State of New Jersey
Department of Environmental Protection

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. McCABE
Commissioner

PROJECT PROPOSAL

OVERALL GOAL

The State of New Jersey, as a beneficiary of the Trust established pursuant to the national Volkswagen settlement, intends to use its allocation from the mitigation trust to efficiently implement projects that reduce oxides of nitrogen (NOx) emissions in a cost effective and technically feasible manner. The implemented projects must meet the criteria of the Consent Decree. New Jersey is issuing this solicitation for project ideas to ensure a broad range of project ideas are considered.

NJDEP anticipates primarily funding pilot electrification projects, including the replacement of heavy-duty vehicles/engines such as buses, trucks, and non-road equipment in urban areas disproportionately impacted by diesel emissions, as well as electric vehicle charging/fueling infrastructure installation in strategic locations across the state.

Submissions must contain all the information outlined in the "Project Proposals" section of this document.

ELIGIBLE PROJECTS

A general summary is below. Click here for comprehensive list and associated definitions.

Source Category	Emission Reduction Strategy	Allowed Expenditure Amount
1. Class 8 local freight trucks & port drayage trucks	Repower and replacement	Up to 40% for repower with diesel or alternative fuel or up to 75% (up to 100% if government owned) for repower with electric. Electric charging infrastructure costs are an eligible expense. Up to 25% for replacement with diesel or alternative fuel or up to 75% (up to 100% if government owned) for electric replacement. Electric charging infrastructure costs are an eligible expense.
2. Class 4-8 school bus, shuttle bus or transit bus	Repower and replacement	Same as row 1
3. Freight switching locomotives	Repower and replacement	Same as row 1
4. Ferries/Tugs	Repower	Same as row 1
5. Oceangoing vessels	Shorepower	Up to 25% for shore side infrastructure if non-government owned (up to 100% if government owned)

Source Category	Emission Reduction Strategy	Allowed Expenditure Amount
6. Class 4-7 local freight trucks	Repower and replacement	Same as row 1.
7. Airport ground support equipment	Repower and replacement	Up to 75% to repower or replace with electric (100% if government owned). Electric charging infrastructure costs are an eligible expense.
8. Forklifts and Port Cargo Handling Equipment	Repower and replacement	Up to 75% to repower or replace with electric (100% if government owned). Electric charging infrastructure costs are an eligible expense.
9. Electric vehicle charging stations or hydrogen fueling stations for light duty vehicles only		Up to 100% to purchase, install and maintain infrastructure if available to public at *government owned* property. Up to 80% to purchase, install and maintain infrastructure if available to public at *non-government owned* property. Up to 60% to purchase, install and maintain infrastructure at a workplace or multi-unit dwelling that is not available to the general public. Up to 33% to purchase, install and maintain infrastructure for publicly available hydrogen dispensing that is high volume or 25% for lower volume.

PROJECT PROPOSALS (Open with Adobe Reader)

Electronic submittals are preferred and should be sent to VWComments@dep.nj.gov, however paper submittals will also be accepted and should be sent to:

NJDEP
Division of Air Quality
Mail code 401-02E
Trenton, NJ 08625-0420
Attn: VW Settlement

All proposals must contain the following information; incomplete applications will not be considered. If your project is selected, you may be contacted for additional detailed information. Send questions to VWComments@dep.nj.gov

To enter information electronically, use Adobe Reader

CONTACT INFORMATION

Applicant Name	Colonial Concrete, Inc.
Applicant Address	1196 McCarter Hwy
City, State, Zip Code	Newark, NJ 07104
Contact Person	Eric McIlvene
Title/Position	Fleet Manager
Phone	817-835-4147
E-mail	emcilvene@us-concrete.com
Owner Name	US Concrete
Owner Address	331 N. Main Street
City, State, Zip Code	Euless, TX 76039
Contact Person	Eric McIlvene
Title/Position	Fleet Manager
Phone	817-835-4147
E-mail	emcilvene@us-concrete.com

PROJECT NAME	MIxer Truck Replacement

PROJECT CATEGORY OR CATEGORIES (choose from 1-9 in "Eligible Projects" section above)

1 ■ **2** ☐ **3** ☐ **4** ☐ **5** ☐ **6** ☐ **7** ☐ **8** ☐ **9** ☐

PROJECT PRIORITY Priority # 2 of 2 proposals
If submitting more than one proposal, what is the sponsor's priority of this proposal?

NOTE FOR CATEGORY 9 PROPOSALS

If your proposal is for Category 9 (Light Duty Zero Emission Vehicle Supply Equipment), follow these instructions:

Electric Vehicle stations: Do not complete this form. Instead, go to *It Pay$ to Plug In* – NJDEP's Electric Vehicle Charging Grants Program, and apply for a Charging Grant. Volkswagen funds for charging stations will be administered through *It Pay$ to Plug In*.

Hydrogen fuel cell vehicle supply equipment: Complete all of the questions on this form.

PROJECT BUDGET
Provide total estimated project budget, include source, amount of cost share, and administrative costs if applicable:

$4,214,209.12
Grant Request: $1,053,522.28 (25%)

PROJECT DESCRIPTION (Briefly describe the project by completing the following questions)

Colonial Concrete, Inc. ("Colonial Concrete") is proposing to replace 19 old high Nitrogen Oxide ("NOx") emitting diesel mixer trucks with 19 new more efficient mixer trucks. Please see below and supplemental pages for additional details.

Geographic area where emissions reductions will occur? Newark

Estimated size of population benefitting from the emission reductions? 282,090

Estimated useful life of the project? 20 years

Number of engines/vehicles/vessels/equipment included in the project? 19

DEP will be modeling emission benefits for all projects. Please provide the necessary information below: See attached Fleet Spreadsheet

Model Year

Horsepower

Annual hours of use

Annual amount of fuel used

Will the project benefit one or more communities that are disproportionately impacted by air pollution? If so, please describe?

Colonial Concrete has a large presence throughout the state of New Jersey, with a concentration of 2006 and older diesel mixer trucks in the Newark area.

Only shovel ready projects will be considered. Please list project partners.

Colonial Concrete currently has long standing customer relationships with local businesses to provide concrete and material services in the Newark and surrounding areas.

Estimated timeframe for implementation? Include a project timeline that identifies start and end dates, as well as the timeline for key milestones.

-Within 3-6 months of award: Reach procurement contracts with mixer truck supplier.
-Within 6-12 months of award: Begin implementation of mixer trucks.
-Within 12-24 months of award: Complete implementation of mixer trucks.

Demonstrated success in implementing similar projects?

See Supplemental Pages

If your proposed project involves alternative fuels, provide a demonstration of current or future plans to provide adequate refueling infrastructure.

Not applicable.

Has your organization been approved to receive and expend any other grant funds related to this project? If so, please provide details.

Not applicable.

Please provide any additional information that supports this project.

See Supplemental Pages

Two additional pages have been provided as supplemental space to answer any of the questions above.

Supplemental Page 1

Will the project benefit one or more communities that are disproportionately impacted by air pollution?

Colonial Concrete is a wholly owned subsidiary of US Concrete and is an essential provider of construction material across the US. US Concrete has been a leader in the industry for over 20 years. US Concrete is a fairly young company but has made a tremendous impact on the socio-economic impact of concrete and material solutions. US Concrete's goal is to continue to advance the industry and be a steward of continuous improvement.

US Concrete serves a diverse body of businesses, supplying well time materials and great customer service. The businesses US Concrete serves, US Concrete workers, and the communities served, are negatively impacted by breathing in the diesel particulate matter emitted from the current older high NOx emitting mixer trucks. The nature of cement mixers and the high idle time drastically exposes the communities they serve everyday. By funding this project it will substantially decrease the amount of NOx emitted in crowded metro areas with construction sites, and will allow US Concrete, New Jersey, and their communities to continue to create positive and transformative narratives of success. US Concrete is proposing to replace 19 Class 8 mixer trucks with 19 brand new, low NOx emitting mixer trucks. These mixer trucks currently operate within and around the Newark, New Jersey area delivering materials to job sites.

US Concrete would like to partner with New Jersey to lower the emission of higher NOx vehicles and improve the effect on the health of the communities that they serve every day. US Concrete chose mixer trucks in Newark because it is a High Priority Area for the state and also received an Ozone grade of "D". Newark NJ is ranked 12th on the most Ozone-Pulluted Cities based on the American Lung association State of the Air Report. High pollutants typically correlate with high percentage of lung disease among children and adults. By partnering with New Jersey, US Concrete will continue to do its part to remove Newark off of this list, and do its part to remove harmful emissions, in turn creating a city where better air quality promotes active and healthy lifestyles.

The cement industry is one of the largest producers of carbon dioxide (“CO2”), creating 8% of world-wide man-made emissions of CO2. In an industry that historically has higher than average emissions, US Concrete has shown consistent modernization of its fleet and practices to reduce emissions. US Concrete has invested consistently on more improved vehicles and systems to reduce their carbon footprint. US Concrete ensures the availability of the funds required for this project.

US Concrete was the first national concrete company to formalize a company-wide commitment to green building through its Environmental Friendly Technologies ("EF"), environmental friendly concrete mixes. Since 2009 US Concrete has saved over 1 million tons of CO2 emissions from entering the atmosphere through the use of EF Technology. US Concrete is committed to providing the highest standard to our employees, the many businesses we service, and the communities we are in. US Concrete welcomes the opportunity to partner with New Jersey to further the goal to decrease the carbon footprint in New Jersey. Replacing 19 diesel mixers with 19 new lower NOx emitting mixer will reduce emissions by 16.88 short tons of NOx over the life of the project. Another great benefit of this project is due to the nature of the industry and the high reduction of NOx, the cost effectiveness is greater than most other projects. This will allow New Jersey to stretch their grant funds further. This will provide safer and healthier conditions for Newark and the surrounding communities which these mixer trucks operate. Replacing high NOx emitting older diesel engines aligns with New Jersey's plan to decrease emissions greatly in areas that are disproportionately affected by harmful high emittance diesel vehicles.

Demonstrated success in implementing similar projects?

US Concrete has a long history of replacing vehicles. They routinely replace older vehicles each year. In the field of concrete it is very important the scrappage of older vehicles are quick, due to the typically low space for storage on yards. US Concrete has experience in this area and would be able to make the scrappage requirements in a timely and seamless process. Having an partner with experience and contacts will be an advantage to New Jersey during the scrappage process.

Fleet Information Spreadsheet

See Attached

Existing Vehicle											Replacement Vehicle			Funding Request
Vehicle Number	VIN	Location	Make	Model	Model Year	Fuel Type	Annual Hours of Use	Annual Fuel Usage (Gallons)	Horsepower	Engine Model Year	Replacement Model Year	Replacement Fuel Type	Replacement Cost	
1	1M2AL02CX6M003357	Newark	MACKX	CT713	2006	Diesel	2000	7000	370	2005	2021	Diesel	$ 221,800.48	$ 55,450.12
2	1M2AL02CX6M003164	Newark	MACKX	CT-713	2006	Diesel	2000	7000	370	2005	2021	Diesel	$ 221,800.48	$ 55,450.12
3	1M2AL02C86M003163	Newark	MACKX	CT-713	2006	Diesel	2000	7000	370	2005	2021	Diesel	$ 221,800.48	$ 55,450.12
4	1M2AL02C66M003162	Newark	MACKX	CT-713	2006	Diesel	2000	7000	370	2005	2021	Diesel	$ 221,800.48	$ 55,450.12
5	1M2AL02C66M003159	Newark	MACKX	CT713	2006	Diesel	2000	7000	370	2005	2021	Diesel	$ 221,800.48	$ 55,450.12
6	1M2AL02C46M003161	Newark	MACKX	CV713	2006	Diesel	2000	7000	370	2005	2021	Diesel	$ 221,800.48	$ 55,450.12
7	1M2AL02C36M003359	Newark	MACKX	CV713	2006	Diesel	2000	7000	370	2005	2021	Diesel	$ 221,800.48	$ 55,450.12
8	1M2AL02C26M003160	Newark	MACKX	CT-713	2006	Diesel	2000	7000	370	2005	2021	Diesel	$ 221,800.48	$ 55,450.12
9	1M2AL02C16M003358	Newark	MACKX	CT713	2006	Diesel	2000	7000	370	2005	2021	Diesel	$ 221,800.48	$ 55,450.12
10	1M2AL02C16M003165	Newark	MACKX	CT713	2006	Diesel	2000	7000	370	2005	2021	Diesel	$ 221,800.48	$ 55,450.12
11	1M2AG12CX5M025433	Newark	MACKX	CV713	2005	Diesel	2000	7000	300	2004	2021	Diesel	$ 221,800.48	$ 55,450.12
12	1M2AG12CX3M007091	Newark	MACKX	CV713	2003	Diesel	2000	7000	300	2002	2021	Diesel	$ 221,800.48	$ 55,450.12
13	1M2AG12C85M025432	Newark	MACKX	CV713	2005	Diesel	2000	7000	300	2004	2021	Diesel	$ 221,800.48	$ 55,450.12
14	1M2AG12C85M025429	Newark	MACKX	CV713	2005	Diesel	2000	7000	300	2004	2021	Diesel	$ 221,800.48	$ 55,450.12
15	1M2AG12C65M020648	Newark	MACKX	CV713	2005	Diesel	2000	7000	300	2004	2021	Diesel	$ 221,800.48	$ 55,450.12
16	1M2AG12C45M025427	Newark	MACKX	CV713	2005	Diesel	2000	7000	300	2004	2021	Diesel	$ 221,800.48	$ 55,450.12
17	1M2AG12C35M025435	Newark	MACKX	CV713	2005	Diesel	2000	7000	300	2004	2021	Diesel	$ 221,800.48	$ 55,450.12
18	1M2AG12C15M025434	Newark	MACKX	CV713	2005	Diesel	2000	7000	300	2004	2021	Diesel	$ 221,800.48	$ 55,450.12
19	1M2AG12C13M007092	Newark	MACKX	CV713	2003	Diesel	2000	7000	300	2002	2021	Diesel	$ 221,800.48	$ 55,450.12
												Totals	**$ 4,214,209.12**	**$ 1,053,552.28**

Additional Supporting Documents

See Attached

Science & Environment

Climate change: The massive CO2 emitter you may not know about

By Lucy Rodgers
BBC News

17 December 2018

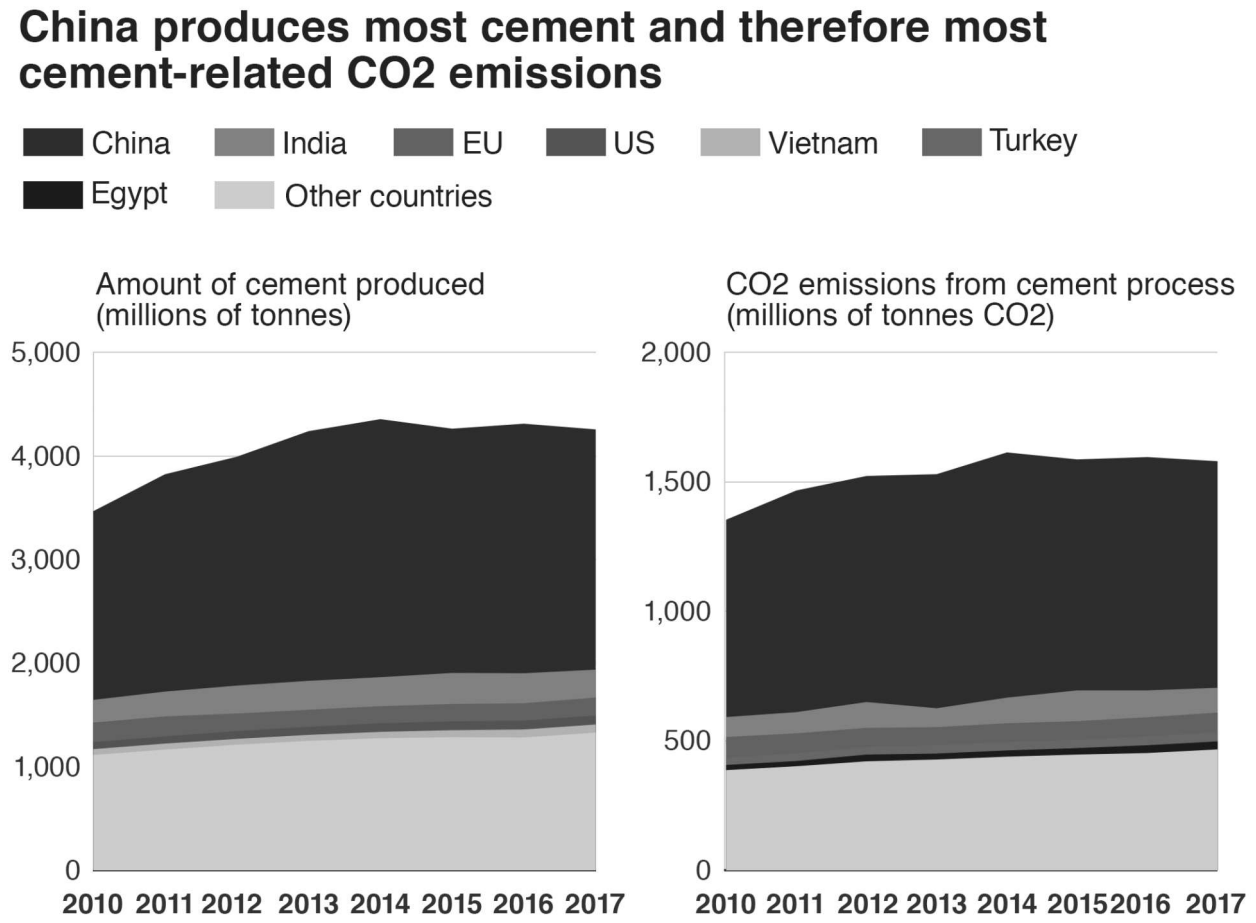
Climate change

Concrete is the most widely used man-made material in existence. It is second only to water as the most-consumed resource on the planet.

But, while cement - the key ingredient in concrete - has shaped much of our built environment, it also has a massive carbon footprint.

Cement is the source of **about 8% of the world's carbon dioxide (CO2) emissions,** according to think tank Chatham House.

If the cement industry were a country, it would be the third largest emitter in the world - behind China and the US. It contributes more CO2 than aviation fuel (2.5%) and is not far behind the global agriculture business (12%).



Cement industry leaders were **in Poland for the UN's climate change conference** - COP24 - to discuss ways of meeting the requirements of the Paris Agreement on climate change. To do this, annual emissions from cement will need to fall by at least 16% by 2030.

So, how did our love of concrete end up endangering the planet? And what can we do about it?

In praise of concrete

As the key building material of most tower blocks, car parks, bridges and dams, concrete has, for the haters, enabled the construction of some of the world's worst architectural eyesores.

In the UK, it helped the massive wave of post-World War Two development - much of it still dividing opinion - with several of the country's major cities, such as Birmingham, Coventry, Hull and Portsmouth, largely defined by the concrete structures from that building push.

But concrete is also the reason some of the world's most impressive buildings exist.

Sydney Opera House, the Lotus Temple in Delhi, the Burj Khalifa in Dubai as well as the magnificent Pantheon in Rome - boasting the largest unsupported concrete dome in the world - all owe their form to the material.

A mix of sand and gravel, a cement binder and water, concrete is so widely embraced by architects, structural engineers, developers and builders because it is a remarkably good construction material.

"It's affordable, you can produce it almost anywhere and it has all the right structural qualities that you want to build with for a durable building or for infrastructure," explains Felix Preston,

deputy research director at the Energy, Environment and Resources Department at Chatham House.

