


The Nation's Air Quality

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May 24, 2012



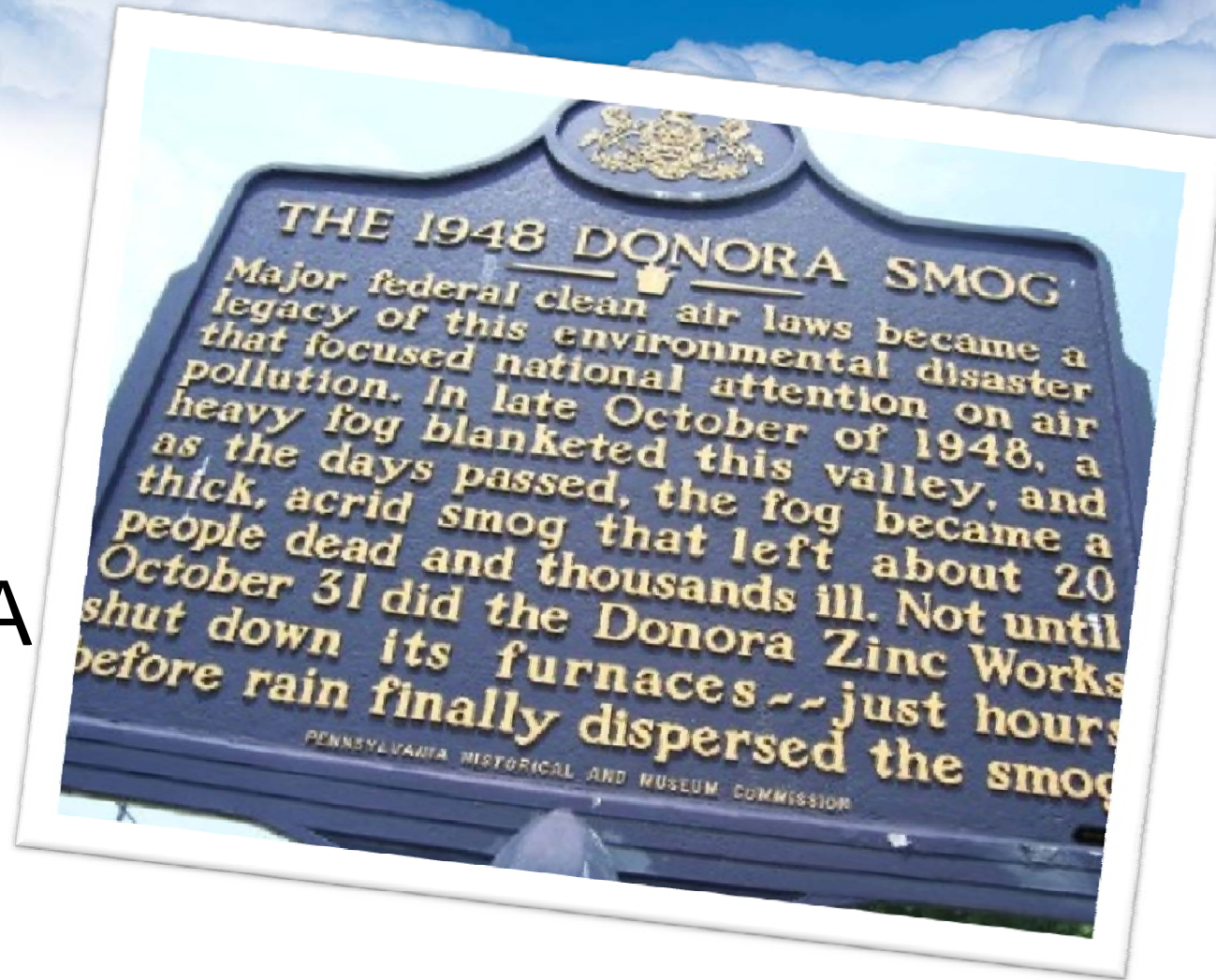
Janice Nolen,
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Where we are

- 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

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





12 noon Oct 29, 1948



London Smog 1952

Milestones in Clean Air

1948 Donora Smog

1952 London Smog

1955 Air Pollution Control Act

1963 Clean Air Act

1970 Clean Air Act/EPA

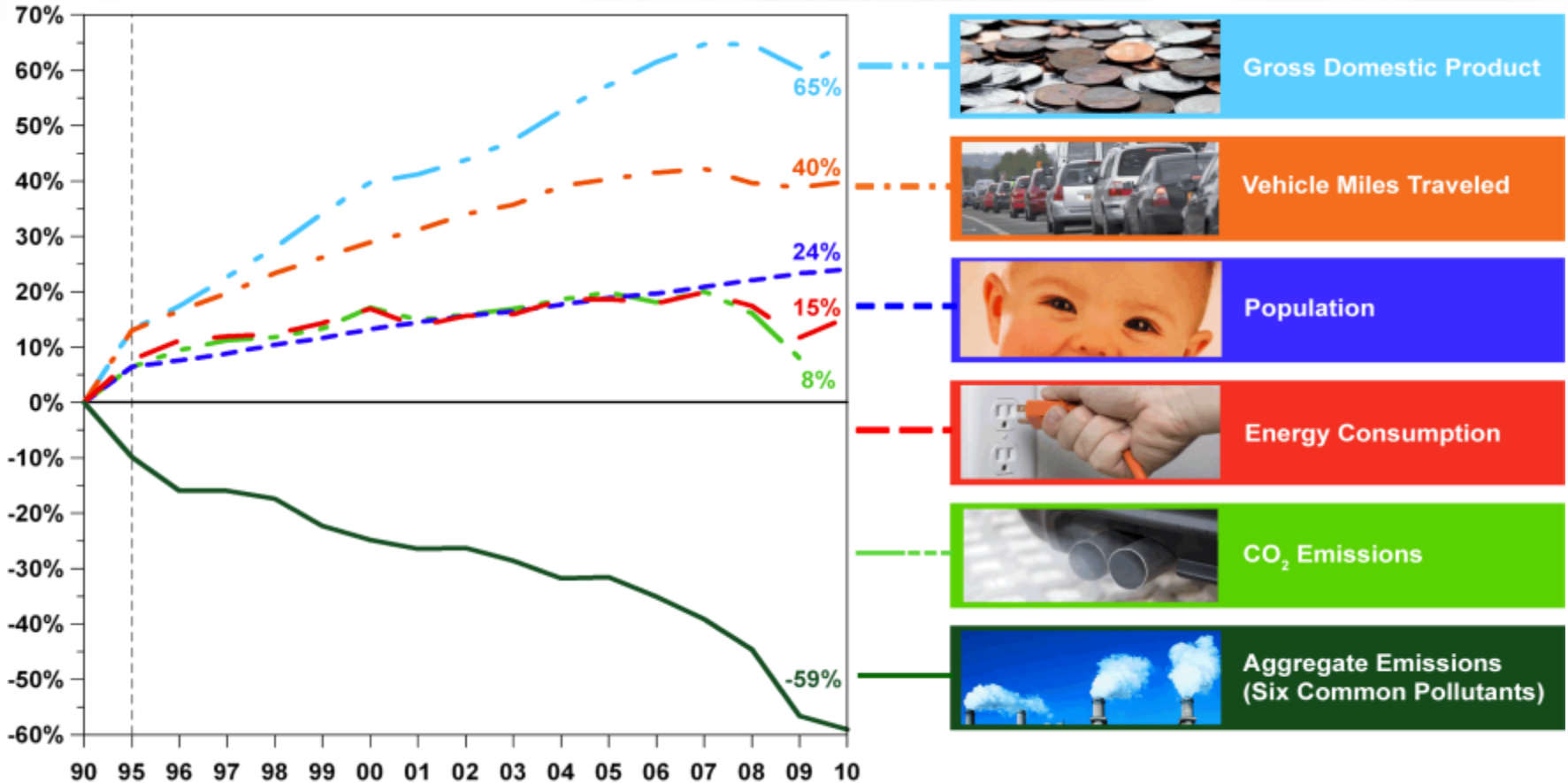
In 2010 alone, the Clean Air Act

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

– *EPA, 2011*



Healthy air does not hurt the economy



EPA, 2012

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 diabetes⁴¹;

Anyone over 65;

Infants, children and teens;

