AQLI Air Quality Life Index® | Cameroon Fact Sheet

According to the latest satellite-derived estimates of $PM_{2.5}$, Cameroon was the most polluted African country in 2023. An average Cameroon resident could live 2.7 years longer if particulate pollution ($PM_{2.5}$) were permanently reduced to meet the World Health Organization (WHO) guideline of 5 µg/m³.[1,2] In the country's most polluted regions, individuals could gain more than 5 years of life expectancy (Figure 1).

KEY TAKE-AWAYS

- Particulate pollution is the biggest external threat to life expectancy in Cameroon. While particulate pollution takes 2.7 years off the life expectancy of the average Cameroon resident, neglected tropical diseases and malaria, and HIV/AIDS and other sexually transmitted infections take off 2.2 and 1.7 years, respectively (Figure 3).
- As of 2024, Cameroon's 30.2 million people had no access to government-monitored data. This factsheet relies on satellite-derived estimates of $PM_{2.5}$ to calculate potential gains in life expectancy from breathing cleaner air across regions in the country. And to help plug air quality data gaps in countries like Cameroon, we launched the EPIC Air Quality Fund in 2024. Two out of our first cohort of 31 awardees are working towards improving air quality data availability in Cameroon.[3]
- In 2023, the satellite-derived annual-average $PM_{2.5}$ concentration in Cameroon was 32.5 µg/m³—6.5 times higher than the WHO guideline. As a result, all of Cameroon's 30.2 million people live in areas where the annual average particulate pollution level exceeded the WHO guideline.
- Residents of the most populous provinces of the country—Centre, Extrême-Nord, and Littoral—could potentially gain 2.9, 0.9, and 3.9 years of life expectancy from breathing air that meets the WHO guideline, respectively, collectively adding 39.1 million total life years (Figure 2).

Figure 1 · Potential gain in life expectancy from permanently reducing $PM_{2.5}$ from the 2023 concentration to the WHO guideline

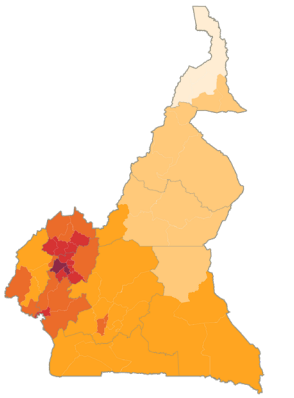
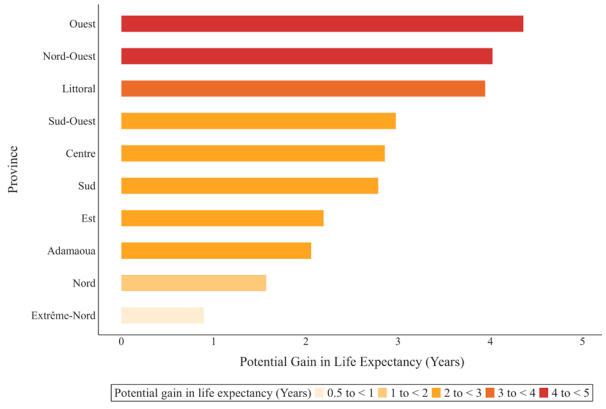


Figure 2 · Potential gain in life expectancy from reducing $PM_{2.5}$ from 2023 levels to the WHO guideline in the 10 most populous provinces of Cameroon



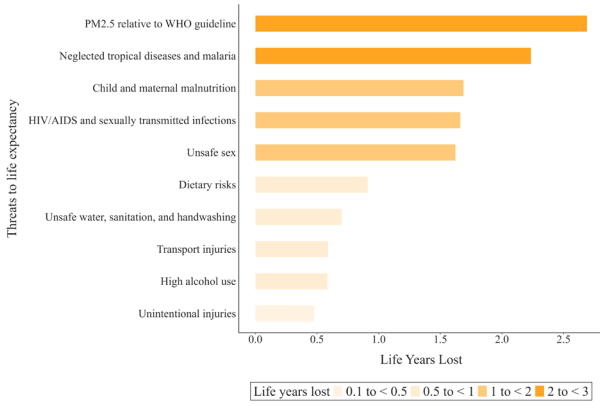
1 This data is based on the AQLI 2023 dataset. All annual average $PM_{2.5}$ values (measured in micrograms per cubic meter: µg/m³) are population weighted.

