

Asthma and Air pollution

- **Germaine Gooden-Patterson**, Community Health Worker, Women for a Healthy Environment and Holistic Health Coach, *Wellness Within: A Mother's Experience with her Children's Asthma*
- **Anjani Ravindra**, MD, Physician, UPMC: *A Clinicians' View of Asthma and Air Pollution, and an Agenda for a Better Future*

Air Pollution and Health: Advocating for Solutions

Deborah Gentile, MD

Medical Director, Community Partners in Asthma Care

Director of Allergy, Asthma and Immunology, East Suburban Pediatrics

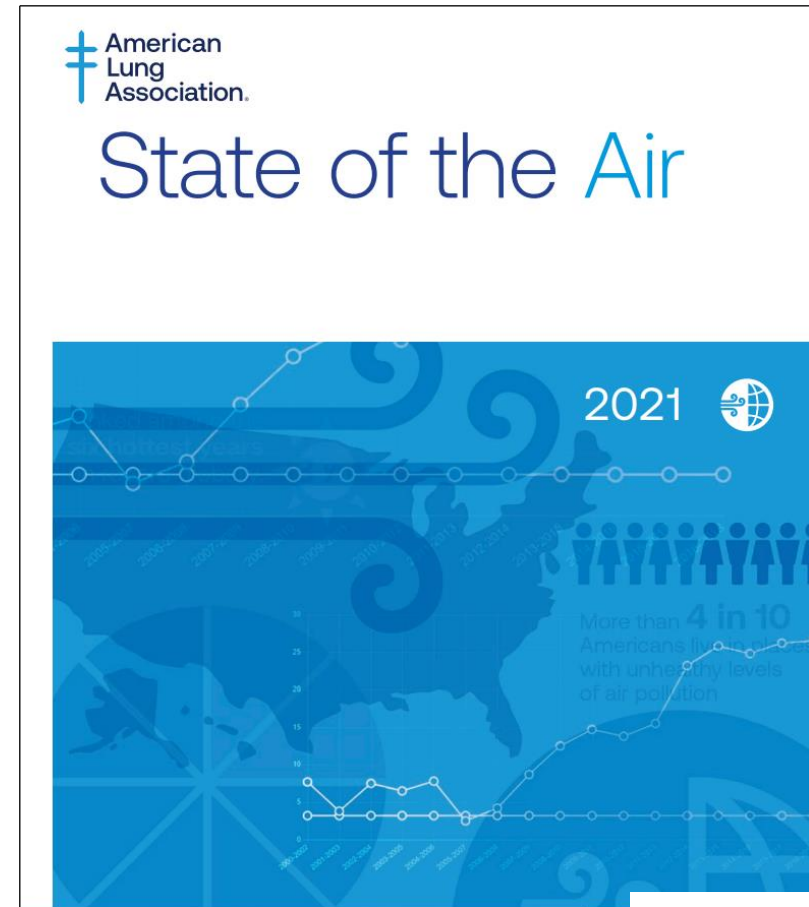


Why Regional Health Systems Should Care

- A significant proportion of our population breathes air pollution
 - Disproportionate impact in **environmental justice communities**
 - **People of color, poor, live near point sources of air pollution**
- Air pollution is a major health risk in our region
 - Responsible for **significant morbidity and mortality**
 - Tremendous **direct and indirect health care costs**
 - Significant impact on **quality of life/well-being**
- Air pollution's toll on human health is worsening
 - Vicious cycle with **climate change**

The Scope of Our Air Pollution Problem

- **2021 State of Air Report**
 - **Our metro region received “F”**
 - **9th worst** (out of 199) for long-term $PM_{2.5}$
 - **16th worst** (out of 216) for short-term $PM_{2.5}$
 - **35th worst** (out of 226) for ozone
- **Environmental Protection Agency**
 - Expected to decrease long-term $PM_{2.5}$ to 8-10 $\mu g/m^3$
- **World Health Organization**
 - ***“No safe level of air pollution”***
 - ***Recently decreased long-term $PM_{2.5}$ threshold from 10 to 5 $\mu g/m^3$***



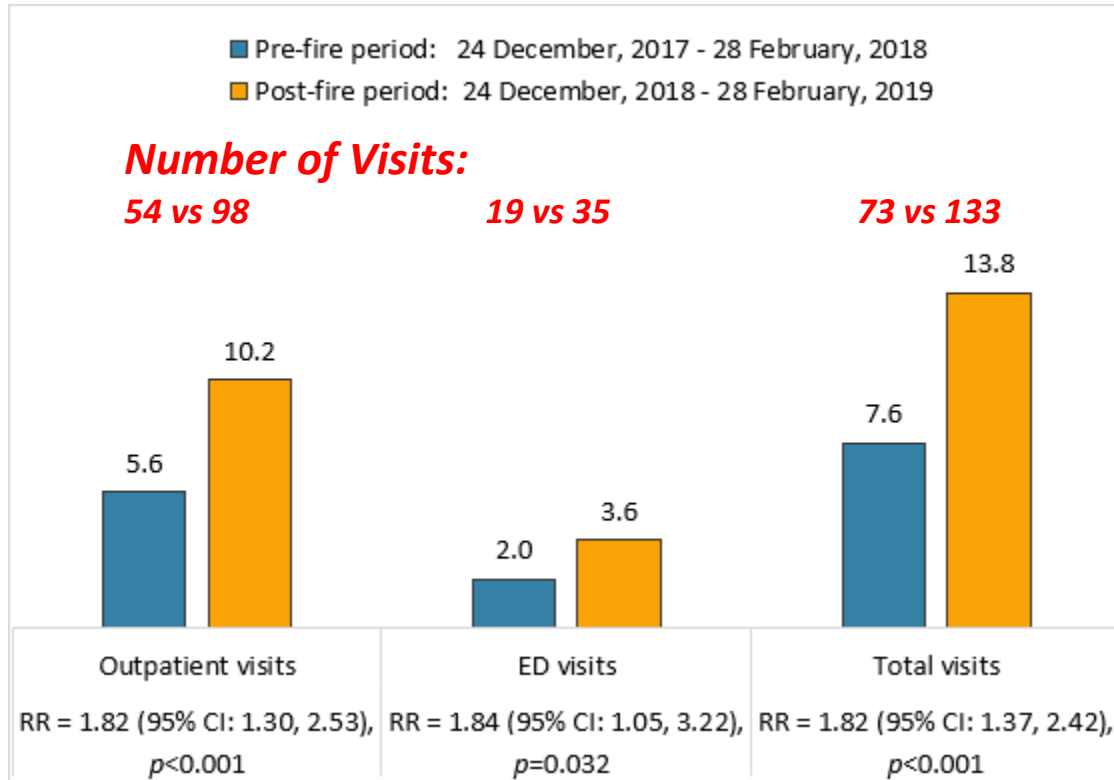
Disparate Impact of Outdoor Air Pollution on Childhood Asthma in Allegheny County

