Nigeria Fact Sheet

Air pollution is among the top 10 threats to life expectancy in Nigeria. Fine particulate air pollution ($PM_{2.5}$) shortens the average Nigerian resident'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 3.3 years in parts of Taraba state in northeastern Nigeria.[2]

KEY TAKEAWAYS

- All of Nigeria's 218.6 million people live in areas where the annual average particulate pollution level exceeds the WHO guideline. Despite a high health burden due to particulate pollution, the country does not have a national standard.
- Measured in terms of life expectancy, particulate pollution takes 1.8 years off the life of the average Nigerian resident. In contrast, HIV/AIDS and sexually transmitted infections reduce average life expectancy by 1.2 years.
- Particulate pollution has increased over time. From 1999 to 2021, average annual particulate pollution increased by 24.3 percent, further reducing life expectancy by more than 5 months.
- In the most polluted local government area of the country—Sardauna—residents are on track to lose 4 years of life expectancy on average relative to the WHO guideline. In the Niger River Delta, where oil refineries are linked to the grim daily reality of air pollution, 45.5 million residents are on track to lose 2.1 years of life expectancy.[3] In the states of Akwa Ibom, Cross River, Rivers and Abia, residents would lose between 2.2 to 2.7 years of life expectancy.
- If Nigeria were to reduce particulate pollution to meet the WHO guideline, residents in Lagos—Nigeria's most populous state—would gain 1.4 years of life expectancy. In Abuja—Nigeria's capital city—residents would gain 2.3 years of life expectancy.

Figure 1 · Potential gain in life expectancy from permanently reducing $PM_{2.5}$ from 2021 concentration to the WHO guideline

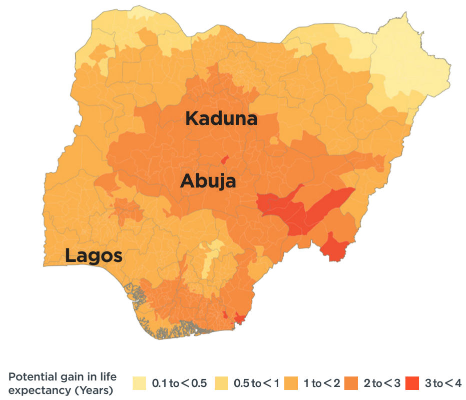
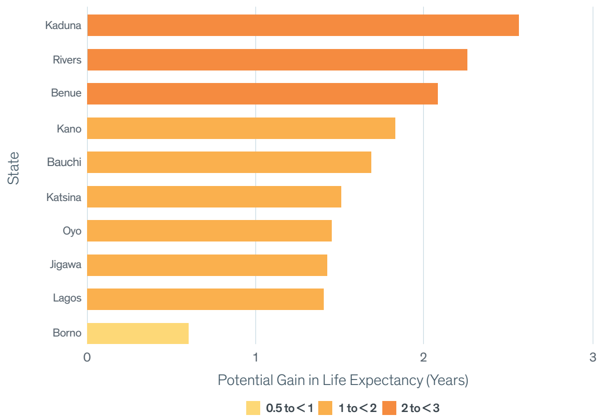


Figure 2 · Potential gain in life expectancy from reducing $PM_{2.5}$ from 2021 levels to the WHO guideline in the 10 most populous states of Nigeria

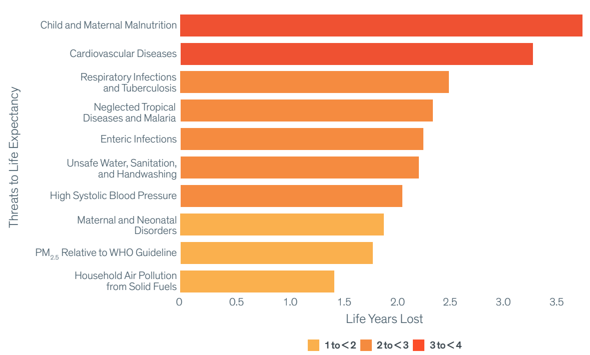


1 This data is based on the AQLI 2021 dataset. All annual average $PM_{2.5}$ values (measured in micrograms per cubic meter: µg/m³) are population weighted.
2 Six out of the ten most polluted Local Government Areas (LGAs) of Nigeria lie in the Taraba state as follows: Sardauna, Donga, Bali, Takum, Ibi, Wukari.
3 Niger river delta is defined as the following nine states: Rivers, Delta, Akwa Ibom, Imo, Edo, Ondo, Cross River, Abia, Bayelsa.

