AQLI Air Quality Life Index® Democratic Republic of the Congo Fact Sheet

Fine particulate air pollution ($PM_{2.5}$) shortens the average Democratic Republic of the Congo (DRC) resident's life expectancy by 2.9 years, relative to what it would be if the World Health Organization (WHO) guideline of 5 µg/m³ was met .[1] DRC is the most polluted country in the African continent—with pollution shortening people's life expectancy by as much as 4.4 years in the country's most polluted regions (Figure 1).[2]

KEY TAKE-AWAYS

- In 2022, the annual-average PM2.5 concentration in DRC was 34.7 µg/m³—6.9 times higher than the WHO guideline. As a result, all of DRC's 108.3 million people live in areas where the annual average particulate pollution level exceeds the WHO guideline.
- In the most populous provinces of the country—Kinshasa, Nord-Kivu and Kwilu—29.1 million residents or 26.8 percent of DRC's population are on track to lose 95.3 million total life years if the current pollution levels persist (Figure 2).
- While particulate pollution takes 2.9 years off the life of the average DRC resident, high blood pressure, dietary risks and diabetes & kidney disease takes off 2.3, 1.5 and 1 years, respectively (Figure 3).
- If DRC were to reduce particulate pollution to meet the WHO guideline, the 12.3 million residents in Kinshasa, the capital of DRC, would gain 3.3 years of life expectancy on average.
- Since 2010, particulate concentrations have remained stable in the DRC, fluctuating between 31.2 and 38.3 µg/m³. These levels are six to seven times higher than the WHO guideline and reinforce the need for concerted action towards air pollution in the country (Figure 4).

Figure 1 · Potential gain in life expectancy from permanently reducing PM2.5 from 2022 concentration to the WHO guideline

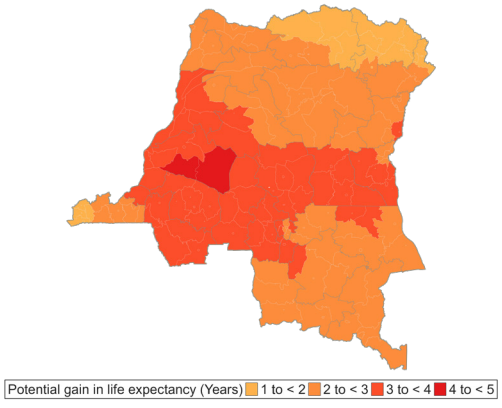
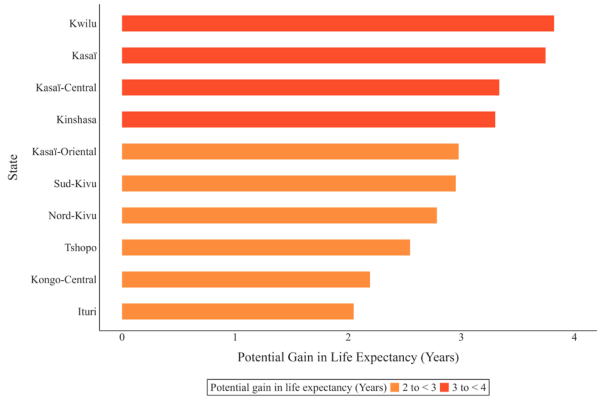


Figure 2 · Potential gain in life expectancy from reducing PM2.5 from 2022 levels to the WHO guideline in 10 most populous provinces of Democratic Republic of the Congo



POLICY IMPACTS

Despite being the most polluted country in the African continent, DRC is yet to adopt the East African community air quality standard of 35 µg/m³ for annual PM2.5 concentration.[3] Almost half of DRC's population lives in regions with pollution levels that exceed this standard. If these regions were to meet this standard, the average life expectancy in the country would increase by 6 months, collectively adding 25 million total life years to DRC's life expectancy.

1 This data is based on the AQLI 2022 dataset. All annual average PM2.5 values (measured in micrograms per cubic meter: µg/m³) are population weighted.

