Cancer & Environment Network of Southwestern Pennsylvania

Air Pollution and Cancer Risk:
Emerging Evidence and Opportunities for Policy Action
May 2026

Cancer remains a significant public health challenge in Southwest Pennsylvania. Currently (based on 2020-2022 data) Allegheny County for example, overall cancer incidence rates (for both males and females) are statistically significantly higher than the state-wide average and even more elevated considering national rates. Air pollution remains one of the most significant environmental risk factors for cancer and other diseases.

The Cancer & Environment Network of Southwestern Pennsylvania (CENSWPA) began in 2019 to bring together scientists, physicians, public health experts, and community leaders to take action against environmental cancer risks and advance health equity. Earlier this year, as part of its annual Year in Review process that examines the peer-reviewed research, CENSWPA conducted a focused analysis of studies examining links between air pollution and cancer risk and outcomes. Southwestern Pennsylvania—with its legacy industrial activity, expanding petrochemical infrastructure, and significant traffic-related pollution trapped in river valley corridors—remains a region of particular concern and continues to experience some of the poorest air quality levels in the nation. Cancers with well-established links to air pollution – particularly lung and bladder cancers – are significantly elevated in Allegheny County compared to state rates with Black residents experiencing disproportionately higher rates of incidence. However, CENSWPA found mounting evidence that the burden associated with air pollution is likely much greater as recent research shows that pollution exposure is also linked to other cancer types.

We are sharing this brief to raise awareness of the growing scientific evidence and to support policy attention and action to reduce air pollution in Pennsylvania.

What the Research Shows

Recent scientific studies as outlined in our Year in Review (citations to the specific studies noted in the full review) consistently show that:

- **Long-term exposure to fine particulate matter ($PM_{2.5}$) and nitrogen dioxide (NO_2)**—pollutants commonly produced by traffic, fossil fuel combustion, and industrial activity—is associated with increased cancer risk and poorer cancer outcomes.
- Air pollution affects **both cancer development and survivorship**, influencing how aggressive cancers become and how well patients respond to treatment.
- Children may be particularly vulnerable. Emerging evidence suggests that **prenatal exposure to air pollution may increase the risk of childhood leukemia**, and pollution exposure may worsen outcomes for children undergoing cancer treatment.

- Pollution-related cancer risks extend beyond lung cancer to include **breast, digestive, prostate, pediatric, and central nervous system cancers**.
    - Several large U.S. studies published in 2025 identify **breast cancer as a major pollution-related concern**. Long-term exposure to NO_2—a pollutant associated with traffic and combustion sources—was consistently linked to higher breast cancer incidence. Exposure to certain industrial pollutants has also been associated with increased breast cancer risk, and studies suggest that higher pollution levels may worsen survival among breast cancer patients.
    - Research also links air pollution to cancers of the **liver, colon, prostate, brain, and head and neck**. For example, long-term exposure to $PM_{2.5}$ and NO_2 has been associated with increased incidence and mortality from liver cancer, while exposure to particulate matter and other pollutants has been linked to worse survival among colorectal cancer patients.
- **Exposure is not evenly distributed.** Communities located near major roadways, industrial facilities, or energy infrastructure—often lower-income communities and communities of color—experience higher pollution levels and greater health risks.

Policy Opportunities for Pennsylvania

Reducing cancer risks associated with air pollution requires coordinated action across state and local governments, industry, and communities. Key opportunities include:

A. Improve Industrial Oversight and Accountability
- Strengthen emissions limits and enforcement for hazardous air pollutants linked to cancer
- Require improved reporting and transparency around industrial malfunctions and releases
- Ensure cumulative exposure impacts are considered in policy decisions for new or expanded polluting infrastructure
- Expand the use of community-based and supplemental air monitoring data to help identify pollution hotspots and inform regulatory oversight
- Strengthen transparency and public reporting related to industrial emissions, malfunctions, and pollution events

B. Protect Communities Facing Higher Pollution Burdens
- Prioritize monitoring and enforcement in environmental justice communities
- Integrate health considerations into land-use planning, zoning, and transportation decisions

C. Support Cleaner Energy and Industrial Practices
- Encourage legislation that accelerates transitions toward lower-emission energy and manufacturing technologies
- Use state procurement, incentives, and partnerships to support cleaner industrial practices

The scientific evidence linking air pollution and cancer continues to grow. CENSWPA stands ready to serve as a resource to the legislative community by helping interpret emerging science and identifying evidence-based strategies to reduce environmental cancer risks in our region.