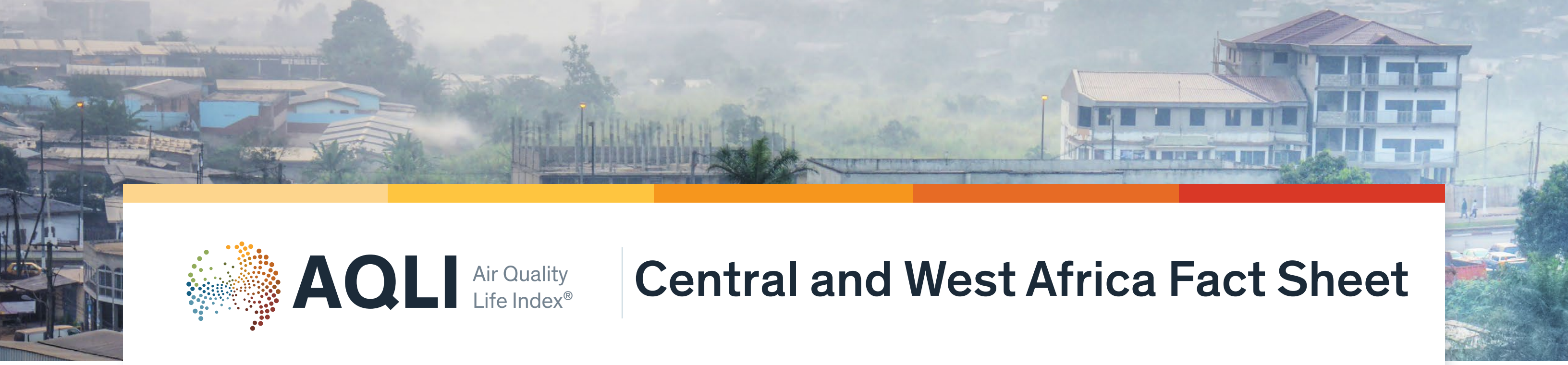


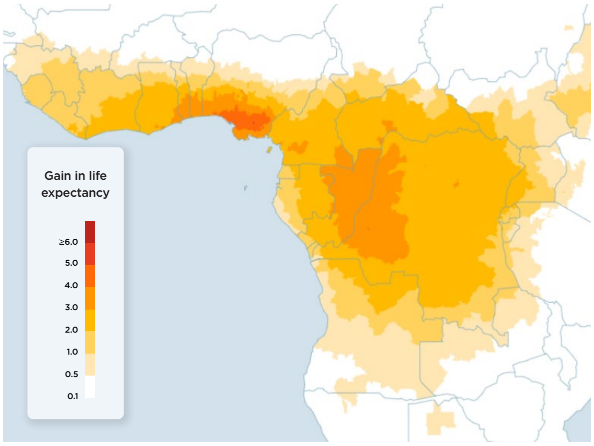
Central and West Africa Fact Sheet

In Central and West Africa , regions together comprised of 27 countries and 577 million people, the average person is exposed to particulate pollution levels that are double the World Health Organization's (WHO) guideline[1]. If these particulate pollution levels persist, average life expectancy in the regions would be 1.2 years lower, and a total of 677 million person-years would be lost, relative to if air quality met the WHO standard.