- 1,200 children residing near point sources
 - **1.6 mile** median distance
 - **40%** with PM_{2.5} exposure above EPA threshold (12 ug/m³)
 - **70%** with PM_{2.5} exposure above prior WHO threshold (10 ug/m³)
 - **100%** with PM_{2.5} exposure above current WHO threshold (5 ug/m³)
- **22.4%** asthma prevalence overall
 - **2-3X** state and national prevalence of 8-10%
 - **26.8% in African Americans**
 - **58%** increased risk with PM_{2.5} above prior WHO threshold
- **60%** uncontrolled asthma
 - **2X** state rate
 - **5X** increased risk in girls with PM_{2.5} above prior WHO threshold
- **Results show impact of outdoor air pollution and underscore the need for primary prevention of disease**



Gentile D. J of Asthma, 2020.

Near Doubling of Asthma Attacks in Aftermath of Clairton Coke Works Fire



Results unrelated to weather inversions and flu activity.

- Results consistent with Pitt study
 - Increased asthma symptoms and rescue medication use
 - **50%** unaware of fire and exceedances
- **Policy initiatives**
 - **Alert system** to warn residents
 - **Regulations** to decrease pollution
 - **Organized response** to assess, treat and monitor health outcomes
 - **Including long-term impacts**

Gentile D. Toxics, 2021. Byrwa-Hill B. JACI, 2021.

Other Impacts of Outdoor Air Pollution

- **Vulnerable populations**
 - Pregnant women, children, elderly, underlying health conditions
 - People of color, poor
- **Widespread health impacts in Allegheny County**
 - Mortality, cardiac, respiratory, birth outcomes, autism
- Synergism with other triggers, including **COVID-19**
 - **8% increase in COVID-19 mortality** per 1 $\mu\text{g}/\text{m}^3$ increase in long-term $\text{PM}_{2.5}$

Wu X. medRxiv, 2020.

Current Standards Do Not Protect Public Health

- New studies of larger populations report **effects below current standards**
 - **13,500-52,100 annual deaths** from long-term PM_{2.5}
 - **1,200 to 3,870 annual deaths** from short-term PM_{2.5}
 - **No evidence of threshold to protect health**
- **Recommendations**
 - Decrease long-term PM_{2.5} standard from 12 to **8-10 ug/m³ annually**
 - Decrease short-term PM_{2.5} from 35 to **25-30 ug/m³ over 24 hours**
- **21-27% relative risk reduction in annual deaths** with long-term PM_{2.5} standard of **9 ug/m³ annually**

Independent PM Review Panel. NEJM, 2020.



Observations as a Health Care Provider

- **All chronic disease is devastating**
 - Direct and indirect costs
 - School/work, family life, physical activity
 - **Risk of death**
- **We are all at risk of adverse health effects from air pollution**
- **Must focus on primary prevention**
 - **Medications are not a cure and carry risks**
- **Need to protect underserved**
 - Better access to care
 - **Advocacy to decrease air pollution**



Call to Action for Regional Health Systems

- **Educate** team, patients, community and policy makers about our air pollution problem and its impact on health
- **Screen** patients for air pollution exposure
- **Offer clinical recommendations**, although they are limited
 - Stay indoors on high pollution days, take medications

Advocate on behalf of patients to protect public health

- *Engage with industry leaders and policy makers*
- *Lead policy efforts to lower air pollution exposure and improve health outcomes*

What Can We Say About SWPA's Air Quality?

Matthew M. Mehalik, Ph.D.

*Executive Director, Breathe Project/Collaborative
Adjunct Professor, Heinz College,
Carnegie Mellon University*

**The Pittsburgh Study
Panel on Air Quality**

December 2, 2021

**BREATHE
PROJECT**
The Air We Share

**We still have a serious air quality
problem**

**Adding to our airshed burden will
only make things worse.**

Allegheny County

Pittsburgh-New Castle-Weirton, PA-OH-WV

If you live in Allegheny County, the air you breathe may put your health at risk.