- **The battle to curb our appetite for concrete**
- **The hidden strengths of unloved concrete**
- **The illusion of concrete Britain**

Despite known durability problems with using steel reinforcement, which can crack concrete from the inside, it is still the go-to material across the world.

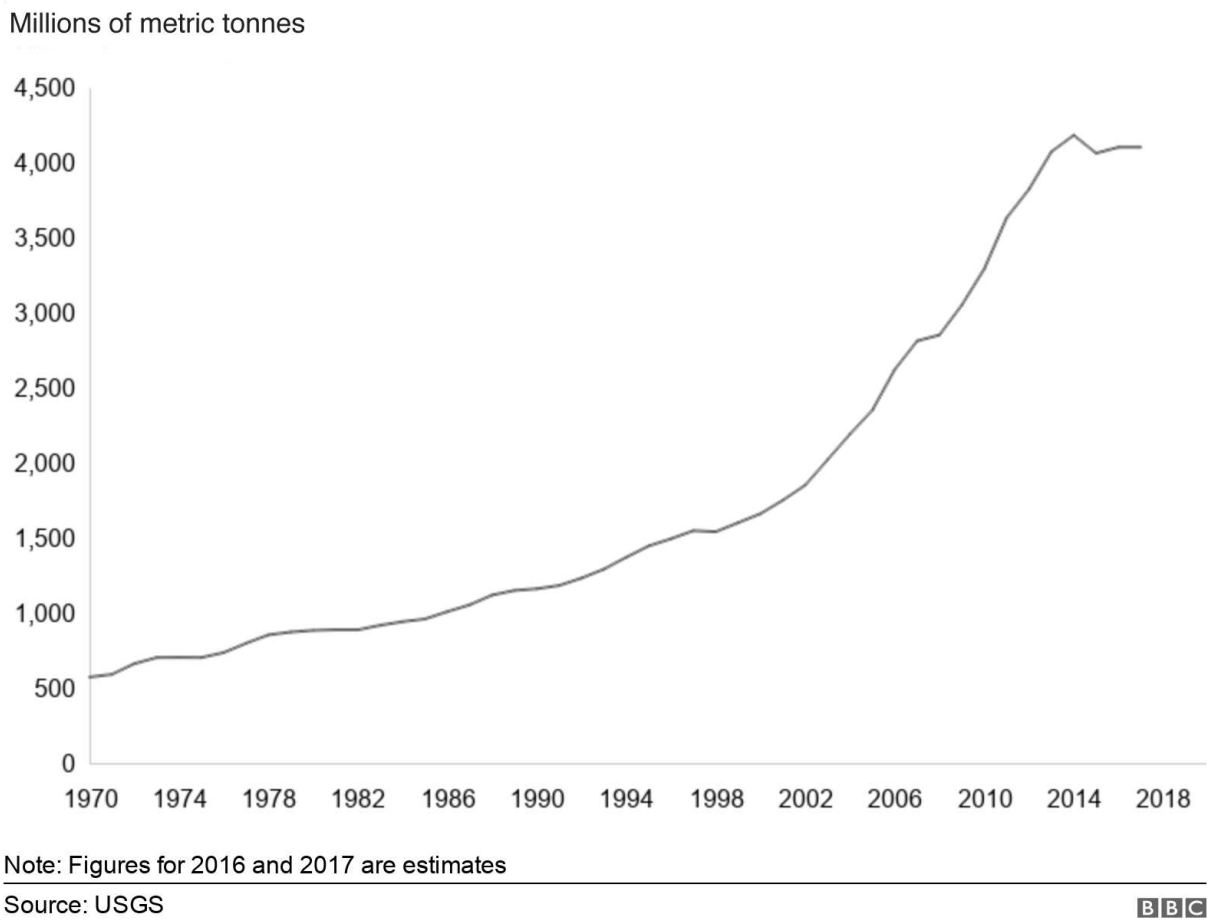
"Building without concrete, although it is possible, is challenging," says Mr Preston.

Growth of cement industry

It is these unrivalled attributes of concrete that have helped boost global cement production since the 1950s, with Asia and China accounting for the bulk of growth from the 1990s onwards.

Production has **increased more than thirtyfold since 1950 and almost fourfold since 1990.** China used more cement between 2011 and 2013 than the US did in the entire 20th Century.

Global cement production has risen sharply, but appears to have levelled off



Note: Figures for 2016 and 2017 are estimates

Source: USGS

BBC

But with Chinese consumption now appearing to level off, most future growth in construction is expected to happen in the emerging markets of South East Asia and sub-Saharan Africa - driven by rapid urbanisation and economic development.

The floor area of the world's buildings is projected to double in the next 40 years, say Chatham House researchers, requiring cement production to increase by a quarter by 2030.

Concrete has a long history

LEEDS LIBRARY

While many of us assume concrete is a recent addition to our cities, architects, and builders have actually been using cement-like binders for millennia.

The earliest use is believed to have been more than 8,000 years ago, with traders in Syria and Jordan using such binders to create floors, buildings and underground cisterns.

Later, the Romans were known to be masters of cement and concrete, building the Pantheon in Rome in 113-125AD, with its 43m-diameter free-standing concrete dome the largest in the world.

But the concrete used in our modern-built environment owes much of its make-up to a process patented in the early 19th Century by bricklayer Joseph Aspdin of Leeds.

His new technique of roasting limestone and clay in an oven and then grinding it to a powder to make "artificial stone" is now known as Portland cement - still the key ingredient in almost all modern concrete.

But, despite its ubiquitous presence, concrete's environmental credentials have come under increased scrutiny in the last couple of decades.

Not only does the production of Portland cement involve quarrying - causing airborne pollution in the form of dust - it also requires the use of massive kilns, which require large amounts of energy.

The actual chemical process of making cement also emits staggeringly high levels of CO2.

- **Climate change: Where we are in seven charts**
- **What is your diet's carbon footprint?**
- **Five things we've learnt from COP24**

'Action needed'

The sector has made progress - improvements in the energy-efficiency of new plants and burning waste materials instead of fossil fuels has seen the average CO2 emissions per tonne of output fall by 18% over the last few decades, according to Chatham House.

The newly-established Global Cement and Concrete Association (GCCA), currently representing about 35% of the world's cement production capacity and with a focus on sustainable development, **was at COP24.**

Chief executive Benjamin Sporton says the fact the organisation now exists "is a demonstration of the commitment of the industry to sustainability, including taking action on climate change".

The GCCA is due to publish a set of sustainability guidelines, which its membership will have to follow.

"By bringing together global players to provide leadership and focus, as well as delivering a detailed work programme, we can help ensure a sustainable future for cement and concrete, and for the needs of future generations," Mr Sporton says.

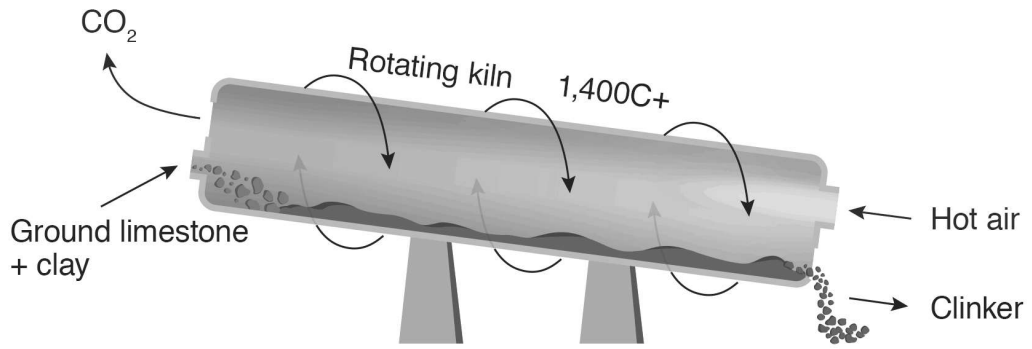
But despite the promise, Chatham House argues that the industry is reaching the limits of what it can do with current measures.

If the sector has any hope of meeting its commitments to the 2015 Paris Agreement on climate change, it will need to look at overhauling the cement-making process itself, not only reducing the use of fossil fuels.

'Clinker' - the big polluter

It is the process of making "clinker" - the key constituent of cement - that emits the largest amount of CO2 in cement-making.

How cement is made



Source: Carbon Brief, Chatham House BBC

- 1. Raw materials, mainly limestone and clay, are quarried and crushed
- 2. They are ground and mixed with other materials - such as iron ore or ash
- 3. They are fed into huge, cylindrical kilns and heated to about 1,450C (2,640F)
- 4. The process of "calcination" splits the material into calcium oxide and CO2
- 5. A new substance called clinker emerges as marble-sized grey balls
- 6. The clinker is cooled, ground and mixed with gypsum and limestone
- 7. The cement is transported to ready-mix concrete companies

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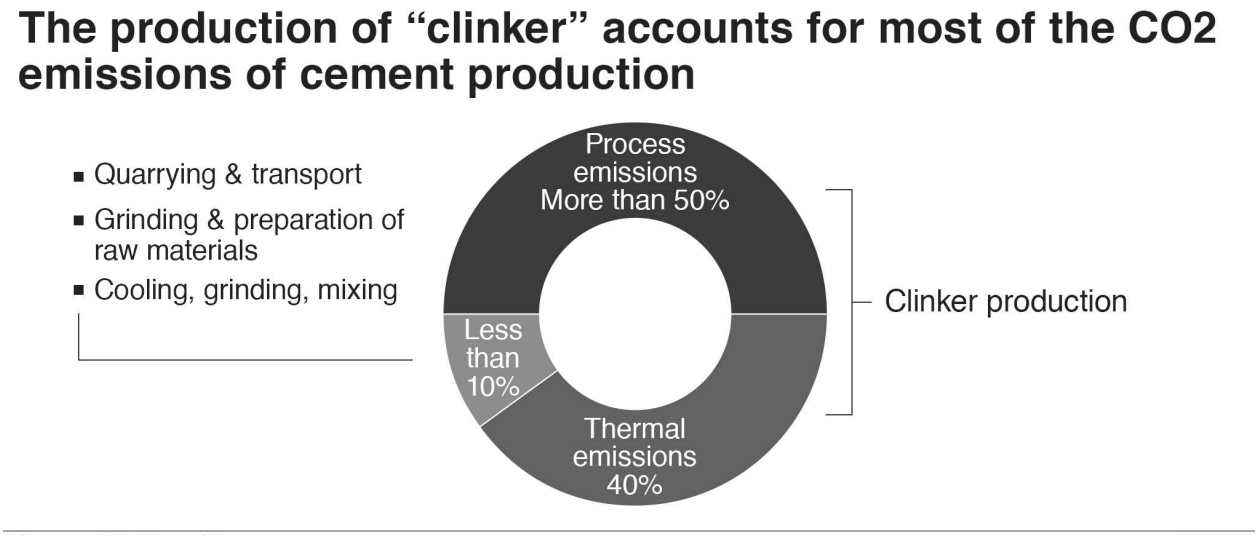
In 2016, **world cement production generated around 2.2 billion tonnes of CO2 - equivalent to 8% of the global total.** More than half of that came from the calcination process.

Together with thermal combustion, 90% of the sector's emissions could be attributed to the production of clinker.



Because of this, Mr Preston and his colleagues argue the sector urgently needs to pursue a number of CO2 reduction strategies.

Further efforts on energy efficiency, a move away from fossil fuels and pursuing carbon capture and storage will help, but can only do so much.

"We've got a long way to close the gap," Mr Preston says.

What the industry really needs to do is plough efforts into producing new types of cement, he argues. In fact, low-carbon cements and "novel cements" might do away with the need for clinker altogether.

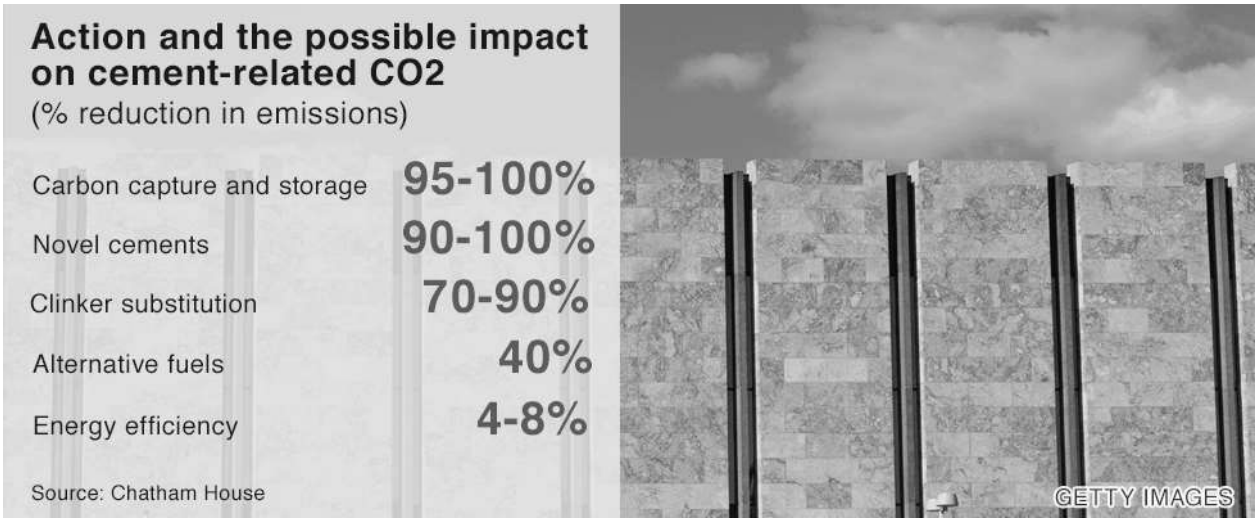
New cements

One of those trying to drum up greater support for such alternative cements is Ginger Krieg Dosier, co-founder and CEO of **BioMason - a start-up in North Carolina that uses trillions of bacteria to grow bio-concrete bricks.**

The technique, which involves placing sand in moulds and injecting it with microorganisms, initiates a process similar to the one that creates coral.

"I have a long fascination with marine cements and structures," explains Ms Krieg Dosier, a trained architect who was surprised to find no real green alternatives to bricks and masonry when she began research at an architectural firm more than 10 years ago.

The discovery led her to create her own solution, which, after years of development, now takes only four days. It happens at room temperature, without the need for fossil fuels or calcination - two of the main sources of the cement industry's CO2 emissions.



Ms Krieg Dosier believes green cements and technologies such as hers offer a solution to the sector's emissions issue.

"Traditional Portland-based cement production practices will continue to release CO2 due to its fundamental chemistry," she says, adding that rather than turning to carbon capture and storage, we should be investing more in techniques that actively remove carbon from the atmosphere.

"Alternative cements and binding technologies go beyond evolutionary CO2 capture to revolutionary methods that fundamentally sequester CO2."

'Disruptive forces'

Alongside such alternative cements, other "disruptive" forces are also beginning to drive change. Digitalisation, machine learning and an increasing awareness of sustainability are all having an impact on the cement industry's culture.

"It's partly changing because of how people want to live, but also because of our ability to dream up new and innovative structures and test those with computer models," says Mr Preston. "There's also the ability to build things more cheaply with robots - with automation."

But changing processes quickly enough to meet the cement industry's obligations will be a challenge.

The sector is dominated by a small number of major producers who are reluctant to experiment or change business models. Architects, engineers, contractors and clients are also, rather understandably, cautious about using new building materials.

"This quite slow-moving, difficult-to-change sector is starting to bump against these quite profound disruptions that we're starting to see in the built environment," says Mr Preston.

But, with very few low-carbon cements reaching commercialisation, and none being applied at scale in an industry where bigger and taller is often the ambition, it looks likely that sustained government support will be needed.

Without governments applying pressure on the industry or providing funding, it may not be possible to get the next generation of low-carbon cements out of the laboratory and into the market within the required timescale.

And the timescale is ever-shrinking.

The Intergovernmental Panel on Climate Change - the leading international body on global warming - last month argued the global average temperature rise needed to be kept below 1.5C - not 2C as noted in the Paris Agreement. This means CO2 emissions need to decline by 45% from 2010 levels by 2030.

Like other young companies, Ms Krieg Dosier describes the difficulties of simultaneously developing and marketing her products and scaling up manufacturing processes to compete within the wider construction industry.

But she thinks there are reasons to be optimistic.

"I do believe the construction industry is approaching a point where alternative materials will be more widely adopted," she says. "This is in part due to market demand, other innovative technologies and wider concern for climate change."

The cement industry, too, points to more optimistic assessments of the industry's progress on emissions and suggests that, across its lifetime, concrete could make a net climate benefit when all possible action is taken into account.

This includes re-carbonation (or the re-absorption of CO2 by cement), concrete's contribution to the energy efficiency of buildings, and innovation in the way cement is manufactured - including carbon capture and storage.

The GCCA says such innovation is its key priority in the months and years ahead. Projects are already underway and showing promise, it added.

But Mr Preston says it is imperative that governments and industry now act quickly at a time when global development is expected to rise but CO2 emissions need to fall.

"There's a desperate need for quality, affordable homes," he says. "There's a need for new infrastructure. We can only square this circle if we can dramatically improve the way that we build, so that overall these buildings are constructed with, as close as possible, net zero emissions."

Design by Lilly Huynh.

Related Topics

American Lung Association.
State of the Air

2020

State of the Air

In Memoriam

This report is dedicated to Janice E. Nolen,
the leading force behind the history of this report and
a tireless champion of lung health and healthy air.

Acknowledgments

The American Lung Association "State of the Air® 2020" is the result of the hard work of many people:

To produce the national report: Deb Brown, who leads the Mission Team; Paul G. Billings, who supervised the work; Janice E. Nolen, M.A., who directed the project, analyzed data, wrote the text and coordinated print and web presentations; Kevin M. Stewart, who assisted in the data analysis, writing and coordination of the report content and metro area assessments; Laura Kate Bender, Diana Van Vleet, Ronni Flannery and Liz Mueller, who integrated the Healthy Air Campaign with this report; Will Barrett, who compiled material for metro area assessments; Zach Jump, M.A., who converted the raw data into meaningful tables and comparisons and calculated all the population data; Susan Rappaport, M.P.H., who supervised the data analysis; John Balmes, M.D., who reviewed the science and health discussions; Neil Ballentine, who directed the online presentation; Todd Nimirowski, who designed and created the user experiences online; Lauren Innocenzi and Shanna Johnson, who managed content production online; Laura Lavelle, Carrie Emge and Elexis Rodgers, who developed the social sharing and digital engagement strategy; Julia Fitzgerald, Kim Lacina, Allison MacMunn, Stephanie Goldina, Gregg Tubbs and Erin Meyer, who coordinated internal and external communications and media outreach; Michael Albiero, who designed the logo and report cover; and Craig Finstad, who coordinated sharing the data with direct-mail donors.

For state-level outreach: Michael Seilback and Lance Boucher coordinated work with the state staff across the nation. Staff contacted state and local air directors to ensure that they were informed and had a chance to review the draft data.

Outside the American Lung Association: Allen S. Lefohn of A.S.L. and Associates, who compiled the data; Beaconfire RED Consulting, who uploaded the data to the website; and Our Designs, Inc., who designed the print version.

Great appreciation goes to the National Association of Clean Air Agencies who strove to make this report better through their comments, review and concerns. Many of their members reviewed and commented on the individual state data presented and the methodology to make this report more accurate. We also appreciate the assistance of the Association of Air Pollution Control Agencies, whose members also assisted in the review of the data from their states. We appreciate them as our partners in the fight against air pollution. This report should in no way be construed as a comment on the work any of these agencies do.

The American Lung Association assumes sole responsibility for the content of the American Lung Association "State of the Air® 2020."

American Lung Association
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Contents

The State of the Air 2020

The "State of the Air" 2020 found that, in 2016-2018, more cities had high days of ozone and short-term particle pollution compared to 2015-2017 and many cities measured increased levels of year-round particle pollution.

