The Nation's Air Quality

Albert Rizzo, MD FCCP

Chair, National Board of Directors

American Lung Association

Section Chief, Pulmonary/Critical Care

Christiana Care Health Systems, Newark DE

May 24, 2012

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Fighting for Air

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Assistant VP National Policy and Advocacy

Mary Havell
Director Public Relations Communications and Marketing

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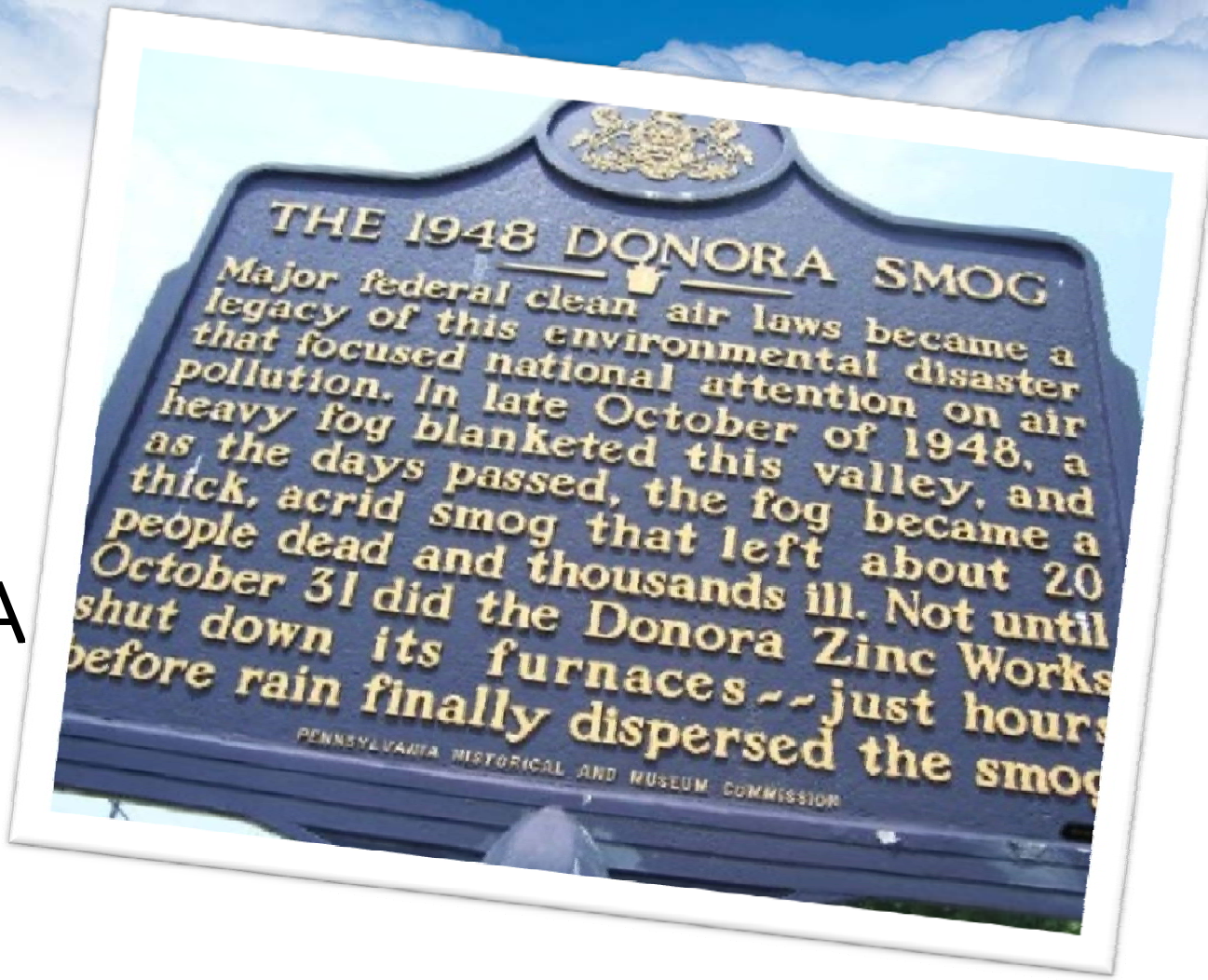
Where we are

- The air is getting cleaner, but needs more work
- Clean up efforts advancing, but face big hurdles
- Clean Air Act under assault, but still intact—
  so far

Air is getting cleaner

Cleaning up air pollution started in Donora, PA over 50 years ago.



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London Smog 1952

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Milestones in Clean Air

1948 Donora Smog

1952 London Smog

1955 Air Pollution Control Act

1963 Clean Air Act

1970 Clean Air Act/EPA

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In 2010 alone, the Clean Air Act

- Saved 160,000 lives
- Prevented 130,000 acute myocardial infarctions
- Prevented 1.7 million asthma exacerbations
- Prevented 86,000 ED visits
  - *EPA, 2011*

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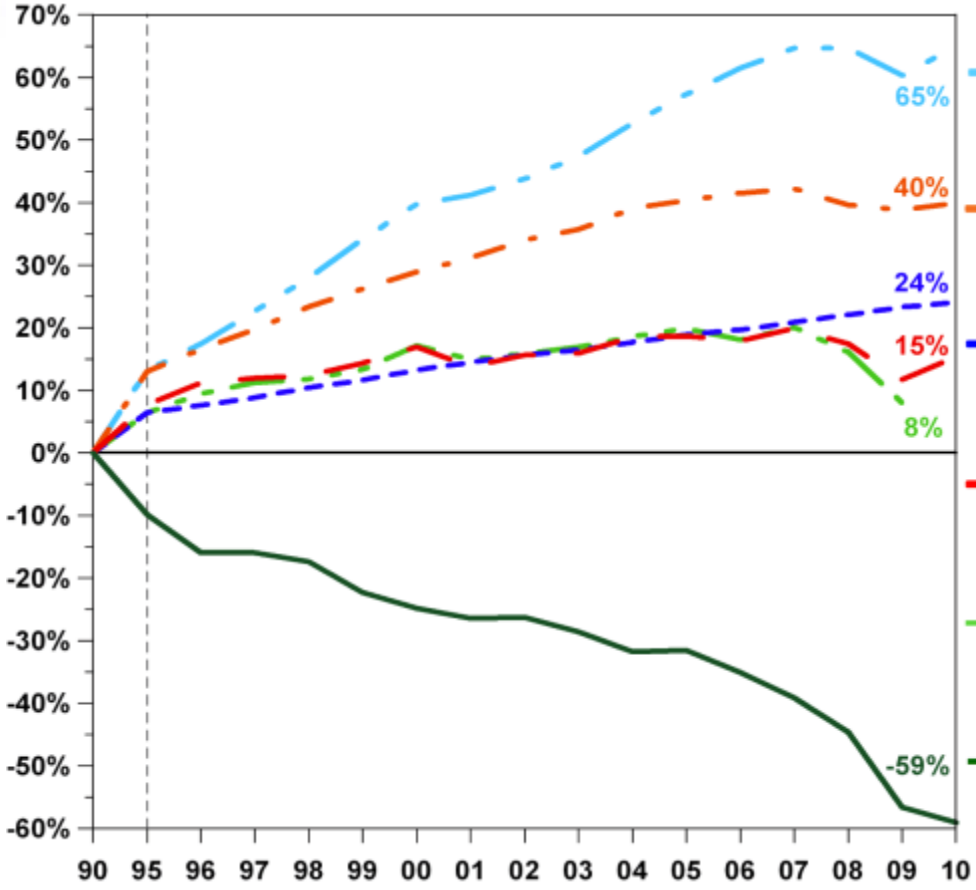
Air is getting cleaner

Healthy air does not hurt the economy



EPA, 2012

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Health Effects of Air Pollution

Who Is At Risk?

Anyone who lives where particle pollution levels are high is at risk

Some people face higher risk, however. People at the greatest risk from particle pollution exposure include:

Anyone with lung disease such as asthma and chronic obstructive pulmonary disease (COPD), which includes chronic bronchitis and emphysema;

Anyone with heart disease or diabetes[41];

Anyone over 65;

Infants, children and teens;
People with low incomes; and

People who work or are active outdoors.[42]

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Asthma Facts: Mortality / Morbidity

- 17 million asthma patients[1]
- Asthma deaths: more than 5,000 each year[1]
- Asthma-related hospitalizations: 466,000 in 1994[1]
- Emergency department visits for asthma: 1.9 million in 1995[1]
- Healthcare costs for asthma care: estimated at more than $11 billion a year[2]
- 3 million lost workdays in the US[3]

[1] Surveillance for Asthma--United States, 1960-1995. *MMWR Morb Mortal Wkly Rep.* April 1998;47(SS-1):1-28.
[2] NHLBI. *Data Fact Sheet on Asthma Statistics.* 1999. Publication 55-798.
[3] Weiss et al. *N Engl J Med.* 1992;326:862-866.

