

Prediction HALE (0 year): MALE



Prediction HALE (0 year): FEMALE



Time-trend projection of DALYs

Changes of Top 20 DALY Rank from 2014 to 2030 in Both sex (Based on Projection Model)

Rank	DALYs	2014	2030	DALYs	Rank	% changes
1	1594.4	Stroke	Stroke	1386.1	1	-13.1%
2	1587.3	Traffic accidents	Diabetes	1107.6	2	-16.6%
3	1327.7	Diabetes	Ischaemic heart disease	946.8	3	-11.7%
4	1072.2	Ischaemic heart disease	Traffic accidents	854.2	4	-46.2%
5	849.4	Liver cancer	Osteoarthritis	799.1	5	24.4%
6	846.4	HIV/AIDS	Liver cancer	714.6	6	-15.9%
7	667.0	Alcohol dependence/harmful use	Dementia	697.9	7	74.2%
8	642.2	Osteoarthritis	COPD	586.1	8	-2.7%
9	602.2	COPD	Alcohol dependence/harmful use	580.2	9	-13.0%
10	592.2	Cirrhosis	Deafness	509.1	10	34.9%
11	471.6	Bronchus & Lung cancer	Cataracts	480.1	11	59.2%
12	400.6	Dementia	Bronchus & Lung cancer	417.8	12	-11.4%
13	377.5	Deafness	Cirrhosis	410.8	13	-30.6%
14	362.1	Schizophrenia	Schizophrenia	355.1	14	-1.9%
15	359.8	Nephritis & nephrosis	Asthma	296.1	15	-13.4%
16	341.8	Asthma	Nephritis & nephrosis	283.0	16	-21.3%
17	321.6	Homicide and violence	Anaemia	257.4	17	14.2%
18	309.6	Drownings	Colon & rectum cancer	248.4	18	-22.8%
19	307.9	Suicides	HIV/AIDS	231.1	19	-72.7%
20	307.1	Lower respiratory tract infections	Depression	217.9	20	-11.7%
21	301.6	Cataracts	Homicide and violence	177.7	22	-44.7%
23	276.5	Colon & rectum cancer	Suicides	163.3	22	-47.0%
26	246.7	Depression	Drownings	160.0	24	-48.3%
27	225.4	Anaemia	Lower respiratory tract infections	75.7	38	-75.4%

Prediction of tobacco prevalence from different interventions

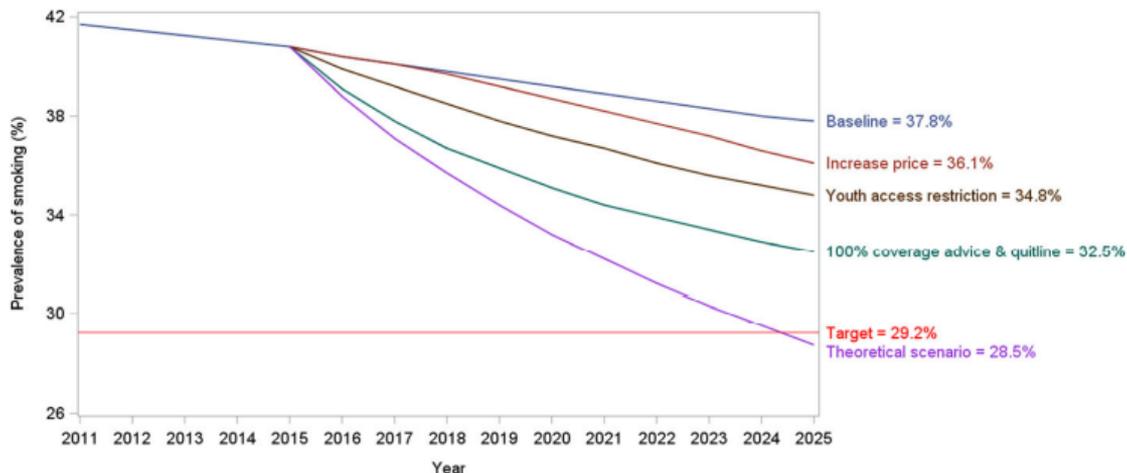
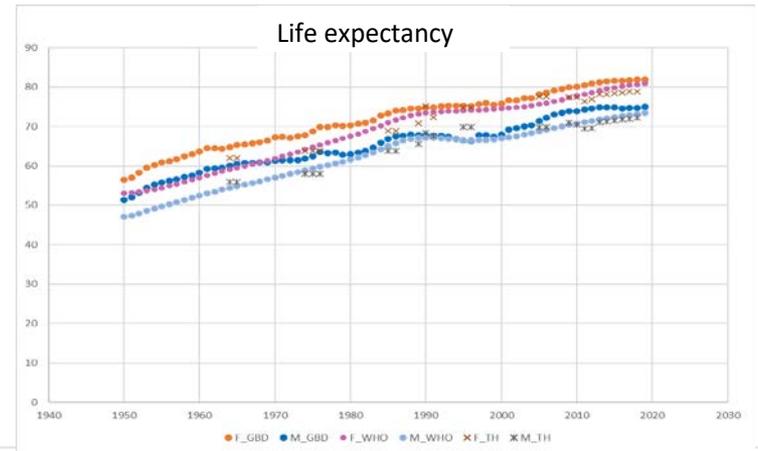