People with low incomes; and

People who work or are active outdoors.⁴²

Asthma Facts: Mortality / Morbidity

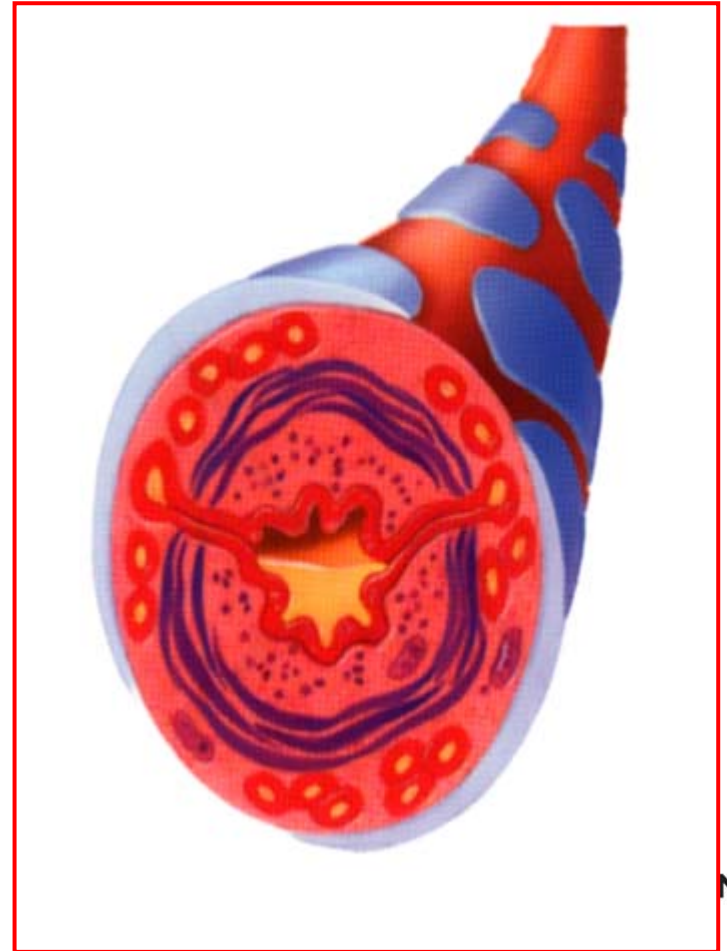
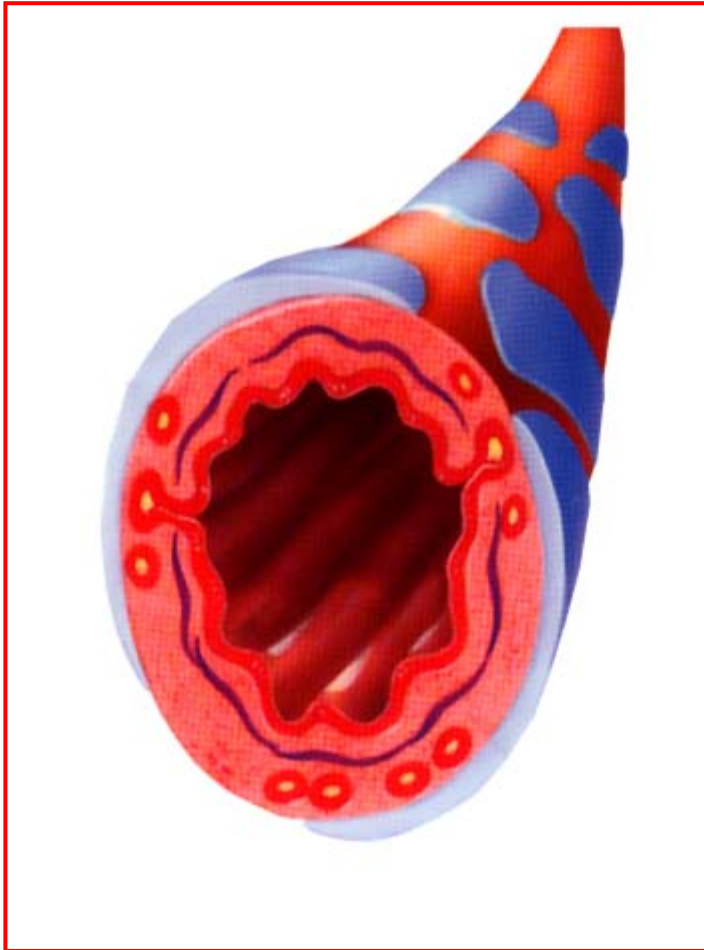
- 17 million asthma patients¹
- Asthma deaths: more than 5,000 each year¹
- Asthma-related hospitalizations: 466,000 in 1994¹
- Emergency department visits for asthma: 1.9 million in 1995¹
- Healthcare costs for asthma care: estimated at more than \$11 billion a year²
- 3 million lost workdays in the US³

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.