2020 marks the 50th anniversary of the Clean Air Act, the landmark law that has driven dramatic improvements in air quality over its history. This is critical because far too many communities reported air pollution that still threatens health, and climate change impacts continue to threaten to progress. Further, harmful revisions and setbacks to key protections currently in place or required under the Act threaten to make air quality even worse in parts of the country. "State of the Air" 2020 shows that we must not take the Clean Air Act for granted.

Too many cities across the nation experienced more ozone and more particle pollution in 2016-2018. Many reached or tied their highest levels ever.

The "State of the Air" 2020 report shows that too many cities across the nation increased the number of days when particle pollution, often called "soot," soared to often record-breaking levels. More cities suffered from higher numbers of days when ground-level ozone, also known as "smog," reached unhealthy levels. Many cities saw their year-round levels of particle pollution increase as well.

The "State of the Air" 2020 report adds to the evidence that a changing climate is making it harder to protect human health. The three years covered in this report ranked among the five hottest years on record globally. High ozone days and spikes in particle pollution followed, putting millions more people at risk and adding challenges to the work cities are doing across the nation to clean up.

The 2020 report—the 21st annual release—uses the most recent quality-assured air pollution data, collected by the federal, state and local governments and tribes in 2016, 2017 and 2018. The "State of the Air" 2020 report looks at levels of ozone and particle pollution found at official monitoring sites across the United States in those years. For comparison, the "State of the Air" 2019 report covered data from 2015, 2016 and 2017.

The report examines fine particle pollution (particulate matter smaller than 2.5 microns in diameter, also known as $PM_{2.5}$) in two separate ways: averaged year-round (annual average) and short-term levels (24-hour). For both ozone and short-term particle pollution, the analysis uses a weighted average number of days that allows recognition of places with higher levels of pollution. For the year-round particle pollution rankings, the report uses averages calculated and reported by the U.S. Environmental Protection Agency (EPA). (The full "State of the Air" 2020 methodology is included in a later chapter.)

Overall Trends

The "State of the Air" 2020 found that, in 2016-2018, millions more Americans were living in communities impacted by unhealthy levels of pollution in the form of more unhealthy ozone days, more particle pollution days and higher annual particle levels than was found in previous reports.

Nearly five in ten people—150 million Americans or approximately 45.8 percent of the population—live in counties with unhealthy ozone or particle pollution (with at least one F). That represents an increase from the past three reports: it's higher than the 141.1 million in the 2019 report (covering 2015-2017), 133.9 million in the 2018 report (covering 2014-2016) and 125 million in the 2017 report (covering 2013-2015). **More than 20.8 million people, or 6.4 percent of the population, live in the 14 counties that failed all three measures.**

Nearly five in 10 people live where the air is unhealthy.

Los Angeles remains the city with the worst ozone pollution in the nation, as it has been for 20 years of the 21-year history of the report. **Bakersfield, CA,** returned to the most-polluted slot for year-round particle pollution, while **Fresno-Madera-Hanford, CA,** returned to its rank as the city with the worst short-term particle pollution.

This shows growing evidence that a changing climate is making it harder to protect human health. All three years ranked among the five hottest years in history, increasing

high ozone days and widespread wildfires, putting millions more people at risk and adding challenges to the work cities are doing across the nation to clean up. Rollbacks of EPA cleanup rules and reduced Clean Air Act enforcement are further adding to these air quality challenges.

This marks the fourth report in a row that worsening air quality threatened the health of more people, despite other protective measures being in place. Climate change clearly drives the conditions that increase these pollutants. The nation must do more to address climate change and to protect communities from these growing risks to public health.

The Clean Air Act must remain intact and enforced to enable the nation to continue working to protect all Americans from the dangers of air pollution. As the nation celebrates the 50th anniversary of the Clean Air Act this year and the dramatic improvements in air quality over its history, everyone must ensure that the Clean Air Act's tools remain in place, funded and followed in order to protect the public.

The Lung Association will continue to champion the Clean Air Act and push for clean air for all, defending Americans against proposals to reverse and reduce protections in place and supporting new efforts to curb harmful pollution.

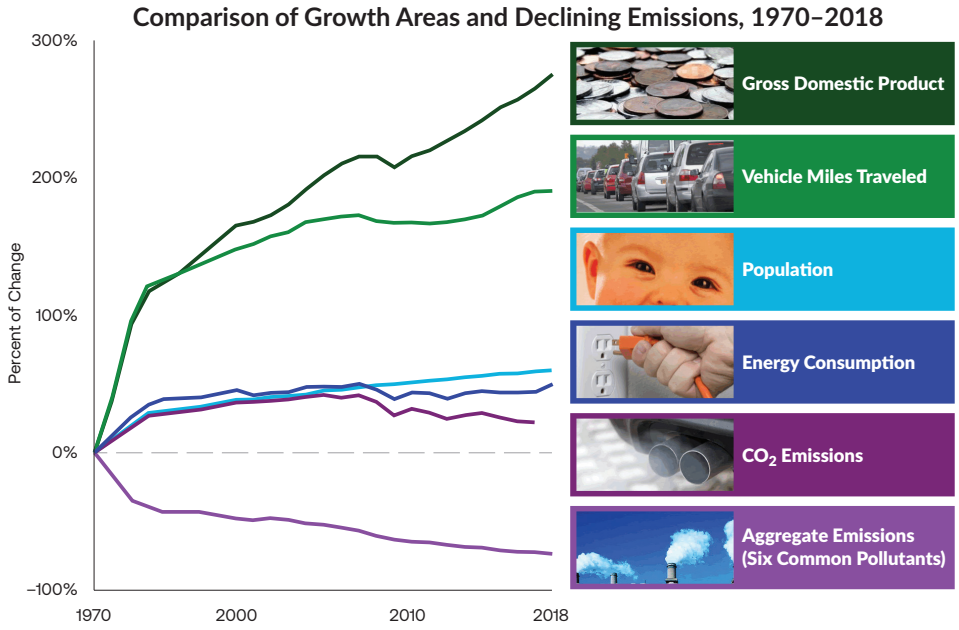


Figure 1: Air pollution emissions have dropped steadily since 1970 thanks to the Clean Air Act. Source: U.S. EPA, Air Trends: Air Quality National Summary, 2019.

Ozone Pollution

Far more people suffered unhealthy ozone pollution in 2016-2018 than in the last three reports. In 2016-2018, more than 137 million people lived in the 205 counties that earned an F for ozone.

That is significantly higher than in the 2019, 2018 and 2017 reports and is the highest since the 2016 report. This trend shows strong evidence of the impacts on air quality from the warmer years also reported in this period. Of the ten most polluted cities, six did worse than in the 2019 report, including some of the nation's largest metropolitan areas.

Why? Increased heat. The three years in this report were three of the five warmest on record in the United States: the year 2016 remains the warmest year on record, while 2017 is now the fourth warmest, and 2018 ranked fifth warmest. Warmer temperatures make ozone more likely to form and harder to clean up.

Changes in where ozone is worst in the U.S. continue a trend seen in the past four reports, where increased oil and gas extraction in the Southwest and cleanup of power plants in the eastern U.S. have shifted the cities that experienced the greatest number of unhealthy air days.

Ozone rankings are all based on unhealthy air days as recorded using the Air Quality Index adopted with the 2015 national air quality standard for ozone. In 2018, EPA officially designated all or parts of the 25 most polluted cities as "nonattainment" areas for that ozone air quality standard. That action requires these areas to take steps to clean up the sources of pollution going forward.

Los Angeles remains at the top of the list of most polluted cities for ozone, as it has been for all but one of the 21 reports, despite the metro area's continued fight against ozone. Los Angeles-Long Beach also recorded more unhealthy ozone days in this report, measured by weighted average.

In addition to Los Angeles, 13 others among the 25 cities with the worst ozone pollution each had a higher weighted average of unhealthy days in 2016-2018, including some of the nation's largest metropolitan areas: Phoenix, Las Vegas, Denver, Salt Lake City, Chicago and Milwaukee. Many smaller cities on that list also suffered from more ozone: Visalia, CA; Bakersfield, CA; El Centro, CA; El Paso-Las Cruces, TX-NM; Chico, CA; Fort Collins, CO; and Sheboygan, WI.

Eleven of the 25 cities with the worst ozone pollution had fewer unhealthy ozone days on average in 2016-2018. Those included San Jose-San Francisco-Oakland and Dallas-Fort Worth, each of which reached its fewest unhealthy ozone days ever. Other cities that had fewer high-ozone days included Fresno; Sacramento; San Diego; New York-Newark; Redding-Red Bluff, CA; Houston; Washington-Baltimore; Philadelphia; and Hartford, CT.

Regional Differences. Only seven cities among the worst for ozone are east of the Mississippi River, including the New York City metro area, where Fairfield County, CT, suffers from the highest levels in the eastern U.S. Others in the Northeast and Mid-Atlantic in the 25 most-polluted list are Washington-Baltimore; Philadelphia; and Hartford, CT. The Midwest has three: Chicago; Sheboygan, WI and Milwaukee. For the first time, with Atlanta's improvement, no city in the Southeast has any city on the most-ozone-polluted list.

Cities in the West and the Southwest continue to dominate the most-ozone-polluted list. California retains its historic distinction, as it is home to 10 of the 25 most polluted cities. The Southwest continues to fill most of the remaining slots, with eight of the 25 cities, including three in Texas—Houston, El Paso, and Dallas-Fort Worth. Colorado has two—Denver and Fort Collins. Arizona, Nevada and Utah each have one.

The findings show the continued impact of transported pollution that moves ozone and ozone precursors across state lines. For example, emissions generated in Chicago cross Lake Michigan to reach Sheboygan, WI. Fairfield County, CT, remains the county with the highest ozone in the eastern half of the nation because of the transported ozone and ozone precursors from upwind states.

Short-Term Particle Pollution

More cities experienced more days of spikes in particle pollution, compared to the 2019 report. Twenty-two of the 25 most polluted cities had more such days on average in the 2020 report. Many cities reached their highest number of such days ever reported.

More people experienced unhealthy spikes in particle pollution than in the last three reports. More than 53.3 million people suffered those episodes of unhealthy spikes in 86 counties where they live. In the 2019 report, the total was approximately 49.6 million people who experienced too many unhealthy days; in the 2018 report, approximately 35.1 million people; and in the 2017 report, approximately 43 million people.

Why? Wildfires in 2017 and 2018, especially in California, were a main reason for many of these spikes. In the western U.S., climate change has made more likely the conditions of heat and drought that promote wildfire hazards. In some communities, wood smoke from home heating, especially when worsened by stagnant air masses known as inversions, has also contributed to high levels of particle pollution.

Nine of the ten most polluted cities had more days when particle pollution reached unhealthy levels; four of those reached their worst exposure ever recorded. Of the 25 most polluted cities, 22 had more days on average in this year's report, with nine cities reaching their highest number of days on average ever recorded.

Fresno-Madera-Hanford, CA, returns to rank as the #1 most polluted city for short-term particle levels. This marks the third time Fresno-Madera-Hanford has ranked at the top in this category; the last period was from 2011-2013, covered in the 2015 report. Bakersfield, which had been ranked in that spot for eight of the last ten reports, shifted to the 2nd most polluted city.

Nine cities had their highest-ever weighted average number of days with spikes in particle levels: Fairbanks, AK; Yakima, WA; Redding-Red Bluff, CA; Phoenix, AZ; Spokane-Spokane Valley-Coeur d'Alene, WA-ID; Chico, CA; Salinas, CA; Santa Maria-Santa Barbara, CA; and Las Vegas, NV.

Just as people move around, so too does harmful pollution. Wildfire smoke is just one example of pollution threatening health far from the source.

Showing the impact of wildfires, this year's report marks the second year that Santa Maria-Santa Barbara, CA, showed up on the list of the most polluted for short-term particle pollution. Prior to the 2019 report, this city had been on the list of cleanest cities in the nation for the previous six years for the same pollutant.

Twelve other cities on the most-polluted list also suffered from more days with unhealthy levels of particle pollution. These include Bakersfield; San Jose-San Francisco; Los Angeles; Salt Lake City, UT; Sacramento; Visalia, CA; Logan, UT; Medford-Grants Pass, OR; El Centro, CA; Eugene, OR; Reno, NV; and Portland, OR.

Only three of the 25 most polluted cities improved and had fewer unhealthy air days on average than in the 2019 report. Though it improved from its worst performance in last year's report, Missoula, MT, remained among the nation's 10 most polluted cities. Two other cities on the list had fewer unhealthy days on average: Seattle and Pittsburgh.

In California, Montana, Oregon and Washington, extended wildfires increased the days when PM levels spiked during 2016-2018. The Los Angeles metro area had two days when levels spiked to "hazardous," the highest, "maroon" level in the Air Quality Index. The Chico, CA, metro area also recorded two hazardous days in Butte County, reaching its highest ever short-term weighted average. Eugene, OR, and rural counties Mendocino County, CA, Okanagan County, WA and Gallatin County, MT, each reached one hazardous day.

Wildfires are not the only source of high particle pollution days. Other contributing sources include wood stove use (especially in Fairbanks, AK), older diesel vehicles and equipment, and industrial sources (as in Pittsburgh, PA). Changes in weather patterns can create atmospheric inversions that trap particles in place, leading to days with spikes.

Pittsburgh is the only city in the 25 most polluted that is east of the Mississippi River.

Year-Round Particle Pollution

This year saw mixed results in terms of annual particle levels among the 26 most polluted cities in the United States: 13 of these cities saw increased particle levels; 11 cities improved; one was not included in last year's report; and one maintained the same levels as last year's report. Nine cities among the most polluted achieved their lowest ever annual particle levels. (The list of most polluted cities for annual particle pollution contains 26 cities instead of 25 due to a tie for 25th place.)

More people live in areas with unhealthy year-round particle pollution than in last year's report. More than 21.2 million people live in 19 counties where the annual average concentration of particle pollution was too high. This is higher than the 20.5 million Americans living in 18 counties in the 2019 report.

Bakersfield, CA returned to the rank of most polluted city for year-round particle pollution in 2016-2018. As with the short-term particle category, Bakersfield and Fresno also swapped rankings for annual particle pollution levels. Bakersfield returns to #1 most polluted in the nation while Fresno ranks #2, having tied its lowest annual average.

Thirteen of the 26 cities most polluted year-round by particle pollution saw increases over levels in the 2019 report: Bakersfield, CA; Visalia, CA; San Jose-San Francisco-Oakland, CA; Phoenix, AZ; El Centro, CA; Detroit-Warren-Ann Arbor, MI; McAllen-Edinburgh, TX; Philadelphia-Reading-Camden, PA-NJ-DE-MD; Sacramento-Roseville, CA; Shreveport-Bossier City-Minden, LA; Medford-Grants Pass, OR; Chico, CA and St. Louis-St. Charles-Farmington, MO-IL.

Eleven of the 26 most polluted cities had lower year-round particle levels, of which nine matched (Pittsburgh and Fresno) or newly achieved (Atlanta, Birmingham, Chicago, Cincinnati, Cleveland, Houston, and Indianapolis) their lowest respective averages ever.

Of the remaining two cities among the most polluted in the nation by annual particles, Los Angeles, CA, had the same level as last year, while Brownsville, TX, did not have annual particle pollution data available last year for comparison.

More cities among the most polluted by annual particle levels saw increases than improved in the 2020 report.

Nine cities among the most polluted for annual particle pollution fail to meet the current national air quality standards. However, evidence shows that no threshold exists for harmful effects from particle pollution—that is, that even levels lower than the official standard are not safe to breathe.

Overall, cities in the western U.S. dominate the list, with 15 cities among the 26 most polluted by annual particles. California continues to claim more places on the list than any other state, with six of the ten most polluted, including each of the worst five—and six of the nine cities that fail to achieve the national standard. Fairbanks, Phoenix, Pittsburgh and Detroit are also among the ten most polluted, with only Detroit achieving the national standard. Beyond cities in western states, the remainder of the most particle-polluted cities all meet the standard and are distributed throughout the Midwest, Southeast and Mid-Atlantic regions.

Cities with high power plant emissions as well as local, industrial sources continue to show up on the list, including Pittsburgh; Detroit; Cleveland; Philadelphia; Cincinnati; Birmingham, AL; Indianapolis; Shreveport, LA; and Atlanta.

Fortunately, year-round particle pollution continues to decline across most of the nation, unlike the days with high ozone and high short-term particle pollution.

Because of their high numbers and long duration, western wildfires contributed to some of the elevated annual averages in Western cities. That is especially true in California and Pacific Northwest communities that experienced major wildfire smoke impacts in 2018.

Cleanest Cities

Four cities rank on all three cleanest cities lists for ozone, year-round particle pollution and short-term particle pollution. They had zero high ozone or high particle pollution days and are among the 25 cities with the lowest year-round particle levels. All four repeat their ranking on this list. Listed alphabetically, these cities are:

- Bangor, ME
- Burlington-South Burlington, VT
- Urban Honolulu, HI
- Wilmington, NC

Nine other cities rank among the cleanest cities for both year-round and short-term levels of particle pollution. That means they had no days in the unhealthy level for short-

term particle pollution and are on the list of the cleanest cities for year-round particle pollution. Listed alphabetically below, they are:

- Appleton-Oshkosh-Neenah, WI
- Elmira-Corning, NY
- Gainesville-Lake City, FL
- Grand Island, NE
- Palm Bay-Melbourne-Titusville, FL
- Sioux Falls, SD
- Springfield, MA
- St. George, UT
- Syracuse-Auburn, NY

Seventeen other cities rank among the cleanest for ozone and short-term particle pollution. That means they had no days in the unhealthy level for ozone or for short-term particle pollution. Listed alphabetically below, they are:

- Bowling Green-Glasgow, KY
- Clarksville, TN-KY
- Corpus Christi-Kingsville-Alice, TX
- Fayetteville-Sanford-Lumberton, NC
- Fayetteville-Springdale-Rogers, AR
- Florence, SC
- Fort Smith, AR-OK
- Gadsden, AL
- Houma-Thibodaux, LA
- La Crosse-Onalaska, WI-MN
- Lincoln-Beatrice, NE
- Monroe-Ruston, LA
- Morgantown-Fairmont, WV
- Roanoke, VA
- Springfield, MO
- Tallahassee, FL
- Topeka, KS

Five cities rank on both lists for ozone and year-round particle pollution levels. These cities had no days in the unhealthy level for ozone pollution and are on the list of the cleanest cities for year-round particle pollution. Listed alphabetically below, they are:

- Anchorage, AK
- Bismarck, ND
- Casper, WY
- Duluth, MN-WI
- Salinas, CA

People at Risk

The "State of the Air" 2020 shows that too many people in the United States live where the air is unhealthy for them to breathe.

- **Nearly five in 10 people (45.8 percent) in the United States live in counties with unhealthful levels of either ozone or particle pollution.** Approximately 150 million Americans live in these 257 counties with unhealthful levels of either ozone or short-term or year-round particles.
  - **The number has increased—again.** This year's report found 8.76 million more Americans living in counties with unhealthy air compared to last year's report, and 15.9 million more Americans compared to the 2018 report. Fortunately, the total is still far below the 166 million in the years covered in the 2016 report (2012-2014).
  - **Why? One big reason is climate change.** Warmer weather, different rain patterns and major wildfires all contribute to continued challenges to long-term progress in reducing harmful air pollution under the Clean Air Act.
- **More than four in 10 (41.9 percent) of the people in the United States live in areas with unhealthy levels of ozone pollution.** More than 137 million people live in the 205 counties that earned an F for ozone in this year's report, approximately 3 million more people than in last year's report.
- **Nearly one in six people (16.3 percent) in the United States—more than 53.3 million—live in an area with too many days with unhealthful levels of particle pollution.** More people experienced those unhealthy spikes than in the last three reports. In the 2019 report, approximately 49.6 million people experienced too many unhealthy days; in the 2018 report, approximately 35.1 million people; and in the 2017 report, approximately 43 million people.