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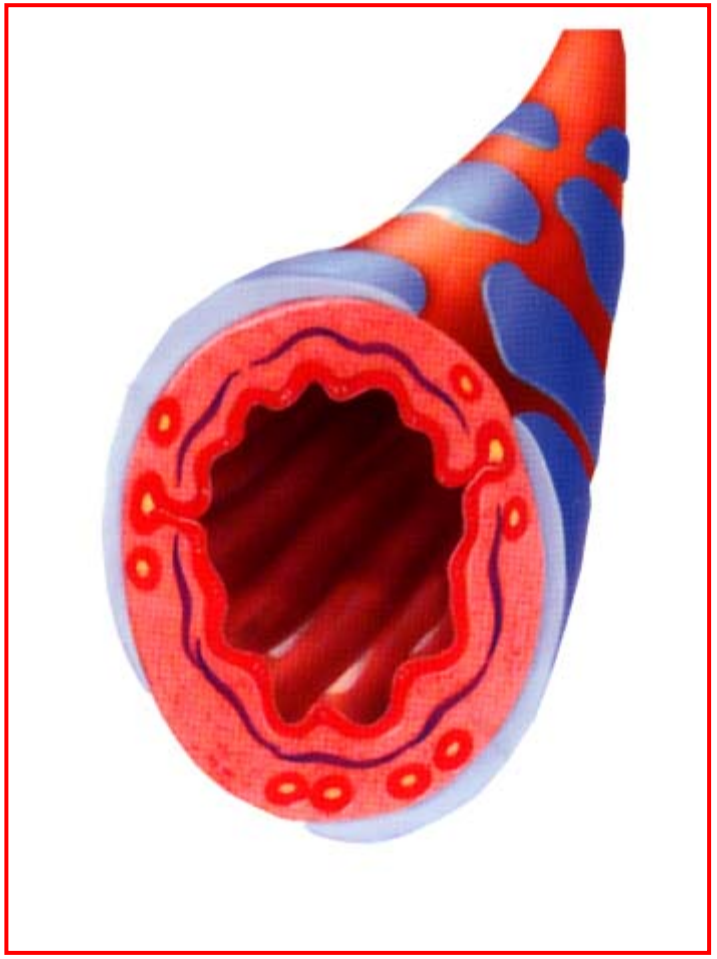
Airway Pathology in Asthma



Some Facts on COPD

- In the US
  - 12 million diagnosed with COPD
  - 12 million with signs/symptoms undiagnosed
- Death rate among women doubled last 20 years
- Costs
  - 14.7 billion direct
  - 15.7 billion indirect
- Rising prevalence and mortality especially in women and African Americans
- Fourth leading cause of death in the US and estimated to climb to third by 2020

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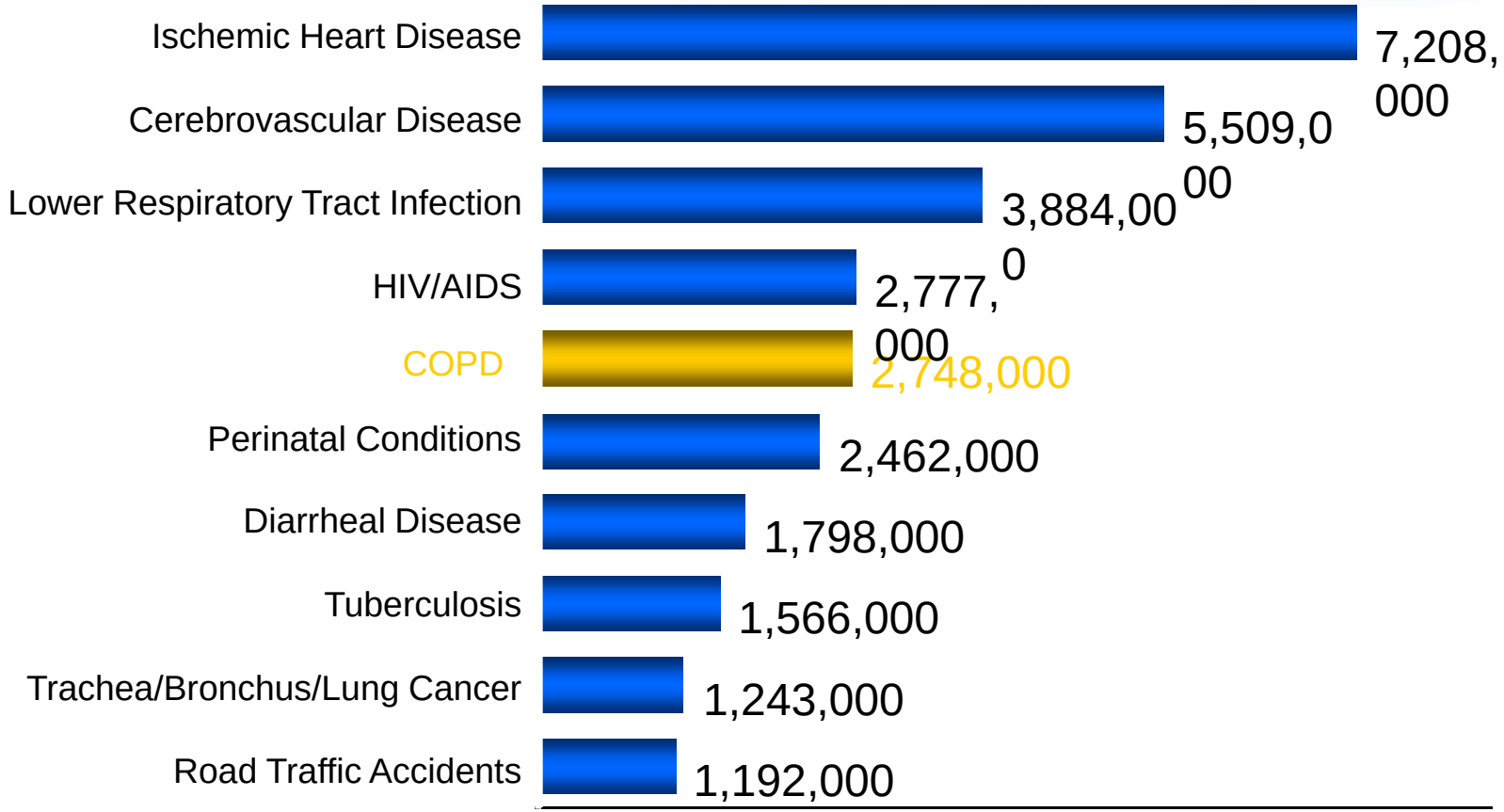
COPD: 5th Leading Cause of Death Worldwide