Ozone



Particle Pollution 24-hour



Particle Pollution Annual

FAIL

Source: ALA SOTA 2021

Air quality in the Pittsburgh Region was considered

NOT GOOD

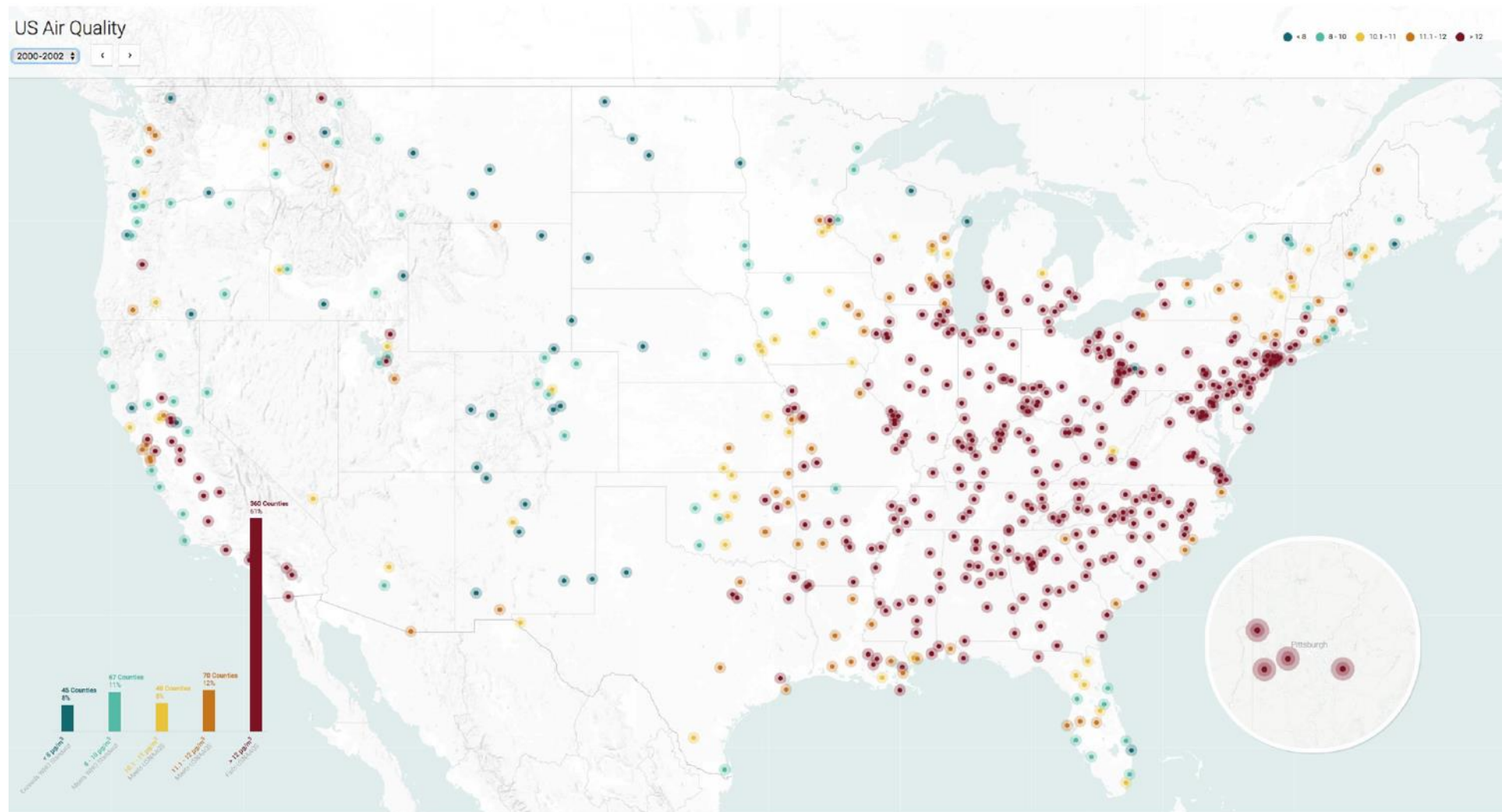
170 days (2020)

230 days (2019)

229 days (2018)