- **More than 21.2 million people (6.5 percent) suffered from unhealthy year-round levels of particle pollution in 2016-2018.** These people live in 19 counties where the annual average concentration of particle pollution was too high. This population estimate is higher than the 20.5 million Americans living in 18 counties with unhealthy levels of year-round particle pollution reported in the 2019 report that covered 2015-2017.
- **20.8 million people (6.4 percent) live in 14 counties with unhealthful levels of all three: ozone and short-term and year-round particle pollution in 2016-2018.** This is over 600,000 more people living in the 12 U.S. counties with unhealthy levels for all three measures than in the 2019 report that covered 2015-2017.

Many people are at greater risk because of their age; because they have asthma or other chronic lung disease or cardiovascular disease; because they have ever smoked; because they belong to communities of color or because they have low socioeconomic status. With the risks from airborne pollution being so great, the Lung Association seeks to inform people who may be in danger. The following list identifies the numbers of people in each at-risk group.

- **Older and Younger**—Nearly 22 million adults age 65 and over and 34.2 million children under age 18 live in counties that received an F for at least one pollutant. More than 2.8 million seniors and 5 million children live in counties failing all three tests.
- **Asthma**—2.5 million children and 10.6 million adults with asthma live in counties that received an F for at least one pollutant. More than 316,000 children and nearly 1.4 million adults with asthma live in counties failing all three tests.
- **Chronic Obstructive Pulmonary Disease (COPD)**—Nearly 7 million people with COPD live in counties that received an F for at least one pollutant. More than 750,000 people with COPD live in counties failing all three tests.
- **Lung Cancer**—More than 77,000 people were diagnosed with lung cancer and live in counties that received an F for at least one pollutant. Nearly 8,400 people were diagnosed with lung cancer and live in counties failing all three tests.
- **Cardiovascular Disease**—More than 9.3 million people with cardiovascular diseases live in counties that received an F for at least one pollutant. Over 1 million people live in counties failing all three tests.
- **Poverty**—Evidence shows that people who have low incomes may face higher risk from air pollution. More than 18.7 million people with incomes meeting the federal poverty definition live in counties that received an F for at least one pollutant. More than 3 million people in poverty live in counties failing all three tests.
- **Communities of Color**—Studies have found that Hispanics, Asians, American Indians/Alaska Natives and especially African Americans experienced higher risks of harm, including premature death, from exposure to air pollution. Approximately 74 million people of color live in counties that received at least one failing grade for ozone and/or particle pollution. Over 14 million people of color live in counties that received failing grades on all three measures.
- **People Who Have Ever Smoked**—There is some recent evidence suggesting that people who have a history of smoking are at greater risk of premature death and of lung cancer when subjected to long-term exposure to fine particle pollution. Over 14.3 million Americans who have ever smoked live in counties that received at least one F for particle pollution. Of those, some 5.5 million people live in counties that received failing grades for all three pollutants.

Threats and opportunities for the nation's air quality

After 50 years under the Clean Air Act, the nation has made significant strides in cleaning up harmful air pollution. However, this year's report shows that many communities are still waiting for healthy air, and that climate change poses current and growing threats to the nation's progress. Fully implementing and enforcing the Clean Air Act and addressing climate change requires a strong, coordinated effort on the part of our federal, state, tribal and local leaders, and the need is more urgent than ever.

Unfortunately, in almost every case, the current Administration has continued to attempt to roll back, weaken, or undermine core healthy air protections under the Clean Air Act. Not only has this Administration targeted specific Clean Air Act safeguards for rollbacks, it has also sought to weaken EPA's ability to set future protections. Many of the rollbacks are not yet final and face challenges in court. However, the impacts of some of this Administration's actions could be felt for years to come.

At the same time as the Administration is halting progress or even moving backward on addressing climate change, many members of the U.S. Congress have worked to advance policies to reduce greenhouse gas emissions. This critical work presents real opportunities for cleaning up air pollution and improving lung health. However, some climate proposals actually include provisions that would weaken the Clean Air Act, a tradeoff that could lead to more health harm from air pollution.

Below are key threats and opportunities for the nation's progress toward cleaner, healthier air, plus ways that you can help.

Opportunity: Congressional action on climate change

To protect public health from climate change, the nation needs urgent action in every arena—from the Administration to the U.S. Congress to state, local and tribal governments to the private sector. The Clean Air Act requires EPA to limit greenhouse gases because of the danger they pose to human health. Congressional action is critical too, and climate conversations and ideas have been proliferating on Capitol Hill.

There are many ways Congressional legislation could reduce emissions, like investing further in clean, renewable energy and incentivizing low- and zero-emission cars, buses and trucks. The Lung Association led a Declaration on Climate Change and Health with more than a dozen other leading national health organizations laying out five requirements for climate action. The nation needs climate policies that:

- Adopt science-based targets to prevent climate change above 1.5° C.
- Maximize benefits to health, reducing carbon and methane pollution while at the same time reducing other dangerous emissions from polluting sources.
- Ensure pollution is cleaned up in all communities, including those near polluting sources that have historically borne a disproportionate burden from air pollution.
- Leave the Clean Air Act fully in place. Any policy to address climate change must not weaken or delay the Clean Air Act or the authority that it gives EPA to reduce carbon emissions.
- Ensure communities have the tools and resources to identify, prepare for and adapt to the unique health impacts of climate change in their communities.
    - The nation's public and environmental health systems must have adequate resources to protect communities by identifying, preparing for and responding to the health impacts of climate change.
    - Community leaders must be able to adequately protect those whose health is most at risk, and provide access to uninterrupted, quality health care during and after disasters.

What you can do:

- Urge your members of Congress to support climate action to protect health, including the Climate Change Health Protection and Promotion Act. Take action now.

Congress must make certain that the Clean Air Act remains strong, fully implemented and fully enforced.

Threat 1: Weakening the Clean Air Act

The Clean Air Act remains a strong public health law put in place by an overwhelming bipartisan majority in Congress 50 years ago. Congress wrote the Clean Air Act to set up science-based, technology-fostering steps to protect public health by reducing pollution. Under the Clean Air Act, Congress directed EPA and each state to take steps to clean up the air to protect public health. For years, the "State of the Air" report chronicled the slow but steady improvement in the nation's air quality thanks to the Clean Air Act.

Now, that positive trend is threatened. Climate change is making pollution cleanup more difficult, and unfortunately, some in Congress seek changes to the Clean Air Act that would dismantle key provisions of the law and threaten the progress made over five decades.

Undermining the Clean Air Act itself is one of the fundamental goals of polluters and their allies. They have repeatedly challenged Clean Air Act provisions in court, and have repeatedly lost, so now they seek to weaken the law. Proposed efforts include exempting certain polluting facilities from some emissions controls, delaying science-based updates to air pollution standards and undermining public health as the core premise of the Act's key pollution limits.

Another emerging threat is the idea that legislation to address climate change must come at the price of weakening the Clean Air Act. Several bills have been introduced that would put a fee or price on carbon, but would also postpone or permanently restrict EPA's ability to reduce greenhouse gas emissions. We don't accept this trade-off. The Clean Air Act can and should work hand-in-hand with new laws in Congress to address climate change. Now is not the time to remove tools from the nation's toolbox to address this urgent challenge.

To protect the lives and health of millions of Americans, the Lung Association calls on Congress to reject attempts to weaken the Clean Air Act and make certain the law remains strong, fully implemented and fully enforced.

What you can do:

- Spread the word that some climate change legislation would actually weaken the Clean Air Act.

Threat 2: Considering outdated particle and ozone pollution limits

A fundamental reason for the success of the Clean Air Act is the requirement that EPA base decisions and actions on up-to-date science to protect public health. EPA has to periodically review its national limits on ozone and particle pollution (as well as four other pollutants) based on the current science and update them if necessary to reflect how much of each pollutant is safe to breathe. This requires ensuring that independent expert scientists regularly analyze current, peer-reviewed research and then provide their conclusions and perspectives to the EPA staff scientists and the Administrator. This process is critical. Over the years, research has shown that these pollutants are more dangerous than was known previously. In this way, the Clean Air Act requires EPA to make sure the national ozone and particle pollution standards protect Americans' health.

However, in 2018, the agency put forward a very aggressive timeline for completing a full review of both the ozone and particulate matter standards before the end of 2020.[1] Such a shortened review has severely limited what has historically been a thorough assessment of the science. The current EPA also removed independent science advisors from key advisory committees, including the Clean Air Scientific Advisory Committee (CASAC), and replaced them with people with far less experience in the research or who were paid by polluting industries.[2] EPA also dismissed a panel of experts who had been providing advice based on their deep understanding of the complex research on particle pollution. Many former participants and independent

health and medical groups, including the Lung Association, urged EPA to reinstitute the panel.[3] Former chairs and members of CASAC have raised concerns about the lack of scientific expertise in the new members of the committee, as well as the dramatically reduced capacity for scientific reviews.[4]

With these changes to the process, in 2020, EPA proposed keeping the current limits on particle pollution in place, and is expected to do the same for ozone pollution—despite the fact that science has shown for years that these limits are too weak.

What you can do:

- Tell EPA today that they need to set strong limits on particle and ozone pollution that protect the public. Take action now.

Threat 3: Dramatically weakening cleaner cars standards

In 2020, EPA and the Department of Transportation finalized rules to weaken limits on greenhouse gas emissions from cars, SUVs and personal trucks for model year 2021-2026 vehicles. Weakening these cleaner cars standards will not only greatly slow progress in cleaning up climate pollution from the transportation sector, but will also cause additional premature deaths from air pollution.

Even more drastically, in 2019, the Administration decided to attack the rights states have to set stronger standards to protect their residents. Under the Clean Air Act, California has the right to establish its own, stronger emissions standards for cars and trucks, and other states have the option of adopting California's standards. The Administration formally revoked California's permission to set its own limits on greenhouse gas emissions for cars, SUVs and light trucks, setting off a heated legal battle.

California's Clean Air Act authority to set more protective emissions standards has helped drive lifesaving reductions in harmful pollution from vehicles nationwide; maintaining this authority is critical. The Lung Association strongly opposed these rollbacks and recruited nearly 100 national, state and local health organizations to join comments to EPA in opposition.[5]

What you can do:

- Drive less. Combine trips, walk, bike, carpool or vanpool, and use buses, subways or other alternatives to driving.
- Support community plans that provide ways to get around that don't require a car, such as more sidewalks, bike trails and transit systems.

Threat 4: Putting limits on mercury and air toxics at risk

In April 2020, EPA finalized a proposal that could undermine the Mercury and Air Toxics Standards, lifesaving protections that are fully implemented, widely supported, and successful in reducing a long list of dangerous emissions. In its proposal, EPA deliberately undercounted the benefits of these protections.

EPA adopted the Mercury and Air Toxics Standards in 2011 to limit emissions of mercury and other hazardous air pollutants, including carcinogens, like arsenic, acid gases and other dangerous toxins. Reducing these emissions from power plants results in the reduction of other harmful emissions at the same time. Since then, the standards have not only slashed mercury and air toxics emissions but have also reduced particulate matter, preventing thousands of premature deaths and asthma attacks every year. EPA has proposed not to count the benefits stemming from reductions of particulate matter and other pollutants not explicitly covered by the rule, which artificially tips the balance to make the rule appear less cost effective than it is. This approach to calculating benefits, by design, obscures the enormous positive health impacts resulting from the Mercury and Air Toxics Standards.

What you can do:

- Call on your members of Congress to oppose EPA's decision that threatens to undermine the Mercury and Air Toxics Standards. The standards have bipartisan

support, and your representative and senators need to hear from you so they speak up about this critical issue.

Threat 5: Censoring the science available for EPA's decisions

In March 2020, EPA issued a proposal that resurrected a dangerous effort at the agency to suppress sound science, misleadingly labeled "Strengthening Transparency in Regulatory Science." The proposed rule, which the Lung Association has deemed the "Censoring Science" proposal, would permit EPA to restrict the scientific studies the agency considers when it makes policy.

EPA's effort is under the guise of transparency because the proposal would undervalue or block studies based on data that, for privacy reasons, can't be made public. However, this effort is disingenuous. The proposed rule would exclude sound research from informing regulations or important scientific information. The rule would ignore or discount key health studies that show that particle pollution, for example, can cause premature death—because those health studies are based on personal medical data that cannot and should not be released.

Many databases that scientists use today do allow unrestricted access to their information, but others do not because of the need for patient confidentiality for subjects included in the research. The studies are available and transparent, but the private health data they are based on must be protected. Blocking the use of these key studies that have been through multiple independent reviews and show widespread harm from outdoor air pollutants introduces dangerous bias that could limit the evidence, risking weaker air pollution safeguards.

Even in the midst of the COVID-19 crisis, EPA is pushing ahead with the Censoring Science proposal. The Lung Association is leading health, medical, scientific and academic organizations in pushing back.

What you can do:

- Raise your voice. There's still time to sign our petition opposing EPA's efforts to censor science. Join us at www.Lung.org/savescience

Threat 6: Replacing the Clean Power Plan with dangerously weak standards

Climate change is a public health emergency. To address it, the nation must dramatically cut greenhouse gases, including carbon pollution. Power plants comprise the largest stationary source of carbon pollution in the United States. The electric sector produced 28 percent of all U.S. greenhouse gas emissions in 2017.[6] Unfortunately, the current EPA repealed a sweeping plan to limit carbon pollution from power plants, the Clean Power Plan, and has now finalized a new rule that will not only fail to meaningfully cut carbon, but could actually increase harmful emissions.

EPA's replacement for the Clean Power Plan could be worse than doing nothing at all.

The now-repealed Clean Power Plan was the only nationwide plan to clean up carbon pollution from power plants. Adopted in 2015, it would have delivered a flexible, practical toolkit for states to reduce carbon from power plants approximately 32 percent (below 2005 levels) by 2030. States could have chosen a variety of ways to cut carbon, including requiring cleaner fuels for existing utilities, improving energy efficiency, producing more clean energy or partnering with other states to jointly reduce carbon pollution. This would have not only tackled climate change, but also reduced ozone, particle pollution, and other air pollutants and immediately benefited people's health.

Even though EPA repealed the Clean Power Plan, the Clean Air Act still requires that the agency reduce carbon pollution from power plants. In 2019, EPA finalized into law a dangerous replacement, called the "Affordable Clean Energy" (ACE) Rule. The ACE rule rejects the strong menu of options to reduce emissions that states had under the Clean Power Plan. Instead, it sets only minimal, totally inadequate limits on carbon emissions at power plants themselves. Worse, independent scientists found that this rule could result

in dirtier power plants running more often, which would actually increase air pollution emissions and the risk of premature deaths.[7] In short, EPA's replacement for the Clean Power Plan could be worse than doing nothing at all.

The Lung Association led national health and medical organizations in speaking out in opposition to the ACE rule[8] and is suing the Administration to stop it.[9] The Clean Air Act requires that EPA address carbon pollution in a way that protects public health. The nation urgently needs a system-wide reduction in carbon dioxide emissions from power plants and other sources to combat climate change.

What you can do:

- Raise your voice. The Lung Association is taking EPA to court to get them to clean up climate pollution from power plants, but they're not the only ones who can act. Call on your states and local governments to switch to clean, renewable electricity to address climate change and protect public health.
- Reduce your electricity use. Turn off the lights and unplug appliances when you're not using them. Switch to more energy-efficient electric appliances. If you have the option in your community, buy power from clean, renewable sources.

Threat 7: Removing limits on methane emissions from the oil and gas industry

Natural gas is far from clean. Oil and gas production wells, processing plants, transmission pipelines and storage units emit harmful gases, including volatile organic compounds and methane, a potent greenhouse gas. For the last few years, "State of the Air" has reported elevated levels of unhealthy ozone in places where oil and gas production has expanded, even in largely rural counties in the West.

Despite this, EPA has taken multiple steps to weaken pollution limits for the industry that were set in 2016.[10] Most recently, the agency proposed in 2019 to entirely roll back methane standards for new oil and gas sources, which would also result in other dangerous pollution that could have been prevented. EPA's proposal would also prevent any limits on existing oil and gas industry sources, despite the fact that they are currently a major source of air pollution, including methane. We led hundreds of health professionals in raising their voices in opposition to EPA's efforts.[11]

What you can do:

- Raise your voice. Producing and burning natural gas for electricity creates air pollution and causes climate change. Call on your state and local governments to switch to clean, renewable electricity to address climate change and protect public health.
- Reduce your electricity use. Turn off the lights and unplug appliances when you're not using them. Switch to more energy-efficient electric appliances. If you have the option in your community, buy power from clean, renewable sources.

Threat 8: Cutting funding needed to clean up the air

The Trump Administration's proposed budget would greatly reduce the ability of EPA to protect public health.

The Clean Air Act set up smart, open processes for protecting Americans from air pollution, which have enabled the U.S. to reduce some of the most common pollutants by more than 70 percent. Still, these processes only work if EPA and state, local and tribal air agencies have the funding and staffing they need to implement and enforce the law. The Trump Administration has consistently proposed budgets that would greatly reduce the ability of EPA to protect public health, including slashing overall funding for the agency and reducing grants to support the work of state and local agencies and tribes to implement the requirements of the Clean Air Act and other critical laws.

The Lung Association calls on Congress to ensure that EPA has sufficient funding to protect public health with the full range of programs, including state, local and tribal grants. In many cases, key EPA and other public health programs need funding increases to keep pace with their role in protecting the public. Investment in clean air and public health protections is critical.

Threat 9: Chipping away at air pollution enforcement

EPA has issued several directives to roll back or undermine steps to implement the Clean Air Act's requirements for reducing major air pollutants, weakening both current pollution cleanup and likely future air pollution standards, including for ozone and particulate matter.

EPA proposed weakening "New Source Review" requirements, which would allow new polluting sources to add to the burden of unhealthy air in communities in several ways. The proposal would allow emissions to be calculated at an hourly rate as opposed to an annual one. The result would be that emissions could increase dramatically, but facilities would not have to install and operate modern pollution controls as long as their hourly rate of emissions did not increase. A similar bill, HR 172, has also been introduced in Congress.

In 2019, EPA finalized guidance that redefined "ambient air" to allow industries to pollute more at their own facilities. This decision reversed a decades-old policy that narrowed the area that an industry could use, which helped limit public exposure to its emissions.[12] The change will allow the industry to produce more emissions.

EPA also announced an end to its decades-old "Once-In, Always-In" policy, allowing facilities to increase toxic air emissions.[13] Under the old policy, if a facility emitted toxic air pollution above a certain threshold, it had to install and keep running strong pollution controls in the future. EPA's reversal weakened the requirements that these facilities keep running their controls, potentially resulting in some of them increasing their pollution to just under the legal threshold.

Finally, amidst the COVID-19 crisis, polluting industries have sought, and EPA has granted, compliance waivers. We strongly oppose a widespread relaxation of Clean Air Act compliance and enforcement. The COVID-19 pandemic and its disproportionate impacts on people with lung disease and other chronic conditions make the continued reduction of air pollution more important, not less.

What You Can Do

We at the Lung Association are long-time champions for healthy air! You can help reduce air pollution outdoors by taking these steps:

Speak Up Today:

Tell EPA to set stronger limits on particle and ozone pollution. The science is clear: The nation needs stronger limits on ozone and particle pollution to safeguard health. The current National Ambient Air Quality Standards for particulate matter and ozone are not sufficient to protect public health. Every family has the right to breathe healthy air—and the right to know when air pollution levels are unhealthy. Tell the Environmental Protection Agency to follow the science and set stronger limits on particle and ozone pollution.