Potential life expectancy impacts of particulate pollution reductions in the 25 most populous local government areas (LGAs) of Nigeria

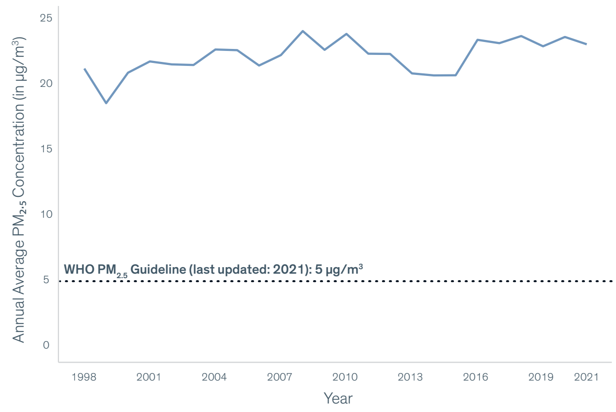
Local government area	Population (millions)	Annual average 2021 $PM_{2.5}$ concentration, (µg/m³)	Life expectancy gains from reducing $PM_{2.5}$ from 2021 concentration to WHO $PM_{2.5}$ guideline of 5 µg/m (years)	Life expectancy gains from reducing $PM_{2.5}$ from 2021 concentration by 30 percent (years)
Alimosho	2.6	19	1.4	0.6
Abuja	2.3	28.9	2.3	0.8
Ikorodu	1.8	21.4	1.6	0.6
Ado Odo/Ota	1.7	20.1	1.5	0.6
Amuwo Odofin	1.6	18.9	1.4	0.6
Surulere	1.6	18.8	1.4	0.6
Eti-Osa	1.4	19.7	1.4	0.6
Apapa	1.4	18.8	1.4	0.6
Ungogo	1.4	23.1	1.8	0.7
Ikeja	1.4	18.6	1.3	0.5
Ojo	1.3	20.8	1.5	0.6
Obio/Akpor	1.2	28.5	2.3	0.8
Mainland	1.1	18.9	1.4	0.6
Lagos Island	1	19.1	1.4	0.6
Kosofe	1	19.4	1.4	0.6
Bwari	1	32.3	2.7	0.9
Akko	1	21.6	1.6	0.6
Konduga	0.9	10	0.5	0.3
Gezawa	0.9	23.1	1.8	0.7
Oshodi/Isolo	0.9	18.5	1.3	0.5
Igabi	0.9	31.8	2.6	0.9
Bauchi	0.9	24.9	2	0.7
Shomolu	0.8	18.6	1.3	0.5
Port Harcourt	0.8	26.5	2.1	0.8
Ifo	0.8	20.3	1.5	0.6

Figure 3 · Top 10 threats to life expectancy in Nigeria



Sources: Global Burden of Disease (https://vizhub.healthdata.org/gbd-results/) level-2 causes and risks data and WHO Life Tables (https://apps.who.int/gho/data/node.main.LIFECOUNTRY?lang=en) were combined with the Life table method to arrive at these results. '$PM_{2.5}$ relative to WHO Guideline' bar displays the reduction in life expectancy relative to the WHO guideline as calculated by latest AQLI (2021) data.

Figure 4 · Annual average $PM_{2.5}$ concentration in Nigeria, 1998-2021



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 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, satellite measurements of global particulate matter ($PM_{2.5}$), yielding unprecedented insight into the true cost of 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 particulate air pollution from other factors that affect health. Ebenstein et al. (2017) 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. This metric is then combined with sea-salt and mineral dust removed satellite-derived $PM_{2.5}$ data. All 2021 annual average $PM_{2.5}$ values are population-weighted and AQLI's source of population data is https://landscan.ornl.gov/. We are grateful to the Atmospheric Composition Analysis Group, based at the Washington University in St. Louis for providing us with the satellite data. The original dataset can be found here: https://sites.wustl.edu/acag/datasets/surface-pm2-5/. To learn more deeply about the methodology used by the AQLI, visit: aqli.epic.uchicago.edu/about/methodology.