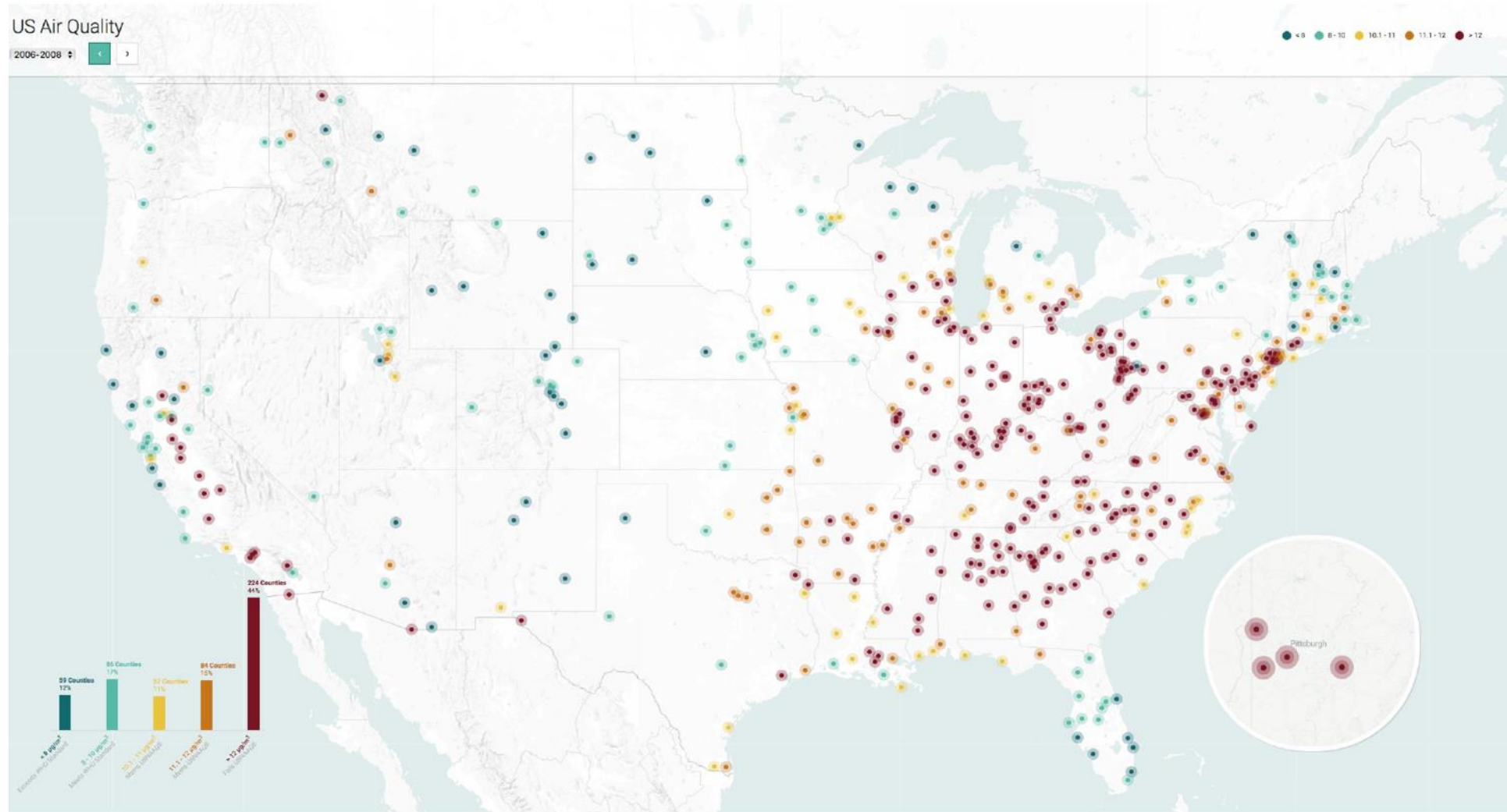
(about 1/2 - 2/3 of the time)

