



# Thailand Fact Sheet

Thailand is today the world's seventh-most polluted country. Air pollution shortens the average Thai's life expectancy by more than two years, relative to what it would have been if the World Health Organization (WHO) guideline for long-term fine particulate matter (PM<sub>2.5</sub>) pollution was met. Some areas of Thailand fare much worse than average, with air pollution shortening lives by more than four years in the most polluted regions.

## KEY TAKEAWAYS

- In 2016, 87 percent of Thailand's 68 million people lived in areas where the annual average particulate pollution level exceeded the WHO guideline. Seventy-five percent lived in areas where it exceeded Thailand's own air quality standard.
- This is a problem decades in the making. In Thailand's capital city Bangkok, the annual average PM<sub>2.5</sub> pollution level in 1998 was already nearly triple the WHO guideline, cutting life expectancy by 1.7 years.
- By 2016, growth in industry and vehicle prevalence had led to a 23 percent increase in pollution. That year, life expectancy was 2.4 years shorter for the average Bangkok resident than it would have been if the WHO guideline was met.
- Air pollution is even more severe in Northern Thailand, where agricultural biomass burning and forest fires are common. In 2016, a person living in the northern Chiang Mai Province, which includes the region's largest city of Chiang Mai, would live 3.6 fewer years than if the WHO guideline was met. Chiang Mai actually fares better than other northern provinces; in the worst-affected province, lives are cut short by 4.7 years.

## POLICY IMPACTS

The dual challenges of economic growth and environmental quality faced by Thailand today are no different from those once confronted by London, England, Los Angeles, California, or Osaka, Japan—once respectively known as “the big smoke,” “the smog capital of the world,” and the “smoke capital”—during their periods of industrialization.

The legacy of environmental improvement in these former pollution capitals is evidence that today's pollution does not need to be tomorrow's fate. These countries have largely been successful in confronting their pollution challenge thanks to a demand for change from their citizens and subsequent strong policies.

Nor is this dynamic limited to the world's wealthiest countries. China has made tremendous progress since declaring a “war against pollution” in 2014, with cities cutting particulate pollution by 32 percent on average according to measurements from ground-level monitors—improving life expectancy by 2.3 years if the reductions persist.<sup>1</sup> India, having declared its own war against pollution in January 2019, is on a path toward similar success.

Thailand has the opportunity to experience the same progress. If Thailand were to achieve the same percentage reduction in particulates that China experienced, its residents could live a full year longer on average.

Figure 1 · Annual Average PM<sub>2.5</sub> Concentration, 2016

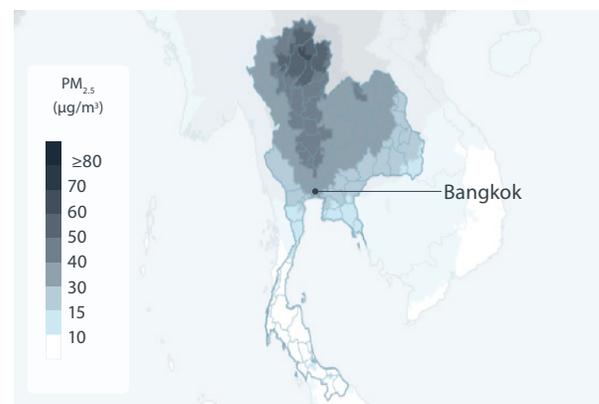
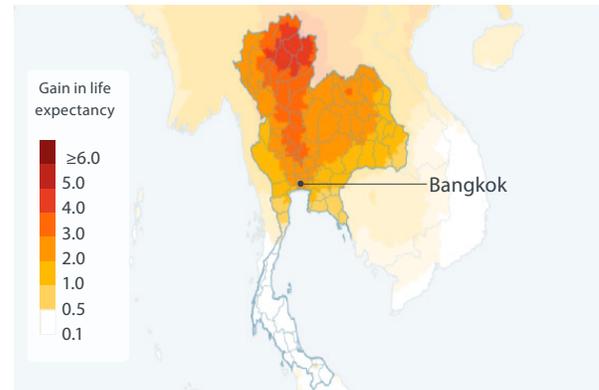


Figure 2 · Potential Gain in Years of Life Expectancy through Permanently Meeting WHO Guideline for Annual Average PM<sub>2.5</sub>, 2016



“As countries navigate the dual challenges of sustaining economic growth and protecting the environment and public health, the AQLI shows not only the damage caused by pollution but also the enormous gains that can be made with policies to address it.”