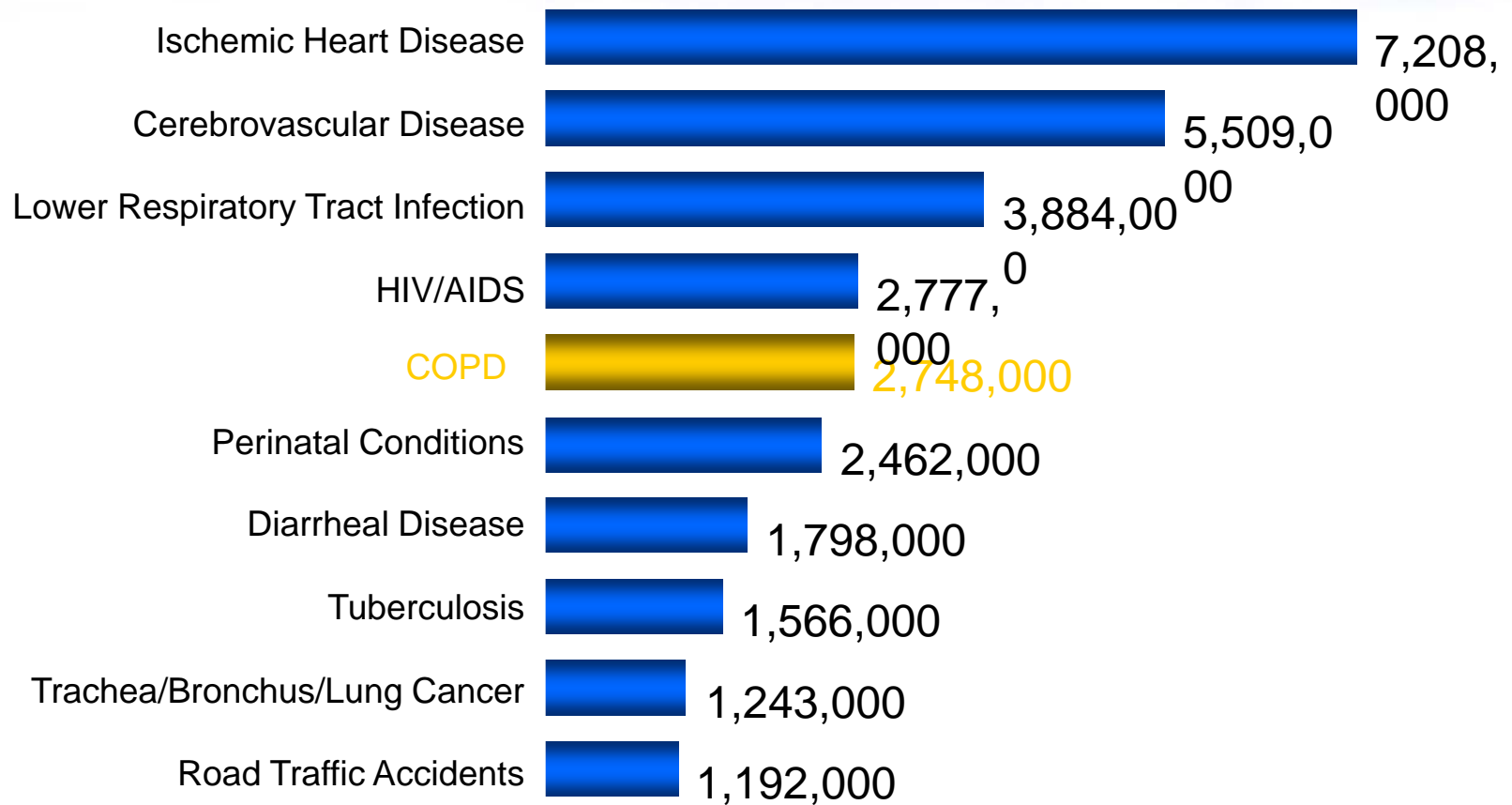
Airway Pathology in Asthma



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

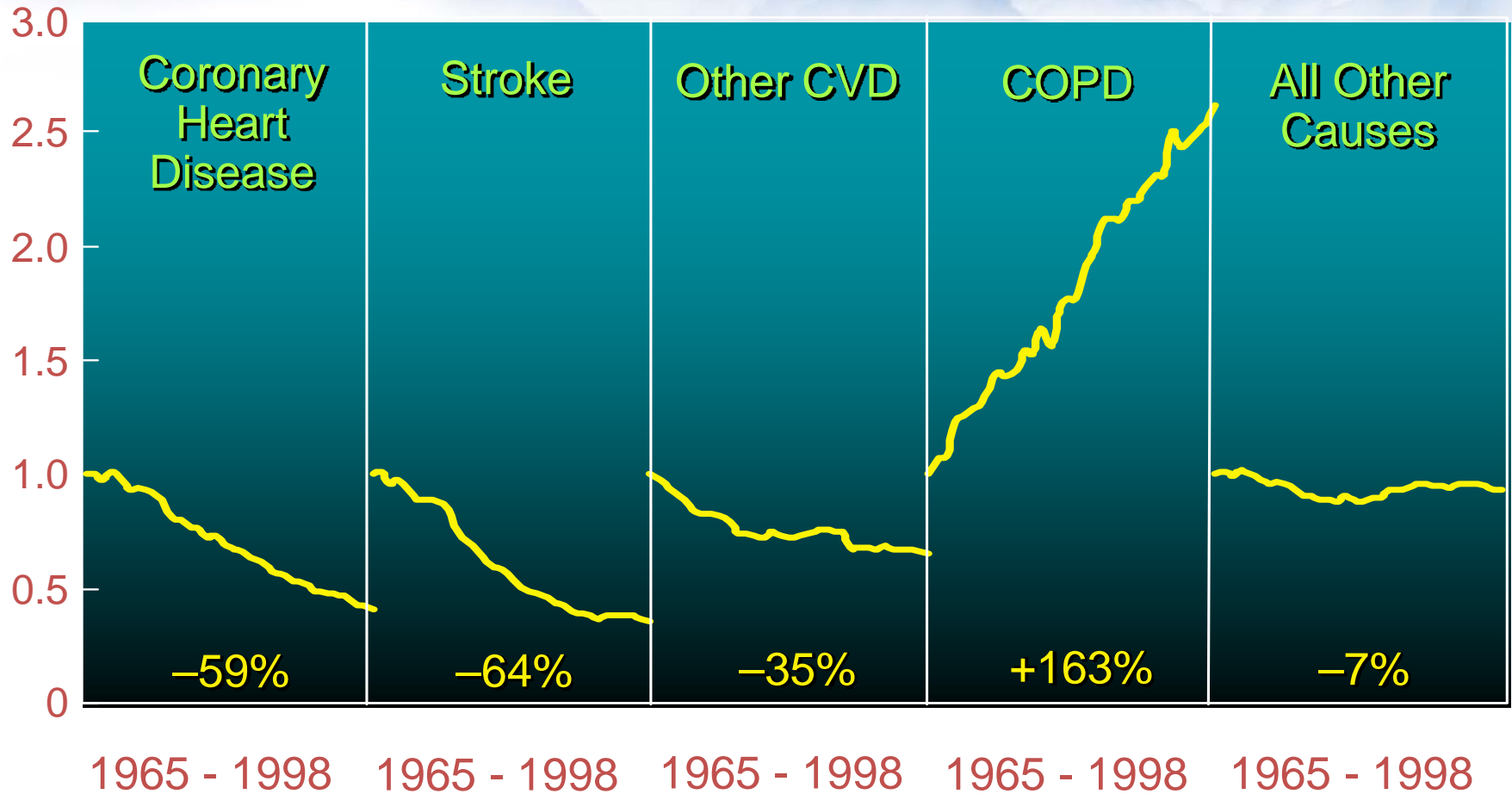
COPD: 5th Leading Cause of Death Worldwide



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

Proportion of 1965 Rate



CVD=Cardiovascular disease.

