Bangladesh Fact Sheet

In 2019, at 65.5 µg/m³, Bangladesh recorded the second-highest average $PM_{2.5}$ concentration in the world. Air pollution shortens the average Bangladeshi's life expectancy by 5.4 years, relative to what it would have been if the World Health Organization (WHO) guideline was met. Some areas of Bangladesh fare much worse than average, with air pollution shortening lives by 6.5 years in the most polluted district.

KEY TAKE-AWAYS

- All of Bangladesh's 16 million people live in areas where the annual average particulate pollution level exceeds both the country's own standard and the WHO guideline.

- Particulate matter pollution has continued to rise. Since 1998, the average annual particulate pollution has increased 15.3 percent, cutting 0.9 years off the lives of the average Bangladesh resident over those years.

- In each of the country's 64 districts, particulate matter pollution levels are at least three times the WHO guideline. The most polluted areas of the country are the divisions of Khulna and Rajshahi, where the average resident is exposed to pollution that is more than seven times the WHO guideline—reducing life expectancy by more than 6 years.

- Even in the second largest city of Chittagong, where air quality is better than the national average, residents still lose 3.6 life-years because pollution levels exceed the WHO guideline.

POLICY IMPACTS

The dual challenges of economic growth and environmental quality faced by Bangladesh today are no different from those once confronted by other countries during periods of industrialization. Nor is this dynamic limited to the world's wealthiest countries.
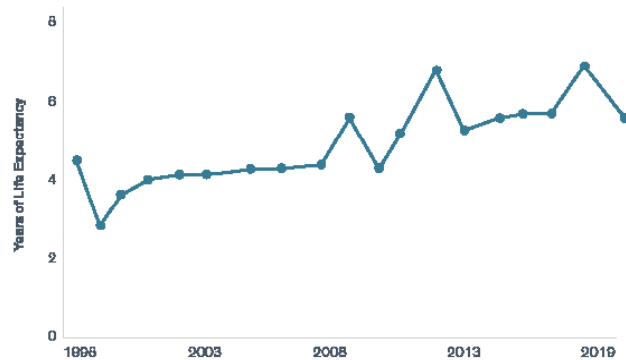
China has made tremendous progress since declaring a "war against pollution" in 2014, cutting country-wide average particulate pollution by about 30 percent—improving life expectancy by 1.5 years if the reductions persist.. India, having declared its own war against pollution in January 2019, has likewise declared an ambitious target of 20-30 percent reduction. If it achieves a 25 percent reduction in pollution nationwide, it has the potential to also improve life expectancy by 1.8 years.

Bangladesh could experience the similar gains. If Bangladesh were to achieve the same reduction in pollution experienced by China, its residents could live 2.6 years longer; 1.9 years longer if it achieves India's target.

Figure 1 · Potential Gain in Life Expectancy through Permanently Reducing $PM_{2.5}$ from 2019 Concentration to the WHO Guideline

Gain in life expectancy

≥6.0
5.0
4.0
3.0
2.0
1.0
0.5
0.1
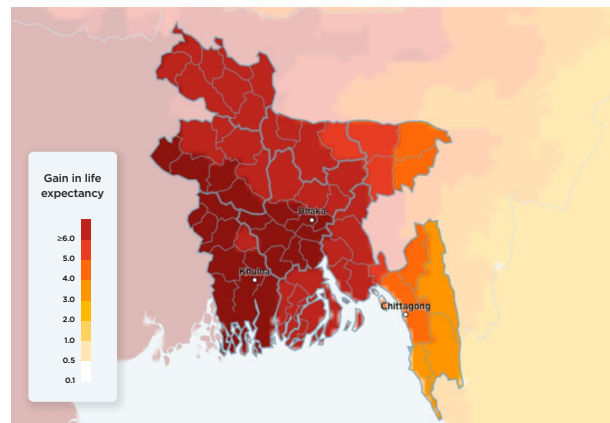
Figure 2 · Average Years of Life Expectancy Lost due to $PM_{2.5}$ Relative to the WHO Guideline, 1998-2019

Note: The WHO changed its particulate pollution guidance on September 22, 2021. The data here reflects the previous guidance.

PM₂.₅ Concentration and Potential Life Expectancy Gains in 25 Most Populous Districts.

Division	District	Population (Millions)	PM₂.₅ Concentration, 2019 (µg/m³)	Years of Life Expectancy Gain through Reducing PM₂.₅ from 2019 Concentration		
				To WHO Guideline of 10 µg/m³	To National Standard of 15 µg/m³	By 30%
Dhaka	Dhaka	13.5	71	6	5.5	2.1
Chittagong	Chittagong	8.5	47	3.6	3.2	1.4
Chittagong	Comilla	6	68	5.7	5.2	2.0
Mymensingh	Mymensingh	5.7	64	5.3	4.8	1.9
Dhaka	Tangail	4	69	5.8	5.3	2.0
Dhaka	Gazipur	3.9	71	5.9	5.4	2.1
Sylhet	Sylhet	3.8	49	3.9	3.4	1.4
Rajshahi	Bogra	3.8	68	5.7	5.2	2.0
Chittagong	Noakhali	3.5	63	5.2	4.7	1.9
Rajshahi	Sirajganj	3.5	70	5.9	5.4	2.1
Chittagong	Cox's Bazar	3.4	38	2.7	2.2	1.1
Rangpur	Dinajpur	3.4	68	5.7	5.2	2.0
Dhaka	Kishoreganj	3.3	64	5.3	4.8	1.9
Rangpur	Rangpur	3.3	67	5.6	5.1	2.0
Chittagong	Brahamanbaria	3.2	66	5.5	5	1.9
Dhaka	Narayanganj	3.1	73	6.1	5.6	2.1
Khulna	Jessore	3.1	73	6.1	5.6	2.1
Rajshahi	Naogaon	2.9	70	5.8	5.4	2.1
Rajshahi	Rajshahi	2.9	73	6.2	5.7	2.1
Rajshahi	Pabna	2.8	72	6.1	5.6	2.1
Sylhet	Sunamganj	2.7	54	4.3	3.8	1.6
Chittagong	Chandpur	2.7	69	5.7	5.2	2.0
Rangpur	Gaibandha	2.7	66	5.5	5	1.9
Barisal	Barisal	2.6	69	5.8	5.3	2.0
Khulna	Khulna	2.6	73	6.2	5.7	2.1

"The legacy of environmental improvement in former pollution capitals is evidence that today's pollution does not need to be tomorrow's fate. 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, The Milton Friedman Distinguished Service Professor in Economics, the College, and the Harris School; Director, EPIC

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 University of Chicago's 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.

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/m3 of PM10 reduces life expectancy by 0.64 years. In terms of PM2.5, this translates to the relationship that an additional 10 µg/m3 of PM2.5 reduces life expectancy by 0.98 years. To learn more about the methodology used by the AQLI, visit: aqli.epic.uchicago.edu/about/methodology

aqli.epic.uchicago.edu   @UChiAir #AQLI