Michael Greenstone, Milton Friedman Distinguished Service Professor in Economics, the College, and the Harris School; Director, EPIC

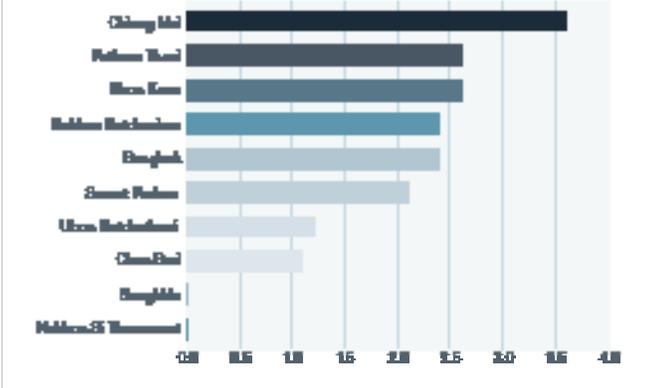
<sup>1</sup> The monitor data generally show higher PM<sub>2.5</sub> concentrations, and larger percent reductions, than the satellite-derived pollution data used in the AQLI. For more information about our analysis of Chinese monitor data, see “Is China Winning its War on Pollution” at [aqli.epic.uchicago.edu/reports](http://aqli.epic.uchicago.edu/reports)

## 25 Most Populous Provinces

Province	Population (Millions)	PM <sub>2.5</sub> Concentration, 2016 (µg/m <sup>3</sup> )	Life Expectancy Gain Through Meeting National Standard of 25 µg/m <sup>3</sup> , 2016 (Years)	Life Expectancy Gain Through Meeting WHO Guideline of 10 µg/m <sup>3</sup> , 2016 (Years)	Life Expectancy Gain Through a 32% PM <sub>2.5</sub> Reduction (Years)
Bangkok	8.61	34	0.9	2.4	1.1
Nakhon Ratchasima	2.63	34	0.9	2.4	1.1
Samut Prakan	1.95	31	0.6	2.1	1.0
Ubon Ratchathani	1.80	23	0.0	1.2	0.7
Khon Kaen	1.80	37	1.1	2.6	1.1
Chiang Mai	1.76	47	2.2	3.6	1.5
Chon Buri	1.61	21	0.0	1.1	0.7
Songkhla	1.52	8	0.0	0.0	0.2
Nakhon Si Thammarat	1.50	6	0.0	0.0	0.2
Pathum Thani	1.39	37	1.2	2.6	1.2
Udon Thani	1.34	39	1.3	2.8	1.2
Buri Ram	1.31	29	0.4	1.8	0.9

Province	Population (Millions)	PM <sub>2.5</sub> Concentration, 2016 (µg/m <sup>3</sup> )	Life Expectancy Gain Through Meeting National Standard of 25 µg/m <sup>3</sup> , 2016 (Years)	Life Expectancy Gain Through Meeting WHO Guideline of 10 µg/m <sup>3</sup> , 2016 (Years)	Life Expectancy Gain Through a 32% PM <sub>2.5</sub> Reduction (Years)
Nonthaburi	1.31	35	1.0	2.5	1.1
Chiang Rai	1.20	50	2.4	3.9	1.6
Surin	1.16	27	0.2	1.6	0.8
Roi Et	1.11	31	0.6	2.1	1.0
Si Sa Ket	1.09	23	0.0	1.3	0.7
Surat Thani	1.04	5	0.0	0.0	0.2
Nakhon Sawan	1.02	42	1.6	3.1	1.3
Chaiyaphum	0.99	36	1.1	2.6	1.1
Nakhon Pathom	0.98	31	0.6	2.1	1.0
Sakon Nakhon	0.97	32	0.7	2.2	1.0
Phetchabun	0.97	39	1.4	2.9	1.2
Phitsanulok	0.93	44	1.8	3.3	1.4
Phra Nakhon Si Ayutthaya	0.89	39	1.4	2.9	1.2

Figure 3 · 10 Most Populous Provinces: Potential Gain in Life Expectancy through Permanently Meeting WHO Guideline for Annual Average PM<sub>2.5</sub>, 2016



### ABOUT THE AIR QUALITY LIFE INDEX (AQLI)

The AQLI is a pollution index that translates particulate air pollution into perhaps the most important metric that exists: its impact on life expectancy. Developed by the Milton Friedman Distinguished Service Professor in Economics Michael Greenstone and his team at the Energy Policy Institute at the University of Chicago (EPIC), the AQLI is rooted in recent research that quantifies the causal relationship between long-term human exposure to air pollution and life expectancy. The Index then combines this research with hyper-localized, global particulate measurements, yielding unprecedented insight into the true cost of particulate pollution in communities around the world. The Index also illustrates how air pollution policies can increase life expectancy when they meet the World Health Organization's guideline for what is considered a safe level of exposure, existing national air quality standards, or user-defined air quality levels. This information can help to inform local communities and policymakers about the importance of air pollution policies in concrete terms.

[aqli.epic.uchicago.edu](http://aqli.epic.uchicago.edu)

 @UChiEnergy #AQLI

Methodology: The life expectancy calculations made by the AQLI are based on a pair of peer-reviewed studies, Chen et al. (2013) and Ebenstein et al. (2017), co-authored by Michael Greenstone, that exploit a unique natural experiment in China. By comparing two subgroups of the population that experienced prolonged exposure to different levels of particulate air pollution, the studies were able to plausibly isolate the effect of particulates air pollution from other factors that affect health. The more recent of the two studies found that sustained exposure to an additional 10 µg/m<sup>3</sup> of PM<sub>10</sub> reduces life expectancy by 0.64 years. In terms of PM<sub>2.5</sub>, this translates to the relationship that an additional 10 µg/m<sup>3</sup> of PM<sub>2.5</sub> reduces life expectancy by 0.98 years. To learn more about the methodology used by the AQLI, visit: [aqli.epic.uchicago.edu/about/methodology](http://aqli.epic.uchicago.edu/about/methodology)