Source: NHLBI/NIH/DHH

Cigarette
Smoke

Susceptibility
Genes

Gender

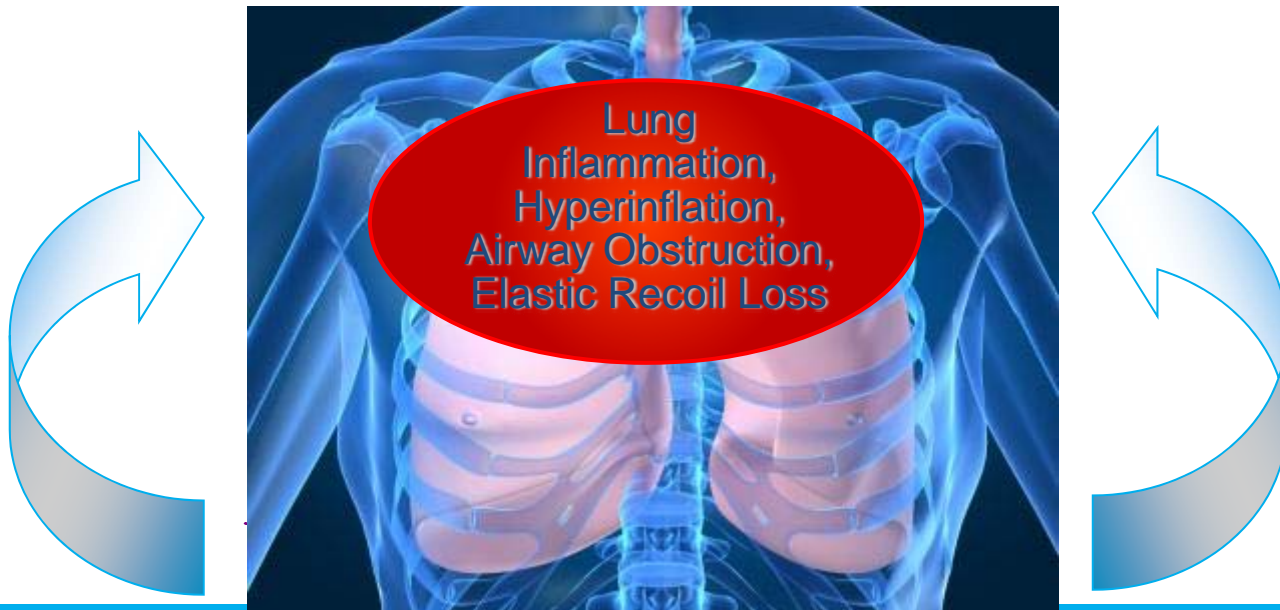
Proteinases/
Cell Mediators

Oxidative
Stress

Environmental
Irritants

Respiratory
Infections

Overview of COPD Pathophysiology



Exacerbations

Chronic
Bronchitis

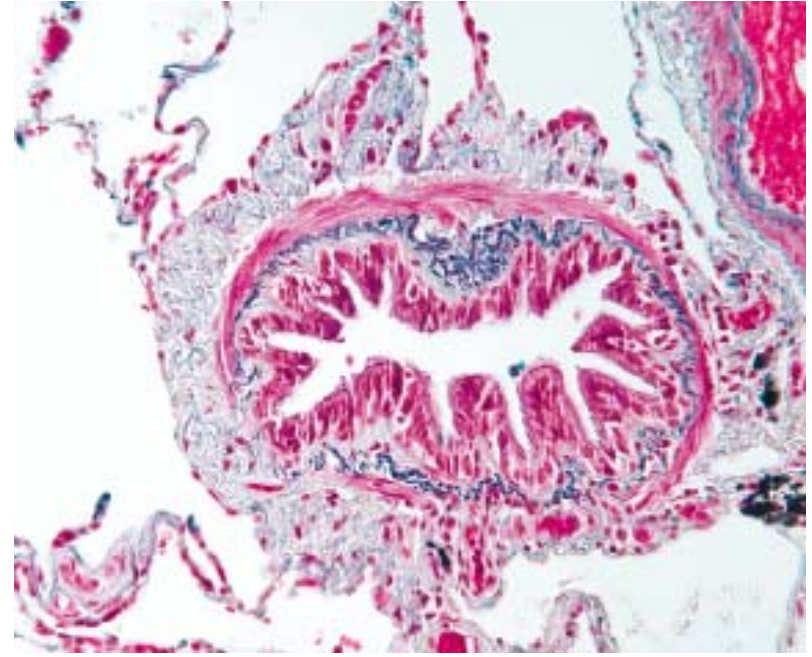
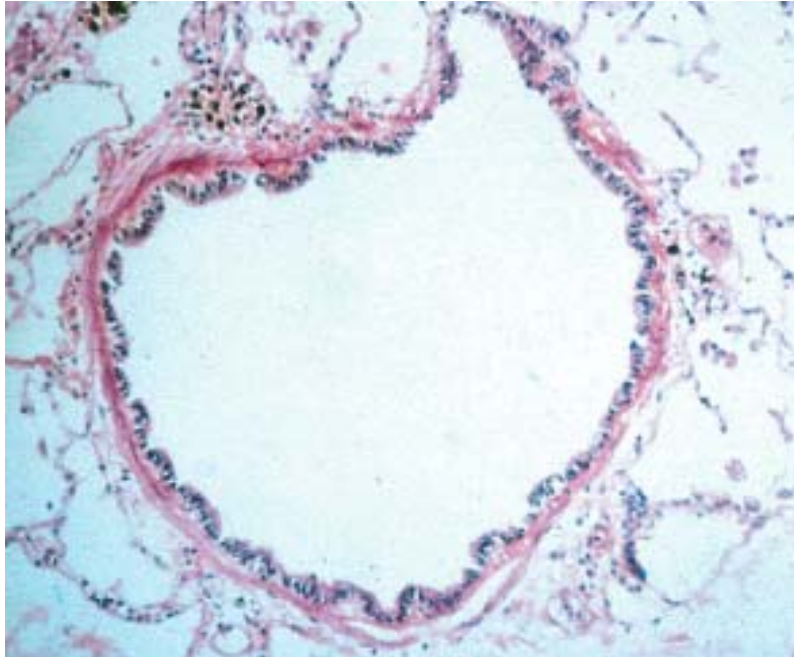
Emphysema

Systemic/ Extrapulmonary
Effects

Mucociliary
Dysfunction

Structural
Changes

Inflammation Destruction of Alveolar Architecture



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

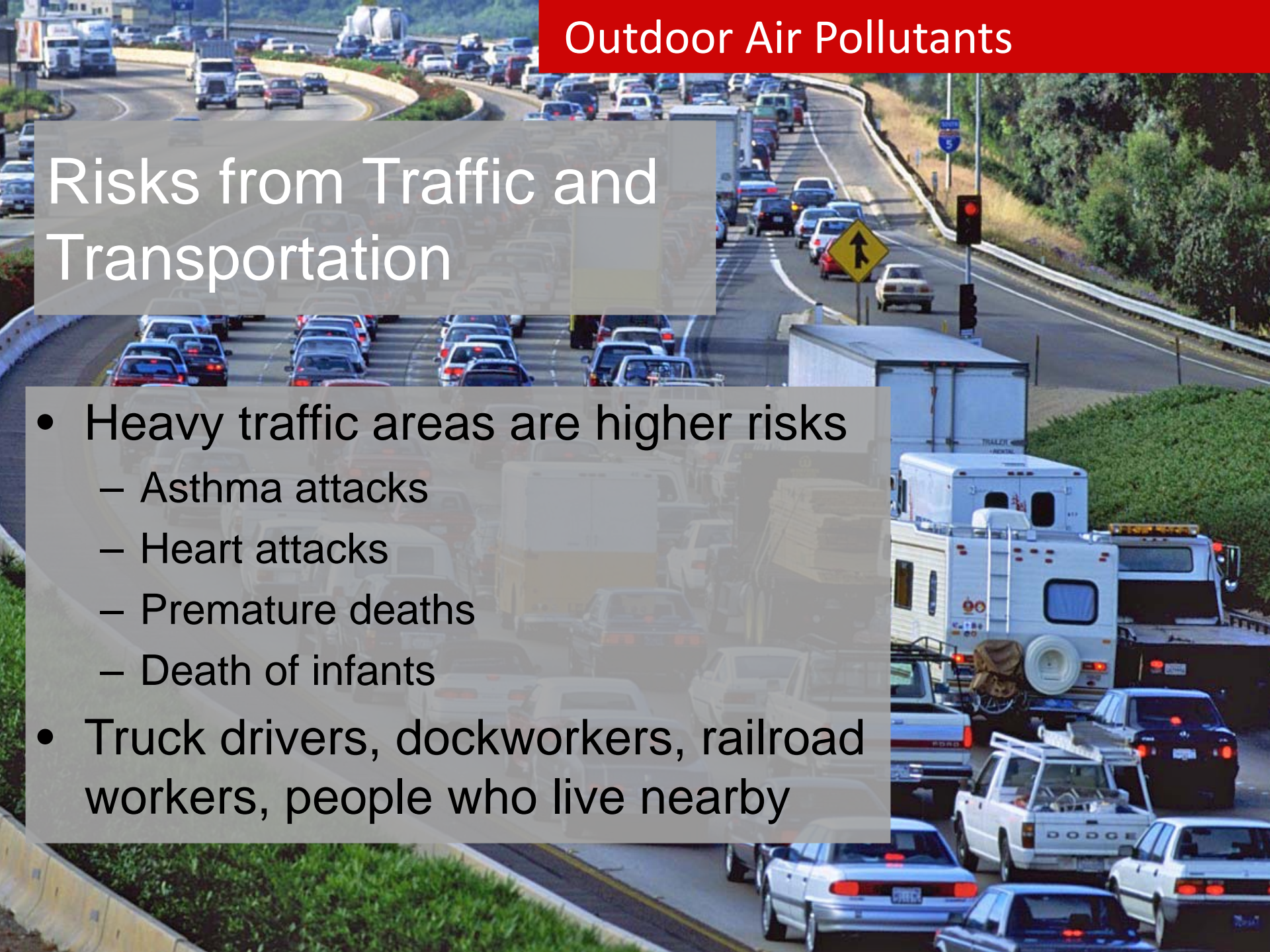
EPA, Integrated Science Assessment, 2009

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](#)}

STATE OF THE AIR 2012 |  **AMERICAN LUNG ASSOCIATION®**

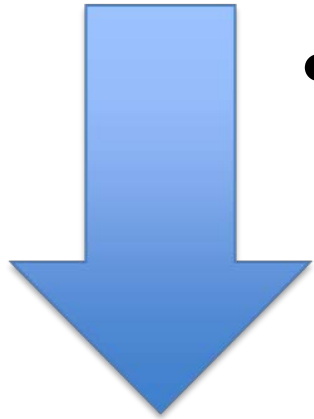
- There is cleaner air across much of nation thanks to standards enforced under the Clean Air Act.
- Despite this progress, 127.2 million Americans continue to live in areas with dangerous levels of ozone or particle pollution.

In 2008-2010

4 out of 10 people
in the U.S.A. lived in counties with an
F for air quality

The News

Much less Ozone nationwide



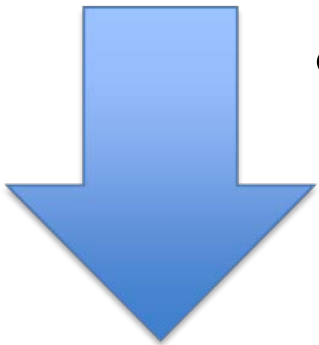
- 22 of the 25 cities most polluted year-round had fewer unhealthy days
 - 18 had fewest days to date



- 3 had more days

The News

Less Particle Pollution Year-round

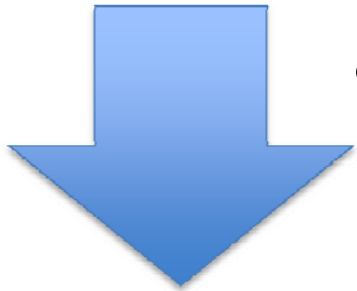


- 24 of the 27 cities most polluted by particles had improved annual levels
- 17 saw their lowest levels ever
- 3 had more days/worse days



