AQLI Air Quality Life Index®

Nigeria Fact Sheet

Air pollution's impact on life expectancy in Nigeria is greater than that of HIV/AIDS and almost on par with malaria and unsafe water and sanitation, shortening the average Nigerian's life expectancy by 1.8 years, relative to what it would be if the World Health Organization (WHO) guideline of 5 μg/m³ was met.[1] Some areas of Nigeria fare much worse than average, with air pollution shortening lives by almost 4 years on average in parts of Taraba state in Northeastern Nigeria.

KEY TAKE-AWAYS

- All of Nigeria's 208.3 million people live in areas where the annual average particulate pollution level exceeds the WHO guideline.
- Measured in terms of life expectancy, particulate pollution ranks among the top threats to human health in Nigeria, reducing life expectancy by 1.8 years on average. Malaria, in comparison, reduces average life expectancy by about 2.2 years, while HIV/AIDS and unsafe water and sanitation reduces average life expectancy by 1.1 and 2.2 years respectively.
- Particulate pollution has increased over time. Since 2000, the average annual $PM_{2.5}$ concentration has increased by almost 15 percent, cutting average life expectancies short by roughly 4 months.
- In Lagos, Nigeria's most populous city, home to 20 million people, an average resident stands to gain 1.5 years of life expectancy on average from clean air.
- The highest pollution levels in Nigeria were observed in the Niger Delta, where oil refineries—many illegal—are linked to the grim daily reality of air pollution. In the states of Akwa Ibom, Taraba, Cross River, and Delta, residents on average are losing 2.6 to 3 years of life expectancy on average, relative to the scenario in which the WHO guideline is met. In Nigeria's most polluted city, Sardauna in Taraba state, residents stand to lose about 4 years of life expectancy on average.

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

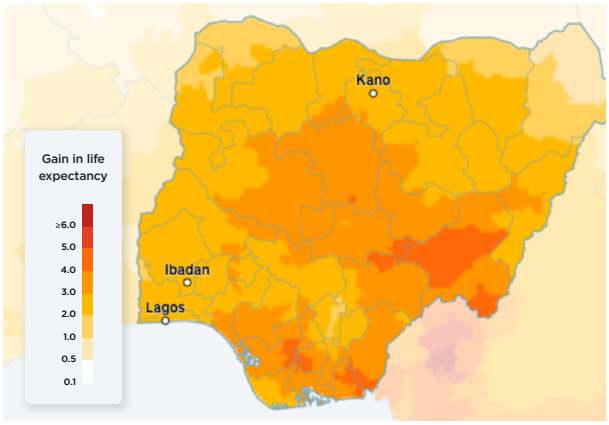
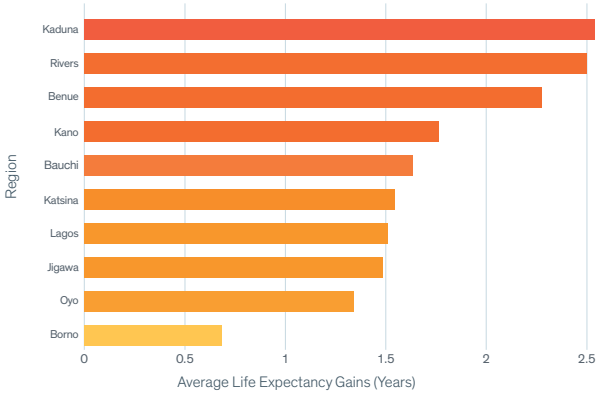


Figure 2 · Potential Gain in Life Expectancy from Reducing $PM_{2.5}$ to the WHO Guideline in 10 Most Populous States of Nigeria



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 by State

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

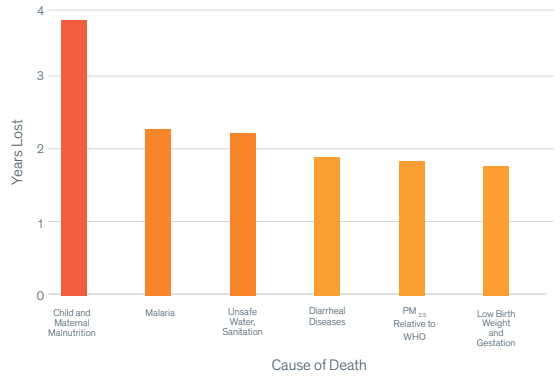
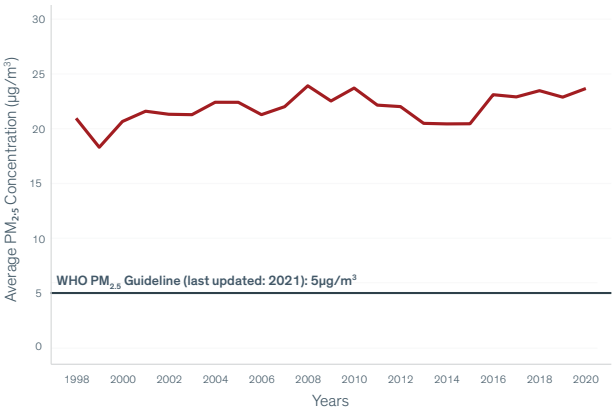


Figure 4 · Average $PM_{2.5}$ Concentrations in Nigeria, 1998 to 2020



State	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	Years of Life Expectancy Gain Through Reducing $PM_{2.5}$ from 2020 Concentration: To National Standard of 15 µg/m³
Abia	3.9	30	2.5	0.9
Adamawa	4	22.9	1.8	0.7
Akwa Ibom	5.5	35.1	3	1
Anambra	5.7	25.8	2	0.8
Bauchi	7.1	21.7	1.6	0.6
Bayelsa	2.2	26.1	2.1	0.8
Benue	6	28.2	2.3	0.8
Borno	6.5	11.9	0.7	0.3
Cross River	4.1	31.5	2.6	0.9
Delta	5.8	31.1	2.5	0.9
Ebonyi	2.9	20.7	1.5	0.6
Edo	4.5	25.4	2	0.8
Ekiti	3.2	25	2	0.7
Enugu	4.6	15.7	1	0.5
Federal Capital Territory	3.7	29.2	2.4	0.9
Gombe	3.5	21.7	1.6	0.6
Imo	5.5	29.5	2.4	0.9
Jigawa	6	20.2	1.5	0.6
Kaduna	8.3	30.9	2.5	0.9
Kano	13.1	23	1.8	0.7
Katsina	8	20.8	1.6	0.6
Kebbi	5	17.2	1.2	0.5
Kogi	4.6	21.2	1.6	0.6
Kwara	3.4	23.3	1.8	0.7
Lagos	20.1	20.4	1.5	0.6
Nassarawa	2.9	29.7	2.4	0.9
Niger	5.6	27.2	2.2	0.8
Ogun	6	20.8	1.6	0.6
Ondo	4.4	24.6	1.9	0.7
Osun	5.1	20.8	1.6	0.6
Oyo	7.9	18.7	1.3	0.6
Plateau	4.4	30.3	2.5	0.9
Rivers	7.4	30.5	2.5	0.9
Sokoto	5.7	13.5	0.8	0.4
Taraba	3.2	34.6	2.9	1
Yobe	4.1	15.2	1	0.4
Zamfara	4.4	19.3	1.4	0.6

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