Fig. 4 Effect of smoking control policies on smoking prevalence in males aged 15 years or more under a theoretical ideal scenario, 2015 to 2025

Aungkulanon S, Pitayarangarit S, Bundhamcharoen K, Akaleephan C, Chongsuivatwong V, Phoncharoen R, Tangcharoensathien V. Smoking prevalence and attributable deaths in Thailand: predicting outcomes of different tobacco control interventions. BMC Public Health. 2019 Jul 23;19(1):984. doi: 10.1186/s12889-019-7332-x. PMID: 31337385; PMCID: PMC6651958.

Differences between national and global estimates



Top 20 Causes of DALYs loss (no discount, no age weight)

2014				2019			
Rank	% of Total	DALYs ('000)	Disease	Disease	DALYs ('000)	% of Total	
1	7.35	1097	Traffic accidents	Stroke	1040	7.50	
2	6.93	1036	Stroke	Traffic accidents	874	6.30	
3	5.83	871	Diabetes	Diabetes	864	6.22	
4	4.66	696	Ischaemic heart disease	Ischaemic heart disease	707	5.09	
5	4.50	672	HIV/AIDS	Liver cancer	554	3.99	
6	3.64	544	Liver cancer	Osteoarthritis	467	3.36	
7	2.91	434	Alcohol dependence/harmful use	Alcohol dependence/harmful use	422	3.04	
8	2.77	414	Osteoarthritis	COPD	404	2.91	
9	2.70	404	Cirrhosis	Cirrhosis	360	2.59	
10	2.56	382	COPD	HIV/AIDS	342	2.46	
11	2.01	300	Bronchus & Lung cancer	Dementia	324	2.34	
12	1.80	269	Dementia	Bronchus & Lung cancer	310	2.23	
13	1.66	249	Nephritis & nephrosis	Deafness	276	1.99	
14	1.63	243	Deafness	Cataracts	239	1.72	
15	1.62	243	Tuberculosis	Schizophrenia	235	1.69	
16	1.57	234	Schizophrenia	Nephritis & nephrosis	228	1.65	
17	1.53	229	Lower respiratory tract infections	Asthma	215	1.55	
18	1.49	222	Asthma	Colon & rectum cancer	184	1.32	
19	1.36	203	Homicide and violence	Homicide and violence	176	1.27	
20	1.32	197	Suicides	Suicides	166	1.19	



Data improvement over time

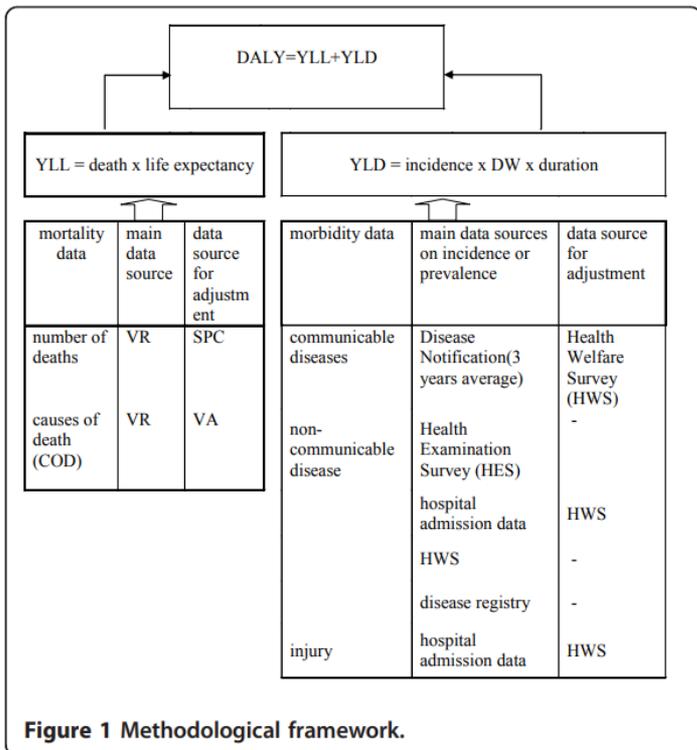


Figure 1 Methodological framework.