KEY TAKE-AWAYS

- During the last decade, Benin, the Democratic Republic of the Congo, the Republic of Congo, Ghana, Nigeria and Togo have all been among the top ten most polluted countries in one or more years.
- **Nigeria:** Nigeria is one of the region's pollution hotspots. Air pollution is second only to HIV/AIDS in terms of its impact on life expectancy—shaving off more years than malaria and water and sanitation concerns. The country's most populous city is Lagos, home to 20 million people and one of the fastest growing cities in the world. Residents there could gain 2.9 years in life expectancy if air quality complied with the WHO guideline. In Onitsha, the most polluted city in Nigeria, residents could gain 4 years.
- **Republic of the Congo:** The Republic of Congo is the most polluted country in the region, with residents gaining 2 years onto their lives if the air quality met the WHO guideline. Its capital, Brazzaville, is not only its most populous city with 1.4 million residents, but also one of its most polluted. Residents there could gain 2.6 years in life expectancy if air quality met the WHO guideline.
- **Democratic Republic of the Congo:** Air pollution in the Democratic Republic of Congo shaves more off life expectancy than any other comparable health threat except malaria. In Kinshasa, the capital and largest city of the Democratic Republic of the Congo and home to more than 10 million people, life expectancy is lowered by 2.5 years relative to what it could be if air quality complied with the WHO guideline

Figure 1 · Potential Gain in Years of Life Expectancy Through Permanently Reducing PM2.5 From 2018 Concentrations to the WHO Guideline.



- **Ghana:** Air pollution is the deadliest health threat in Ghana, when stacked up against similar diseases. The most polluted region of Ghana is the Volta Region. Residents there could gain 2.1 years in life expectancy if air quality met the WHO guideline. In Accra, Ghana's capital and its most populous city with 2.6 million residents, life expectancy is lowered by 1.93 years.
- **Côte d'Ivoire:** In Cote d'Ivoire, air pollution shortens life by about the same amount as HIV/AIDS, malaria and water and sanitation concerns. In the economic capital of the Côte d'Ivoire, Abidjan with a population of 5 million, residents could gain 1.7 years in life expectancy if air quality complied with the WHO guideline.

"The legacy of environmental improvement in former pollution capitals is evidence that today's pollution does not need to be tomorrow's fate. As countries navigate the dual challenges of sustaining economic growth and protecting the environment and public health, the AQLI shows not only the damage caused by pollution but also the enormous gains that can be made with policies to address it."

Michael Greenstone, The Milton Friedman Distinguished Service Professor in Economics, the College, and the Harris School; Director, EPIC

1Central Africa is here defined as the 11 countries in the Economic Community of Central African States. West Africa is defined following the United Nations' definition, which includes 16 countries.

POLICY IMPACTS

Going forward, the populations and economies of African countries will grow. In fact, growth in coal consumption in Africa over the next two decades is projected to be triple what it was in the past two decades. As such, the dual challenges of economic growth and environmental quality faced by Central and West Africa will become more difficult to balance. Countries and regions throughout the world, however, have demonstrated success in confronting these challenges during their periods of industrialization.

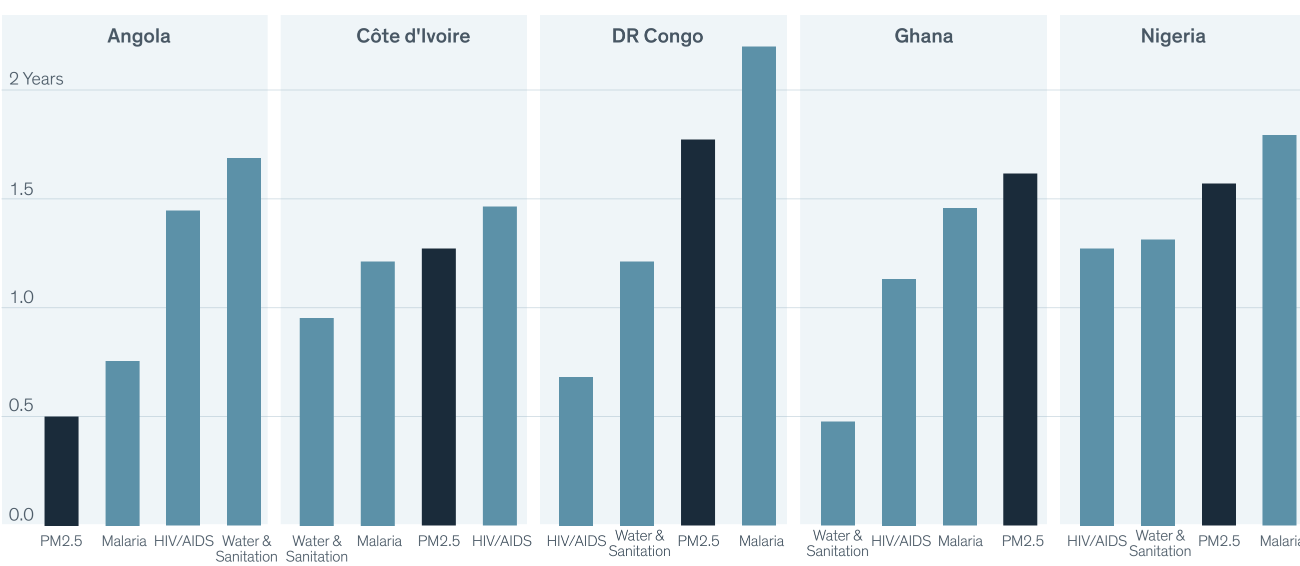
China has made tremendous progress since declaring a "war against pollution" in 2014, with cities cutting particulate pollution by about 40 percent—improving life expectancy by 2 years if the reductions persist. India, having declared its own war against pollution in January 2019, has set an ambitious target to reduce pollution by 20-30 percent. If it achieves a 25 percent reduction in pollution nationwide, it has the potential to improve life expectancy by 2 years.