Other Ways You Can Help:

Share your story. Do you or any member of your family have a personal reason to fight for healthier, cleaner air? Let us know why clean air matters to you. Your story helps us remind decision makers what is at stake when it comes to clean air.

Speak up to Congress. Urge your members of Congress to oppose EPA's proposal that could undermine the Mercury and Air Toxics Standards, to oppose legislation that would weaken the Clean Air Act, and to support climate action to protect health, including the Climate Change Health Protection and Promotion Act. Take action on climate and health now.

Support strong science. Sign our petition opposing EPA's efforts to censor science. Join us at www.Lung.org/savescience

Get involved locally. Participate in state and local efforts to clean up air pollution and

address climate change, including by supporting clean, renewable electricity and cleaner vehicles. To find your local air pollution control agency, go to www.4cleanair.org.

Step up to Curb Pollution in Your Community:

Drive less. Once stay-at-home orders are lifted, combine trips, walk, bike, carpool or vanpool, and use buses, subways or other alternatives to driving. Vehicle emissions are a major source of air pollution. Support community plans that provide ways to get around that don't require a car, such as more sidewalks, protected bike lanes and transit systems. If you must drive, switch to electric vehicles.

Use less electricity. Turn out the lights and use energy-efficient electric appliances. Generating electricity is one of the biggest sources of pollution, particularly in the eastern U.S. If you have the option in your community, buy power from clean, renewable sources.

Don't burn wood or trash. Burning firewood and trash is among the largest sources of particle pollution in many parts of the country. If you must use a fireplace or stove for heat, convert your wood stove to natural gas, which has far fewer polluting emissions. Compost and recycle as much as possible and dispose of other waste properly; don't burn it. Support efforts in your community to ban outdoor burning of construction and yard wastes. Avoid the use of outdoor hydronic heaters, also called outdoor wood boilers, which are frequently much more polluting than wood stoves.

Make sure your local school system requires cleaner school buses, which includes replacing them with electric buses or retrofitting old school buses with filters and other equipment to reduce emissions. Make sure your local schools don't idle their buses; this step can immediately reduce emissions. Parents shouldn't idle in their cars outside of schools either.

Thank you for being a champion for healthy air.

Endnotes

1. Memo from Scott Pruitt, EPA Administrator, Re: Back-to-Basics Process for Reviewing National Ambient Air Quality Standards, May 9, 2018.
2. Memo from EPA Administrator Scott Pruitt. Subject: Strengthening and Improving Membership on EPA Federal Advisory Committees. October 31, 2017.
3. The testimony took place at the December 12, 2018 meeting of the Chartered Clean Air Scientific Advisory Committee (CASAC) Public Meeting on Particulate Matter. All testimony is posted on that site.
4. Letter to Tony Cox, Chair Clean Air Scientific Advisory Committee from H. Christopher Frey, Jonathan M. Samet, et al. RE: CASAC Advice on the EPA's Integrated Review Plan for the Ozone National Ambient Air Quality Standards (External Review Draft). November 26, 2018.
5. Letter from health and medical organizations opposing EPA's proposed SAFE rule. https://www.lung.org/getmedia/7bcf3cd4-1d8b-4dfa-9acb-77d470e8654c/letter-from-health-orgs-cars.pdf.pdf
6. U.S. Environmental Protection Agency. *Inventory of Greenhouse Gas Emissions and Sinks: 1990-2016.* Washington, DC: U.S. EPA, 2017. Accessed at https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#electricity .
7. Driscoll C, Buonocore J, Levy J, Lambert K, et al. 2015 US power plant carbon standards and clean air and health co-benefits. Nature Climate Change 5: 525-540. Schwartz J, Buonocore J, Levy J, Driscoll C, Fallon Lambert K, and Reid S. Health Co-Benefits of Carbon Standard for existing Power Plants: Part 2 of the Co-Benefits of Carbon Standards Study. September 30, 2014. Harvard School of Public Health, Syracuse University, Boston University. Available at https://science-policy-exchange.org/sites/default/files/documents/Co-benefits%20of%20Carbon%20Standards%20Part%202%20Sept%202014.pdf.
8. These comments are available at http://www.Lung.org/get-involved/become-an-advocate/advocacy-archive.html.
9. U.S. Court of Appeals for the District of Columbia. Case # 19-1140. *American Lung Association, et al. v. EPA.*
10. U.S. EPA. Proposed Improvements 2016 New Source Performance Standards, September 11, 2018.
11. Letter from More than 660 Health Professionals in Support of Existing Methane Standard. https://www.Lung.org/getmedia/3cdda4b9-4e2f-4697-bd02-b4e2ab302d9a/letter-from-more-than-660.pdf.pdf
12. U.S. EPA. Draft Guidance: Revised Policy on Exclusions from "Ambient Air." November 2018.
13. U.S. EPA. News Release: Reducing Regulatory Burdens: EPA withdraws "once in always in" policy for major sources under Clean Air Act. January 25, 2018.

People at Risk from Short-Term Particle Pollution (24-Hour $PM_{2.5}$)

	Chronic Diseases					Age Groups						
In Counties where the Grades were:	**Adult Asthma**	**Pediatric Asthma**	**COPD**	**Lung Cancer**	**CV Disease**	**Under 18**	**65 and Over**	**Ever Smoked**	**Poverty**	**People of Color**	**Total Population**	**Number of Counties**
Grade A (0.0)	6,771,123	1,540,293	5,031,440	54,370	6,467,143	19,623,845	14,558,915	28,761,321	11,548,118	35,476,477	89,725,896	297
Grade B (0.3-0.9)	3,395,014	825,353	2,534,578	28,260	3,264,583	10,789,019	7,142,293	14,992,254	6,255,351	22,545,548	48,238,919	146
Grade C (1.0-2.0)	1,667,126	453,027	1,170,274	12,828	1,576,668	5,899,670	3,304,468	7,263,158	3,592,833	13,274,054	24,844,467	45
Grade D (2.1-3.2)	297,273	78,677	227,604	2,422	293,574	1,006,718	647,467	1,353,195	533,123	1,220,236	4,261,043	20
Grade F (3.3+)	3,650,451	805,614	2,072,796	22,256	2,943,875	12,296,306	7,698,577	14,323,380	6,472,755	29,407,484	53,316,714	86
National Population in Counties with $PM_{2.5}$ Monitors	16,365,270	3,835,792	11,435,112	124,583	15,088,287	51,343,463	34,641,698	69,123,521	29,256,648	104,469,732	228,178,923	645

People at Risk from Year-Round Particle Pollution (Annual $PM_{2.5}$)

	Chronic Diseases					Age Groups						
In Counties Where the Grades Were:	**Adult Asthma**	**Pediatric Asthma**	**COPD**	**Lung Cancer**	**CV Disease**	**Under 18**	**65 and Over**	**Ever Smoked**	**Poverty**	**People of Color**	**Total Population**	**Number of Counties**
Pass	13,797,857	3,247,886	9,842,855	106,862	12,901,183	42,746,567	29,184,251	58,662,062	24,290,620	84,732,794	191,137,371	519
Fail	1,399,442	323,798	767,735	8,595	1,098,607	5,048,346	2,913,516	5,499,833	3,112,327	14,329,923	21,224,804	19
National Population in Counties with $PM_{2.5}$ Monitors	16,365,270	3,835,792	11,435,112	124,583	15,088,287	51,343,463	34,641,698	69,123,521	29,256,648	104,469,732	228,178,923	645

People at Risk from Ozone[1]

	Chronic Diseases				Age Groups					
In Counties Where the Grades Were:	**Adult Asthma**	**Pediatric Asthma**	**COPD**	**CV Disease**	**Under 18**	**65 and Over**	**Poverty**	**People of Color**	**Total Population**	**Number of Counties**
Grade A (0.0)	1,485,752	361,796	1,149,162	1,520,167	4,612,771	3,484,440	2,872,939	7,809,825	20,784,760	170
Grade B (0.3-0.9)	1,949,843	446,903	1,580,840	2,067,129	5,690,920	4,802,293	3,020,587	8,174,133	26,703,636	156
Grade C (1.0-2.0)	2,646,783	609,876	2,023,691	2,615,173	7,893,302	5,762,978	4,256,792	12,510,496	35,749,159	162
Grade D (2.1-3.2)	1,548,364	344,073	1,093,194	1,439,274	4,628,217	3,330,503	2,336,936	9,669,752	21,124,073	71
Grade F (3.3+)	9,684,568	2,320,597	6,462,926	8,607,973	31,417,262	19,906,283	17,458,838	68,018,031	137,058,693	205
National Population in Counties with Ozone Monitors	17,448,325	4,115,709	12,413,590	16,386,810	54,651,603	37,598,655	30,170,408	106,556,189	243,244,612	803

Note:

1. "State of the Air" 2020 covers the period 2016-2018. The Appendix provides a full discussion of the methodology.

People at Risk In 25 U.S. Cities Most Polluted by Short-Term Particle Pollution (24-hour $PM_{2.5}$)

2020 Rank[1]	Metropolitan Statistical Areas	Total Population[2]	Under 18[3]	65 and Over[3]	Pediatric Asthma[4,6]	Adult Asthma[5,6]	COPD[7]	Lung Cancer[8]	CV Disease[9]	Ever Smoked[10]	People of Color[11]	Poverty[12]
1	Fresno-Madera-Hanford, CA	1,303,438	366,122	159,680	22,603	79,423	41,465	505	59,329	307,787	913,514	264,309
2	Bakersfield, CA	896,764	259,180	98,347	16,001	53,894	27,503	348	39,003	208,055	596,328	177,021
3	San Jose-San Francisco-Oakland, CA	9,666,055	2,083,848	1,441,150	128,651	647,292	353,447	3,744	513,313	2,532,824	5,940,594	910,851
4	Fairbanks, AK	98,971	23,861	10,204	1,708	6,791	4,061	55	4,617	31,974	30,429	8,104
5	Yakima, WA	251,446	74,480	34,524	5,444	16,911	8,764	135	13,490	66,527	144,155	40,961
6	Los Angeles-Long Beach, CA	18,764,814	4,270,638	2,583,214	263,657	1,234,623	662,425	7,264	956,017	4,815,313	13,006,958	2,440,945
7	Missoula, MT	118,791	22,315	18,506	1,189	9,790	5,034	62	7,707	41,975	12,853	14,719
7	Redding-Red Bluff, CA	243,956	53,947	49,942	3,331	16,467	9,990	94	15,013	65,808	57,523	37,668
7	Salt Lake City-Provo-Orem, UT	2,606,548	775,252	263,814	42,545	170,894	75,292	664	104,041	457,968	603,254	217,929
10	Phoenix-Mesa, AZ	4,911,851	1,164,393	775,920	93,868	379,311	261,519	2,194	337,858	1,505,840	2,203,881	600,386
11	Sacramento-Roseville, CA	2,619,754	599,091	414,668	36,986	173,009	96,594	1,013	141,372	679,845	1,234,160	338,884
12	Visalia, CA	465,861	142,848	53,292	8,819	27,348	14,170	181	20,216	105,845	335,036	102,451
13	Logan, UT-ID	140,794	42,891	13,952	2,427	8,983	3,916	39	5,308	25,208	22,401	17,024
14	Spokane-Spokane Valley-Coeur d'Alene, WA-ID	721,396	160,636	124,491	11,686	52,584	30,239	379	46,302	215,142	102,458	87,827
14	Seattle-Tacoma, WA	4,853,364	1,036,349	704,616	75,755	365,436	187,900	2,611	286,299	1,434,277	1,687,561	424,549
16	Pittsburgh-New Castle-Weirton, PA-OH-WV	2,612,492	493,652	526,956	47,773	214,077	160,936	1,678	219,828	920,378	363,815	291,201
17	Chico, CA	231,256	46,213	42,992	2,853	15,844	9,018	90	13,309	62,372	65,598	42,016
18	Medford-Grants Pass, OR	306,957	62,363	70,945	4,521	28,323	18,493	155	26,297	108,610	54,567	46,792
19	Salinas, CA	435,594	113,834	59,201	7,028	27,378	14,688	169	21,215	106,690	306,813	55,614
20	El Centro, CA	181,827	51,765	23,580	3,196	11,043	5,862	71	8,440	42,925	162,999	37,014
21	Santa Maria-Santa Barbara, CA	446,527	98,787	68,465	6,099	29,547	15,916	173	23,056	115,063	249,761	54,029
22	Eugene-Springfield, OR	379,611	69,868	73,392	5,065	36,150	21,366	192	29,676	133,980	70,215	67,217
23	Reno-Carson City-Fernley, NV	629,453	132,368	114,311	9,214	39,394	37,442	319	47,976	208,837	216,972	63,145
24	Portland-Vancouver-Salem, OR-WA	3,239,335	704,918	498,715	51,192	288,636	159,742	1,659	222,293	1,060,542	870,251	340,971
25	Las Vegas-Henderson, NV	2,276,993	525,247	342,326	36,562	139,723	124,078	1,152	156,491	722,232	1,300,943	314,702

Notes:

1. Cities are ranked using the highest weighted average for any county within that Combined Metropolitan Statistical Area or Metropolitan Statistical Area.
2. **Total population** represents the at-risk populations for all counties within the respective Combined Metropolitan Statistical Area or Metropolitan Statistical Area.
3. Those **under 18** and **65 and over** are vulnerable to $PM_{2.5}$ and are, therefore, included. They should not be used as population denominators for disease estimates.
4. **Pediatric asthma** estimates are for those under 18 years of age and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
5. **Adult asthma** estimates are for those 18 years and older and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
6. Adding across rows does not produce valid estimates. Adding the disease categories (asthma, COPD, etc.) will double-count people who have been diagnosed with more than one disease.
7. **COPD** estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
8. **Lung cancer** estimates are the number of new cases diagnosed in 2016.
9. **CV disease** is cardiovascular disease and estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
10. **Ever smoked** estimates are for adults 18 and over who have ever smoked 100 or more cigarettes in their life, based on state rates (BRFSS) applied to population estimates (U.S. Census).
11. **People of color** are anyone of Hispanic ethnicity or a race other than white.
12. **Poverty** estimates come from the U.S. Census Bureau and are for all ages.

People at Risk In 25 U.S. Cities Most Polluted by Year-Round Particle Pollution (Annual $PM_{2.5}$)

2020 Rank[1]	Metropolitan Statistical Areas	Total Population[2]	Under 18[3]	65 and Over[3]	Pediatric Asthma[4,6]	Adult Asthma[5,6]	COPD[7]	Lung Cancer[8]	CV Disease[9]	Ever Smoked[10]	People of Color[11]	Poverty[12]
1	Bakersfield, CA	896,764	259,180	98,347	16,001	53,894	27,503	348	39,003	208,055	596,328	177,021
2	Fresno-Madera-Hanford, CA	1,303,438	366,122	159,680	22,603	79,423	41,465	505	59,329	307,787	913,514	264,309
3	Visalia, CA	465,861	142,848	53,292	8,819	27,348	14,170	181	20,216	105,845	335,036	102,451
4	Los Angeles-Long Beach, CA	18,764,814	4,270,638	2,583,214	263,657	1,234,623	662,425	7,264	956,017	4,815,313	13,006,958	2,440,945
5	San Jose-San Francisco-Oakland, CA	9,666,055	2,083,848	1,441,150	128,651	647,292	353,447	3,744	513,313	2,532,824	5,940,594	910,851
6	Fairbanks, AK	98,971	23,861	10,204	1,708	6,791	4,061	55	4,617	31,974	30,429	8,104
7	Phoenix-Mesa, AZ	4,911,851	1,164,393	775,920	93,868	379,311	261,519	2,194	337,858	1,505,840	2,203,881	600,386
8	El Centro, CA	181,827	51,765	23,580	3,196	11,043	5,862	71	8,440	42,925	162,999	37,014
8	Pittsburgh-New Castle-Weirton, PA-OH-WV	2,612,492	493,652	526,956	47,773	214,077	160,936	1,678	219,828	920,378	363,815	291,201
10	Detroit-Warren-Ann Arbor, MI	5,353,002	1,167,571	878,042	100,227	467,545	361,975	3,258	405,383	1,903,919	1,711,850	766,528
11	Cleveland-Akron-Canton, OH	3,599,264	762,709	665,627	59,285	266,809	248,192	2,369	303,425	1,308,507	862,428	482,828
12	McAllen-Edinburg, TX	930,464	303,179	103,338	23,991	46,626	37,355	460	54,456	221,989	875,994	278,136
12	Philadelphia-Reading-Camden, PA-NJ-DE-MD	7,204,035	1,563,815	1,172,273	137,782	546,942	367,327	4,448	505,159	2,313,363	2,755,807	863,095
14	Birmingham-Hoover-Talladega, AL	1,315,071	299,130	216,148	39,477	107,332	104,605	863	131,219	445,278	458,703	188,402
14	Cincinnati-Wilmington-Maysville, OH-KY-IN	2,272,152	531,476	347,135	39,399	171,496	158,664	1,608	181,756	812,130	462,928	262,757
16	Indianapolis-Carmel-Muncie, IN	2,431,361	587,696	347,061	51,145	182,624	164,004	1,743	195,671	830,603	618,582	297,292
16	Missoula, MT	118,791	22,315	18,506	1,189	9,790	5,034	62	7,707	41,975	12,853	14,719
16	Sacramento-Roseville, CA	2,619,754	599,091	414,668	36,986	173,009	96,594	1,013	141,372	679,845	1,234,160	338,884
16	Shreveport-Bossier City-Minden, LA	436,341	104,477	72,410	9,142	29,706	33,398	282	39,553	144,433	203,797	85,607
20	Chicago-Naperville, IL-IN-WI	9,866,910	2,241,630	1,451,741	140,534	673,886	510,490	6,298	633,418	2,960,335	4,578,321	1,110,613
20	Medford-Grants Pass, OR	306,957	62,363	70,945	4,521	28,323	18,493	155	26,297	108,610	54,567	46,792
22	Houston-The Woodlands, TX	7,183,143	1,897,159	809,495	150,125	395,360	317,983	3,559	462,780	1,889,107	4,591,549	1,018,964
23	Atlanta-Athens-Clarke County-Sandy Springs, GA-AL	6,775,511	1,642,659	855,689	124,911	461,612	374,851	4,240	461,776	1,931,461	3,450,999	803,621
23	Chico, CA	231,256	46,213	42,992	2,853	15,844	9,018	90	13,309	62,372	65,598	42,016
25	Brownsville-Harlingen-Raymondville, TX	445,423	133,641	60,430	10,575	23,290	19,934	220	29,290	112,466	406,442	123,562
25	St. Louis-St. Charles-Farmington, MO-IL	2,909,777	643,945	483,131	50,287	208,874	193,154	1,965	220,425	969,825	748,141	337,275

Notes:

1. Cities are ranked using the highest weighted average for any county within that Combined Metropolitan Statistical Area or Metropolitan Statistical Area.
2. **Total population** represents the at-risk populations for all counties within the respective Combined Metropolitan Statistical Area or Metropolitan Statistical Area.
3. Those **under 18** and **65 and over** are vulnerable to $PM_{2.5}$ and are, therefore, included. They should not be used as population denominators for disease estimates.
4. **Pediatric asthma** estimates are for those under 18 years of age and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
5. **Adult asthma** estimates are for those 18 years and older and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
6. Adding across rows does not produce valid estimates. Adding the disease categories (asthma, COPD, etc.) will double-count people who have been diagnosed with more than one disease.
7. **COPD** estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
8. **Lung cancer** estimates are the number of new cases diagnosed in 2016.
8. **CV disease** is cardiovascular disease and estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
9. **Ever smoked** estimates are for adults 18 and over who have ever smoked 100 or more cigarettes in their life, based on state rates (BRFSS) applied to population estimates (U.S. Census).
10. **People of color** are anyone of Hispanic ethnicity or a race other than white.
11. **Poverty** estimates come from the U.S. Census Bureau and are for all ages.