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

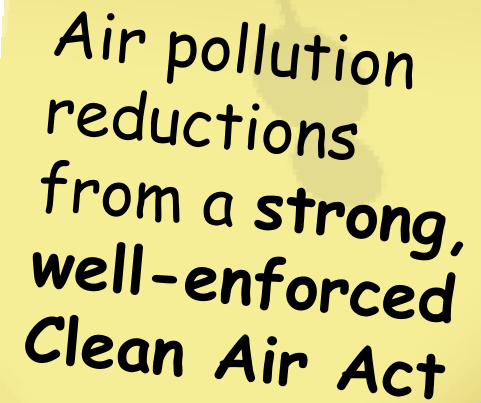


- 13 of the cities on the list did worse than in 2007-2009

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



Air pollution reductions from a strong, well-enforced Clean Air Act

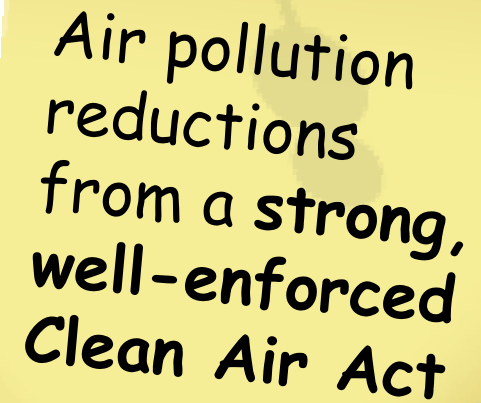
Reasons for improvement

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

Reasons for improvement

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Air pollution reductions from a strong, well-enforced Clean Air Act

Cleanest City



**Santa Fe-
Española,
New
Mexico**

Postcard image courtesy of Zazzle.com

 **AMERICAN LUNG ASSOCIATION.**
Fighting for Air

Most-Polluted

#1 Ozone Pollution



Most-Polluted

#1 Year-Round and Short-term Particles



**Bakersfield,
Calif.**

Postcard images courtesy of Zazzle.com

STATE OF THE AIR 2012 AMERICAN LUNG ASSOCIATION. Donate | Download Report
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What's the State of Your Air?

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.



Air a Health Risk?
Yes, the air still threatens health of millions.
[Learn more.](#)

REPORT CARD:
What's the Grade for your air?

Select Your State

Or

Enter Your Zip

Breathing polluted air can harm your health and even shorten your life. **State of the Air** is a report card on air pollution in communities across the nation. The more you learn, the more you can protect your health and take steps to make our air cleaner and healthier.

[Did You Know?](#) [Take Action Now](#)

Over 127 million people [Join Our Fight For Air](#)

Latest @LungAssociation Tweets

LungAssociation: @RepTierney Thanks for your support for the #PreventionFund and your support of lung health!
Fri, Apr 27

LungAssociation: #StateoftheAir 2012 monitored the 2 most widespread types of air pollution, ozone (smog) & particle pollution (soot) from 2008-2010
Fri, Apr 27

LungAssociation: #5Words to consider: Don't gut clean air protections! Take action at <http://t.co/mQQqATCZ>
Fri, Apr 27

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Health Risks

- » [Ozone](#)
- » [Particle Pollution](#)
- » [Children's Health](#)
- » [Disparities](#)
- » [Near Highways](#)
- » [Protect Yourself](#)

Take Action

- » [Join Our Fight For Air](#)
- » [Donate](#)
- » [Share Your Story](#)
- » [Share Your Air](#)
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Health Effects of Ozone and Particle Pollution

Ozone and particle pollution are the most widespread air pollutants—and among the most dangerous. Recent research has revealed new insights into how they can harm the body—including taking the lives of infants and altering the lungs of children. All in all, the evidence shows that the risks are greater than we once thought.

Recent findings provide more evidence about the health impacts of these pollutants:

- A major review of particle pollution and other air pollutants concluded that many cause heart attacks, even when people inhaled elevated levels for as little as one week.¹ This review looked at evidence from 177 studies and found that particle pollution (both fine and coarse), carbon monoxide, nitrogen oxides, and sulfur dioxide all increased the risk of heart attack.
- Particle pollution that lasts for just a short while may be causing strokes, even at levels considered safe, according to a study of Boston area patients.² In particular, researchers found that breathing levels of traffic-related particles were linked to increased risk of stroke within 12 to 14 hours of breathing them.

Trusted Links

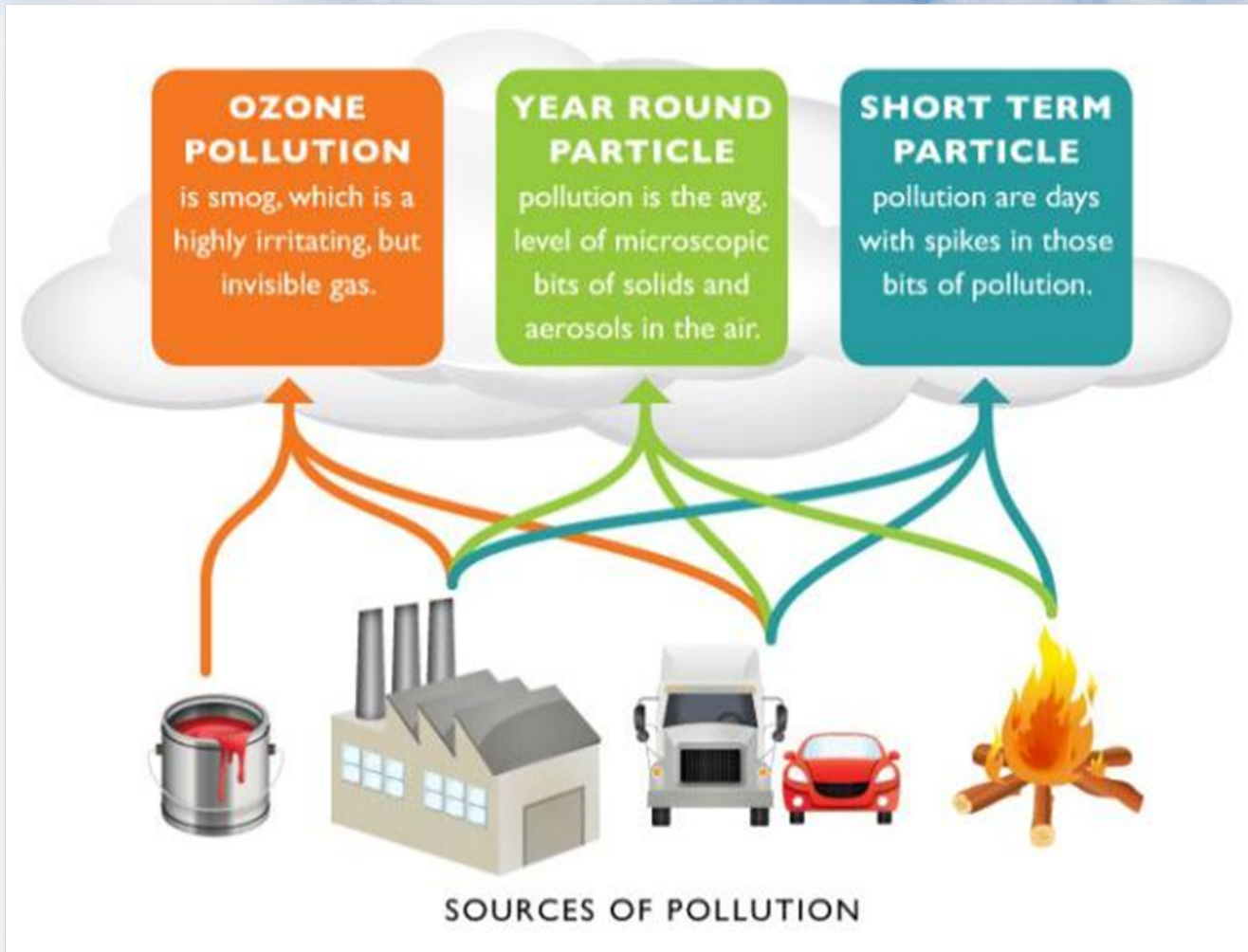
- » [AirNow](#)
- » [National Association of Clean Air Agencies](#)

U. S. Environmental Protection Agency sites:

- » [Clean School Bus USA](#)
- » [Information for Citizens and Communities](#)
- » [National Ambient Air Quality Standards](#)
- » [Protect the Environment: Act Locally](#)
- » [What You Can Do](#)

News from Lung

Infographics explain



Delaware

New Castle County

Philadelphia-Camden-Vineland, PA-NJ-DE-MD

[How to Protect Yourself](#)

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

Ozone



Particle Pollution 24-hour



Particle Pollution Annual



You can make a difference in the air that you breathe.

