



Pakistan Fact Sheet

Pakistan is today the world's fourth most polluted country. Air pollution shortens the average Pakistani's life expectancy by 3.9 years, relative to what it would have been if the World Health Organization (WHO) guideline was met. Some areas of Pakistan fare much worse than average, with air pollution shortening lives by almost 7 years in the most polluted regions.

KEY TAKE-AWAYS

- All of Pakistan's 228 million people live in areas where the annual average particulate pollution level exceeds the WHO guideline as well as Pakistan's own air quality standard of $15 \mu\text{g}/\text{m}^3$.
- Particulate pollution has increased over time. Since the early 2000s, average annual particulate pollution has increased 20 percent, shaving 0.9 years off the lives of the average Pakistan resident over those years.
- The most polluted areas of the country are the provinces of Sindh, Baluchistan, and Punjab, where residents would gain between 3 to 5 years of life expectancy if particulate pollution were permanently reduced to the WHO guideline.
- In Karachi, Pakistan's largest city, residents would gain 5.2 years. In Lahore, the second largest city, residents would gain 4 years. Residents of the capital of Islamabad residents would gain 3.1 years.

POLICY IMPACTS

The dual challenges of economic growth and environmental quality faced by Pakistan 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. Presently, Pakistan is experiencing particulate pollution levels similar to the levels experienced by China back in 2013. If Pakistan were to achieve the same reduction in pollution experienced by China, its residents could also live 1.5 years longer.

Figure 1 · Potential Gains in Life Expectancy through Permanently Reducing $\text{PM}_{2.5}$ from 2019 Concentration to the WHO Guideline

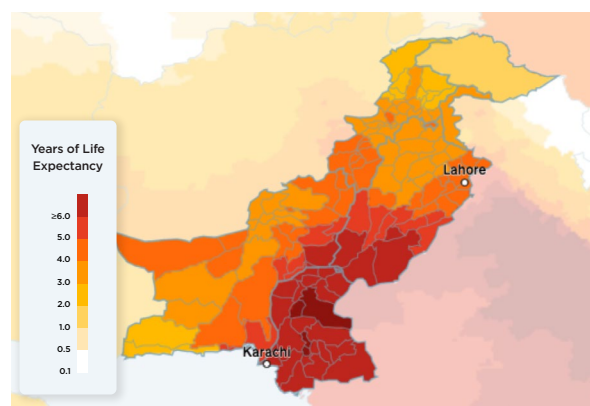
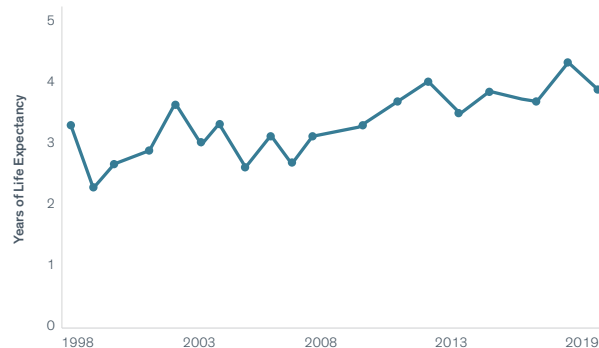


Figure 2 · Average Years in Life Expectancy Lost due to $\text{PM}_{2.5}$ Relative to the WHO Guideline, 1998-2019



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

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

PM_{2.5} Concentrations and Potential Life Expectancy Gains in Most Populous Districts.

Years of Life Expectancy Gain through Reducing PM_{2.5} from 2019 Concentration

Province	District	Population (Millions)	PM _{2.5} Concentration, 2019 (µg/m ³)	To WHO Guideline of 10 µg/m ³	To National Standard of 15 µg/m ³	By 30%
Sindh	Karachi City	27.2	63	5.2	4.7	1.8
Punjab	Lahore	8.9	50	3.9	3.4	1.5
Punjab	Faisalabad	6.8	42	3.2	2.7	1.2
Punjab	Rawalpindi	5.6	40	2.9	2.4	1.2
Punjab	Multan	5.6	59	4.8	4.3	1.7
Azad Kashmir		5.4	31	2.1	1.6	0.9
Punjab	Bahawalpur	5.0	65	5.4	4.9	1.9
Punjab	Rahim Yar Khan	4.9	70	5.9	5.4	2.1
Punjab	Muzaffargarh	4.6	60	4.9	4.4	1.8
Khyber Pakhtunkhwa	Peshawar	4.5	42	3.2	2.7	1.2
Punjab	Gujranwala	4.3	42	3.1	2.6	1.2
Punjab	Sargodha	4.1	38	2.8	2.3	1.1
Punjab	Bahawalnagar	3.7	60	4.9	4.4	1.8
Punjab	Sialkot	3.4	45	3.4	2.9	1.3
Punjab	Jhang	3.4	40	2.9	2.4	1.2
Punjab	Gujrat	3.3	40	3.0	2.5	1.2
Punjab	Bhakkar	3.2	41	3.0	2.5	1.2
Punjab	Khanewal	3.2	54	4.3	3.8	1.6
Punjab	Kasur	3.1	50	4.0	3.5	1.5
Punjab	Vehari	3.1	58	4.7	4.2	1.7
Punjab	Attock	2.9	38	2.7	2.2	1.1
Federal Capital Territory	Islamabad	2.8	42	3.1	2.7	1.2
Punjab	Okara	2.8	50	3.9	3.4	1.5
Punjab	Chakwal	2.8	35	2.4	1.9	1.0
Punjab	Mianwali	2.7	39	2.9	2.4	1.2

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