Data	1999			2014		
	availability	coverage	accuracy	availability	coverage	accuracy
Mortality	+++	94.8%	++	+++	95.2%	++
Morbidity Survey Hospital	+++	+++	++	+++	+++	++
	++	+	++	++	++	+++
Risk factors	+++	++	+++	+++	+++	+++
Other epidemiological study	++	++	+++	++	++	+++

Bundhamcharoen K, Odton P, Phulkerd S, Tangcharoensathien V. Burden of disease in Thailand: changes in health gap between 1999 and 2004. BMC Public Health. 2011 Jan 26;11:53. doi: 10.1186/1471-2458-11-53. PMID: 21266087; PMCID: PMC3037312.

Causes of death, 2019



Rank	COD from vital registration	% of total deaths	COD from physician panel and VA	% of total deaths
1	<u>No diagnosis</u>	16.9	Stroke	12.7
2	Lower respiratory infections	7.2	Diabetes mellitus	11.6
3	Stroke	7.0	Ischemic heart disease	7.5
4	<u>Senility</u>	5.1	Alzheimer disease and other dementias	5.4
5	Chronic kidney disease	4.6	Road injuries	5.3
6	Ischemic heart disease	4.2	Liver cancer	4.1
7	Road injuries	4.0	Tracheal, bronchus, and lung cancer	3.3
8	<u>Septicemia</u>	3.7	Chronic obstructive pulmonary disease	2.9
9	Liver cancer	3.3	Chronic kidney disease	2.8
10	Alzheimer disease and other dementias	3.3	Cirrhosis and other chronic liver diseases	2.8
11	Tracheal, bronchus, and lung cancer	3.0	Tuberculosis	2.3
12	Diabetes mellitus	2.8	Urinary diseases and male infertility	1.9
13	Cirrhosis and other chronic liver diseases	2.3	HIV/AIDS	1.8
14	Urinary diseases and male infertility	1.6	Lower respiratory infections	1.7
15	Chronic obstructive pulmonary disease	1.4	Self-harm	1.6
16	Tuberculosis	1.3	Colon and rectum cancer	1.6
17	Self-harm	1.2	Falls	1.5
18	Colon and rectum cancer	1.1	Breast cancer	1.2
19	Breast cancer	0.9	Gallbladder and biliary tract cancer	1.1
20	HIV/AIDS	0.9	Drowning	1.1

รายงานการศึกษา

สาเหตุการตายของประชากรไทย

พ.ศ. 2560-62

Burden of Disease Research Program Thailand (BOD Thailand)

Achievement and challenges

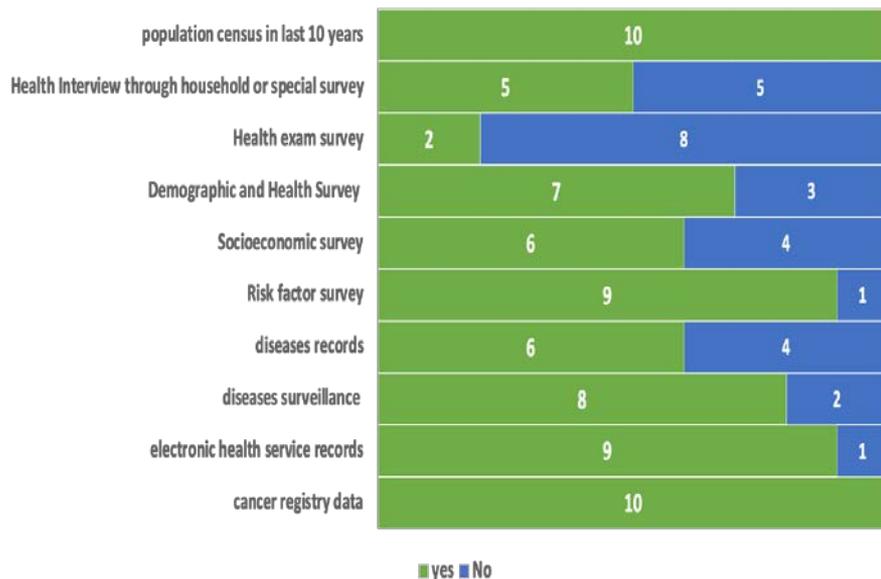
- Burden of disease and injuries & Burden attributable to risk factors: 1999, 2004, 2009, 2014
- HALE
- Subnational BOD
- Projection of DALYs and HALE (2014-2030)
- Premature mortality due to 4NCDs
- ASEAN BOD networking workshop
- Policy application and awareness among MOPH's decision makers
- More data available
- Core methods changes
 - Prevalent based YLDs
 - Increasing cause and risk categories, including sequelae and their respective DWs
 - Model-based estimation
- Quality of COD data
- Exhaustive data needed
- Timeliness