[Tell your member of Congress to protect your health: Don't weaken the Clean Air Act.](#)

[Tell us why having healthy air matters to you.](#)

Tell your friends about the air where you live.



SEND AN EMAIL



SHARE ON FACEBOOK



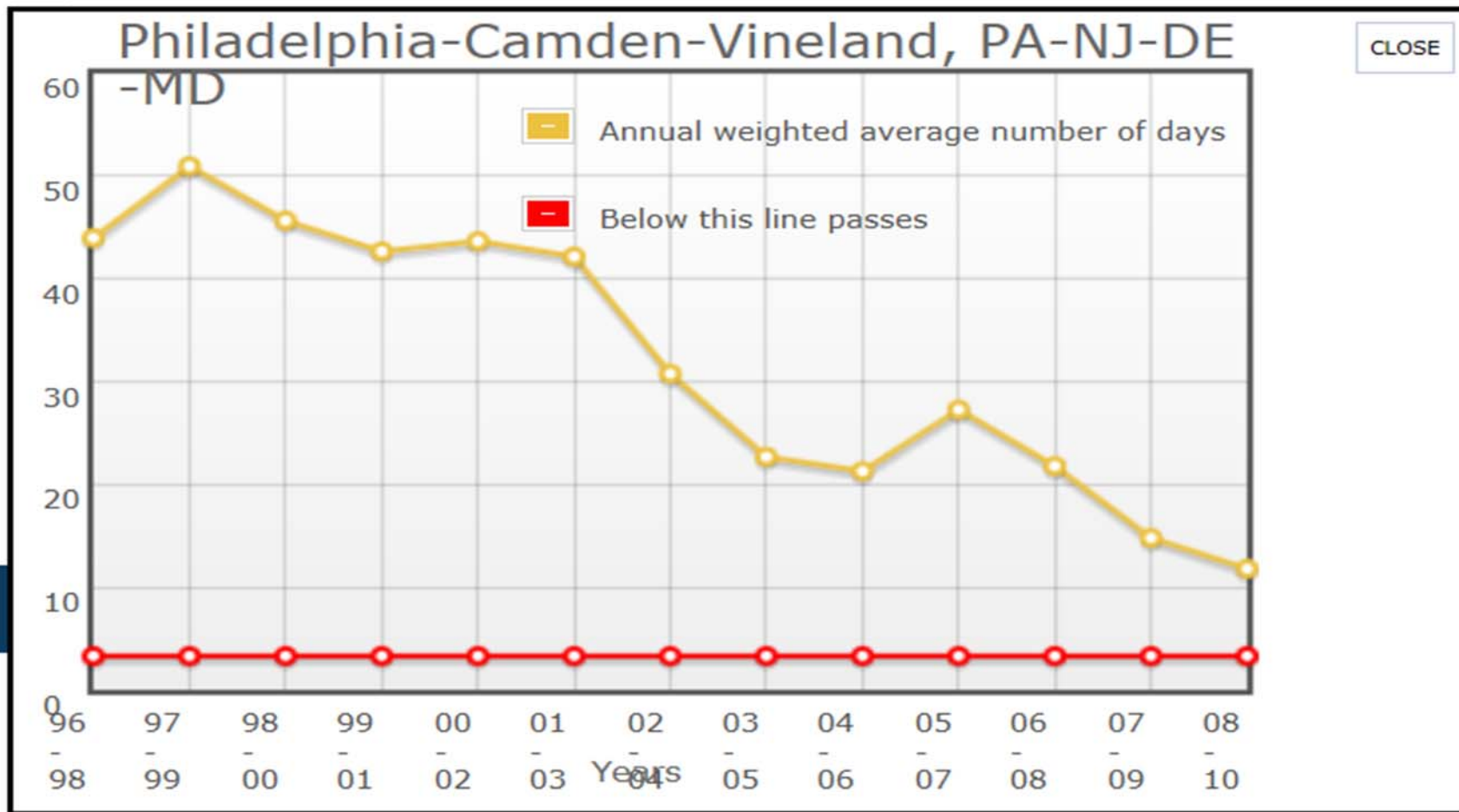
SHARE ON TWITTER

High Ozone Days

[Learn More](#)