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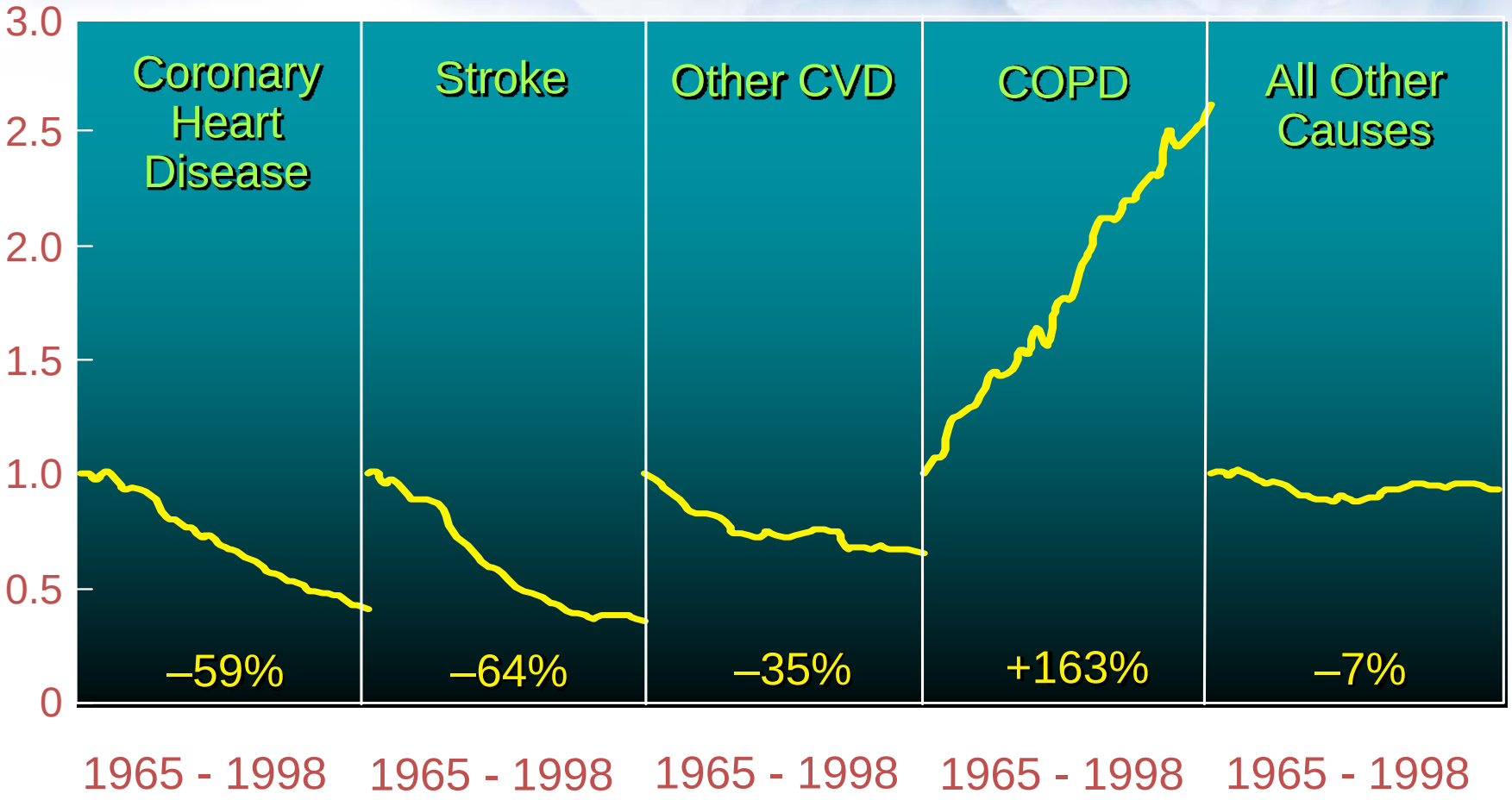
Pauwels RA et al. Am J Respir Crit Care Med 2001;163:1256-76.

Percent Change in Age-Adjusted Death Rates in the U.S., 1965-1998



CVD=Cardiovascular disease.

Source: NHLBI/NIH/DHH

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Cigarette Smoke | Susceptibility Genes | Gender | Proteinases/ Cell Mediators | Oxidative Stress | Environmental Irritants | Respiratory Infections

Overview of COPD Pathophysiology

Exacerbations | Chronic Bronchitis | Emphysema | Systemic/ Extrapulmonary Effects | Mucociliary Dysfunction | Structural Changes

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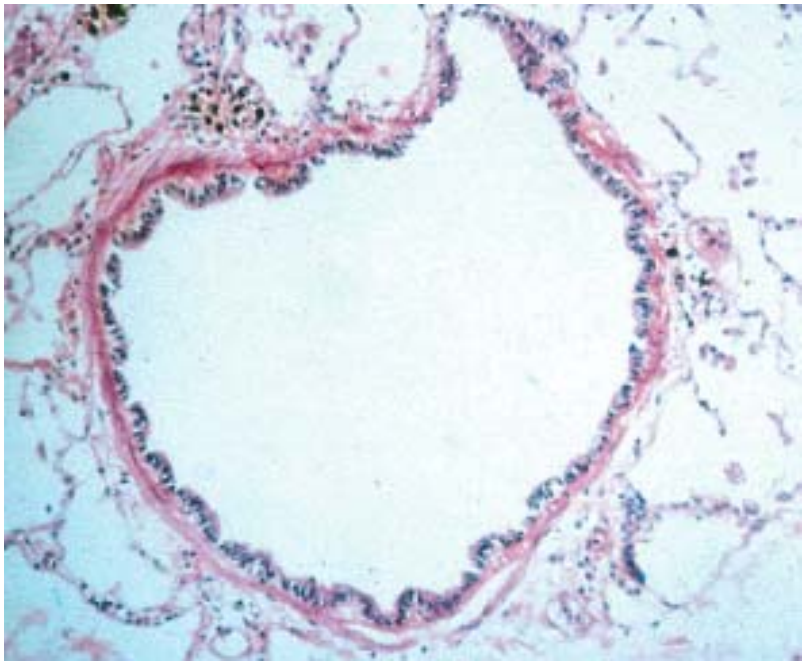
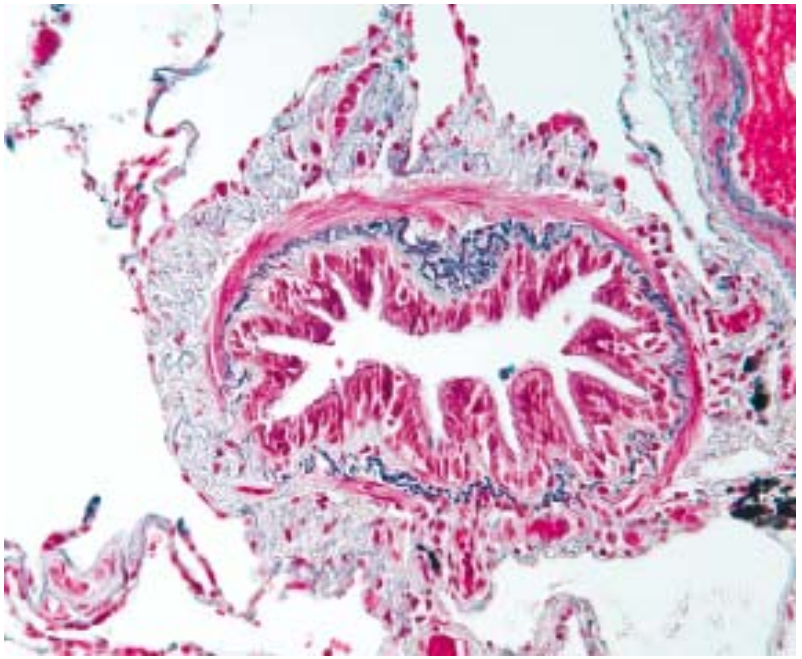
Inflammation Destruction of Alveolar Architecture





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Risks from breathing ozone:

- Premature death
- Pulmonary inflammation
- Asthma attacks
- Hospital and ER admissions
- Worsening of COPD
  - US EPA, *Air Quality Criteria for Ozone and Related Photochemical Oxidants*, 2006

Risks from breathing particle pollution:

- Premature mortality
- Pulmonary & cardiovascular inflammation
- Asthma attacks
- Heart attacks, strokes
- Worsening of pulmonary & cardiovascular diseases
- Hospital and ER admissions

EPA, Integrated Science Assessment, 2009

Air Pollution even more dangerous

- Lower levels of pollution are harmful
- Particle pollution can cause heart attacks even when levels high for 1 week
- Ozone pollution may put kidney transplant recipients at higher risk of fatal heart disease
- Diabetics face greater risk than previously known, possible insulin resistance?
- Poorer people face greater harm

Risks from Traffic and Transportation

- Heavy traffic areas are higher risks
  - Asthma attacks
  - Heart attacks
  - Premature deaths
  - Death of infants
- Truck drivers, dockworkers, railroad workers, people who live nearby

Disparities

First, groups may face greater exposure to pollution because of factors ranging from racism to class bias to housing market dynamics and land costs. For example, pollution sources may be located near disadvantaged communities, increasing exposure to harmful pollutants.

Second, low social position may make some groups more susceptible to health threats because of factors related to their disadvantage. Lack of access to health care, grocery stores and good jobs, poorer job opportunities, dirtier workplaces or higher traffic exposure are among the factors that could handicap groups and increase the risk of harm.