ASEAN BOD Networking

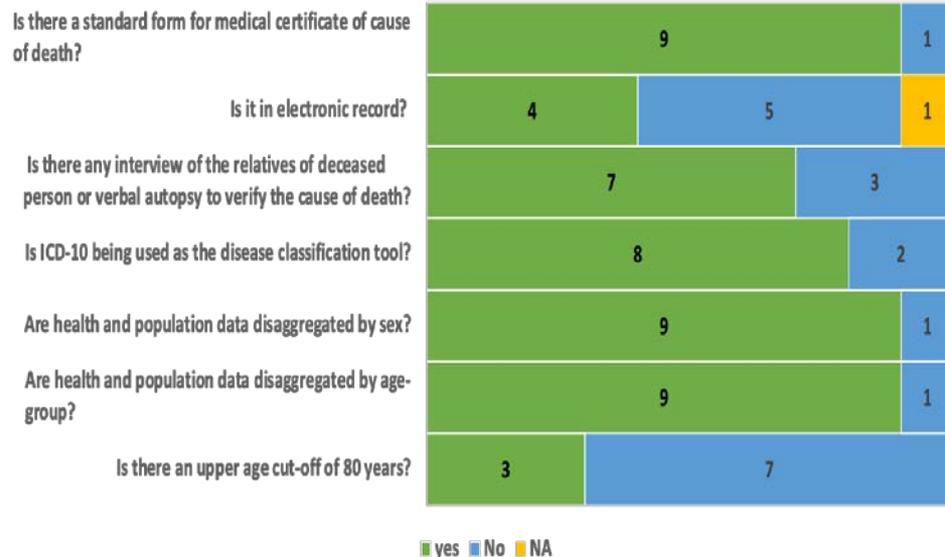
- Country self-assessment of the availability and quality of data sources for BOD and SDGs
- Self-assessment of capacity in generating and utilizing BOD data for policy
- Identify potential research collaboration
- Future action plan and the way forwards



Availability of data sources to monitor SDG3 and BOD study in 10 AMS



Quality of death registration in 10 AMS



BOD data utilization for policy

Questions	Average scores
Organizations, system, and infrastructure	
1) Evidence is not produced on time for policy decision	3.4
2) Ineffective mechanism in translating / packaging BOD evidence for policy maker	3.3
3) Lack of financial resource to staff capacity	3.4
4) Lack of human resource capacity to analyze or interpret data	3.4
Access and availability of relevant evidence	
5) Lack of available evidence for specific contexts	3.4
6) The evidence produced is not relevant to policy questions	2.5
7) Recommendations are not policy relevant	2.2
8) Evidence is not timely available for policy use	3.1
9) Ineffective communication by researchers	2.8
Networking and collaboration between technical/research personnel and policy makers	
10) Limited channels to directly link evidence to policymakers	2.9
11) Policy recommendations are not practical and feasible	2.5
12) Weak linkage with policy makers	2.7
13) Political interests and scientific evidence do not complement each other	2.7
14) Lack of culture of using evidence for decision among policy makers	2.7
15) Policy makers do not value merits of evidence	2.3

Roadmap of ASEAN BOD Network

- ① Analysis and solution to **strengthening data** essential for BOD estimates (deaths and morbidity).
- ② **Capacity building** for countries who find it useful, to quantify DALY loss attributable from top five risk factors including NCDs.
- ③ **Joint research** to estimate excess death from COVID-19 pandemic at national level.



FOLLOW US

THANK YOU



www.ihppthaigov.net



[ihpp.thailand](https://www.facebook.com/ihpp.thailand)



ihpp_thailand@ihpp.thaigov.net



[IhppThailand](https://twitter.com/IhppThailand)



[ihppchannel](https://www.youtube.com/channel/ihppchannel)

www.bodthai.net