People at Risk In 25 Most Ozone-Polluted Cities

2020 Rank[1]	Metropolitan Statistical Areas	Total Population[2]	Under 18[3]	65 and Over[3]	Pediatric Asthma[4,6]	Adult Asthma[5,6]	COPD[7]	CV Disease[8]	People of Color[9]	Poverty[10]
1	Los Angeles-Long Beach, CA	18,764,814	4,270,638	2,583,214	263,657	1,234,623	662,425	956,017	13,006,958	2,440,945
2	Visalia, CA	465,861	142,848	53,292	8,819	27,348	14,170	20,216	335,036	102,451
3	Bakersfield, CA	896,764	259,180	98,347	16,001	53,894	27,503	39,003	596,328	177,021
4	Fresno-Madera-Hanford, CA	1,303,438	366,122	159,680	22,603	79,423	41,465	59,329	913,514	264,309
5	Sacramento-Roseville, CA	2,619,754	599,091	414,668	36,986	173,009	96,594	141,372	1,234,160	338,884
6	San Diego-Chula Vista-Carlsbad, CA	3,343,364	722,408	469,454	44,599	222,727	118,450	170,564	1,832,022	372,148
7	Phoenix-Mesa, AZ	4,911,851	1,164,393	775,920	93,868	379,311	261,519	337,858	2,203,881	600,386
8	San Jose-San Francisco-Oakland, CA	9,666,055	2,083,848	1,441,150	128,651	647,292	353,447	513,313	5,940,594	910,851
9	Las Vegas-Henderson, NV	2,276,993	525,247	342,326	36,562	139,723	124,078	156,491	1,300,943	314,702
10	Denver-Aurora, CO	3,572,798	803,973	464,674	57,540	250,127	117,348	156,017	1,239,843	300,335
11	Salt Lake City-Provo-Orem, UT	2,606,548	775,252	263,814	42,545	170,894	75,292	104,041	603,254	217,929
12	New York-Newark, NY-NJ-CT-PA	22,679,948	4,852,039	3,601,621	332,013	1,727,257	999,220	1,399,513	11,714,237	2,699,912
13	Redding-Red Bluff, CA	243,956	53,947	49,942	3,331	16,467	9,990	15,013	57,523	37,668
14	Houston-The Woodlands, TX	7,183,143	1,897,159	809,495	150,125	395,360	317,983	462,780	4,591,549	1,018,964
15	El Centro, CA	181,827	51,765	23,580	3,196	11,043	5,862	8,440	162,999	37,014
16	Chicago-Naperville, IL-IN-WI	9,866,910	2,241,630	1,451,741	140,534	673,886	510,490	633,418	4,578,321	1,110,613
17	El Paso-Las Cruces, TX-NM	1,063,075	282,247	138,167	22,128	61,919	47,098	67,360	905,812	222,872
18	Chico, CA	231,256	46,213	42,992	2,853	15,844	9,018	13,309	65,598	42,016
19	Fort Collins, CO	350,518	68,703	54,938	4,917	25,460	12,323	16,693	61,373	36,054
20	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA	9,796,147	2,213,754	1,378,591	170,198	715,068	458,462	617,799	4,798,740	829,272
21	Dallas-Fort Worth, TX-OK	7,948,477	2,051,630	931,511	162,557	442,787	361,074	526,069	4,201,204	896,752
22	Sheboygan, WI	115,456	25,431	20,789	2,146	8,211	4,980	7,138	18,681	8,432
23	Philadelphia-Reading-Camden, PA-NJ-DE-MD	7,204,035	1,563,815	1,172,273	137,782	546,942	367,327	505,159	2,755,807	863,095
24	Milwaukee-Racine-Waukesha, WI	2,049,391	464,985	326,928	39,235	145,433	83,225	116,927	619,356	255,115
25	Hartford-East Hartford, CT	1,473,084	293,974	258,397	28,550	121,927	63,740	89,946	467,678	143,411

Notes:

1. Cities are ranked using the highest weighted average for any county within that Combined Metropolitan Statistical Area or Metropolitan Statistical Area.
2. **Total population** represents the at-risk populations for all counties within the respective Combined Metropolitan Statistical Area or Metropolitan Statistical Area.
3. Those **under 18** and **65 and over** are vulnerable to ozone and are, therefore, included. They should not be used as population denominators for disease estimates.
4. **Pediatric asthma** estimates are for those under 18 years of age and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
5. **Adult asthma** estimates are for those 18 years and older and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
6. Adding across rows does not produce valid estimates. Adding the disease categories (asthma, COPD, etc.) will double-count people who have been diagnosed with more than one disease.
7. **COPD** estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
8. **CV disease** is cardiovascular disease and estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
9. **People of color** are anyone of Hispanic ethnicity or a race other than white.
10. **Poverty** estimates come from the U.S. Census Bureau and are for all ages.

People at Risk in 25 Counties Most Polluted by Short-Term Particle Pollution (24-hour $PM_{2.5}$)

2020 Rank[1]	County	State	Total Population[2]	At-Risk Groups										High $PM_{2.5}$ Days in Unhealthy Ranges, 2016–2018	
				Under 18[3]	65 and Over[3]	Pediatric Asthma[4,6]	Adult Asthma[5,6]	COPD[7]	Lung Cancer[8]	CV Disease[9]	Ever Smoked[10]	People of Color[11]	Poverty[12]	Weighted Avg.[13]	Grade[14]
1	Fresno	CA	994,400	281,819	122,113	17,399	60,395	31,587	385	45,226	234,129	705,643	208,627	37.8	F
2	Kings	CA	151,366	40,964	15,516	2,529	9,283	4,580	59	6,416	35,590	103,277	25,481	36.2	F
3	Kern	CA	896,764	259,180	98,347	16,001	53,894	27,503	348	39,003	208,055	596,328	177,021	35.8	F
4	Stanislaus	CA	549,815	148,801	72,319	9,187	34,134	18,290	213	26,395	133,042	323,635	84,744	26.7	F
5	Fairbanks North Star Borough	AK	98,971	23,861	10,204	1,708	6,791	4,061	55	4,617	31,974	30,429	8,104	26.5	F
6	San Joaquin	CA	752,660	204,316	95,916	12,614	46,649	24,840	292	35,760	181,645	519,021	105,351	21.5	F
7	Ravalli	MT	43,172	8,246	11,138	439	3,398	2,415	23	3,745	15,880	3,154	6,628	19.8	F
8	Merced	CA	274,765	80,588	30,845	4,975	16,418	8,420	107	11,965	63,423	200,196	56,863	19.7	F
9	Yakima	WA	251,446	74,480	34,524	5,444	16,911	8,764	135	13,490	66,527	144,155	40,961	17.8	F
9	Lewis and Clark	MT	68,700	14,770	12,903	787	5,395	3,278	36	4,971	24,014	6,059	7,061	17.8	F
11	Madera	CA	157,672	43,339	22,051	2,676	9,745	5,298	61	7,688	38,068	104,594	30,201	17.2	F
11	Siskiyou	CA	43,724	8,802	11,160	543	3,062	1,998	17	3,066	12,428	10,636	7,396	17.2	F
13	Plumas	CA	18,804	3,173	5,345	196	1,378	927	7	1,435	5,635	3,123	2,317	16.2	F
14	Okanogan	WA	42,132	9,769	9,094	714	3,150	1,916	23	3,087	12,841	14,878	7,049	14.8	F
15	Lincoln	MT	19,794	3,609	5,670	192	1,557	1,182	10	1,840	7,431	1,491	3,964	14.3	F
16	Los Angeles	CA	10,105,518	2,188,893	1,375,957	135,136	673,459	358,245	3,911	515,500	2,622,021	7,466,160	1,409,155	13.8	F
17	Shoshone	ID	12,796	2,630	2,923	188	866	662	6	988	4,079	1,140	2,371	13.3	F
18	Missoula	MT	118,791	22,315	18,506	1,189	9,790	5,034	62	7,707	41,975	12,853	14,719	12.3	F
18	Utah	UT	622,213	207,710	48,050	11,399	38,230	15,362	159	20,064	100,766	111,686	57,136	12.3	F
18	Tehama	CA	63,916	15,363	12,389	948	4,205	2,533	25	3,797	16,786	20,718	10,749	12.3	F
21	Colusa	CA	21,627	5,907	3,163	365	1,344	745	8	1,087	5,273	14,202	2,350	12.0	F
22	Pinal	AZ	447,138	100,778	91,129	8,124	34,832	26,058	201	34,552	142,549	194,203	54,399	11.5	F
22	Salt Lake	UT	1,152,633	312,889	125,157	17,171	78,549	35,187	294	49,059	211,172	338,240	102,660	11.5	F
24	Sacramento	CA	1,540,975	363,909	217,601	22,467	100,345	54,282	596	78,584	391,898	859,537	217,138	11.3	F
24	Mendocino	CA	87,606	18,713	19,366	1,155	5,988	3,712	34	5,617	24,035	30,951	15,140	11.3	F

Notes:

1. Counties are ranked by weighted average. See note 13 below.
2. **Total population** represents the at-risk populations in counties with $PM_{2.5}$ monitors.
3. Those **under 18** and **65 and over** are vulnerable to $PM_{2.5}$ and are, therefore, included. They should not be used as population denominators for disease estimates.
4. **Pediatric asthma** estimates are for those under 18 years of age and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
5. Adult asthma estimates are for those 18 years and older and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
6. Adding across rows does not produce valid estimates. Adding the disease categories (asthma, COPD, etc.) will double-count people who have been diagnosed with more than one disease.
7. **COPD** estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
8. **Lung cancer** estimates are the number of new cases diagnosed in 2016.
9. **CV disease** is cardiovascular disease and estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
10. **Ever smoked** estimates are for adults 18 and over who have ever smoked 100 or more cigarettes in their life, based on state rates (BRFSS) applied to population estimates (U.S. Census).
11. **People of color** are anyone of Hispanic ethnicity or a race other than white.
12. **Poverty** estimates come from the U.S. Census Bureau and are for all ages.
13. The **weighted average** was derived by counting the number of days in each unhealthful range (orange, red, purple, maroon) in each year (2016-2018), multiplying the total in each range by the assigned standard weights (i.e., 1 for orange, 1.5 for red, 2.0 for purple, 2.5 for maroon), and calculating the average.
14. **Grade** is assigned by weighted average as follows: A=0.0, B=0.3-0.9, C=1.0-2.0, D=2.1-3.2, F=3.3+.

People at Risk in 25 Counties Most Polluted by Year-Round Particle Pollution (Annual $PM_{2.5}$)

				At-Risk Groups										$PM_{2.5}$ Annual, 2016–2018	
2020 Rank[1]	County	State	Total Population[2]	Under 18[3]	65 and Over[3]	Pediatric Asthma[4,6]	Adult Asthma[5,6]	COPD[7]	Lung Cancer[8]	CV Disease[9]	Ever Smoked[10]	People of Color[11]	Poverty[12]	Design Value[13]	Pass/ Fail[14]
1	Kern	CA	896,764	259,180	98,347	16,001	53,894	27,503	348	39,003	208,055	596,328	177,021	17.8	Fail
2	Kings	CA	151,366	40,964	15,516	2,529	9,283	4,580	59	6,416	35,590	103,277	25,481	16.8	Fail
3	Tulare	CA	465,861	142,848	53,292	8,819	27,348	14,170	181	20,216	105,845	335,036	102,451	16.1	Fail
4	Fresno	CA	994,400	281,819	122,113	17,399	60,395	31,587	385	45,226	234,129	705,643	208,627	15.0	Fail
5	Plumas	CA	18,804	3,173	5,345	196	1,378	927	7	1,435	5,635	3,123	2,317	14.7	Fail
5	San Bernardino	CA	2,171,603	572,278	251,361	35,331	135,544	70,099	841	99,838	524,916	1,564,843	317,514	14.7	Fail
7	Stanislaus	CA	549,815	148,801	72,319	9,187	34,134	18,290	213	26,395	133,042	323,635	84,744	14.2	Fail
8	Riverside	CA	2,450,758	616,126	353,122	38,038	156,550	85,478	949	124,180	612,354	1,600,121	307,511	13.9	Fail
9	San Joaquin	CA	752,660	204,316	95,916	12,614	46,649	24,840	292	35,760	181,645	519,021	105,351	13.8	Fail
10	Merced	CA	274,765	80,588	30,845	4,975	16,418	8,420	107	11,965	63,423	200,196	56,863	13.4	Fail
11	Fairbanks North Star Borough	AK	98,971	23,861	10,204	1,708	6,791	4,061	55	4,617	31,974	30,429	8,104	13.1	Fail
12	Pinal	AZ	447,138	100,778	91,129	8,124	34,832	26,058	201	34,552	142,549	194,203	54,399	13.0	Fail
13	Lincoln	MT	19,794	3,609	5,670	192	1,557	1,182	10	1,840	7,431	1,491	3,964	12.9	Fail
14	Madera	CA	157,672	43,339	22,051	2,676	9,745	5,298	61	7,688	38,068	104,594	30,201	12.8	Fail
15	Los Angeles	CA	10,105,518	2,188,893	1,375,957	135,136	673,459	358,245	3,911	515,500	2,622,021	7,466,160	1,409,155	12.7	Fail
16	Allegheny	PA	1,218,452	227,749	230,377	22,168	99,742	70,310	778	96,971	424,109	263,512	138,397	12.6	Fail
16	Imperial	CA	181,827	51,765	23,580	3,196	11,043	5,862	71	8,440	42,925	162,999	37,014	12.6	Fail
18	Klamath	OR	67,653	14,706	14,340	1,066	6,153	3,903	34	5,512	23,338	15,294	12,310	12.4	Fail
19	Hawaii	HI	200,983	43,553	42,032	4,444	14,524	6,922	92	13,054	62,784	140,018	30,903	12.3	Fail
20	Alameda	CA	1,666,753	342,510	230,510	21,146	112,623	59,859	645	86,118	438,363	1,148,783	147,394	12.0	Pass
21	Lemhi	ID	7,961	1,488	2,409	106	544	458	4	726	2,679	533	1,154	11.4	Pass
22	Wayne	MI	1,753,893	414,221	270,554	35,558	150,021	113,859	1,066	126,753	607,144	886,177	376,649	11.3	Pass
23	Shoshone	ID	12,796	2,630	2,923	188	866	662	6	988	4,079	1,140	2,371	11.2	Pass
24	Ventura	CA	850,967	194,553	132,387	12,011	56,290	31,535	329	46,171	221,522	468,345	76,206	11.0	Pass
24	Cuyahoga	OH	1,243,857	257,882	225,983	20,045	92,829	84,905	817	103,312	453,134	512,719	217,166	11.0	Pass

Notes:

1. Counties are ranked by design value. See note 13 below.
2. **Total population** represents the at-risk populations in counties with $PM_{2.5}$ monitors.
3. Those **under 18** and **65 and over** are vulnerable to $PM_{2.5}$ and are, therefore, included. They should not be used as population denominators for disease estimates.
4. **Pediatric asthma** estimates are for those under 18 years of age and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
5. **Adult asthma** estimates are for those 18 years and older and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
6. Adding across rows does not produce valid estimates. Adding the disease categories (asthma, COPD, etc.) will double-count people who have been diagnosed with more than one disease.
7. **COPD** estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
8. **Lung cancer** estimates are the number of new cases diagnosed in 2016.
9. **CV disease** is cardiovascular disease and estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
10. **Ever smoked** estimates are for adults 18 and over who have ever smoked 100 or more cigarettes in their life, based on state rates (BRFSS) applied to population estimates (U.S. Census).
11. **People of color** are anyone of Hispanic ethnicity or a race other than white.
12. **Poverty** estimates come from the U.S. Census Bureau and are for all ages.
13. The **design value** is the calculated concentration of a pollutant based on the form of the Annual $PM_{2.5}$ National Ambient Air Quality Standard, and is used by EPA to determine whether the air quality in a county meets the current (2012) standard (U.S. EPA).
14. **Grades** are based on EPA's determination of meeting or failure to meet the NAAQS for annual $PM_{2.5}$ levels during 2015-2017. Counties meeting the NAAQS received grades of Pass; counties not meeting the NAAQS received grades of Fail.

People at Risk in 25 Most Ozone-Polluted Counties

2020 Rank[1]	County	State	Total Population[2]	At-Risk Groups								High Ozone Days in Unhealthy Ranges, 2016–2018	
				Under 18[3]	65 and Over[3]	Pediatric Asthma[4,6]	Adult Asthma[5,6]	COPD[7]	CV Disease[8]	People of Color[9]	Poverty[10]	Weighted Avg.[11]	Grade[12]
1	San Bernardino	CA	2,171,603	572,278	251,361	35,331	135,544	70,099	99,838	1,564,843	317,514	174.3	F
2	Riverside	CA	2,450,758	616,126	353,122	38,038	156,550	85,478	124,180	1,600,121	307,511	138.8	F
3	Los Angeles	CA	10,105,518	2,188,893	1,375,957	135,136	673,459	358,245	515,500	7,466,160	1,409,155	111.0	F
4	Tulare	CA	465,861	142,848	53,292	8,819	27,348	14,170	20,216	335,036	102,451	105.2	F
5	Kern	CA	896,764	259,180	98,347	16,001	53,894	27,503	39,003	596,328	177,021	103.2	F
6	Fresno	CA	994,400	281,819	122,113	17,399	60,395	31,587	45,226	705,643	208,627	85.8	F
7	Nevada	CA	99,696	17,071	27,380	1,054	7,266	4,821	7,432	15,030	10,171	51.2	F
8	San Diego	CA	3,343,364	722,408	469,454	44,599	222,727	118,450	170,564	1,832,022	372,148	43.3	F
9	Placer	CA	393,149	87,441	76,906	5,398	26,478	15,911	23,831	109,849	27,596	40.7	F
10	El Dorado	CA	190,678	37,821	40,389	2,335	13,335	8,279	12,506	42,700	15,401	40.2	F
11	Maricopa	AZ	4,410,824	1,052,788	669,285	84,871	340,115	231,647	298,086	1,989,191	535,183	39.8	F
12	Kings	CA	151,366	40,964	15,516	2,529	9,283	4,580	6,416	103,277	25,481	39.5	F
13	Stanislaus	CA	549,815	148,801	72,319	9,187	34,134	18,290	26,395	323,635	84,744	31.8	F
14	Tuolumne	CA	54,539	9,158	14,279	565	3,969	2,562	3,923	11,026	6,417	31.7	F
15	Madera	CA	157,672	43,339	22,051	2,676	9,745	5,298	7,688	104,594	30,201	31.0	F
16	Clark	NV	2,231,647	517,629	328,692	36,032	136,812	120,615	151,858	1,289,911	307,977	30.2	F
17	Jefferson	CO	580,233	114,515	95,477	8,196	41,776	21,576	29,476	127,678	39,799	29.2	F
18	Salt Lake	UT	1,152,633	312,889	125,157	17,171	78,549	35,187	49,059	338,240	102,660	25.7	F
19	Sacramento	CA	1,540,975	363,909	217,601	22,467	100,345	54,282	78,584	859,537	217,138	25.0	F
20	Fairfield	CT	943,823	212,038	149,918	20,593	76,126	39,383	54,861	363,243	92,971	23.0	F
21	Tehama	CA	63,916	15,363	12,389	948	4,205	2,533	3,797	20,718	10,749	22.5	F
21	Mariposa	CA	17,471	2,828	4,882	175	1,289	859	1,325	3,551	2,569	22.5	F
23	Harris	TX	4,698,619	1,251,684	494,264	99,047	257,086	201,143	291,795	3,331,840	767,367	22.3	F
24	Merced	CA	274,765	80,588	30,845	4,975	16,418	8,420	11,965	200,196	56,863	22.0	F
25	Imperial	CA	181,827	51,765	23,580	3,196	11,043	5,862	8,440	162,999	37,014	19.7	F
25	Douglas	CO	342,776	88,978	40,935	6,368	22,775	11,168	14,826	61,999	8,975	19.7	F

Notes:

1. Counties are ranked by weighted average. See note 11 below.
2. **Total population** represents the at-risk populations in counties with $PM_{2.5}$ monitors.
3. Those **under 18** and **65 and over** are vulnerable to ozone and are, therefore, included. They should not be used as population denominators for disease estimates.
4. **Pediatric asthma** estimates are for those under 18 years of age and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
5. **Adult asthma** estimates are for those 18 years and older and represent the **estimated** number of people who had asthma in 2018 based on state rates (BRFSS) applied to population estimates (U.S. Census).
6. Adding across rows does not produce valid estimates. Adding the disease categories (asthma, COPD, etc.) will double-count people who have been diagnosed with more than one disease.
7. **COPD** estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
8. **CV disease** is cardiovascular disease and estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to population estimates (U.S. Census).
9. **People of color** are anyone of Hispanic ethnicity or a race other than white.
10. **Poverty** estimates come from the U.S. Census Bureau and are for all ages.
11. The **weighted average** was derived by counting the number of days in each unhealthful range (orange, red, purple) in each year (2016-2018), multiplying the total in each range by the assigned standard weights (i.e., 1 for orange, 1.5 for red, 2.0 for purple), and calculating the average.
12. **Grade** is assigned by weighted average as follows: A=0.0, B=0.3-0.9, C=1.0-2.0, D=2.1-3.2, F=3.3+.