Finally, existing health conditions, behaviors, or traits may predispose some groups to greater risk. For example, diabetics are among the groups most at risk from air pollutants, and the elderly, African-Americans, Mexican-Americans and people living near a central city have higher incidence of diabetes.[102]

13th annual look at pollution

STATE OF THE AIR 2012

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- There is cleaner air across much of nation thanks to standards enforced under the Clean Air Act.

- Despite this progress, 127.2 million Americans continue to live in areas with dangerous levels of ozone or particle pollution.

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The News

In 2008-2010

4 out of 10 people

in the U.S.A. lived in counties with an

F for air quality

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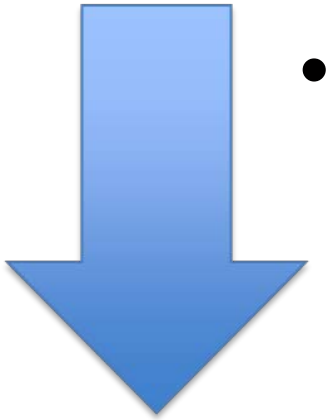
The News
Much less Ozone nationwide



- 22 of the 25 cities most polluted year-round had fewer unhealthy days
  - ➢ 18 had fewest days to date

- 3 had more days

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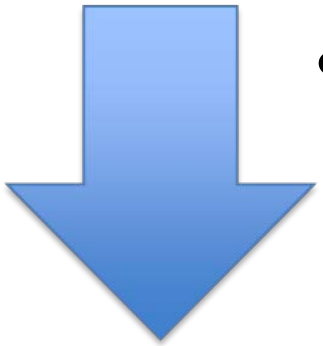
The News
Less Particle Pollution Year-round



- 24 of the 27 cities most polluted by particles had improved annual levels
- 17 saw their lowest levels ever

- 3 had more days/worse days

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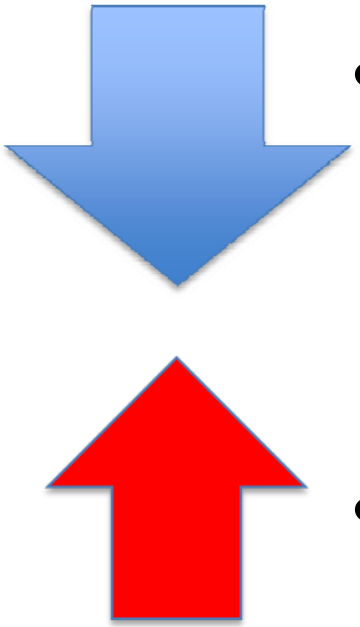
The News
Mixed news in spikes in particle pollution



- 13 of the cities most polluted by short-term levels had fewer high particle days.
  - 9 from last year moved off list
- 13 of the cities on the list did worse than in 2007-2009

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Reasons for improvement

The Clean Air Act tools at work:

- New emissions control equipment on coal-fired power plants
- Converting fleets of buses and trucks to low-emissions vehicles
- Cleaner gasoline fleet, including SUVs

Reasons for improvement

- States have stepped up
- Enforcing the law
- Supporting and implementing local, state, regional and national cleanup strategies

Reasons for improvement

The Clean Air Act tools at work:

- New emissions control equipment on coal-fired power plants
- Converting fleets of buses and trucks to low-emissions vehicles
- Cleaner gasoline fleet, including SUVs

Cleanest City

Santa Fe-Espanola, New Mexico

Postcard images courtesy of Zazzle.com

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Most-Polluted

#1 Ozone Pollution

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#1 Year-Round and Short-term Particles

Bakersfield, Calif.

Postcard images courtesy of Zazzle.com

Website

www.stateoftheair.org

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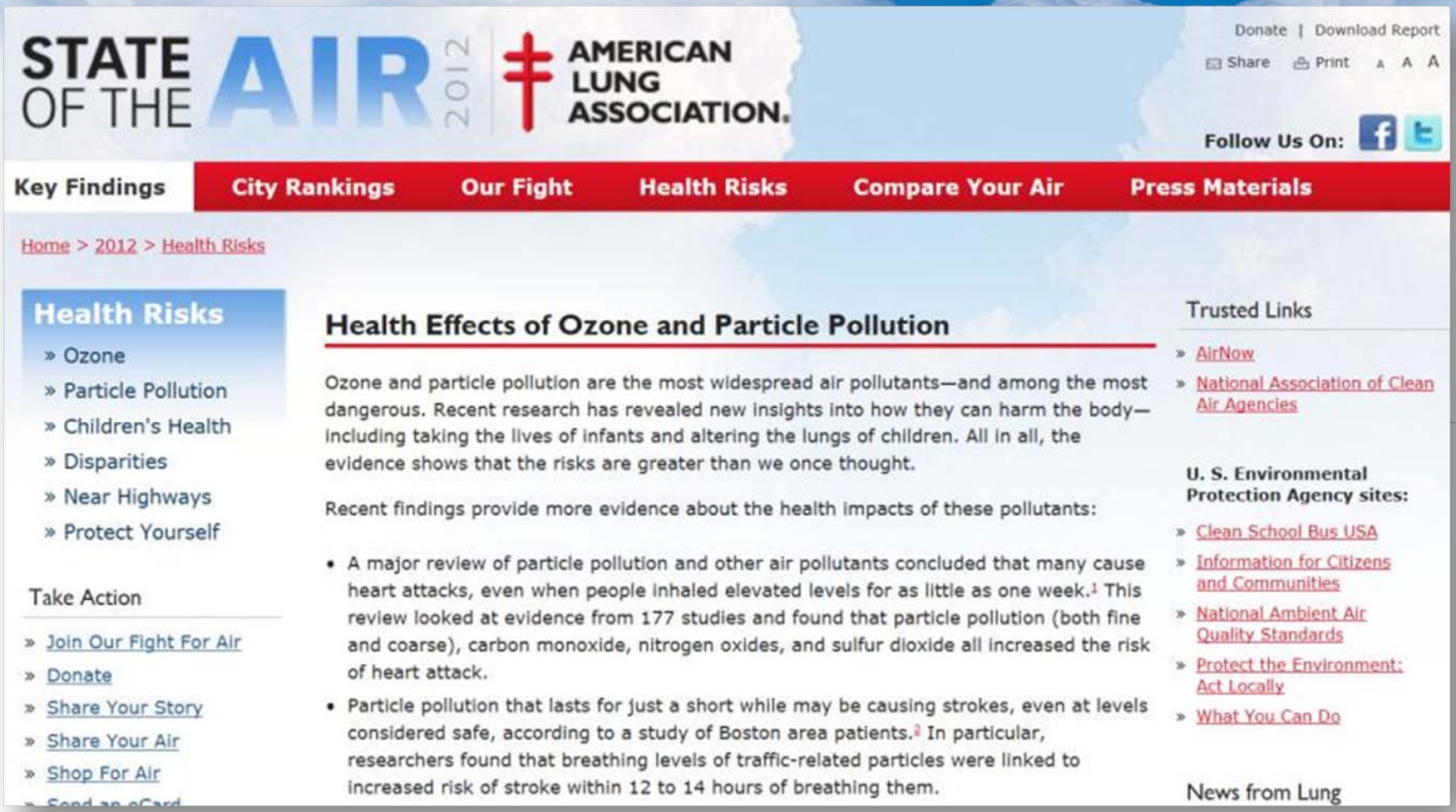
Detailed health information



