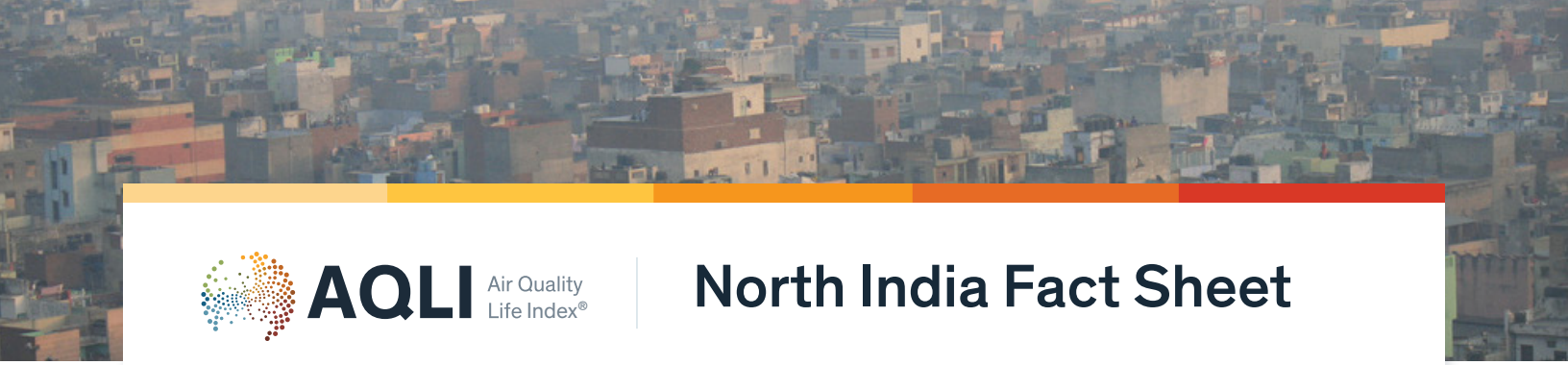


AQLI Air Quality Life Index®

North India Fact Sheet

More than 480 million people, or about 40 percent of India's population, reside in the seven states and union territories comprising the bulk of the Indo-Gangetic Plain region of north India – Bihar, Chandigarh, Delhi, Haryana, Punjab, Uttar Pradesh, and West Bengal (Figure 1). Though the Indo-Gangetic Plain's particulate pollution is exacerbated by geologic and meteorological factors, the AQLI's dust- and sea salt-removed fine particulate matter ($PM_{2.5}$) data imply that human activity plays a key role in generating the severe particulate pollution that these residents face. That is likely due to the fact that the region's population density is more than three times that of the rest of the country, meaning more pollution from vehicular, residential, and agricultural sources. A denser population also means more human lives are impacted by each pollution source. Across India, reducing particulate pollution to the World Health Organization's guideline of 10 $\mu g/m^3$ would increase the national average life expectancy by 4.3 years. In north India, there would be outsize impacts of policy that reduces air pollution to meet Indian or International norms.

KEY TAKEAWAYS

- From 1998-2016, the Indo-Gangetic Plain region of India (Figure 1) experienced particulate pollution that was about twice as high as the rest of the country (Figure 2).
- Sustained exposure to particulate pollution in 1998 would have shortened the lives of residents in the Indo-Gangetic Plain by an average of 3.7 years, relative to if pollution concentrations met the WHO guideline. By 2016, a 72 percent increase in pollution in the region further shortened the lives of residents by 3.4 years to 7.1 years, relative to if air quality met the WHO guideline.
- In comparison, lower concentrations of pollution in the rest of the country are allowing residents to live longer than those in the Indo-Gangetic Plain. If 1998 levels of pollution had continued over a lifetime, residents would have lost an average of 1.2 years of life expectancy. Because of a 65 percent increase in pollution, sustained exposure in 2016 is cutting short life expectancy by 2.6 years, relative to the WHO guideline.

POLICY IMPLICATIONS

In 2019, India launched its National Clean Air Programme (NCAP). The Programme, which aims to reduce particulate pollution by 20-30 percent nationally, will be implemented over the next five years. If successful in meeting its goals and sustaining the reduced pollution levels, the NCAP would produce substantial benefits, extending the life expectancy of the average Indian by about 1.3 years. Those in the Indo-Gangetic Plain would gain about 2 years onto their lives.