2 UNICEF, 2019

Central and West Africa has the opportunity to experience the same progress. If Central and West Africa were to achieve the same reduction in pollution experienced by China, its residents could live 0.83 years longer; 0.52 years longer if it achieves India's target. Some countries in Central and West Africa would see even greater gains. For example, if the Republic of the Congo were to achieve China's reduction, its residents could live 1.18 years longer; 0.74 years longer if it achieves India's target. Togo would gain 1.12 years if pollution levels met China's reduction and 0.7 years if the levels hit India's target; Benin would gain 1.11 years and 0.69 years, respectively.

On the policy front, Central and West Africa does have a long way to go. Of all 27 Central and West African countries, only one – Cameroon – has set a national standard for particulate pollution. Further, only three real-time air quality monitoring stations exist throughout the entire region to provide transparent pollution data to the public[2]. As a point of comparison, about 200 of these monitors exist in India, a land mass smaller than Central and West Africa.

Figure 2 · Life Expectancy Impacts of Particulate Pollution and Other Health Threats in the Five Most Populous Countries in Central and West Africa



$PM_{2.5}$ Concentration and Potential Life Expectancy Gains by Country and in Most Polluted Region annd Most Populous City of Each Country.

Location	$PM_{2.5}$ Concentration 1970 (μg/m³)	Years of Life Expectancy Gain through Reducing $PM_{2.5}$ from 2018 Concentration: To the WHO Guideline of 10 μg/m³	By 25%	By 40%	Percent of Population in Areas Above WHO Guideline
Angola	15	0.5	0.4	0.6	95
Chitato, Lunda Norte	27	1.7	0.7	1.1	
Viana, Luanda	14	0.4	0.3	0.5	
Benin	28	1.8	0.7	1.1	98
Littoral	38	2.8	0.9	1.5	
Atlantique	37	2.7	0.9	1.5	
Burkina Faso	9	0.0	0.2	0.4	27
Noumbiel, Sud-Ouest	16	0.6	0.4	0.6	
Kadiogo, Centre	9	0.0	0.2	0.4	
Burundi	17	0.6	0.4	0.6	100
Bujumbura Mairie	23	1.3	0.6	0.9	
Gitega	15	0.5	0.4	0.6	
Cameroon	22	1.2	0.5	0.9	79
Mefou et Akono, Centre	34	2.3	0.8	1.3	
Wouri, Littoral	31	2.0	0.7	1.2	
Cape Verde	3	0.0	0.1	0.1	0