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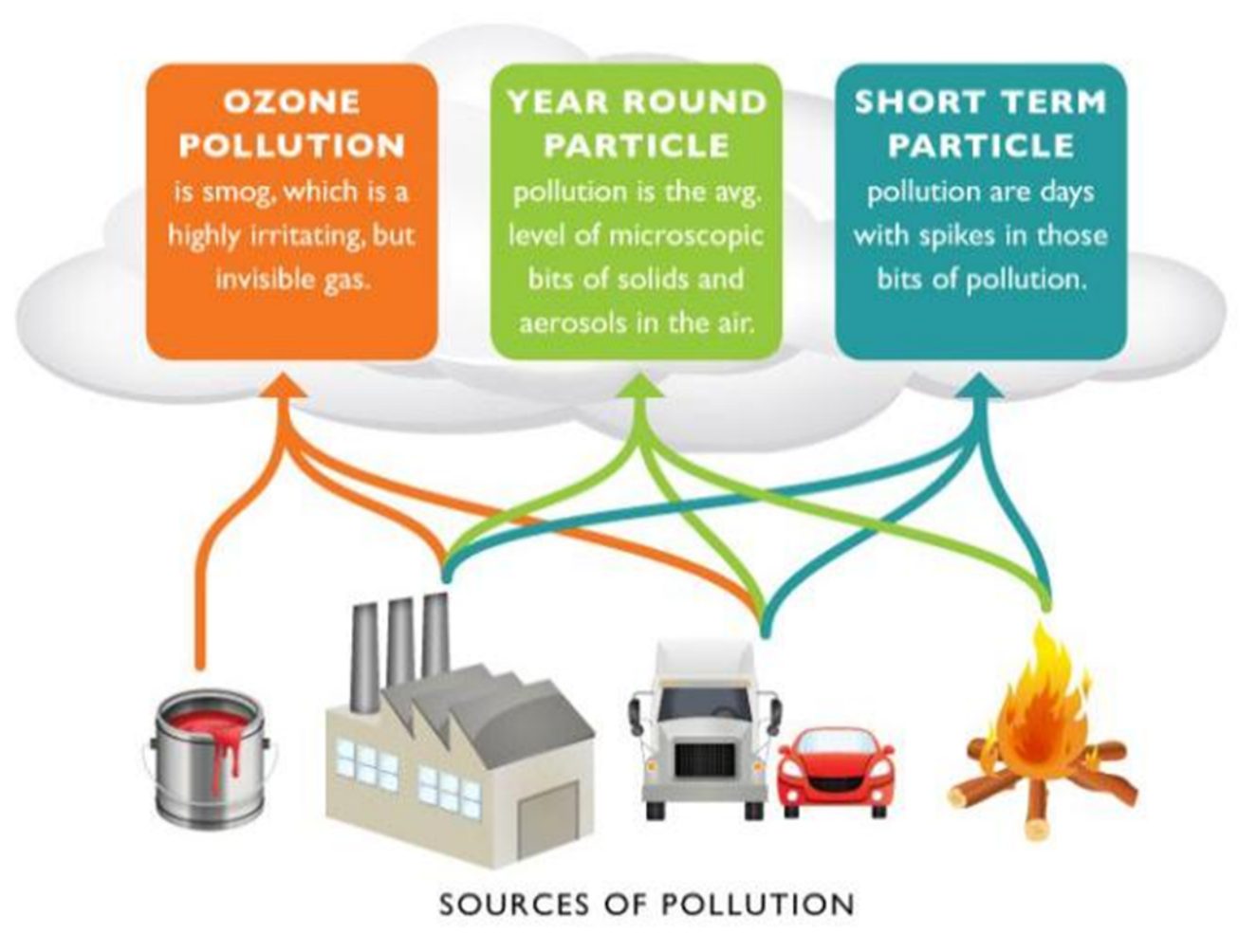
Infographics explain



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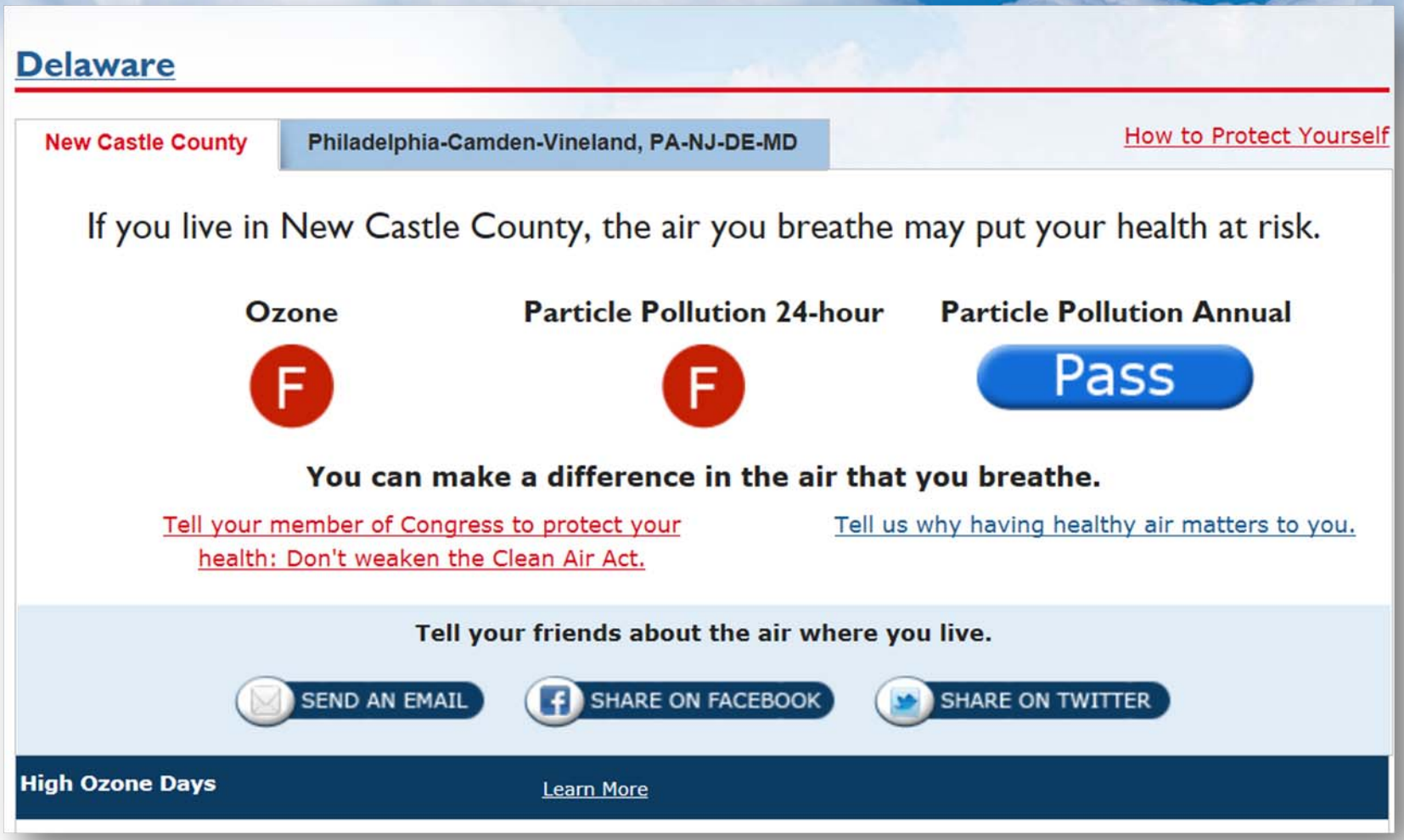
State, County & City data



