Asthma and Air pollution

• **Germaine Gooden-Patterson**, Community Health Worker, Women for a Healthy Environment and Holistic Health Coach, Wellness Withn: 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 ug/m$^3$

• World Health Organization
  • “No safe level of air pollution”
  • Recently decreased long-term PM$_{2.5}$ threshold from 10 to 5 ug/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/m$^3$)
  - 70% with PM$_{2.5}$ exposure above prior WHO threshold (10 ug/m$^3$)
  - 100% with PM$_{2.5}$ exposure above current WHO threshold (5 ug/m$^3$)

- 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

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

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

Results unrelated to weather inversions and flu activity.

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 ug/m³ increase in long-term 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/m$^3$ annually
  - Decrease short-term PM$_{2.5}$ from 35 to 25-30 ug/m$^3$ over 24 hours
  - 21-27% relative risk reduction in annual deaths with long-term PM$_{2.5}$ standard of 9 ug/m$^3$ annually

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

Adding to our airshed burden will only make things worse.
If you live in Allegheny County, the air you breathe may put your health at risk.

Ozone: F
Particle Pollution 24-hour: F
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)

Source: EPA AQI Index 2018, 2019, 2020
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

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>1</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Orange</td>
<td>24</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Yellow</td>
<td>204</td>
<td>215</td>
<td>156</td>
</tr>
<tr>
<td>Green</td>
<td>136</td>
<td>135</td>
<td>196</td>
</tr>
</tbody>
</table>

(Number of Days)

Source: EPA AQI Data 2018 – 2020
Breathe Meter

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

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

PITTSBURGH

23.8%

CLEANEST (100%)

DIRTIEST (0%)

NEW YORK, NY

51.4%

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

Source: CATF 2021
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%

Source: CATF 2021
Ozone: Barely In Attainment

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

Source: CATF 2021
Sulfur Dioxide: Non-Attainment

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

Source: CATF 2021
High Cancer Risks

Allegheny County ranks among the worst 1% of counties nationwide for cancer risk from industrial point sources.
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.
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
'We weren't told': Clairton residents demand action after Coke Works fire caused dangerous emissions

DON HOPEY
Pittsburgh Post-Gazette
dhopey@post-gazette.com

JAN 22, 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.
Collaborative
Visit:
http://breatheproject.org

your voice matters
Thank You

mmehalik@breatheproject.org