Figure 1 · States and Union Territories That are Majority in the Indo-Gangetic Plain

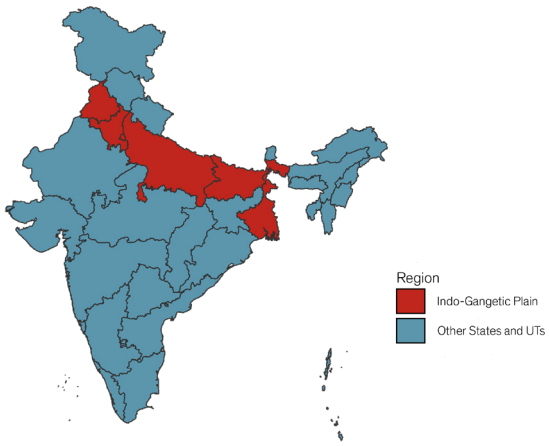
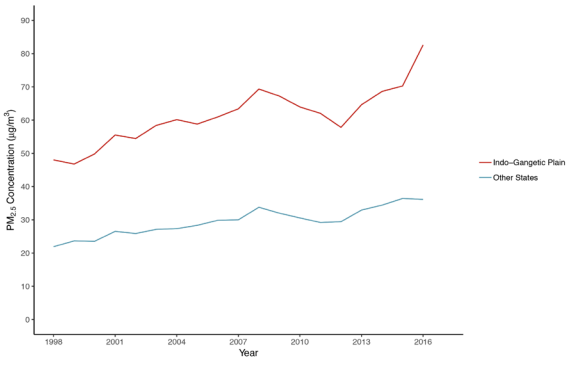


Figure 2 · $PM_{2.5}$ Concentration over Time in Indo-Gangetic Plain and Other States



Appendix Table: Potential Life Expectancy Impacts of Particulate Pollution Reductions in the Indo-Gangetic Plain

State/UT	Population (Millions)	$PM_{2.5}$ Concentration, 2016 (µg/m³)	Years of Decrease in Life Expectancy due to Change in $PM_{2.5}$, 1998-2016	Years of Increase in Life Expectancy through Reducing $PM_{2.5}$ from 2016 Concentration	
				to WHO Guideline	By 25%, per NCAP
NCT of Delhi	16.9	114	4.3	10.2	2.8
Uttar Pradesh	206.1	98	3.8	8.6	2.4
Haryana	26.2	86	3.7	7.5	2.1
Bihar	108.5	81	3.4	6.9	2.0
Chandigarh	1.4	71	3.1	5.9	1.7
Punjab	28.3	68	3.2	5.7	1.7
West Bengal	94.8	49	2.3	3.8	1.2

Figure 3
Life Expectancy Gained through Reduction of $PM_{2.5}$ Concentration to WHO Guideline of 10 µg/m³

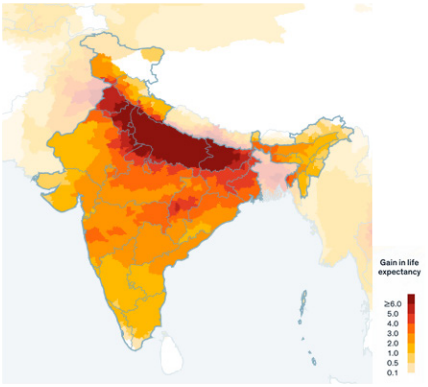
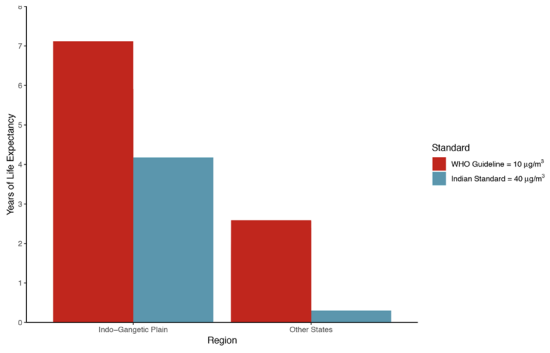


Figure 4
Potential Life Expectancy Gained through Reducing of $PM_{2.5}$ to Specified Standards



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.