Cleanest U.S. Cities for Short-Term Particle Pollution (24-hour $PM_{2.5}$)[1]

Metropolitan Statistical Area	Population
Albany-Schenectady, NY	1,171,593
Albuquerque-Santa Fe-Las Vegas, NM	1,156,187
Alexandria, LA	153,044
Appleton-Oshkosh-Neenah, WI	408,544
Bangor, ME	151,096
Birmingham-Hoover-Talladega, AL	1,315,071
Bloomington-Bedford, IN	213,430
Bloomington-Pontiac, IL	208,589
Boston-Worcester-Providence, MA-RI-NH-CT	8,285,407
Bowling Green-Glasgow, KY	231,638
Buffalo-Cheektowaga-Olean, NY	1,206,992
Burlington-Fort Madison-Keokuk, IA-IL-MO	104,588
Burlington-South Burlington-Barre, VT	279,223
Champaign-Urbana, IL	226,379
Charlotte-Concord, NC-SC	2,753,810
Charlottesville, VA	218,233
Cincinnati-Wilmington-Maysville, OH-KY-IN	2,272,152
Clarksville, TN-KY	305,825
Cleveland-Akron-Canton, OH	3,599,264
Corpus Christi-Kingsville-Alice, TX	536,555
Davenport-Moline, IA-IL	470,898
Dayton-Springfield-Kettering, OH	1,079,837
Decatur, IL	104,712
Eau Claire-Menomonie, WI	213,800
Edwards-Glenwood Springs, CO	132,713
Elmira-Corning, NY	180,050
Erie-Meadville, PA	357,124
Fayetteville-Sanford-Lumberton, NC	848,083
Fayetteville-Springdale-Rogers, AR	526,050
Florence, SC	204,961
Florence-Muscle Shoals, AL	147,149
Fort Smith, AR-OK	250,148
Fort Wayne-Huntington-Auburn, IN	606,645
Gadsden, AL	102,501
Gainesville-Lake City, FL	399,485
Grand Island, NE	75,808
Grand Rapids-Kentwood-Muskegon, MI	1,406,918
Green Bay-Shawano, WI	367,045
Greenville-Kinston-Washington, NC	282,969
Harrisonburg-Staunton, VA	258,284
Hartford-East Hartford, CT	1,473,084
Hot Springs-Malvern, AR	132,855
Houma-Thibodaux, LA	209,136
Huntsville-Decatur, AL	614,739
Jackson-Brownsville, TN	195,589
Johnstown-Somerset, PA	205,682
Kalamazoo-Battle Creek-Portage, MI	504,022
Kokomo-Peru, IN	117,933
La Crosse-Onalaska, WI-MN	136,808
Lafayette-Opelousas-Morgan City, LA	621,902
Lafayette-West Lafayette-Frankfort, IN	262,341
Lansing-East Lansing, MI	550,085
Lawton, OK	126,198
Lexington-Fayette-Richmond-Frankfort, KY	743,778
Lima-Van Wert-Celina, OH	217,707
Lincoln-Beatrice, NE	356,083
Little Rock-North Little Rock, AR	909,346
Louisville/Jefferson County-Elizabethtown-Bardstown, KY-IN	1,488,015
Lynchburg, VA	263,353
Memphis-Forrest City, TN-MS-AR	1,367,788
Mobile-Daphne-Fairhope, AL	648,157
Monroe-Ruston, LA	249,399
Montgomery-Selma-Alexander City, AL	462,747
Morgantown-Fairmont, WV	196,356
New Orleans-Metairie-Hammond, LA-MS	1,506,145
North Port-Sarasota, FL	1,044,060
Orlando-Lakeland-Deltona, FL	4,096,575
Owensboro, KY	119,114
Palm Bay-Melbourne-Titusville, FL	596,849
Parkersburg-Marietta-Vienna, WV-OH	150,188
Pensacola-Ferry Pass, FL-AL	531,631
Peoria, IL	403,217
Portland-Lewiston-South Portland, ME	643,099
Richmond, VA	1,282,442
Roanoke, VA	314,172
Rochester-Batavia-Seneca Falls, NY	1,162,893
Rockford-Freeport-Rochelle, IL	433,334
Saginaw-Midland-Bay City, MI	377,932
Salisbury-Cambridge, MD-DE	441,977
Scranton—Wilkes-Barre, PA	555,485
Sierra Vista-Douglas, AZ	126,770
Sioux Falls, SD	265,653
Springfield, MA	702,724
Springfield, MO	466,978
Springfield-Jacksonville-Lincoln, IL	308,124
St. George, UT	171,700
Syracuse-Auburn, NY	727,647
Tallahassee, FL	385,145
Tampa-St. Petersburg-Clearwater, FL	3,142,663
Terre Haute, IN	186,652
Topeka, KS	232,594
Tuscaloosa, AL	251,808
Urban Honolulu, HI	980,080
Virginia Beach-Norfolk, VA-NC	1,854,604
Waterloo-Cedar Falls, IA	169,659
Wheeling, WV-OH	140,045
Wichita-Winfield, KS	672,796
Wilmington, NC	294,436

Note:

1. Monitors in these cities reported no days when PM2.5 levels reached the unhealthful range using the Air Quality Index based on the 2006 NAAQS.

Top 25 Cleanest U.S. Cities for Year-Round Particle Pollution (Annual $PM_{2.5}$)[1]

2020 Rank[2]	Design Value[3]	Metropolitan Statistical Area	Population
1	3.6	Urban Honolulu, HI	980,080
2	4.1	Kahului-Wailuku-Lahaina, HI	167,207
3	4.4	Cheyenne, WY	98,976
4	4.7	Elmira-Corning, NY	180,050
5	4.9	Wilmington, NC	294,436
6	5.0	Casper, WY	79,115
7	5.1	Syracuse-Auburn, NY	727,647
7	5.1	Bellingham, WA	225,685
9	5.2	Springfield, MA	702,724
9	5.2	St. George, UT	171,700
9	5.2	Duluth, MN-WI	289,457
12	5.3	Bismarck, ND	128,320
13	5.5	Pueblo-Cañon City, CO	215,550
14	5.7	Palm Bay-Melbourne-Titusville, FL	596,849
14	5.7	Burlington-South Burlington-Barre, VT	279,223
16	5.8	Bangor, ME	151,096
16	5.8	Anchorage, AK	399,148
18	5.9	Grand Junction, CO	153,207
18	5.9	Sioux Falls, SD	265,653
18	5.9	Pittsfield, MA	126,348
18	5.9	Grand Island, NE	75,808
22	6.0	Colorado Springs, CO	738,939
23	6.3	Appleton-Oshkosh-Neenah, WI	408,544
23	6.3	Gainesville-Lake City, FL	399,485
23	6.3	Salinas, CA	435,594

Notes:

1. This list represents cities with the lowest levels of annual $PM_{2.5}$ air pollution.
2. Cities are ranked by using the highest design value for any county within that metropolitan area.
3. The design value is the calculated concentration of a pollutant based on the form of the Annual $PM_{2.5}$ National Ambient Air Quality Standard, and is used by EPA to determine whether the air quality in a county meets the current (2012) standard (U.S. EPA).

Cleanest U.S. Cities for Ozone Air Pollution[1]

Metropolitan Statistical Area	Population
Anchorage, AK	399,148
Bangor, ME	151,096
Bismarck, ND	128,320
Bowling Green-Glasgow, KY	231,638
Brownsville-Harlingen-Raymondville, TX	445,423
Brunswick, GA	118,456
Burlington-South Burlington-Barre, VT	279,223
Casper, WY	79,115
Clarksville, TN-KY	305,825
Corpus Christi-Kingsville-Alice, TX	536,555
Crestview-Fort Walton Beach-Destin, FL	278,644
Dothan-Ozark, AL	197,201
Duluth, MN-WI	289,457
Fairbanks, AK	98,971
Fargo-Wahpeton, ND-MN	267,964
Fayetteville-Sanford-Lumberton, NC	848,083
Fayetteville-Springdale-Rogers, AR	526,050
Florence, SC	204,961
Fort Smith, AR-OK	250,148
Gadsden, AL	102,501
Hickory-Lenoir-Morganton, NC	368,416
Houma-Thibodaux, LA	209,136
Jackson-Vicksburg-Brookhaven, MS	678,169
Joplin-Miami, MO-OK	210,077
La Crosse-Onalaska, WI-MN	136,808
Laredo, TX	275,910
Lincoln-Beatrice, NE	356,083
Longview, TX	286,143
McAllen-Edinburg, TX	930,464
Missoula, MT	118,791
Monroe-Ruston, LA	249,399
Morgantown-Fairmont, WV	196,356
Myrtle Beach-Conway, SC-NC	543,140
New Bern-Morehead City, NC	194,743
Panama City, FL	185,287
Rapid City-Spearfish, SD	165,764
Roanoke, VA	314,172
Rochester-Austin, MN	259,813
Rocky Mount-Wilson-Roanoke Rapids, NC	297,726
Salinas, CA	435,594
Savannah-Hinesville-Statesboro, GA	577,093
Scottsboro-Fort Payne, AL	123,121
Shreveport-Bossier City-Minden, LA	436,341
Springfield, MO	466,978
Tallahassee, FL	385,145
Topeka, KS	232,594
Tupelo-Corinth, MS	202,792
Urban Honolulu, HI	980,080
Wausau-Stevens Point-Wisconsin Rapids, WI	307,114
Wilmington, NC	294,436

Notes:

1. This list represents cities with no monitored ozone air pollution in unhealthful ranges using the Air Quality Index based on 2015 NAAQS.

Cleanest Counties for Short-Term Particle Pollution (24-hour $PM_{2.5}$)[1]

County	State	MSAs and Respective CSA[2]
Baldwin	AL	Mobile-Daphne-Fairhope, AL
Clay	AL	
Colbert	AL	Florence-Muscle Shoals, AL
Etowah	AL	Gadsden, AL
Jefferson	AL	Birmingham-Hoover-Talladega, AL
Madison	AL	Huntsville-Decatur, AL
Mobile	AL	Mobile-Daphne-Fairhope, AL
Montgomery	AL	Montgomery-Selma-Alexander City, AL
Morgan	AL	Huntsville-Decatur, AL
Russell	AL	Columbus-Auburn-Opelika, GA-AL
Tuscaloosa	AL	Tuscaloosa, AL
Arkansas	AR	
Crittenden	AR	Memphis-Forrest City, TN-MS-AR
Garland	AR	Hot Springs-Malvern, AR
Jackson	AR	
Polk	AR	
Pulaski	AR	Little Rock-North Little Rock, AR
Washington	AR	Fayetteville-Springdale-Rogers, AR
Apache	AZ	
Cochise	AZ	Sierra Vista-Douglas, AZ
La Paz	AZ	
Del Norte	CA	
Garfield	CO	Edwards-Glenwood Springs, CO
Rio Blanco	CO	
Fairfield	CT	New York-Newark, NY-NJ-CT-PA
Hartford	CT	Hartford-East Hartford, CT
New Haven	CT	New York-Newark, NY-NJ-CT-PA
New London	CT	Hartford-East Hartford, CT
Kent	DE	Philadelphia-Reading-Camden, PA-NJ-DE-MD
Sussex	DE	Salisbury-Cambridge, MD-DE
Alachua	FL	Gainesville-Lake City, FL
Brevard	FL	Palm Bay-Melbourne-Titusville, FL
Broward	FL	Miami-Port St. Lucie-Fort Lauderdale, FL
Escambia	FL	Pensacola-Ferry Pass, FL-AL
Hillsborough	FL	Tampa-St. Petersburg-Clearwater, FL
Leon	FL	Tallahassee, FL
Orange	FL	Orlando-Lakeland-Deltona, FL
Palm Beach	FL	Miami-Port St. Lucie-Fort Lauderdale, FL
Pinellas	FL	Tampa-St. Petersburg-Clearwater, FL
Polk	FL	Orlando-Lakeland-Deltona, FL
Sarasota	FL	North Port-Sarasota, FL
Seminole	FL	Orlando-Lakeland-Deltona, FL
Volusia	FL	Orlando-Lakeland-Deltona, FL
Honolulu	HI	Urban Honolulu, HI
Kauai	HI	
Black Hawk	IA	Waterloo-Cedar Falls, IA
Clinton	IA	Davenport-Moline, IA-IL
Johnson	IA	Cedar Rapids-Iowa City, IA
Lee	IA	Burlington-Fort Madison-Keokuk, IA-IL-MO
Montgomery	IA	
Muscatine	IA	Davenport-Moline, IA-IL
Palo Alto	IA	
Scott	IA	Davenport-Moline, IA-IL
Van Buren	IA	
Woodbury	IA	Sioux City, IA-NE-SD
Champaign	IL	Champaign-Urbana, IL
DuPage	IL	Chicago-Naperville, IL-IN-WI
Hamilton	IL	
Jersey	IL	St. Louis-St. Charles-Farmington, MO-IL
Kane	IL	Chicago-Naperville, IL-IN-WI
Macon	IL	Decatur, IL
McHenry	IL	Chicago-Naperville, IL-IN-WI
McLean	IL	Bloomington-Pontiac, IL
Peoria	IL	Peoria, IL
Randolph	IL	
Rock Island	IL	Davenport-Moline, IA-IL
Sangamon	IL	Springfield-Jacksonville-Lincoln, IL
St. Clair	IL	St. Louis-St. Charles-Farmington, MO-IL
Will	IL	Chicago-Naperville, IL-IN-WI
Winnebago	IL	Rockford-Freeport-Rochelle, IL
Allen	IN	Fort Wayne-Huntington-Auburn, IN
Clark	IN	Louisville/Jefferson County--Elizabethtown--Bardstown, KY-IN
Dubois	IN	
Floyd	IN	Louisville/Jefferson County--Elizabethtown--Bardstown, KY-IN
Greene	IN	
Howard	IN	Kokomo-Peru, IN
LaPorte	IN	Chicago-Naperville, IL-IN-WI
Monroe	IN	Bloomington-Bedford, IN
Spencer	IN	
St. Joseph	IN	South Bend-Elkhart-Mishawaka, IN-MI
Tippecanoe	IN	Lafayette-West Lafayette-Frankfort, IN
Vanderburgh	IN	Evansville, IN-KY
Vigo	IN	Terre Haute, IN
Whitley	IN	Fort Wayne-Huntington-Auburn, IN
Johnson	KS	Kansas City-Overland Park-Kansas City, MO-KS
Neosho	KS	
Sedgwick	KS	Wichita-Winfield, KS

Notes:

1. Monitors in these counties reported no days when $PM_{2.5}$ levels reached the unhealthful range using the Air Quality Index based on the 2006 NAAQS.
2. MSA and CSA are terms used by the U.S. Office of Management and Budget for statistical purposes. MSA stands for Metropolitan Statistical Area. CSA stands for Combined Statistical Area, which may include multiples and individual counties.

Cleanest Counties for Short-Term Particle Pollution (24-hour $PM_{2.5}$)[1] (cont.)

County	State	MSAs and Respective CSA[2]
Shawnee	KS	Topeka, KS
Sumner	KS	Wichita-Winfield, KS
Trego	KS	
Boyd	KY	Charleston-Huntington-Ashland, WV-OH-KY
Campbell	KY	Cincinnati-Wilmington-Maysville, OH-KY-IN
Christian	KY	Clarksville, TN-KY
Daviess	KY	Owensboro, KY
Fayette	KY	Lexington-Fayette--Richmond--Frankfort, KY
Hardin	KY	Louisville/Jefferson County--Elizabethtown--Bardstown, KY-IN
Jefferson	KY	Louisville/Jefferson County--Elizabethtown--Bardstown, KY-IN
Pulaski	KY	
Warren	KY	Bowling Green-Glasgow, KY
Jefferson Parish	LA	New Orleans-Metairie-Hammond, LA-MS
Lafayette Parish	LA	Lafayette-Opelousas-Morgan City, LA
Orleans Parish	LA	New Orleans-Metairie-Hammond, LA-MS
Ouachita Parish	LA	Monroe-Ruston, LA
Rapides Parish	LA	Alexandria, LA
St. Bernard Parish	LA	New Orleans-Metairie-Hammond, LA-MS
Tangipahoa Parish	LA	New Orleans-Metairie-Hammond, LA-MS
Terrebonne Parish	LA	Houma-Thibodaux, LA
West Baton Rouge Parish	LA	Baton Rouge, LA
Bristol	MA	Boston-Worcester-Providence, MA-RI-NH-CT
Essex	MA	Boston-Worcester-Providence, MA-RI-NH-CT
Franklin	MA	Springfield, MA
Hampden	MA	Springfield, MA
Hampshire	MA	Springfield, MA
Plymouth	MA	Boston-Worcester-Providence, MA-RI-NH-CT
Suffolk	MA	Boston-Worcester-Providence, MA-RI-NH-CT
Worcester	MA	Boston-Worcester-Providence, MA-RI-NH-CT
Baltimore	MD	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
Cecil	MD	Philadelphia-Reading-Camden, PA-NJ-DE-MD
Dorchester	MD	Salisbury-Cambridge, MD-DE
Garrett	MD	
Howard	MD	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
Kent	MD	
Montgomery	MD	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
Prince George's	MD	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
Androscoggin	ME	Portland-Lewiston-South Portland, ME
Cumberland	ME	Portland-Lewiston-South Portland, ME
Hancock	ME	
Kennebec	ME	
Oxford	ME	
Penobscot	ME	Bangor, ME
Allegan	MI	Grand Rapids-Kentwood-Muskegon, MI
Bay	MI	Saginaw-Midland-Bay City, MI
Chippewa	MI	
Genesee	MI	Detroit-Warren-Ann Arbor, MI
Ingham	MI	Lansing-East Lansing, MI
Kalamazoo	MI	Kalamazoo-Battle Creek-Portage, MI
Kent	MI	Grand Rapids-Kentwood-Muskegon, MI
Lenawee	MI	Detroit-Warren-Ann Arbor, MI
Macomb	MI	Detroit-Warren-Ann Arbor, MI
Manistee	MI	
Missaukee	MI	
Oakland	MI	Detroit-Warren-Ann Arbor, MI
St. Clair	MI	Detroit-Warren-Ann Arbor, MI
Washtenaw	MI	Detroit-Warren-Ann Arbor, MI
Becker	MN	
Cook	MN	
Lake	MN	Duluth, MN-WI
Scott	MN	Minneapolis-St. Paul, MN-WI
Stearns	MN	Minneapolis-St. Paul, MN-WI
Washington	MN	Minneapolis-St. Paul, MN-WI
Cass	MO	Kansas City-Overland Park-Kansas City, MO-KS
Cedar	MO	
Greene	MO	Springfield, MO
St. Louis	MO	St. Louis-St. Charles-Farmington, MO-IL
DeSoto	MS	Memphis-Forrest City, TN-MS-AR
Grenada	MS	
Harrison	MS	Gulfport-Biloxi, MS
Jackson	MS	Gulfport-Biloxi, MS
Cumberland	NC	Fayetteville-Sanford-Lumberton, NC
Davidson	NC	Greensboro--Winston-Salem--High Point, NC
Forsyth	NC	Greensboro--Winston-Salem--High Point, NC
Mecklenburg	NC	Charlotte-Concord, NC-SC
Montgomery	NC	
New Hanover	NC	Wilmington, NC
Pitt	NC	Greenville-Kinston-Washington, NC
Hall	NE	Grand Island, NE
Lancaster	NE	Lincoln-Beatrice, NE
Washington	NE	Omaha-Council Bluffs-Fremont, NE-IA
Belknap	NH	Boston-Worcester-Providence, MA-RI-NH-CT
Cheshire	NH	
Grafton	NH	

Notes:

1. Monitors in these counties reported no days when $PM_{2.5}$ levels reached the unhealthful range using the Air Quality Index based on the 2006 NAAQS.
2. MSA and CSA are terms used by the U.S. Office of Management and Budget for statistical purposes. MSA stands for Metropolitan Statistical Area. CSA stands for Combined Statistical Area, which may include multiples and individual counties.