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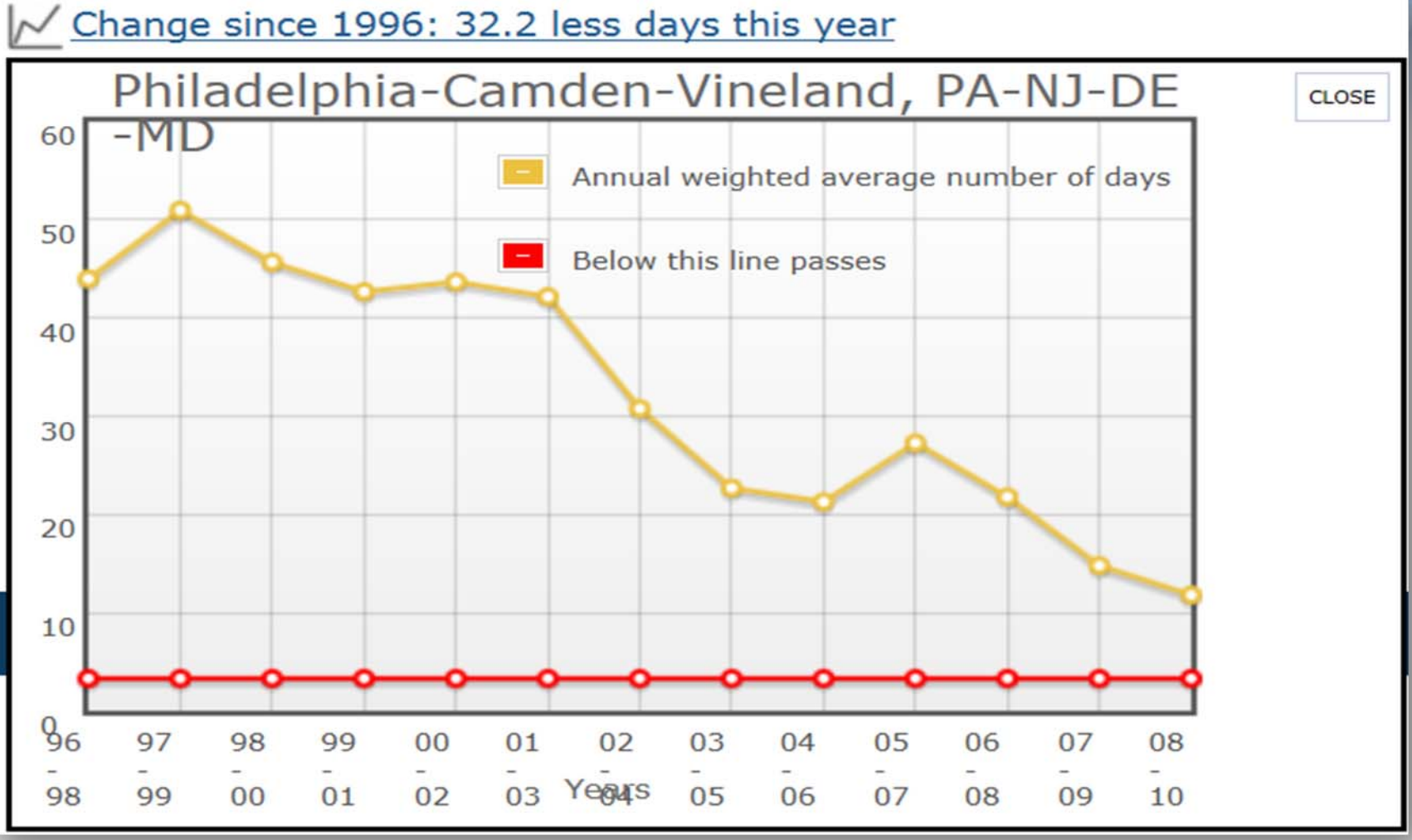
Trends for Ozone



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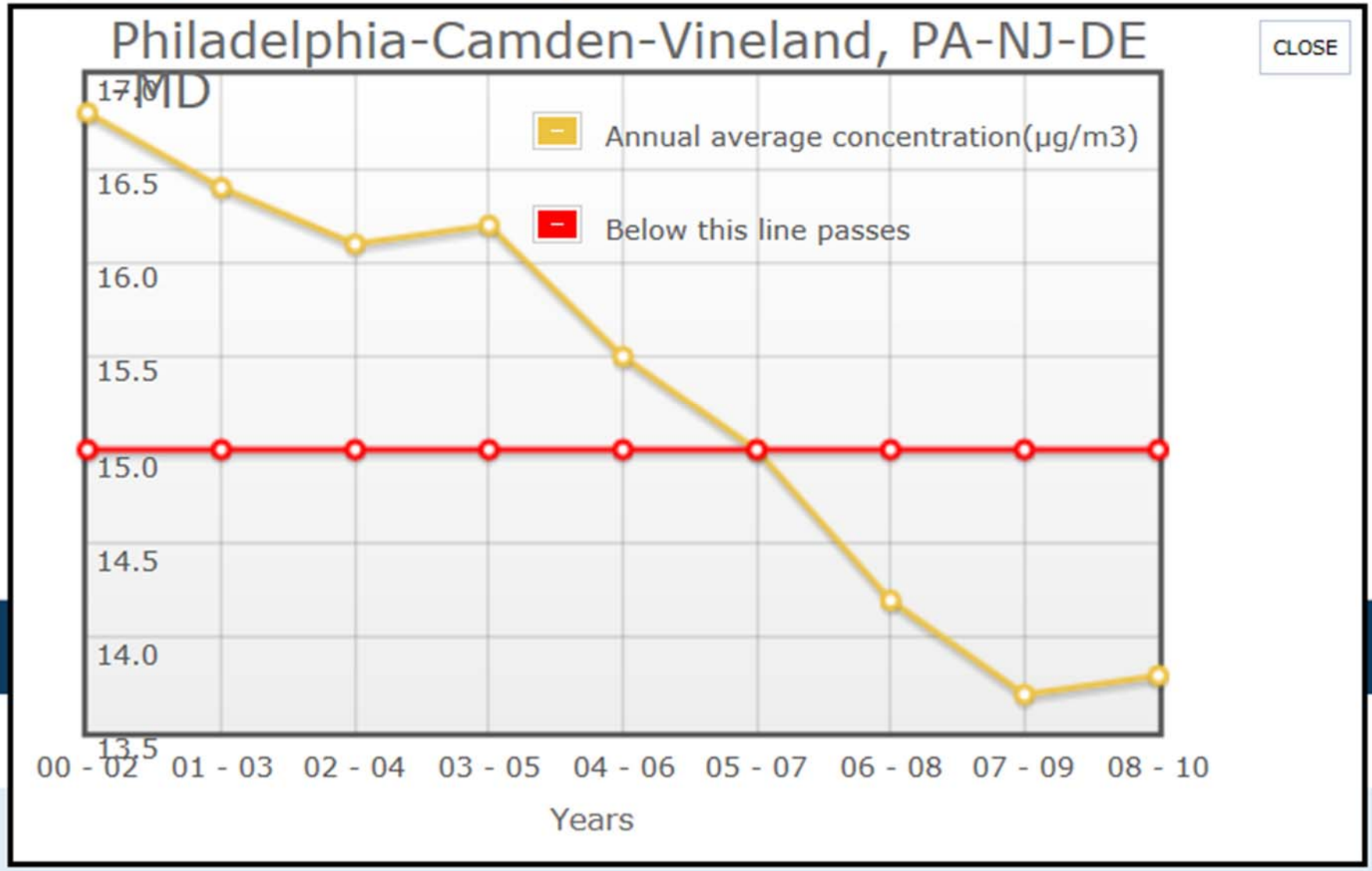
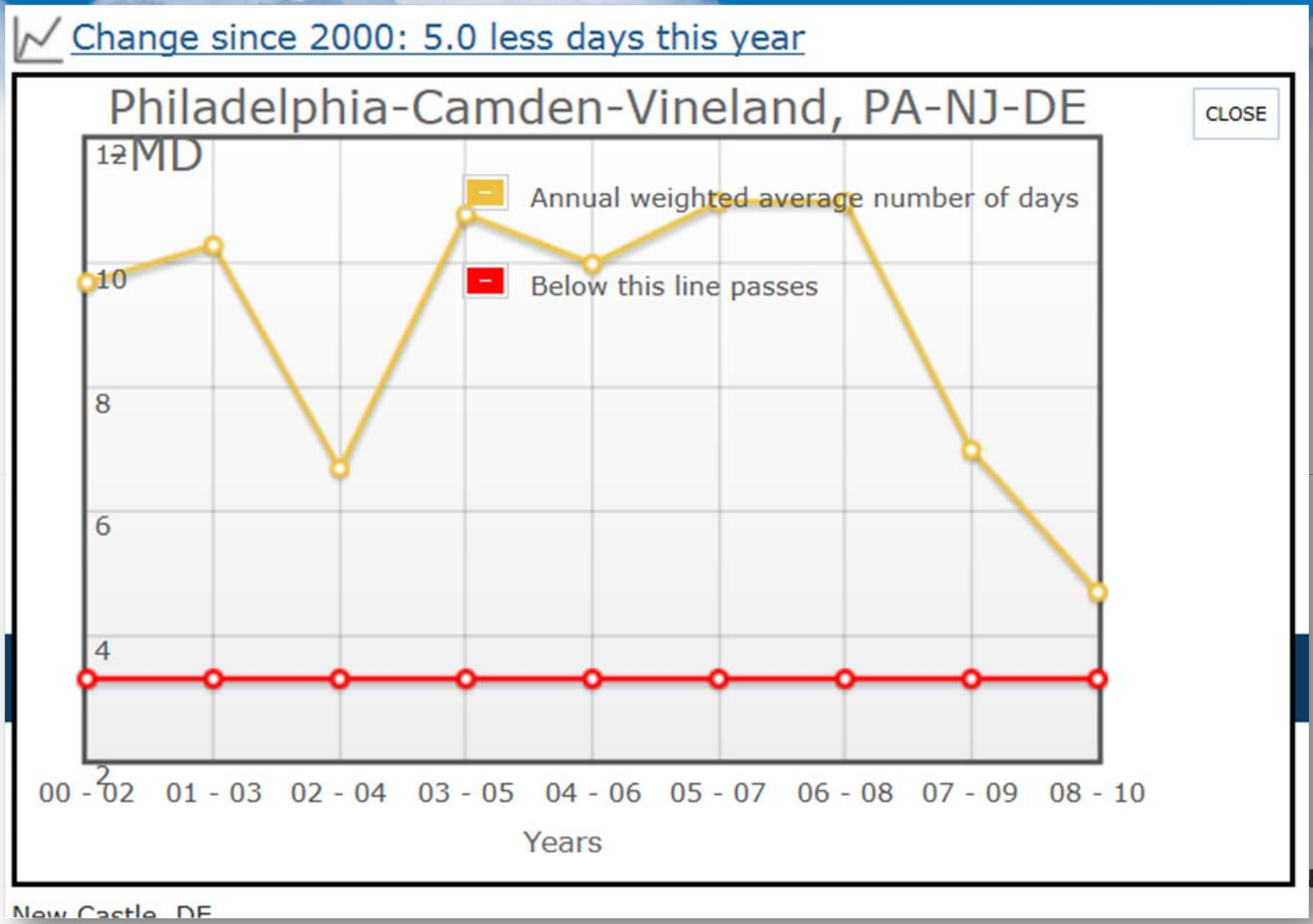
Annual PM Trends