Central African Republic	28	1.8	0.7	1.1	99
Bimbo, Ombella-M'Poko	34	2.3	0.8	1.3	
Chad	10	0.3	0.2	0.4	41
Monts de Lam, Logone Oriental	22	1.2	0.5	0.9	
N'Djamena, Ville de N'Djamena	4	0.0	0.1	0.2	
Côte d'Ivoire	22	1.2	0.6	0.9	100
Sud Comoé, Comoé	28	1.8	0.7	1.1	
Abidjan, Abidjan	28	1.7	0.7	1.1	
Democratic Republic of the Congo	27	1.7	0.7	1.1	100
Bandundu, Kwilu	42	3.1	1.0	1.6	
Kinshasa, Kinshasa	36	2.5	0.9	1.4	
Equatorial Guinea	22	1.1	0.5	0.8	100
Mongomo, Wele-Nzas	25	1.5	0.6	1.0	
Malabo, Bioko Norte	24	1.4	0.6	0.9	
Gabon	21	1.1	0.5	0.8	100
Zadié, Ogooué-Ivindo	31	2.1	0.8	1.2	
Komo-Mondah, Estuaire	19	0.9	0.5	0.7	
Gambia	7	0.0	0.2	0.3	0
Upper River	9	0.0	0.2	0.3	
Western	7	0.0	0.2	0.3	
Ghana	26	1.6	0.6	1.0	100
Ketu, Volta	35	2.5	0.9	1.4	
Accra, Greater Accra	30	1.9	0.7	1.2	
Guinea	15	0.5	0.4	0.6	100
Kissidougou, Faranah	20	1.0	0.5	0.8	
Conakry, Conakry	14	0.4	0.3	0.6	
Guinea-Bissau	9	0.0	0.2	0.3	14
Gabú	10	0.1	0.3	0.4	
Bissau	9	0.0	0.2	0.3	
Liberia	18	0.8	0.5	0.7	100
Maryland	21	1.0	0.5	0.8	
Montserrado	18	0.8	0.4	0.7	
Mali	8	0.0	0.2	0.3	25
Yanfolila, Sikasso	15	0.5	0.4	0.6	
Bamako, Bamako	10	0.0	0.2	0.4	
Mauritania	4	0.0	0.1	0.2	0
Sélibaby, Guidimaka	6	0.0	0.1	0.2	
Nouakchott, Nouakchott	5	0.0	0.1	0.2	
Niger	6	0.0	0.1	0.2	0
Gaya, Dosso	8	0.0	0.2	0.3	
Mirriah, Zinder	6	0.0	0.1	0.2	
Nigeria	25	1.5	0.6	1.0	69
Anambra	48	3.8	1.2	1.9	
Lagos	40	2.9	1.0	1.6	
Republic of Congo	30	2.0	0.7	1.2	100
Mossaka, Cuvette	37	2.6	0.9	1.4	
Brazzaville, Brazzaville	37	2.6	0.9	1.4	
Rwanda	20	0.9	0.5	0.8	100
Amajyaruguru	21	1.1	0.5	0.8	
Iburasirazuba	18	0.8	0.4	0.7	
São Tomé and Príncipe	12	0.2	0.3	0.5	100
Pagué, Príncipe	14	0.4	0.4	0.6	
Água Grande, São Tomé	12	0.2	0.3	0.5	
Senegal	6	0.0	0.1	0.2	1
Kédougou	12	0.2	0.3	0.5	
Dakar	6	0.0	0.1	0.2	
Sierra Leone	17	0.7	0.4	0.7	100
Kono, Eastern	19	0.9	0.5	0.7	
Western Urban, Western	15	0.5	0.4	0.6	
Togo	29	1.8	0.7	1.1	100
Maritime	37	2.6	0.9	1.4	

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 Dinstinguished 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 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. To learn more about the methodology used by the AQLI, visit: aqli.epic.uchicago.edu/about/methodology