AQLI Air Quality Life Index®

United States Fact Sheet

The United States once struggled with heavy air pollution. Before 1970, the Steubenville, Ohio metropolitan area had particulate pollution concentrations similar to those in Beijing in recent years. Los Angeles had become known as the smog capital of the world, and other large metropolitan areas weren't far behind. Pollution had become a part of everyday life for many Americans, and citizens made clear that they wouldn't tolerate it any longer. Congress passed the 1970 Clean Air Act and air quality has vastly improved across the country since then.

Today, most of the country enjoys clean air, and the reductions in particulate pollution have improved life expectancy for the average American by 1.5 years.[1] Since the pollution that is easiest to reduce is reduced first, the majority of the air quality improvement came in the years immediately following the passage of the Clean Air Act. Of the reductions since 1970, 15 percent has come since 1998, which the AQLI tracks. Pockets of high particulate pollution, however, still exist in some areas today.

KEY TAKE-AWAYS

- Particulate pollution in the United States declined by 62 percent between 1970 and 2016. This reduction in particulate pollution has increased life expectancy for the average American by 1.5 years.
- 85 percent of today's U.S. population breathes clean air, living in counties where particulate pollution concentrations are below the World Health Organization (WHO) guideline.
- California suffers from the highest levels of pollution in the country, with levels exceeding both the WHO guideline and U.S. national standard. In Fresno, pollution levels are double the WHO guideline, which, if met, would extend the life expectancy of the average resident by a year. Those in Los Angeles would live about a half year longer if the WHO guideline was met.
- Parts of the Midwest – in Indiana, Illinois and Ohio – as well as Arizona still have levels of particulate pollution slightly above what the WHO considers safe. In these areas, reducing particulate pollution to the WHO guideline would increase life expectancy by up to 3.5 months.

Figure 1 · Change in Particulate Air Pollution

1970-2016, estimated

1998-2016

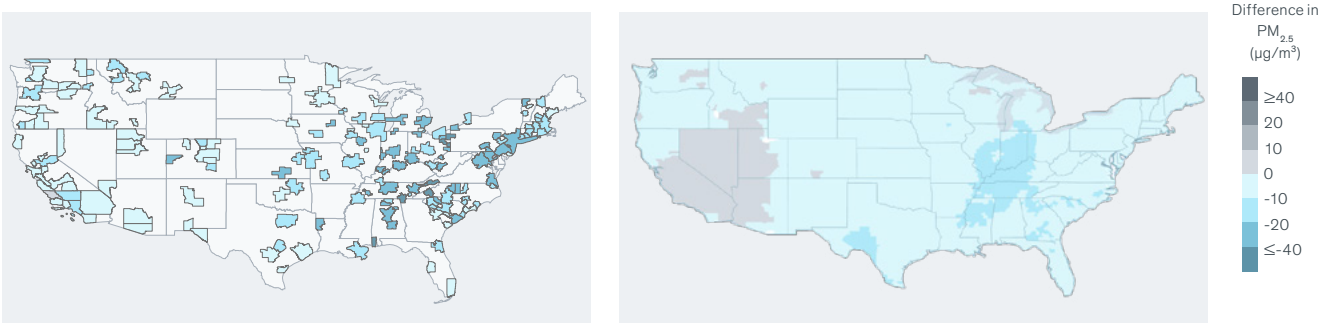
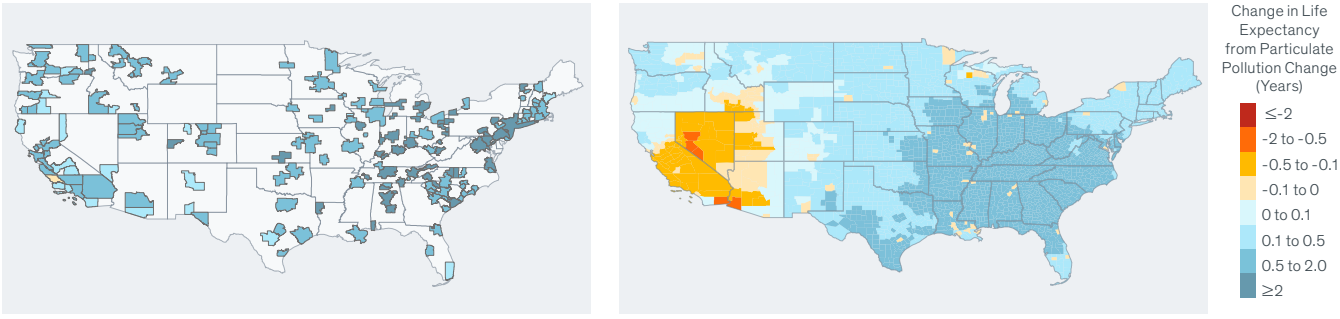


Figure 2 · Change in Life Expectancy from Particulate Pollution Change

1970-2016, estimated

1998-2016



"The Clean Air Act has made a vast difference in the quality of the air we breathe and in the length of our lives. It has led to hundreds of millions of life-years saved from improved air quality over the last several decades. The trick moving forward will be to find economically efficient ways to sustain this clean air and to improve it in the pockets where air pollution remains higher than the United States' national ambient air quality standards."