2 World Health Organization. WHO Global Air Quality Guidelines: Particulate Matter ($PM_{2.5}$ and PM_{10}), Ozone, Nitrogen Dioxide, Sulfur Dioxide and Carbon Monoxide. Geneva, 2021. https://iris.who.int/bitstream/handle/10665/345329/9789240034228-eng.pdf

3 The EPIC Air Quality Fund aims to expand access to air quality data to 1 billion people by 2030. Douala General Hospital and the Institute of Geological and Mining Research (IGMR) are the two awardees in Cameroon. Douala General Hospital is setting up a Reference-grade monitoring station in Douala, and IGMR will establish low-cost air quality monitoring networks in Yaoundé and Cameroon. More about the EPIC Air Quality Fund and the awardees can be found here: https://aqfund.epic.uchicago.edu/

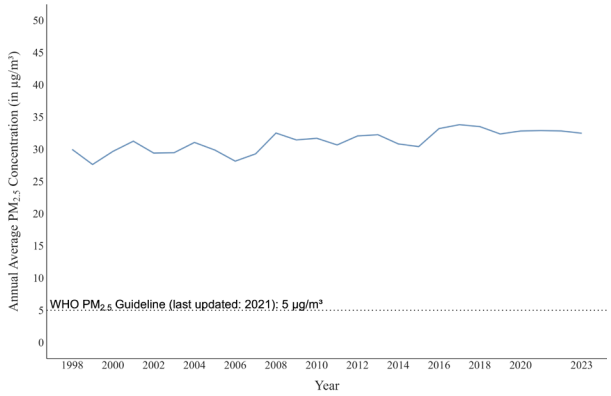
- Based on satellite-derived estimates of $PM_{2.5}$ for the country, the Menoua Department in the Ouest province seems to be the most polluted region in the country. An average resident could gain 5.1 years of life expectancy if the region met the WHO guideline.
- In Cameroon's Mfoundi Department, home to Cameroon's capital city of Yaounde, residents could potentially gain 3 years of life expectancy by breathing air that meets the WHO guideline.
- Particulate concentrations in Cameroon are 8.3 percent higher than they were in 1998. In the past decade, Cameroon's particulate levels have averaged at 32.5 µg/m³, ranging from 30.4 to 33.8 µg/m³. These levels are more than 6 times higher than the WHO guideline (Figure 4).

Figure 3 · Top 10 external threats to life expectancy in Cameroon



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 the latest AQLI (2023 $PM_{2.5}$ concentrations) data.

Figure 4 · Annual average $PM_{2.5}$ concentrations in Cameroon, 1998-2023



ADOPTING AND IMPLEMENTING A NATIONAL STANDARD COULD DELIVER SIGNIFICANT HEALTH BENEFITS

Despite being the most polluted country on the African continent and consistently ranking among the most polluted countries worldwide, Cameroon has yet to adopt a national standard for $PM_{2.5}$. Nigeria, Cameroon's neighbor to the west, adopted a national annual standard of 20 µg/m³ in 2021[4]. If Cameroon were to adopt and enforce policies to implement a similar standard, the average resident could live 1.2 months longer, adding 36.2 million total life-years to the country's population.

4 Federal Republic of Nigeria. Federal Government Gazette Supplement, No. 161, February 17, 2021. https://archive.gazettes.africa/archive/ng/2021/ng-government-gazette-supplement-dated-2021-02-17-no-161.pdf

Potential life expectancy impacts of particulate pollution reduction in the 25 most polluted districts of Cameroon

District	Population (in 100,000)	Annual Average 2023 $PM_{2.5}$ Concentration (µg/m³)	Life Expectancy Gains from reducing $PM_{2.5}$ from 2023 concentration to WHO $PM_{2.5}$ guideline of 5 µg/m³ (in years)	Life Expectancy Gains from reducing $PM_{2.5}$ from 2023 concentration to 20µg/m³ (in years)
Menoua	4.3	56.6	5.1	3.59
Hauts Plateaux	1.2	56.1	5.0	3.54
Koung Khi	1.0	55.8	5.0	3.51
Mifi	4.5	53.8	4.8	3.31
Bamboutos	4.4	53	4.7	3.23
Haut Nkam	2.2	51.2	4.5	3.06
Mezam	8.1	51.1	4.5	3.05
NdÃ©	1.4	50.3	4.4	2.97
Momo	2.2	49.8	4.4	2.92
Bui	5.0	47.1	4.1	2.66
Wouri	35.1	46.9	4.1	2.64
Ngo Ketunjia	2.9	46.5	4.1	2.60
Boyo	1.9	44.1	3.8	2.36
Lebialem	1.8	43.3	3.8	2.28
Sanaga Maritime	2.9	40	3.4	1.96
Donga Mantung	4.2	39.9	3.4	1.95
Moungo	6.9	39.5	3.4	1.91
Nkam	0.7	38.5	3.3	1.81
Ndian	1.9	38.1	3.2	1.77
Fako	7.3	37.2	3.2	1.69
Noun	6.9	37.1	3.1	1.68
Mefou et Akono	1.2	36.1	3.0	1.58
Mfoundi	34.2	35.9	3.0	1.56
Menchum	2.5	35.8	3.0	1.55
KoupÃ© Manengouba	1.7	35	2.9	1.47

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 2023 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 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.