County PM_{2.5} Annual Design Value (DV) 2000-2002



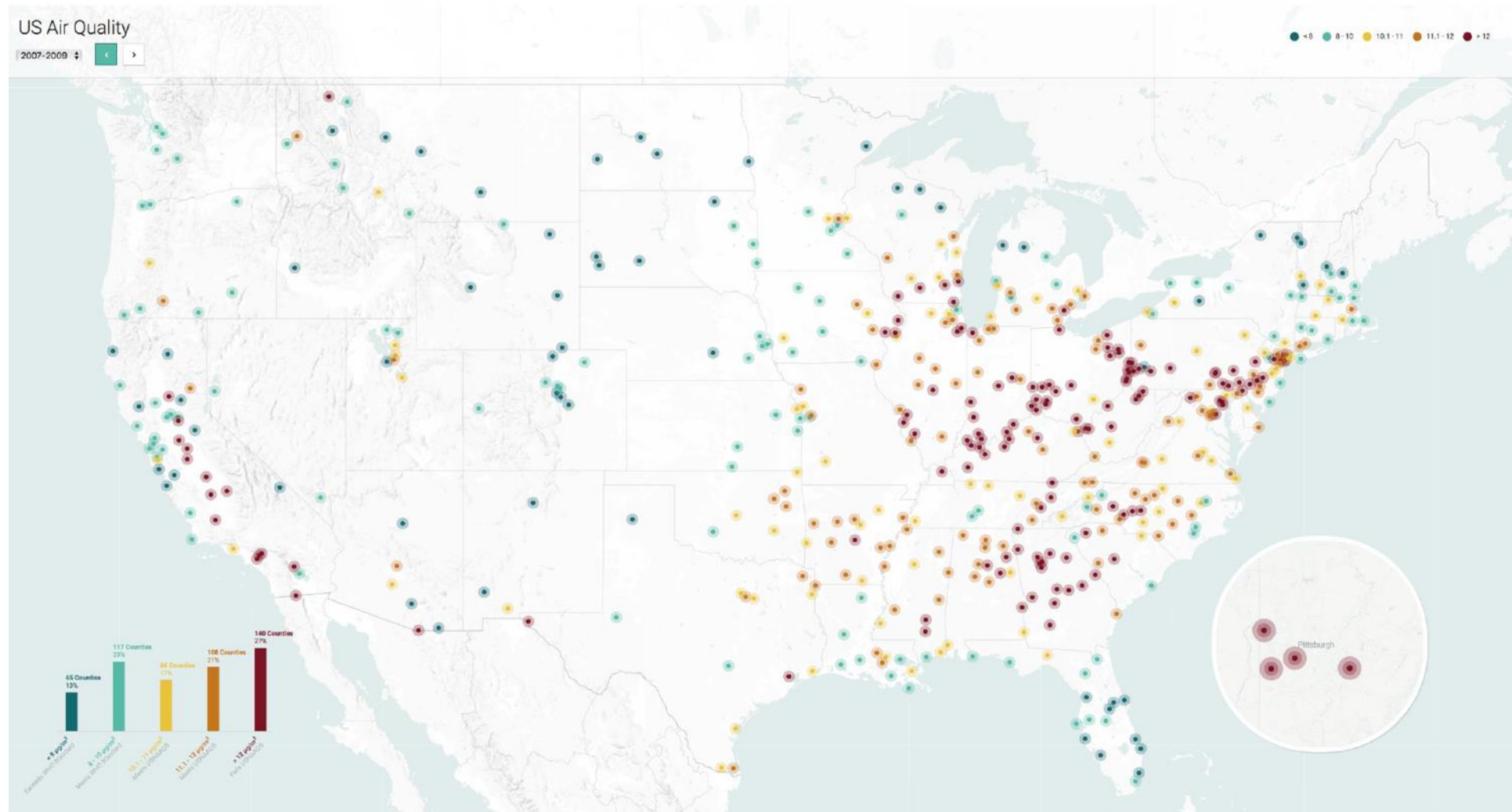
Source: Clean Air Task Force 2019

County PM_{2.5} Annual Design Value (DV) Trend 2006-2008



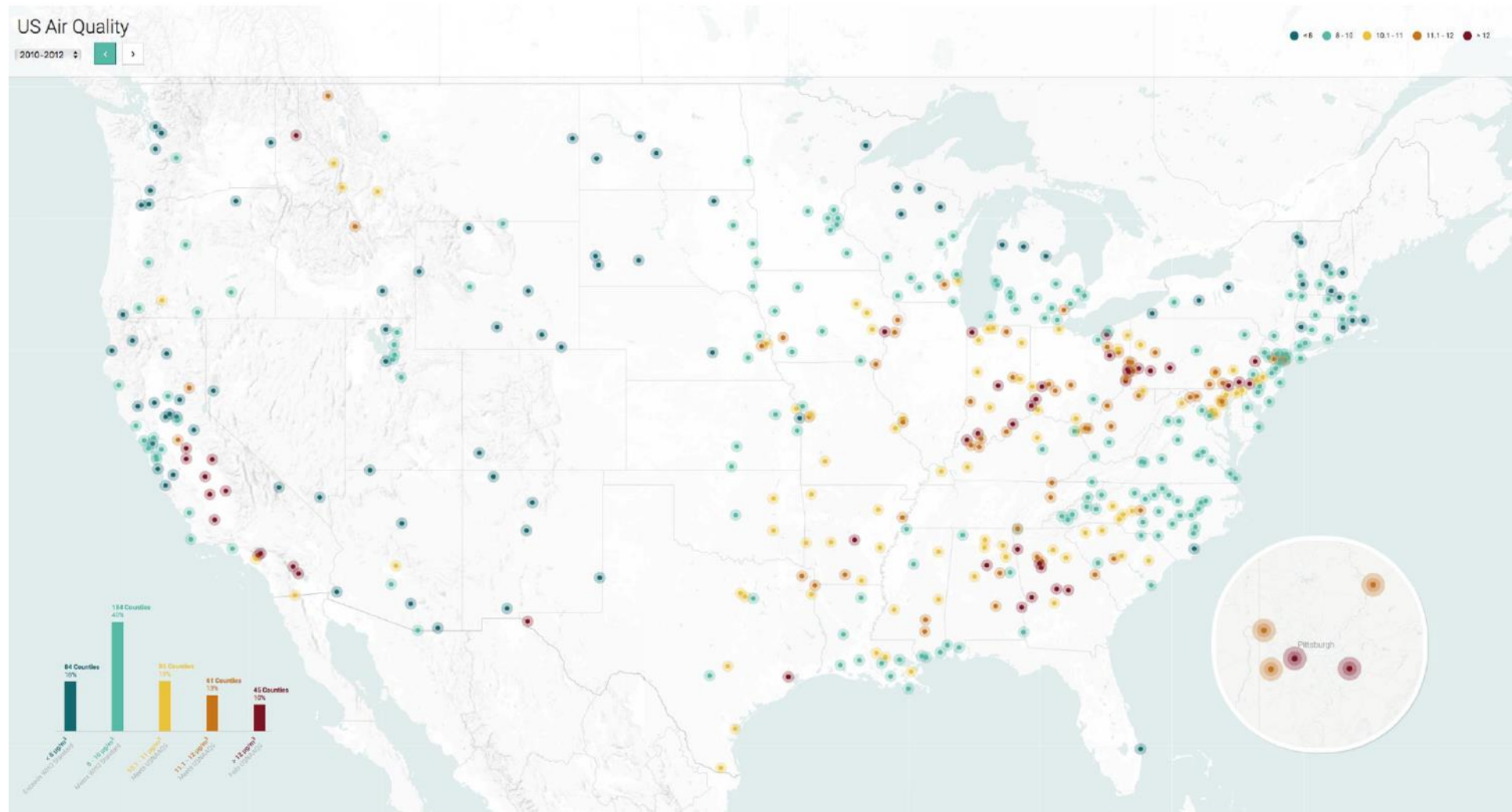
Source: Clean Air Task Force 2019

County PM_{2.5} Annual Design Value (DV) Trend 2007-2009



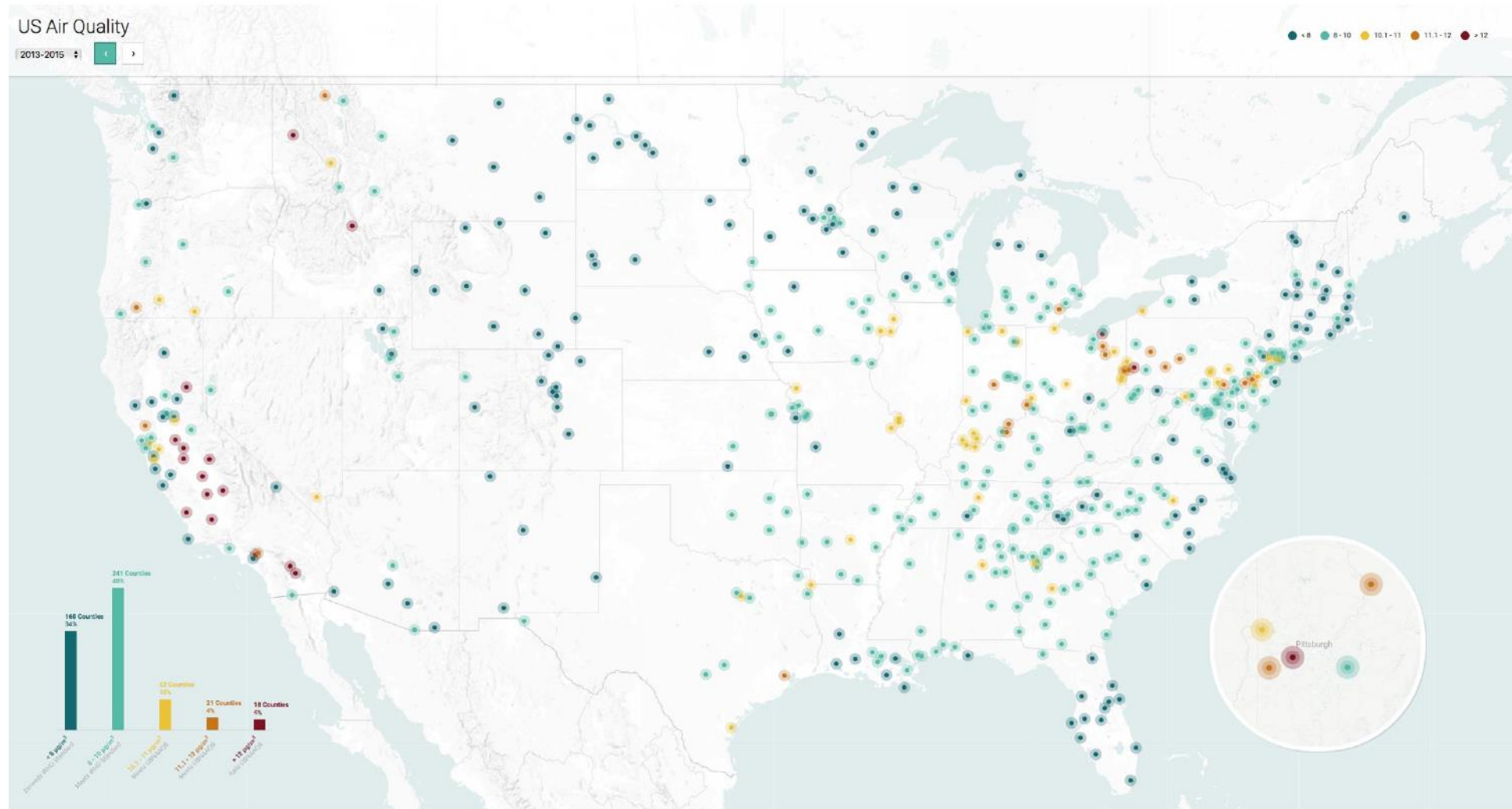
Source: Clean Air Task Force 2019

County PM_{2.5} Annual Design Value (DV) Trend 2010-2012



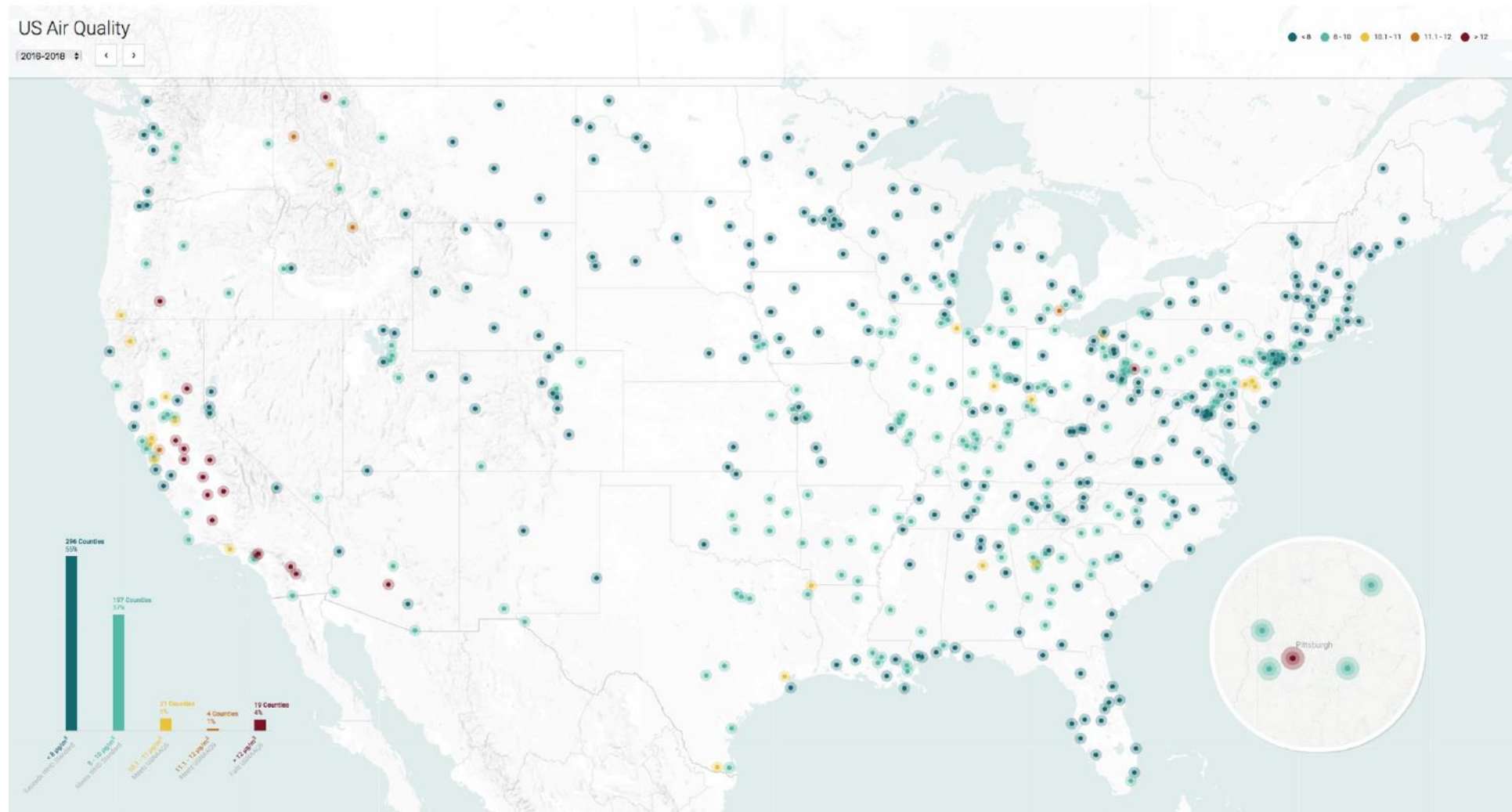
Source: Clean Air Task Force 2019

County PM_{2.5} Annual Design Value (DV) Trend 2013-2015



Source: Clean Air Task Force 2019

County PM_{2.5} Annual Design Value (DV) Trend 2016-2018



Source: Clean Air Task Force 2019

2018 – 2020 AQI Pittsburgh MSA