Michael Greenstone, The Milton Friedman Professor in Economics; Director, EPIC

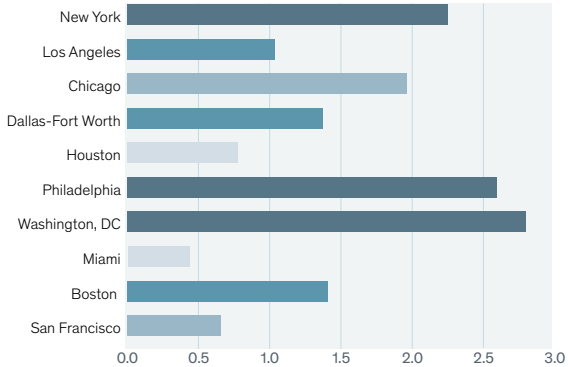
[1] In this Fact Sheet, statistics relating to particulate pollution reduction since 1970 are based on the 234 counties for which 1970 $PM_{2.5}$ concentrations can be calculated using the US Environmental Protection Agency's monitor readings of total suspended particulates (TSP). Details on how 1970 particulate concentrations and life expectancy changes since 1970 were calculated are available at aqli.epic.uchicago.edu/policy-impacts.

50 Most Populous Counties

County	Population (Millions)	$PM_{2.5}$ Concentration, 2016 ($\mu g/m^3$)	Estimated $PM_{2.5}$ Concentration, 1970 ($\mu g/m^3$)	Increase in Life Expectancy if District Meets 12 $\mu g/m^3$ National Standard (years)	Increase in Life Expectancy if District Meets 10 $\mu g/m^3$ WHO Guideline (years)	Change in Life Expectancy Due to Change in $PM_{2.5}$, 1970-2016 (years))
Los Angeles, California	10.2	18	28	0.59	0.78	1.0
Cook, Illinois	5.4	12	28	0.01	0.15	1.7
Harris, Texas	4.7	8	16	0	0	0.8
Maricopa, Arizona	4.1	12	19	0.03	0.18	0.7
San Diego, California	3.3	13	18	0.10	0.27	0.5
Orange, California	3.2	18	31	0.55	0.74	1.3
Dallas, Texas	2.7	8	25	0	0	1.6
Miami-Dade, Florida	2.6	4	6	0	0	0.2
New York, New York	2.4	10	31	0	0.01	2.0
Kings, New York	2.4	11	39	0	0.10	2.7
Riverside, California	2.3	12	20	0.11	0.22	0.8
King, Washington	2.1	5	11	0	0	0.6
San Bernardino, California	2.1	14	16	0.27	0.43	0.2
Clark, Nevada	2.1	7	10	0	0	0.3
Queens, New York	2.0	10	No data	0	0.03	No data
Tarrant, Texas	2.0	8	19	0	0	1.1
Santa Clara, California	2.0	11	20	0	0.12	0.8
Bexar, Texas	1.9	7	11	0	0	0.4
Wayne, Michigan	1.8	11	34	0	0.08	2.3
Broward, Florida	1.8	4	12	0	0	0.8
Middlesex, Massachusetts	1.7	8	21	0	0	1.3
Philadelphia, Pennsylvania	1.6	10	35	0	0.02	2.4
Alameda, California	1.6	11	23	0.02	0.12	1.2
Sacramento, California	1.5	13	24	0.07	0.26	1.1
Baltimore, Maryland	1.5	10	35	0	0.03	2.5
Suffolk, New York	1.5	10	No data	0	0.01	No data
Saint Louis, Missouri	1.5	9	26	0	0	1.7
Palm Beach, Florida	1.4	4	No data	0	0	No data
Hillsborough, Florida	1.4	7	15	0	0	0.7
Nassau, New York	1.4	10	34	0	0.02	2.3
Cuyahoga, Ohio	1.4	11	31	0.01	0.12	1.9
Orange, Florida	1.3	6	No data	0	0	No data
Allegheny, Pennsylvania	1.3	10	No data	0	0.01	No data
Hennepin, Minnesota	1.3	8	15	0	0	0.7
Bronx, New York	1.3	10	40	0	0.01	2.9
Oakland, Michigan	1.3	10	No data	0	0.01	No data
Franklin, Ohio	1.3	11	25	0	0.13	1.4
Travis, Texas	1.2	7	19	0	0	1.1
Salt Lake, Utah	1.2	7	15	0	0	0.7
Fulton, Georgia	1.2	10	No data	0	0	No data
Fairfax, Virginia	1.1	9	32	0	0	2.2
Mecklenburg, North Carolina	1.1	9	26	0	0	1.6
Contra Costa, California	1.0	10	12	0	0.07	0.2
Marion, Indiana	1.0	10	35	0	0.04	2.4
Milwaukee, Wisconsin	1.0	10	30	0	0.05	2.0
Wake, North Carolina	1.0	8	No data	0	0	No data
Montgomery, Maryland	1.0	9	No data	0	0	No data
Bergen, New Jersey	1.0	10	27	0	0.02	1.6
Shelby, Tennessee	1.0	8	26	0	0	1.7
Honolulu, Hawaii	1.0	2	3	0	0	0.1

Figure 3

Change in Life Expectancy Due to Change in $PM_{2.5}$ by Metro Area, 1970-2016[2]



[2]These are the 10 most populous metropolitan areas for which 1970 $PM_{2.5}$ data could be estimated. Details on the 1970 calculations are available at aqli.epic.uchicago/policy-impacts.

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 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.

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