



A closer look at Allegheny County's air quality

Overview: Allegheny County has been maligned, often and just recently, for having the worst pollution in the state. That claim is based on flawed arguments and inadequate attention to air quality data. This *Policy Brief* analyzes recent published claims. It also looks at how particulate matter levels relate to health conditions in several states. The findings contradict commonly held assumptions.

Refuting claim that Allegheny County has the worst air in Pennsylvania

On April 11, there was an article in a local newspaper declaring in large type that Allegheny County had the worst air quality in Pennsylvania. Quoting the Post-Gazette article, “The average daily density of fine particulate matter in Allegheny County as measured by micrograms per cubic meter was 14.1 in the report—the highest in Pennsylvania—based on 2019 data, according to the University of Wisconsin.”

This sentence contains serious flaws and inaccuracies. First, the measurement of particulate matter (called pm2.5 by the Environmental Protection Agency (EPA)) density is from 2019. That is four years ago and was the highest annual average measurement at one monitor. It tells us nothing about current pollution. There were 14 monitors in the county in 2019. Clearly, the air quality in the county should not be determined by measurements at one monitor when other monitors have lower readings. The highest reading was posted at one of three monitors in Liberty Borough, all fairly near a coke plant. There were 11 other monitors in the county.

Note here that the EPA sets the acceptable annual average concentration of pm2.5 as measured by a particulate monitor at 12 micrograms per cubic meter of air. Measurements above that are called exceedances.

A *Policy Brief* from 2019 (*Vol. 19, No. 19*) noted that an “American Lung Association report on the Pittsburgh region comes up short in several ways. First, it fails to mention that readings in all but one of the region’s air quality monitors measuring particulate matter (pm2.5) concentrations are below the Environmental Protection Agency’s (EPA) maximum annual average guidelines with many well below. Second, it fails to mention that the EPA limits on pm2.5 have declined massively over the years, dropping from an annual average of

60 micrograms per cubic meter (mcg/m³) of air in 1970 to 15 in 1997 to 12 in 2012. Meanwhile, Pittsburgh's air has seen equally large declines in pm_{2.5} concentrations.

“And most telling is that the ALA violated EPA rules in calling the region's air some of the worst in the nation based on monitor readings near known generators of particulate matter. Monitors are located specifically in such areas.

“Here is the EPA guidance from their Air Quality Survey reports on monitor readings. *The EPA monitoring data represent the quality of air in the vicinity of the monitoring site and, for some pollutants, may not necessarily represent urban-wide air quality (emphasis added).*”

Returning to the incorrect claim in the Post-Gazette article: The 2019 average of all the annual readings for the 14 monitors in Allegheny County was 9.9 micrograms per cubic meter. Note that the three measurements in Liberty Borough are typically the three highest in the county. Liberty Borough is clearly over-represented in the 14-monitor average. Moreover, and even more important, is that the area of Liberty Borough is only 1.46 square miles or 0.2 percent of the county's 745 square mile area (including water covered areas). Then, too, the borough's population is also 0.2 percent of the county population (all data from EPA monitor data website).

Obviously, the readings at the three monitors in Liberty Borough are not the appropriate measure of the overall county air quality. What's worse, all the monitors but two are in the Mon Valley or in, or close to, Pittsburgh. The monitor in McCandless, which lies well north and west of Liberty Borough, had the lowest annual average reading at 6.8. Interestingly, there were no monitors in the municipalities of Findlay, Mt. Lebanon, Pine, Richland, West Deer or Indiana Township, for example, where the impact of city and Liberty Borough particulate matter is likely to be far less than in municipalities in closer proximity to Liberty Borough. All of which renders the use of the one monitor reading of 14.1 in Liberty Borough as the gauge of overall county air quality illogical and motivationally questionable.

A review of 2022 data

Further, and importantly, particulate matter readings at several monitor locations have fallen since 2019. The offending monitor at Liberty Borough dropped from 14.1 to 12.6 in 2022 and the average of three monitors in the borough fell from 12.8 to 11.3. Indeed, the average measurement of 11 monitors in other municipalities dropped from 9.1 to 8.3 in 2022 with only two failing to improve.