	<u>2018</u>	<u>2019</u>	<u>2020</u>
Red	1	4	0
Orange	24	11	14
Yellow	204	215	156
Green	136	135	196

(Number of Days)

Source: EPA AQI Data 2018 – 2020

Breathe Meter

Our Air Ranks in the Dirtiest 23.8% of U.S. Cities

Click to Select City

Select a city from the dropdown on the right to compare our air.

PITTSBURGH

CLEANEST (100%)

NEW YORK, NY

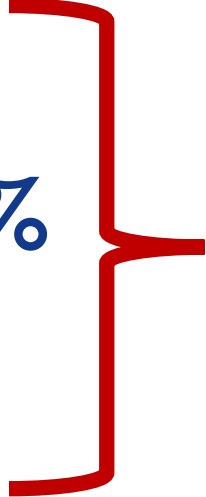
23.8%

51.4%

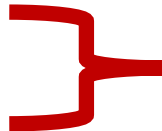
DIRTIEST (0%)

Percentile rank for average annual particle pollution out of 328 urban areas using U.S. EPA data from 2017-2019 (Clean Air Task Force, 2020).

PM 2.5: The problem is county-wide:

- There were eight PM 2.5 monitors in Allegheny County with a valid annual 2018-20 DV
 - One was in the worst 10%
 - Another three in the worst 20%
 - Two more in the worst 40%
 - One in the worst 50%
 - One in the worst 60%
- 
- Do not meet the World Health Organization's Standards

PM 2.5: EPA Daily Standard:

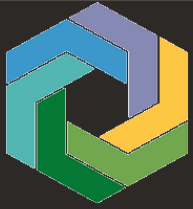
- There were eight PM 2.5 monitors in Allegheny County that measure daily PM 2.5 levels
 - One was in the worst 20%
 - One in the worst 30%
 - One in the worst 40%
 - Two in the worst 50%
 - Two in the worst 60%
 - One in the worst 80%
-  Does not meet the World Health Organization's Standards

Ozone: Barely In Attainment

- There were 3 Ozone monitors in Allegheny County
 - One was in the worst 30%
 - Two were in the worst 40%

Sulfur Dioxide: Non-Attainment

- There were four SO₂ monitors in Allegheny County
 - Two were in the worst 10%
 - Two were in the worst 50%