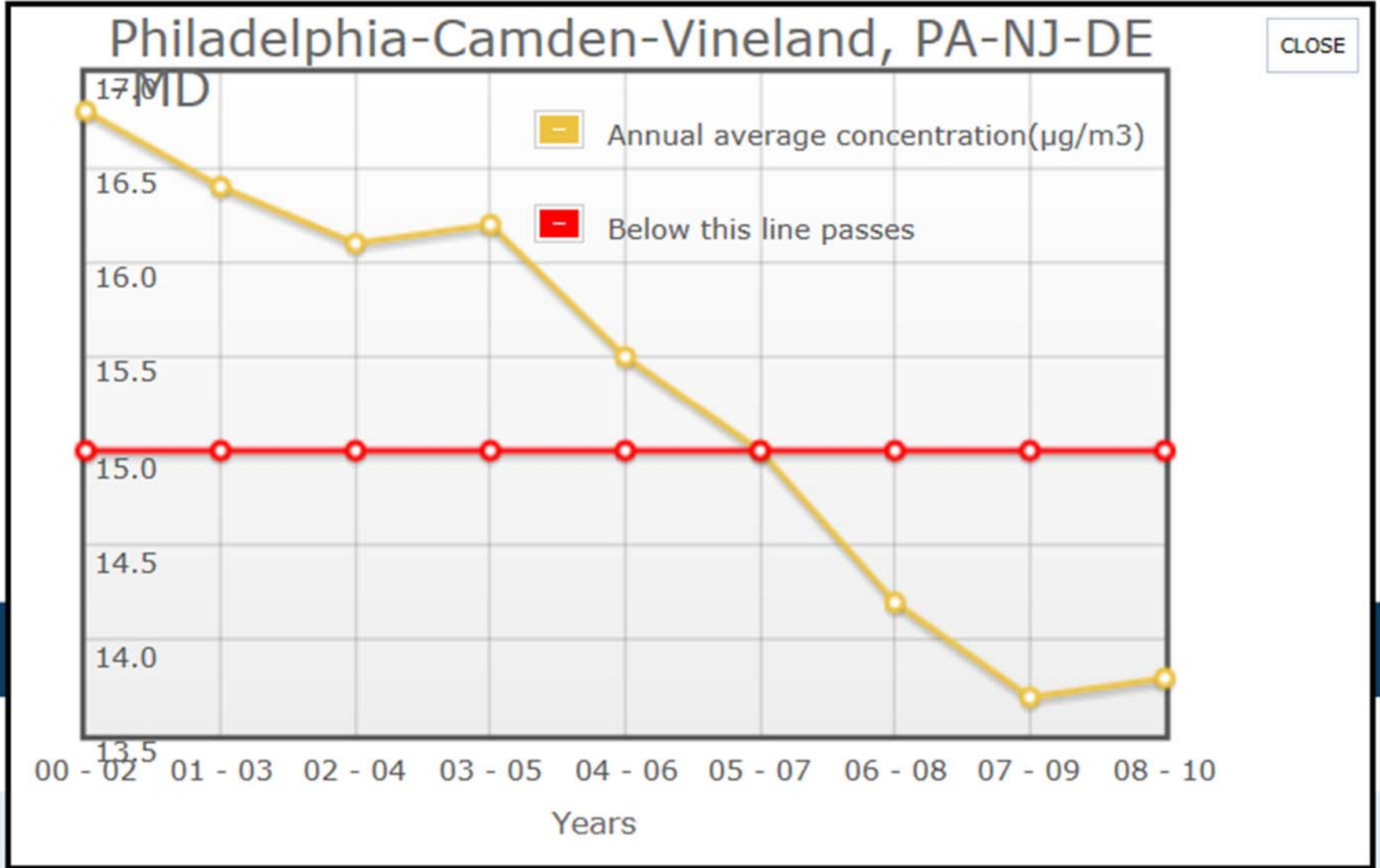
Trends for Ozone

Change since 1996: 32.2 less days this year



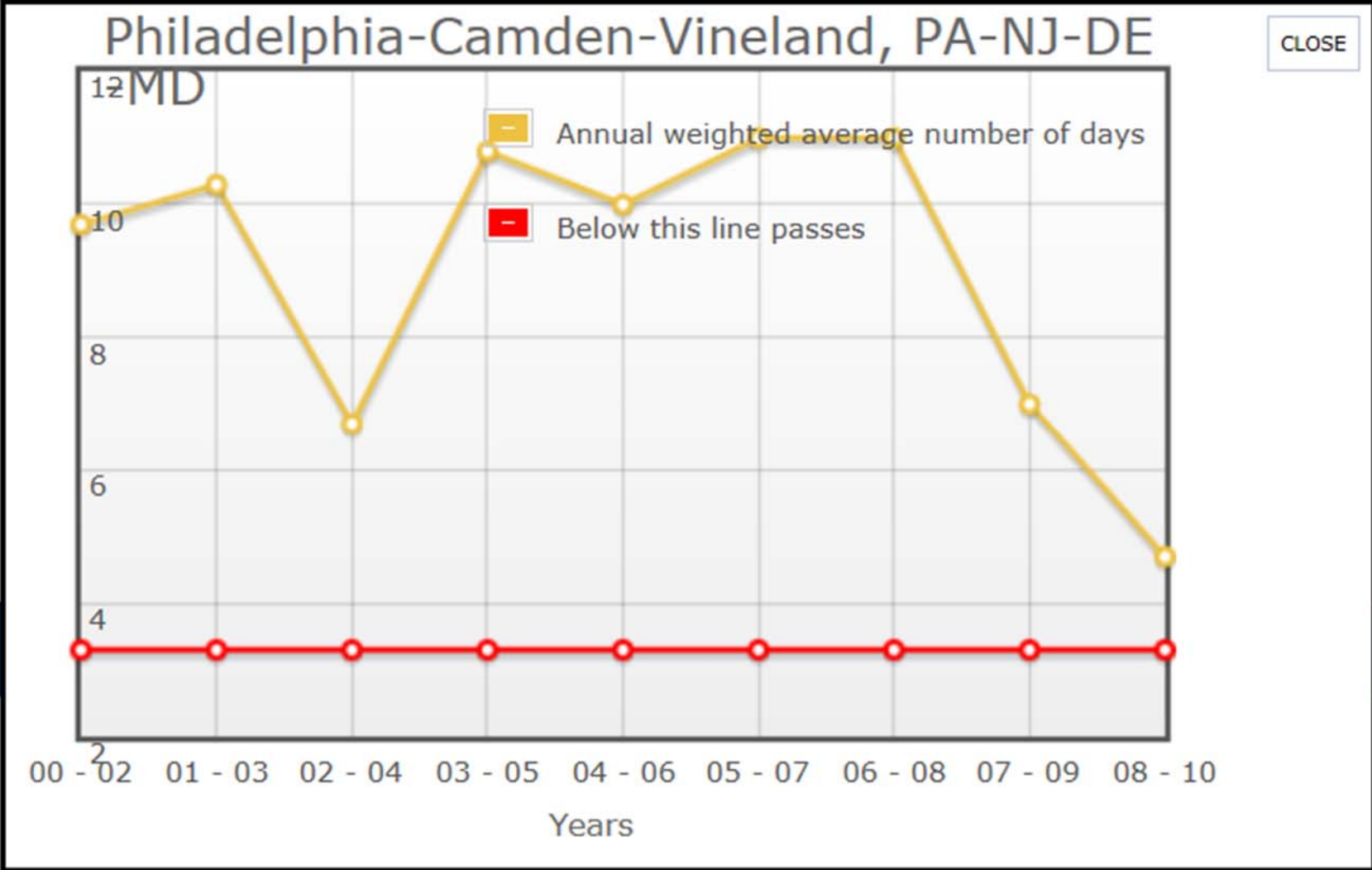
Annual PM Trends

Change since 2000: $-3.0 \mu\text{g}/\text{m}^3$



24-hour PM Trends

Change since 2000: 5.0 less days this year



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



EXHALER

INHALER

Asthma is now a leading chronic disease among children, yet some in Congress are trying to weaken the Clean Air Act. More toxics in the air means more asthma attacks, heart attacks, strokes, cancer and premature deaths. The American Lung Association is joining with 500 health and medical organizations to stop them. Your voice matters. Go to LungUSA.org to find out how you can help.

 **AMERICAN LUNG ASSOCIATION.**
Fighting for Air

www.LungUSA.org

Fighting for Air & State of the Air

 AMERICAN LUNG ASSOCIATION.

Fighting for Air

Join the fight for healthy air



SPREAD THE WORD

ABOUT CLEAN AIR

SHARE YOUR STORY

TAKE ACTION

NEWS

DONATE



Learn more about the issues

For the past 40 years, the Clean Air Act has protected families across the country from breathing high levels of toxic, life-threatening air pollution. Now, the rules that help keep the air we breathe healthy and safe are under attack.

[Find out more about this fight.](#)

Read our stories



Tell Congress: Protect The Air We Breathe

Your right to breathe clean and healthy air is under attack. Big corporate polluters are pressuring Congress to weaken the Clean Air Act – a law that prevents tens of thousands of asthma attacks, heart attacks, strokes and premature deaths caused by air pollution each year.

Fill out the form below to tell your lawmakers to protect the Clean Air Act today:

"Please support full implementation of the Clean Air Act and

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 street the same way about businesses that pollute the air and support policies on the worst polluting corporations.

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



Share Your Story

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

First Name * :

Last Name * :

Email * :

State * :

Your Story * :

Collecting stories
online on both
StateoftheAir.org
FightingforAir.org

Red Carriage Campaign





AMERICAN LUNG ASSOCIATION. Fighting for Air.

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.

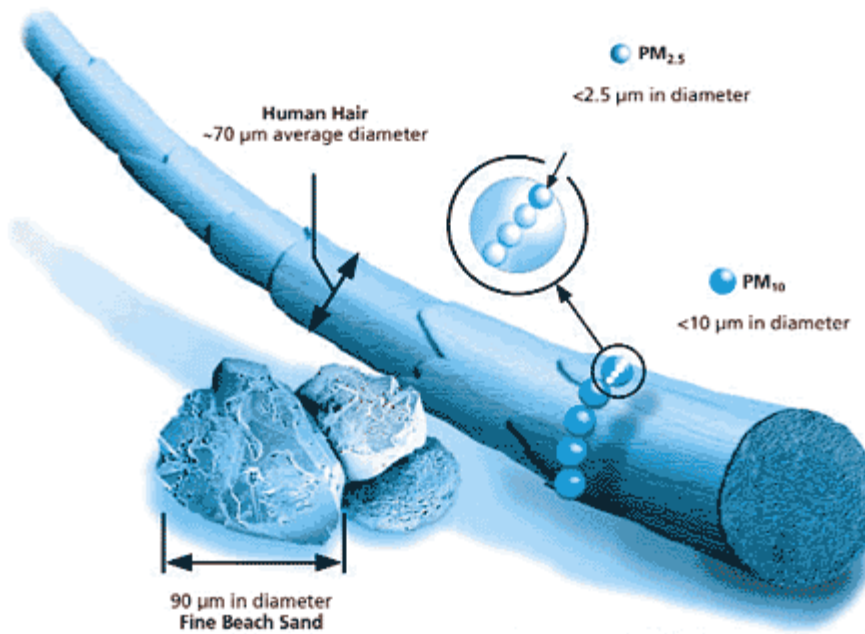
We will breathe easier when people are free from the addictive
grip of cigarettes and the debilitating effects of lung disease.