Change since 2000: -3.0 µg/m³



24-hour PM Trends



Legal Actions

Supporting EPA on these:

- Cross-State Air Pollution Rule
- Mercury and Air Toxics Standards

Challenging EPA on these:

- Ozone and Particulate Matter National Air Standards

American Lung Association Healthy Air Campaign

- Define and reinforce the need for clean, healthy air and the associated health benefits
- Defend the Clean Air Act and EPA
- Promote the ability of the EPA to implement and enforce the entire Clean Air Act
- Push EPA to set standards to maximize protection of public health

Why now?

- Polluters do not want to invest in cleanup
- Cleanup had been postponed
- EPA is poised to follow the law and update safeguards
- Some in Congress want to block, prevent or delay cleanup

The State of Play

- Legislation to weaken the Act
- Budget cuts to the agencies to limit implementation
- Riders to funding bills
- Amendments to unrelated legislation

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Fighting for Air & State of the Air

www.fightingforair.org

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Defending the Clean Air Act

Home > Share Your Story > Share Your Story

Featured Story: Jake C., ME

On New Year's Eve 1999, as other families worried about the Y2K bug, Lisa and Mark spent the night in the emergency room with their newborn son Jake who was suffering an asthma attack. Today, Jake is 11 and lives in Maine where he is active in soccer, basketball and baseball. Of the sports, soccer is his favorite and he uses an inhaler before or during practices and games if he's having a flare up.

When Jake has a bad flare-up it's difficult for him to sleep because of extreme coughing and he's susceptible to colds and "junk in the air."

Jake and his mother get angry at smokers on the st the same way about businesses that pollute the air policies on the worst polluting corporations.

Lisa says it doesn't make any sense to play with pe feels like "it's a pain in the butt" when he has to mi

Share Your Story

Tell us your story about why you're Fighting for Air. Fill in the form below and let u what inspires you to take action in support of healthy, safe air.

First Name*:

Last Name*:

Email*:

State*: AK

Your Story*:

Collecting stories online on both StateoftheAir.org FightingforAir.org

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Red Carriage Campaign


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CHILDHOOD ASTHMA ATTACKS.
STRAIGHT FROM THE SOURCE.
Tell Washington: Don't weaken clean-air protections.
FightingForAir.org

Why do we fight for air?

Millions of reasons

- 127.2 million people in counties with too many days of dirty air (either ozone or particles)
- Nearly 5.8 million people in counties where the air failed every test

We will breathe easier when the air in every American community is clean and healthy.

We will breathe easier when people are free from the addictive grip of cigarettes and the debilitating effects of lung disease.

We will breathe easier when the air in our public spaces and workplaces is clear of secondhand smoke.

We will breathe easier when children no longer battle airborne poisons or fear an asthma attack.

Until then, we are fighting for air.

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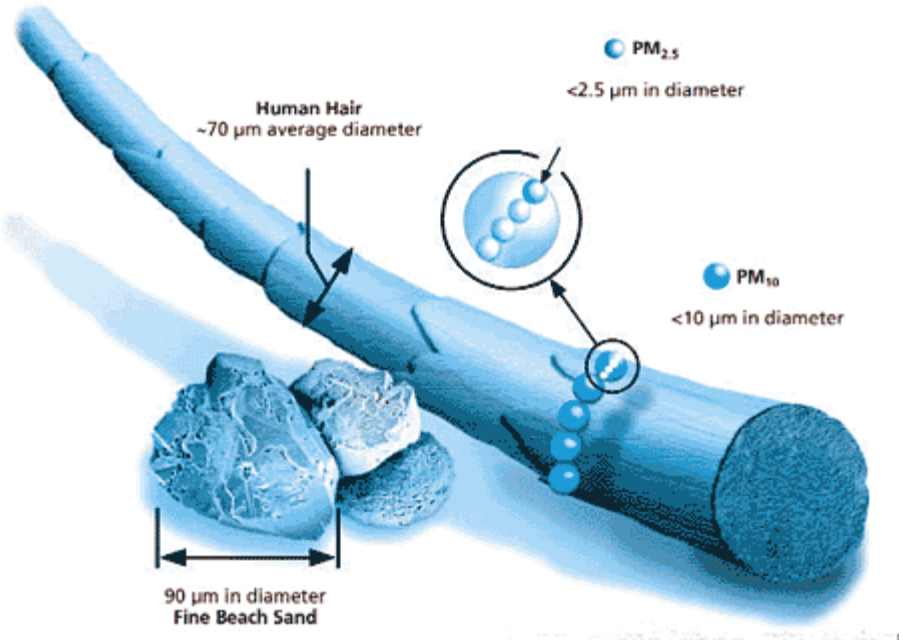
Comparison of PM sizes.



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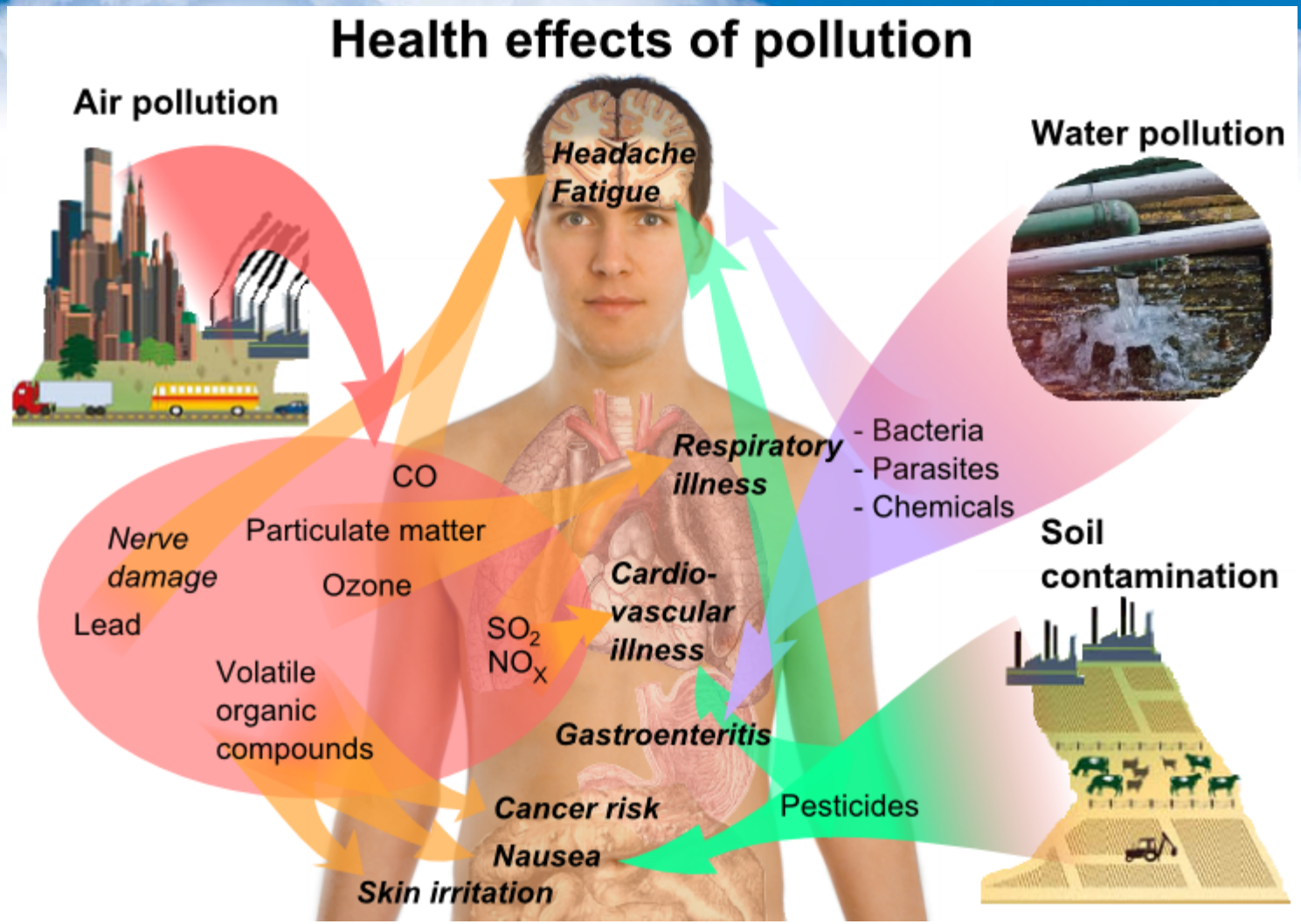
Health effects of pollution



