AQLI Air Quality Life Index®

Nepal Fact Sheet

Nepal is the world's third most polluted country. Air pollution shortens average Nepalese life expectancy by 4.1 years, relative to what it would be if the World Health Organization (WHO) guideline of 5 µg/m³ was met.[1] The highest concentrations of air pollution are observed in Nepal's southwestern districts, which share their borders with the highly-polluted Indo-Gangetic Plain of India. Here, residents stand to lose nearly 7 years of life expectancy.

KEY TAKE-AWAYS

- All of Nepal's 30 million people live in areas where the average particulate matter pollution exceeds the WHO guideline of 5 µg/m³.
- Measured in terms of life expectancy, particulate pollution is the greatest threat to human health in Nepal, reducing life expectancy by 4.1 years on average. In contrast, child and maternal malnutrition reduces average life expectancy by about 1.3 years, while smoking reduces life expectancy by about 2.5 years on average.
- Since 1998, Nepal has seen a 62 percent increase in its average annual particulate pollution concentrations, further cutting short average life expectancies by nearly 2 years.
- Half of Nepal's population resides in the Outer Terai region, where residents stand to lose more than 6 years of life expectancy, on average. In the capital city of Kathmandu, Nepal's most populous city, residents are on track to lose 3 years on average.

Figure 1 · Potential Gain in Years of Life Expectancy through Permanently Reducing $PM_{2.5}$ from 2020 Concentration to the WHO Guideline

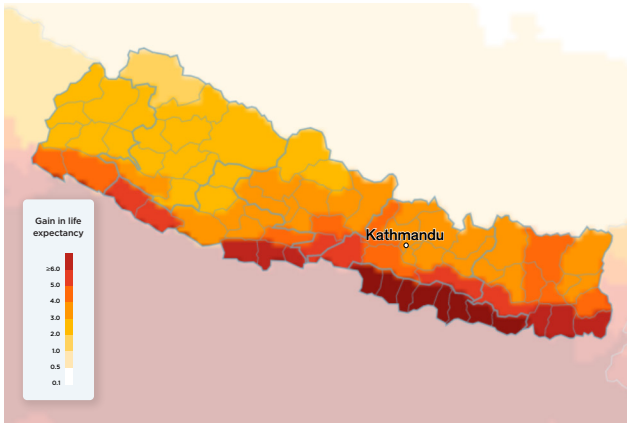
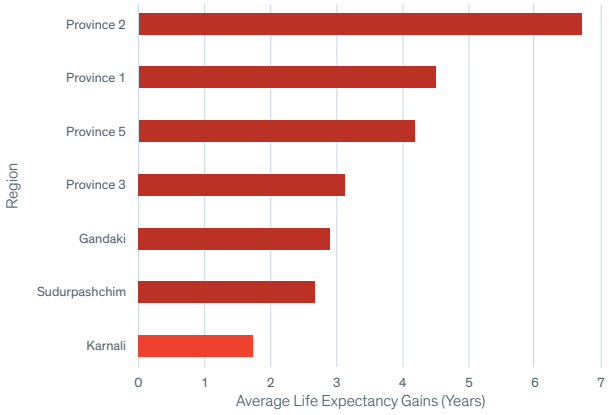


Figure 2 · Potential Gain in Life Expectancy through Permanently Reducing $PM_{2.5}$ from 2020 Concentration to the WHO Guideline in All Major Regions of Nepal



1 All average $PM_{2.5}$ values (measured in micrograms per cubic meter: µg/m³) are population weighted.

$PM_{2.5}$ Concentrations and Potential Life Expectancy Gains in 25 Most Populous Regions of Nepal.

Region	Population (Millions)	$PM_{2.5}$ Concentration, 2020 (µg/m³)	Years of Life Expectancy Gain Through Reducing $PM_{2.5}$ from 2020 Concentration To WHO Guideline of 5 µg/m³	By 30%
Kathmandu	2	35	2.9	1
Morang	1.1	62	5.6	1.8
Rupandehi	1	64.1	5.8	1.9
Jhapa	0.9	58.1	5.2	1.7
Kailali	0.9	43.1	3.7	1.3
Sarlahi	0.9	72.1	6.6	2.1
Dhanusha	0.9	75.2	6.9	2.2
Sunsari	0.8	61.1	5.5	1.8
Bara	0.8	75	6.9	2.2
Rautahat	0.8	76.1	7	2.2
Saptari	0.7	67	6.1	2
Siraha	0.7	70.4	6.4	2.1
Mahottari	0.7	76.8	7	2.3
Parsa	0.7	75.4	6.9	2.2
Chitawan	0.7	48.4	4.3	1.4
Kapilbastu	0.7	61.1	5.5	1.8
Dang	0.6	35	2.9	1
Banke	0.6	51.2	4.5	1.5
Kaski	0.6	33	2.7	1
Kanchanpur	0.5	43.5	3.8	1.3
Lalitpur	0.5	33.7	2.8	1
Bardiya	0.5	49.2	4.3	1.4
Makawanpur	0.5	41.2	3.5	1.2
Kabhrepalanchok	0.4	34.2	2.9	1
Surkhet	0.4	27.2	2.2	0.8

Figure 3 · Life Expectancy Impact of $PM_{2.5}$ and Unassociated Causes/ Risks of Death, Nepal

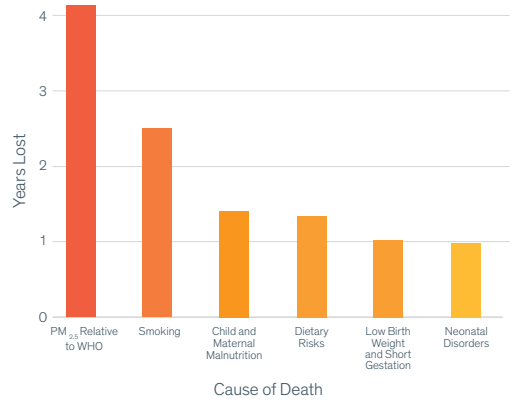
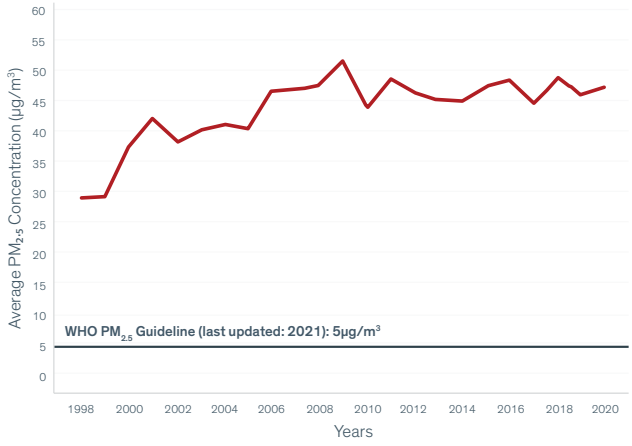


Figure 4 · Average $PM_{2.5}$ Concentrations in Nepal, 1998-2020.



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 PM_{10} reduces life expectancy by 0.64 years. In terms of $PM_{2.5}$, this translates to the relationship that an additional 10 µg/m³ of $PM_{2.5}$ reduces life expectancy by 0.98 years. To learn more about the methodology used by the AQLI, visit: aqli.epic.uchicago.edu/about/methodology