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

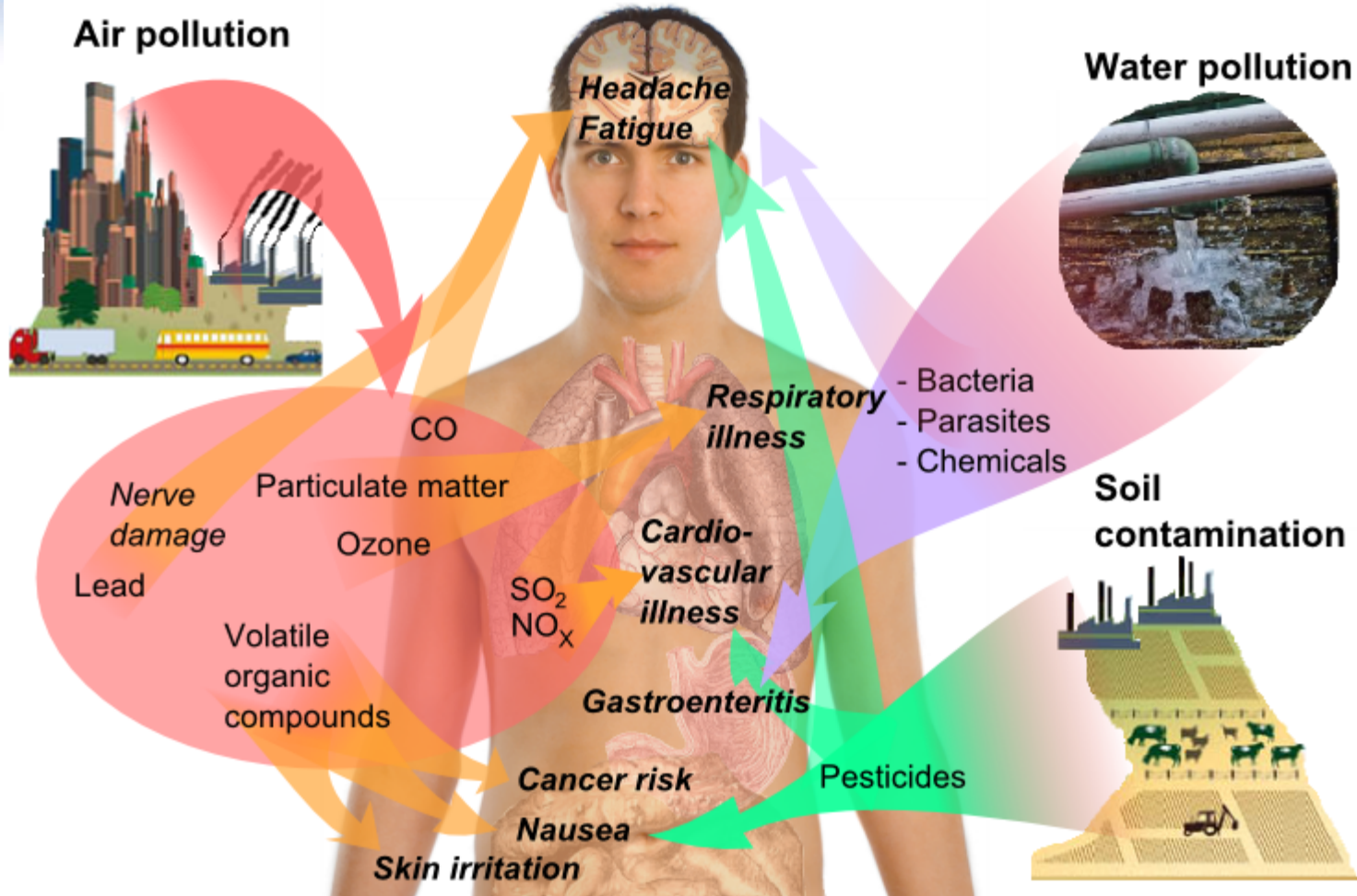
We will breathe easier when children no longer
battle airborne poisons or fear an asthma attack.

Until then, we are fighting for air.

Comparison of PM sizes.



Health effects of pollution





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](#).



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

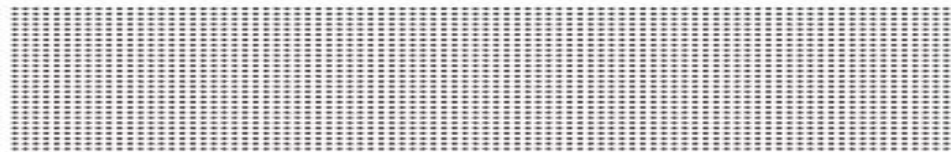
AMERICAN LUNG ASSOCIATION.

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

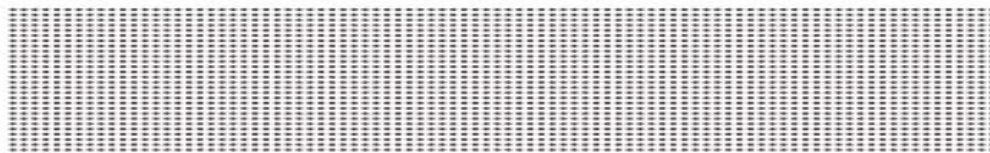
pollution are days with spikes in those bits of pollution.

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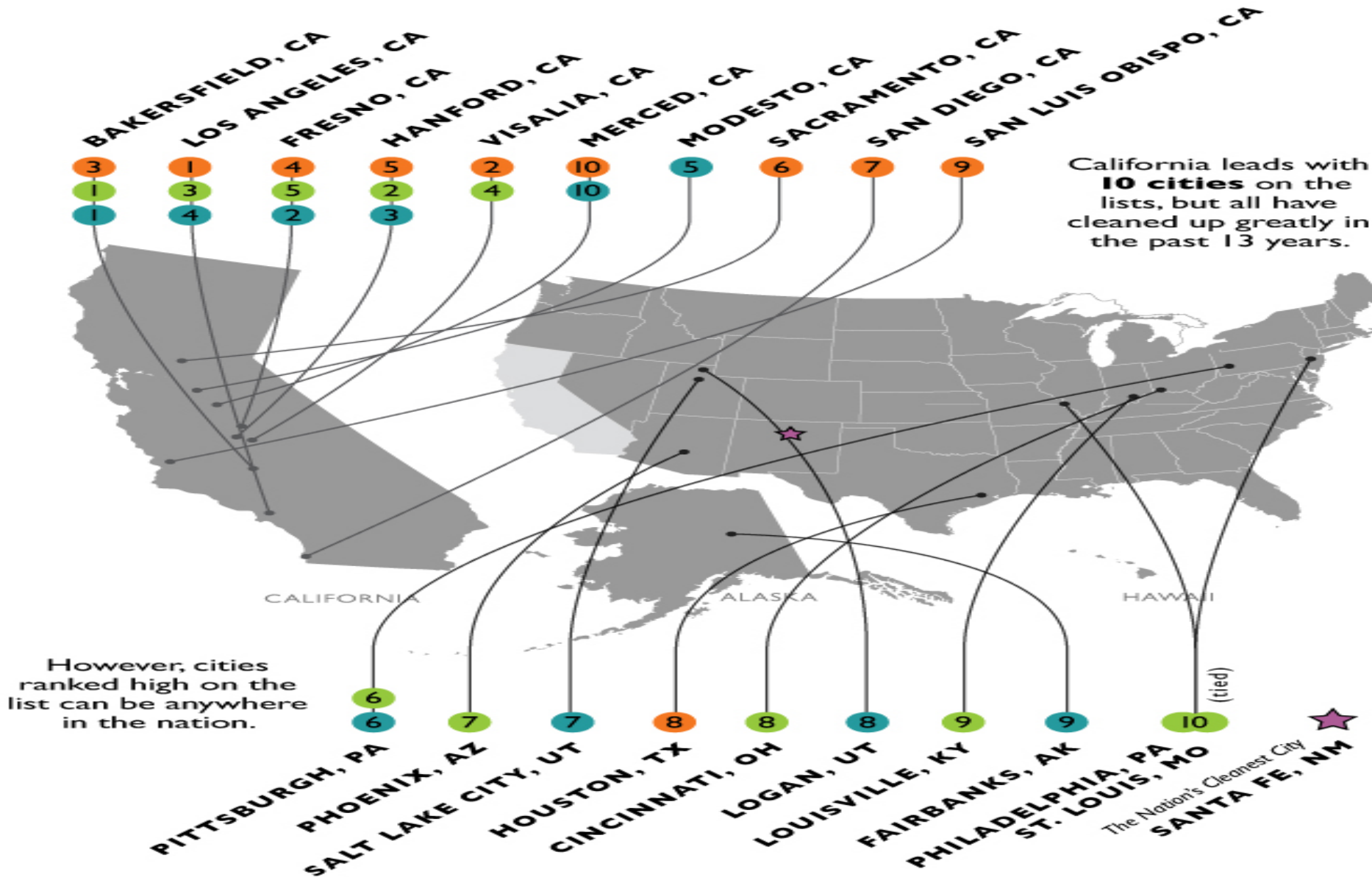
SHORT TERM PARTICLE


pollution are days with spikes in those bits of pollution.



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