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Data Sources

The data on air quality throughout the United States were obtained from the U.S. Environmental Protection Agency's Air Quality System (AQS), formerly called Aerometric Information Retrieval System (AIRS) database. The American Lung Association contracted with Dr. Allen S. Lefohn, A.S.L. & Associates, Helena, Montana, to characterize the hourly averaged ozone concentration information and the 24-hour averaged $PM_{2.5}$ concentration information for the 3-year period for 2008-2010 for each monitoring site.

Design values for the annual $PM_{2.5}$ concentrations by county for the period 2008 - 2010 were downloaded on September 24, 2011 from EPA's website.

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Air Pollution Increases Risk of Underdeveloped Lungs

Another finding from the Southern California Children's Health study looked at the long-term effects of particle pollution on teenagers. Tracking 1,759 children between ages 10 and 18, researchers found that those who grew up in more polluted areas face the increased risk of having underdeveloped lungs, which may never recover to their full capacity. The average drop in lung function was 20 percent below what was expected for the child's age, similar to the impact of growing up in a home with parents who smoked.[87]

Most Polluted Cities in United States 2012

STATE OF THE AIR 2012 | AMERICAN LUNG ASSOCIATION.

Air pollution remains a serious threat to our health.

For 13 years, the American Lung Association has analyzed data from state air quality monitors to compile the *State of the Air* report. The more you learn about the air you breathe, the more you can protect your health and take steps to make our air cleaner and healthier. Here's what we learned about air pollution from 2008–2010, the best, most recent data.

2,531 air monitors like this one spread across the country gather the data.*

* We don't run these monitors. The states, tribes, and some national parks do. We just use the data.

They measure ozone and particle pollution, two of the most widespread problems.

OZONE POLLUTION is smog, which is a highly irritating, but invisible gas.

YEAR ROUND PARTICLE pollution is the avg. level of microscopic bits of solids and aerosols in the air.

SHORT TERM PARTICLE pollution are days with spikes in those bits of pollution.

STATE OF THE AIR 2012

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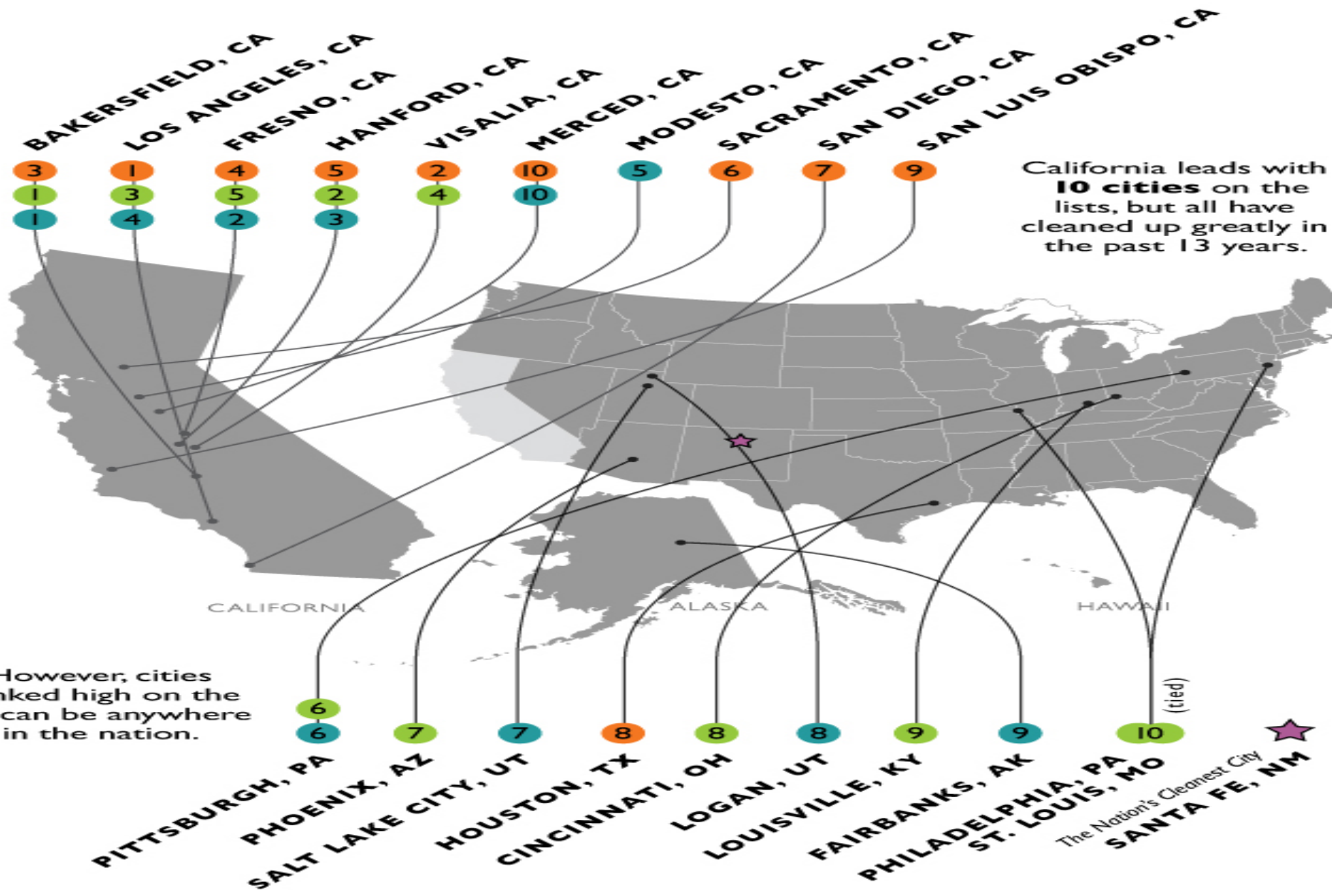
Below are the rankings of the ten most polluted cities in each category.
The Most Polluted is ranked 1 and the 10th Most Polluted is 10 .
The colored circles show the rankings in the categories described above.

● OZONE POLLUTION ● YEAR ROUND PARTICLE ● SHORT TERM PARTICLE



"*Ozone is capable of causing inflammation in the lung at lower concentrations than any other gas. Such an effect would be a hazard to anyone with heart failure and pulmonary congestion, and would worsen the function of anyone with advanced lung disease*."[26]

Ozone at levels currently in the U.S. causes immediate health problems. Many areas in the United States produce enough ground-level ozone during the summer months to cause health problems that can be felt right away. Immediate problems—in addition to increased risk of premature death—include:
shortness of breath;
chest pain when inhaling;
wheezing and coughing;
asthma attacks;
increased susceptibility to respiratory infections;
increased susceptibility to pulmonary inflammation; and
increased need for people with lung diseases, like asthma or chronic obstructive pulmonary disease (COPD), to receive medical treatment and to go to the hospital.[29]

The Timeline

Donora 1948
London 1953

British Clear Air Act 1956
US Clean Air Act 1963

EPA established 1970

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