2 Ten most polluted regions of DRC lie in the provinces of Kwilu, Mai-Ndombe and Kasai

3 The EAS 751:2010 gives permissible limits of some common substances found in polluted air, namely sulfur dioxide, carbon monoxides, particulate matter, oxides of nitrogen, hydrocarbons, and lead. The standard covers both the ambient air and emission sources. The second edition of the standard is available here: https://bbnburundi.org/wp-content/uploads/2021/05/Air-quality-Specification-DEAS-vrai.pdf

Potential life expectancy impacts of particulate pollution reduction in the 25 most populous districts of DRC

Local Government Area	Population (Millions)	Annual Average 2022 PM2.5 Concentration (µg/m³)	Life Expectancy Gains from reducing PM2.5 from 2022 concentration to WHO PM2.5 guideline of 5 µg/m	Life Expectancy Gains from reducing PM2.5 from 2022 concentration by 30 percent
Kinshasa	12.3	38.7	3.3	1.1
Djugu	1.9	27.9	2.2	0.8
Masisi	1.8	34.6	2.9	1
Mbuji-Mayi	1.7	35.5	3	1
Idiofa	1.6	44	3.8	1.3
Rutshuru	1.6	36.2	3.1	1.1
Kamonia	1.6	42.9	3.7	1.3
Lubero	1.6	30.2	2.5	0.9
Oicha	1.5	32.4	2.7	1
Lubumbashi	1.5	28.5	2.3	0.8
Masi-Manimba	1.5	44	3.8	1.3
Walungu	1.3	32.9	2.7	1
Bulungu	1.3	44.7	3.9	1.3
Mahagi	1.2	24.2	1.9	0.7
Kikwit	1.2	45.2	3.9	1.3
Kabare	1.2	33.3	2.8	1
Aru	1.2	22.4	1.7	0.7
Gemena	1.1	31.1	2.6	0.9
Mbanza-Ngungu	1.1	31.4	2.6	0.9
Kisangani	1.1	31.1	2.6	0.9
Kananga	1.1	38.3	3.3	1.1
Gungu	1	41	3.5	1.2
Butembo	1	31.3	2.6	0.9
Uvira	1	37.9	3.2	1.1
Kasongo-Lunda	1	38	3.2	1.1

Figure 3 · Top 10 threats to life expectancy in Democratic Republic of the Congo

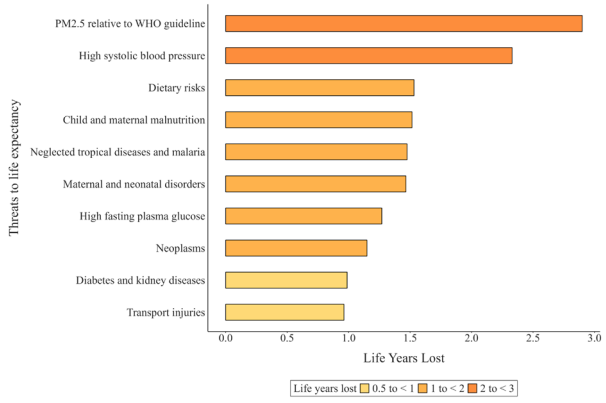
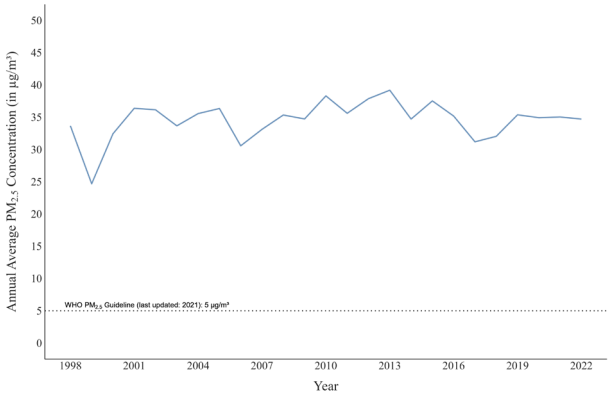


Figure 4 ·Annual average PM2.5 concentrations in Democratic Republic of the Congo, 1998-2022



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 (PM2.5), 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 PM10 reduces life expectancy by 0.64 years. In terms of PM2.5 , this translates to the relationship that an additional 10 µg/m3 of PM2.5 reduces life expectancy by 0.98 years. This metric is then combined with sea-salt and mineral dust removed satellite-derived PM2.5 data. All 2022 annual average PM2.5 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.