Notably, using the methodology that labels the county with the highest single monitor reading in the state as having the worst air quality in the state would now replace Allegheny County with Lancaster County, where a monitor posted a 14.8 microgram per cubic meter reading for 2022. And that, too, would be highly questionable since that county's four other monitor particulate matter measurements averaged 7.7. Moreover, in 2022 Philadelphia had an average of 8.7 at eight monitors with no large outliers while Cambria County's two monitors averaged 10 micrograms per cubic meter. And Washington County's three monitors averaged 8.5 (note that only 31 of Pennsylvania's counties have monitors).

Simply put, based on the measurements in other Pennsylvania counties and the absence of monitors in large areas of Allegheny County, it is unreasonable to claim Allegheny County air is the worst in the state based on one monitor in the worst air quality area of the county.

Lung cancer, asthma and state air quality

A principal air quality argument is that particulate matter should be lowered continuously over time to reduce diseases of the respiratory system, especially lung cancer and asthma.

So, what do the data show about the relationship of particulate matter levels and incidence and death from these two ailments? Bear in mind that the Centers for Disease Control (CDC) provides data for the rate of new lung cancers and deaths from lung cancer per 100,000 population for each state in 2019 (the last completed data set available) as well as the percentage of each state’s population that has asthma.

This comparative analysis looks at the New England states, where annual average particulate matter are among the nation’s lowest, and at Pennsylvania and California, where statewide monitor readings of particulate matter are substantially higher than in New England but still well below the EPA’s 12 micrograms per cubic meter. The U.S. average rate of new lung cancers was 52.9 per 100,000 population in 2019. There were 33.4 deaths per 100,000 that same year.

Generally, Western Mountain states and West Coast states, along with Hawaii and Texas, have the lowest rates of new cases of lung cancer. At the same time, the states with highest rates are bordering the Ohio River or the Mississippi River with a couple of exceptions—Oklahoma and Maine. States in the middle-level groups are in the upper Midwest, on the Eastern Seaboard and Pennsylvania and Alabama.

The table shows the comparison of lung cancer rates and deaths for the four (of six) New England states with the lowest statewide average pm2.5 concentration with the cancer rates in Pennsylvania and California. Note that all six New England states have low monitor readings.

State	Rate of new lung cancer cases (per 100,000 pop.)	Deaths (per 100,000 pop.)	All pm2.5 monitor average reading
Maine	67.6	42.1	4.9
New Hampshire	60.6	32.4	4.3
Rhode Island	62.8	36.4	5.6
Vermont	52.5	36.0	4.8
4-state average	60.9	36.7	4.9
U.S. average	52.9	33.4	--
Pennsylvania	57.8	35.7	8.4
California	37.1	23.7	7.9

Note: All data are from 2019.

Thus, with a pm2.5 average that is 71 percent above the four New England states average, Pennsylvania’s rate of new lung cancers in 2019 was lower than the four-state average and significantly lower than all but Vermont. Meanwhile, California with a pm2.5 average level

61 percent higher than the New England states, had a new lung cancer rate 40 percent under the four-state average rate of 60.9.

Is there a conclusion to be drawn from these comparisons of cancer rates and pollution levels? Obviously, there are other relevant factors that affect lung cancer rates. Clearly, smoking cigarettes is a major element in lung cancer, along with age. The new case rate rises substantially in older age groups. The CDC rate data do not control for those factors. But that does not obviate the fact that cleaner air has not lowered the lung cancer rate in the New England states compared to higher pm2.5 level states.

Finally, the average percentage of persons with asthma in the four New England states in 2020 was 11.3 percent while the combined average for California (9.3) and Pennsylvania (10.2) was 9.8 percent despite the latter two states having average particle concentrations much higher than New England states.

Conclusion

One thing is clear: The long-term efforts of the EPA to reduce pollution through lowering the compliance standard of acceptable pm2.5 levels over the years to 12 micrograms per cubic meter have resulted in major declines in particulate matter concentrations in states where pm2.5 was a serious problem.

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