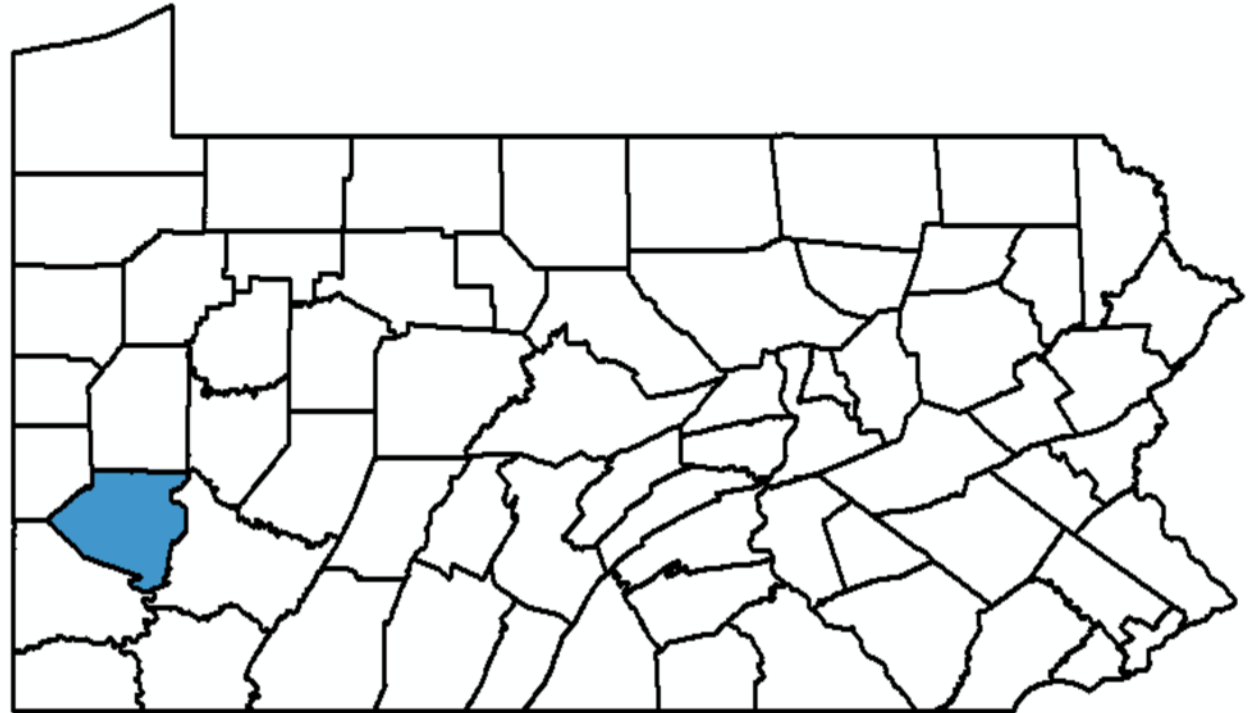


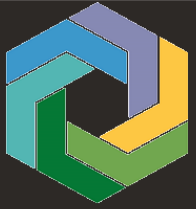
High Cancer Risks

Allegheny County ranks
among the worst

1%

of counties nationwide
for cancer risk from
industrial point sources



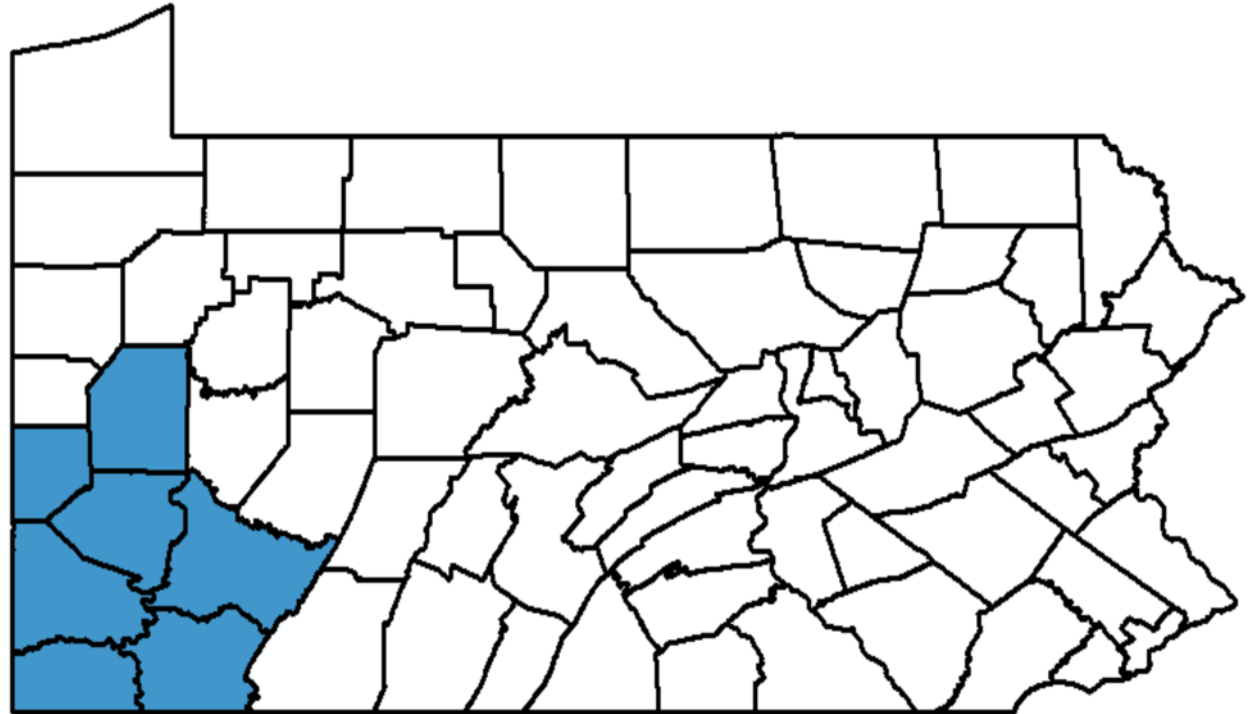


High Cancer Rates

Cancer rates in
Southwestern
Pennsylvania are up to

50%

higher than the rest of
the United States



Additional Cancer Risks from Bad Air in Allegheny County!

- Allegheny County is in the worst 4% of counties nationwide from exposure to HAPs and diesel particulates.
- Nearly 90% of the point source cancer risk estimated in Allegheny County is attributable to coke oven emissions, with ~90% of those emissions from the Clairton facility.
- Vehicle emissions are also problematic in Allegheny County, ranking among the worst 7% of all counties nationally.



Flickr

Jan 15, 2019

Kids in Clairton are experiencing decreased lung function following the Clairton Coke Works fire

The region remains under a health advisory due to high levels of sulfur dioxide pollution.

[Kristina Marusic](#)





Alexandra Wimley

'We weren't told': Clairton residents demand action after Coke Works fire caused dangerous emissions



DON HOPEY ✓

Pittsburgh Post-Gazette
dhohey@post-gazette.com 

JAN 22, 2019



Credit: Kristina Marusic

Jan 24, 2019

Clairton residents plead with officials to protect them from pollution following US Steel fire

"We're still making concessions even though we're dying."

[Kristina Marusic](#)

Advocates have worried about Metalico for years



**We still have a serious air quality
problem**

**Adding to our airshed burden will
only make things worse.**

BREATHE PROJECT

The Air We Share

Visit:

<http://breatheproject.org>





Thank You

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