Cleanest Counties for Short-Term Particle Pollution (24-hour $PM_{2.5}$)[1] (cont.)

County	State	MSAs and Respective CSA[2]
Hillsborough	NH	Boston-Worcester-Providence, MA-RI-NH-CT
Rockingham	NH	Boston-Worcester-Providence, MA-RI-NH-CT
Atlantic	NJ	Philadelphia-Reading-Camden, PA-NJ-DE-MD
Cumberland	NJ	Philadelphia-Reading-Camden, PA-NJ-DE-MD
Essex	NJ	New York-Newark, NY-NJ-CT-PA
Gloucester	NJ	Philadelphia-Reading-Camden, PA-NJ-DE-MD
Hudson	NJ	New York-Newark, NY-NJ-CT-PA
Hunterdon	NJ	New York-Newark, NY-NJ-CT-PA
Mercer	NJ	New York-Newark, NY-NJ-CT-PA
Middlesex	NJ	New York-Newark, NY-NJ-CT-PA
Morris	NJ	New York-Newark, NY-NJ-CT-PA
Ocean	NJ	New York-Newark, NY-NJ-CT-PA
Passaic	NJ	New York-Newark, NY-NJ-CT-PA
Warren	NJ	Allentown-Bethlehem-Easton, PA-NJ
Bernalillo	NM	Albuquerque-Santa Fe-Las Vegas, NM
Albany	NY	Albany-Schenectady, NY
Bronx	NY	New York-Newark, NY-NJ-CT-PA
Chautauqua	NY	
Erie	NY	Buffalo-Cheektowaga-Olean, NY
Essex	NY	
Kings	NY	New York-Newark, NY-NJ-CT-PA
Monroe	NY	Rochester-Batavia-Seneca Falls, NY
Onondaga	NY	Syracuse-Auburn, NY
Orange	NY	New York-Newark, NY-NJ-CT-PA
Queens	NY	New York-Newark, NY-NJ-CT-PA
Richmond	NY	New York-Newark, NY-NJ-CT-PA
Steuben	NY	Elmira-Corning, NY
Suffolk	NY	New York-Newark, NY-NJ-CT-PA
Allen	OH	Lima-Van Wert-Celina, OH
Athens	OH	
Belmont	OH	Wheeling, WV-OH
Butler	OH	Cincinnati-Wilmington-Maysville, OH-KY-IN
Clark	OH	Dayton-Springfield-Kettering, OH
Cuyahoga	OH	Cleveland-Akron-Canton, OH
Greene	OH	Dayton-Springfield-Kettering, OH
Hamilton	OH	Cincinnati-Wilmington-Maysville, OH-KY-IN
Lake	OH	Cleveland-Akron-Canton, OH
Lorain	OH	Cleveland-Akron-Canton, OH
Mahoning	OH	Youngstown-Warren, OH-PA
Medina	OH	Cleveland-Akron-Canton, OH
Montgomery	OH	Dayton-Springfield-Kettering, OH
Portage	OH	Cleveland-Akron-Canton, OH
Stark	OH	Cleveland-Akron-Canton, OH
Summit	OH	Cleveland-Akron-Canton, OH
Comanche	OK	Lawton, OK
Oklahoma	OK	Oklahoma City-Shawnee, OK
Pittsburg	OK	
Sequoyah	OK	Fort Smith, AR-OK
Armstrong	PA	Pittsburgh-New Castle-Weirton, PA-OH-WV
Bradford	PA	
Cambria	PA	Johnstown-Somerset, PA
Chester	PA	Philadelphia-Reading-Camden, PA-NJ-DE-MD
Erie	PA	Erie-Meadville, PA
Greene	PA	
Lackawanna	PA	Scranton--Wilkes-Barre, PA
Mercer	PA	Youngstown-Warren, OH-PA
Monroe	PA	New York-Newark, NY-NJ-CT-PA
Philadelphia	PA	Philadelphia-Reading-Camden, PA-NJ-DE-MD
Tioga	PA	
Washington	PA	Pittsburgh-New Castle-Weirton, PA-OH-WV
Westmoreland	PA	Pittsburgh-New Castle-Weirton, PA-OH-WV
York	PA	Harrisburg-York-Lebanon, PA
Kent	RI	Boston-Worcester-Providence, MA-RI-NH-CT
Providence	RI	Boston-Worcester-Providence, MA-RI-NH-CT
Washington	RI	Boston-Worcester-Providence, MA-RI-NH-CT
Chesterfield	SC	
Florence	SC	Florence, SC
Oconee	SC	Greenville-Spartanburg-Anderson, SC
Spartanburg	SC	Greenville-Spartanburg-Anderson, SC
Brookings	SD	
Minnehaha	SD	Sioux Falls, SD
Dyer	TN	
Lawrence	TN	Nashville-Davidson--Murfreesboro, TN
Madison	TN	Jackson-Brownsville, TN
Maury	TN	Nashville-Davidson--Murfreesboro, TN
Montgomery	TN	Clarksville, TN-KY
Putnam	TN	
Shelby	TN	Memphis-Forrest City, TN-MS-AR
Sumner	TN	Nashville-Davidson--Murfreesboro, TN
Nueces	TX	Corpus Christi-Kingsville-Alice, TX
Tarrant	TX	Dallas-Fort Worth, TX-OK
Uintah	UT	
Washington	UT	St. George, UT
Albemarle	VA	Charlottesville, VA
Charles City	VA	Richmond, VA
Chesterfield	VA	Richmond, VA
Frederick	VA	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA

Notes:

1. Monitors in these counties reported no days when $PM_{2.5}$ levels reached the unhealthful range using the Air Quality Index based on the 2006 NAAQS.
2. MSA and CSA are terms used by the U.S. Office of Management and Budget for statistical purposes. MSA stands for Metropolitan Statistical Area. CSA stands for Combined Statistical Area, which may include multiples and individual counties.

Cleanest Counties for Short-Term Particle Pollution (24-hour $PM_{2.5}$)[1] (cont.)

County	State	MSAs and Respective CSA[2]
Hampton City	VA	Virginia Beach-Norfolk, VA-NC
Henrico	VA	Richmond, VA
Loudoun	VA	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
Lynchburg City	VA	Lynchburg, VA
Norfolk City	VA	Virginia Beach-Norfolk, VA-NC
Richmond City	VA	Richmond, VA
Roanoke	VA	Roanoke, VA
Rockingham	VA	Harrisonburg-Staunton, VA
Salem City	VA	Roanoke, VA
Virginia Beach City	VA	Virginia Beach-Norfolk, VA-NC
Bennington	VT	
Chittenden	VT	Burlington-South Burlington-Barre, VT
Rutland	VT	
Ashland	WI	
Brown	WI	Green Bay-Shawano, WI
Eau Claire	WI	Eau Claire-Menomonie, WI
Forest	WI	
Grant	WI	
Kenosha	WI	Chicago-Naperville, IL-IN-WI
La Crosse	WI	La Crosse-Onalaska, WI-MN
Milwaukee	WI	Milwaukee-Racine-Waukesha, WI
Outagamie	WI	Appleton-Oshkosh-Neenah, WI
Ozaukee	WI	Milwaukee-Racine-Waukesha, WI
Sauk	WI	Madison-Janesville-Beloit, WI
Taylor	WI	
Vilas	WI	
Waukesha	WI	Milwaukee-Racine-Waukesha, WI
Berkeley	WV	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
Brooke	WV	Pittsburgh-New Castle-Weirton, PA-OH-WV
Cabell	WV	Charleston-Huntington-Ashland, WV-OH-KY
Hancock	WV	Pittsburgh-New Castle-Weirton, PA-OH-WV
Harrison	WV	
Kanawha	WV	Charleston-Huntington-Ashland, WV-OH-KY
Marion	WV	Morgantown-Fairmont, WV
Marshall	WV	Wheeling, WV-OH
Monongalia	WV	Morgantown-Fairmont, WV
Ohio	WV	Wheeling, WV-OH
Wood	WV	Parkersburg-Marietta-Vienna, WV-OH
Sweetwater	WY	

Notes:

1. Monitors in these counties reported no days when $PM_{2.5}$ levels reached the unhealthful range using the Air Quality Index based on the 2006 NAAQS.
2. MSA and CSA are terms used by the U.S. Office of Management and Budget for statistical purposes. MSA stands for Metropolitan Statistical Area. CSA stands for Combined Statistical Area, which may include multiples and individual counties.

Top 25 Cleanest Counties for Year-Round Particle Pollution (Annual $PM_{2.5}$)[1]

2020 Rank[2]	County	State	Design Value[3]
1	Burke	ND	2.9
1	Kauai	HI	2.9
3	Hillsborough	NH	3.4
3	Lake	MN	3.4
5	Essex	NY	3.6
5	Custer	SD	3.6
5	Honolulu	HI	3.6
8	Hancock	ME	3.7
8	Jackson	SD	3.7
10	Mercer	ND	3.8
10	Billings	ND	3.8
12	Gallatin	MT	4.0
12	Hughes	SD	4.0
14	Maui	HI	4.1
15	Litchfield	CT	4.2
15	McKenzie	ND	4.2
15	Ashland	WI	4.2
15	Forest	WI	4.2
19	La Paz	AZ	4.3
19	Park	WY	4.3
21	Laramie	WY	4.4
21	Cook	MN	4.4
23	Campbell	WY	4.5
23	Williams	ND	4.5
23	Belknap	NH	4.5
23	Vilas	WI	4.5

Notes:

1. This list represents counties with the lowest levels of monitored long-term $PM_{2.5}$ air pollution.
2. Counties are ranked by design value.
3. The design value is the calculated concentration of a pollutant based on the form of the Annual $PM_{2.5}$ National Ambient Air Quality Standard, and is used by EPA to determine whether the air quality in a county meets the current (2012) standard (U.S. EPA).

Cleanest Counties for Ozone Air Pollution[1]

County	State	Metropolitan Statistical Area
Denali Borough	AK	
Fairbanks North Star Borough	AK	Fairbanks, AK
Matanuska-Susitna Borough	AK	Anchorage, AK
DeKalb	AL	Scottsboro-Fort Payne, AL
Elmore	AL	Montgomery-Selma-Alexander City, AL
Etowah	AL	Gadsden, AL
Houston	AL	Dothan-Ozark, AL
Morgan	AL	Huntsville-Decatur, AL
Russell	AL	Columbus-Auburn-Opelika, GA-AL
Sumter	AL	
Clark	AR	
Newton	AR	
Polk	AR	
Washington	AR	Fayetteville-Springdale-Rogers, AR
Colusa	CA	
Glenn	CA	
Lake	CA	
Marin	CA	San Jose-San Francisco-Oakland, CA
Mendocino	CA	
Monterey	CA	Salinas, CA
San Francisco	CA	San Jose-San Francisco-Oakland, CA
Baker	FL	Jacksonville-St. Marys-Palatka, FL-GA
Bay	FL	Panama City, FL
Collier	FL	Cape Coral-Fort Myers-Naples, FL
Columbia	FL	Gainesville-Lake City, FL
Flagler	FL	Orlando-Lakeland-Deltona, FL
Holmes	FL	
Leon	FL	Tallahassee, FL
Liberty	FL	
Okaloosa	FL	Crestview-Fort Walton Beach-Destin, FL
Santa Rosa	FL	Pensacola-Ferry Pass, FL-AL
Volusia	FL	Orlando-Lakeland-Deltona, FL
Wakulla	FL	Tallahassee, FL
Chatham	GA	Savannah-Hinesville-Statesboro, GA
Chattooga	GA	Chattanooga-Cleveland-Dalton, TN-GA
Glynn	GA	Brunswick, GA
Honolulu	HI	Urban Honolulu, HI
Montgomery	IA	
Van Buren	IA	
Johnson	KS	Kansas City-Overland Park-Kansas City, MO-KS
Leavenworth	KS	Kansas City-Overland Park-Kansas City, MO-KS
Neosho	KS	
Shawnee	KS	Topeka, KS
Sumner	KS	Wichita-Winfield, KS
Trego	KS	
Bell	KY	
Carter	KY	Charleston-Huntington-Ashland, WV-OH-KY
Christian	KY	Clarksville, TN-KY
Edmonson	KY	Bowling Green-Glasgow, KY
Fayette	KY	Lexington-Fayette--Richmond--Frankfort, KY
Perry	KY	
Pike	KY	
Pulaski	KY	
Trigg	KY	Clarksville, TN-KY
Warren	KY	Bowling Green-Glasgow, KY
Bossier Parish	LA	Shreveport-Bossier City-Minden, LA
Caddo Parish	LA	Shreveport-Bossier City-Minden, LA
Lafourche Parish	LA	Houma-Thibodaux, LA
Ouachita Parish	LA	Monroe-Ruston, LA
St. James Parish	LA	New Orleans-Metairie-Hammond, LA-MS
Garrett	MD	
Androscoggin	ME	Portland-Lewiston-South Portland, ME
Aroostook	ME	
Kennebec	ME	
Oxford	ME	
Penobscot	ME	Bangor, ME
Becker	MN	
Carlton	MN	Duluth, MN-WI
Crow Wing	MN	
Hennepin	MN	Minneapolis-St. Paul, MN-WI
Lake	MN	Duluth, MN-WI
Lyon	MN	
Mille Lacs	MN	Minneapolis-St. Paul, MN-WI
Olmsted	MN	Rochester-Austin, MN
St. Louis	MN	Duluth, MN-WI
Washington	MN	Minneapolis-St. Paul, MN-WI
Cedar	MO	
Greene	MO	Springfield, MO
Jasper	MO	Joplin-Miami, MO-OK
Hancock	MS	Gulfport-Biloxi, MS
Hinds	MS	Jackson-Vicksburg-Brookhaven, MS
Lauderdale	MS	
Lee	MS	Tupelo-Corinth, MS
Yalobusha	MS	
Flathead	MT	
Lewis and Clark	MT	
Missoula	MT	Missoula, MT
Phillips	MT	
Richland	MT	
Rosebud	MT	
Alexander	NC	Hickory-Lenoir-Morganton, NC
Caldwell	NC	Hickory-Lenoir-Morganton, NC
Carteret	NC	New Bern-Morehead City, NC

Notes:

1. This list represents counties with no monitored ozone air pollution in unhealthful ranges using the Air Quality Index based on 2008 NAAQS.

Cleanest Counties for Ozone Air Pollution[1] (cont.)

County	State	Metropolitan Statistical Area
Caswell	NC	
Cumberland	NC	Fayetteville-Sanford-Lumberton, NC
Durham	NC	Raleigh-Durham-Cary, NC
Edgecombe	NC	Rocky Mount-Wilson-Roanoke Rapids, NC
Granville	NC	Raleigh-Durham-Cary, NC
Johnston	NC	Raleigh-Durham-Cary, NC
Lee	NC	Fayetteville-Sanford-Lumberton, NC
Martin	NC	
Montgomery	NC	
New Hanover	NC	Wilmington, NC
Pitt	NC	Greenville-Kinston-Washington, NC
Rowan	NC	Charlotte-Concord, NC-SC
Swain	NC	
Billings	ND	
Burke	ND	
Burleigh	ND	Bismarck, ND
Cass	ND	Fargo-Wahpeton, ND-MN
Dunn	ND	
McKenzie	ND	
Mercer	ND	
Oliver	ND	Bismarck, ND
Williams	ND	
Lancaster	NE	Lincoln-Beatrice, NE
Belknap	NH	Boston-Worcester-Providence, MA-RI-NH-CT
Grafton	NH	
Merrimack	NH	Boston-Worcester-Providence, MA-RI-NH-CT
Mahoning	OH	Youngstown-Warren, OH-PA
Portage	OH	Cleveland-Akron-Canton, OH
Adair	OK	
Ottawa	OK	Joplin-Miami, MO-OK
Sequoyah	OK	Fort Smith, AR-OK
Bradford	PA	
Cambria	PA	Johnstown-Somerset, PA
Franklin	PA	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
Aiken	SC	Augusta-Richmond County, GA-SC
Anderson	SC	Greenville-Spartanburg-Anderson, SC
Berkeley	SC	Charleston-North Charleston, SC
Colleton	SC	
Darlington	SC	Florence, SC
Horry	SC	Myrtle Beach-Conway, SC-NC
Custer	SD	
Jackson	SD	
Meade	SD	Rapid City-Spearfish, SD
Anderson	TN	Knoxville-Morristown-Sevierville, TN
DeKalb	TN	
Brewster	TX	
Cameron	TX	Brownsville-Harlingen-Raymondville, TX
Gregg	TX	Longview, TX
Harrison	TX	Longview, TX
Hidalgo	TX	McAllen-Edinburg, TX
Nueces	TX	Corpus Christi-Kingsville-Alice, TX
Polk	TX	
Webb	TX	Laredo, TX
San Juan	UT	
Fauquier	VA	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
Frederick	VA	Washington-Baltimore-Arlington, DC-MD-VA-WV-PA
Roanoke	VA	Roanoke, VA
Rockbridge	VA	
Wythe	VA	
Chittenden	VT	Burlington-South Burlington-Barre, VT
Rutland	VT	
Clallam	WA	
Skagit	WA	Seattle-Tacoma, WA
Ashland	WI	
Forest	WI	
La Crosse	WI	La Crosse-Onalaska, WI-MN
Marathon	WI	Wausau-Stevens Point-Wisconsin Rapids, WI
Taylor	WI	
Vilas	WI	
Greenbrier	WV	
Monongalia	WV	Morgantown-Fairmont, WV
Big Horn	WY	
Carbon	WY	
Converse	WY	
Fremont	WY	
Natrona	WY	Casper, WY
Teton	WY	Teton, WY
Weston	WY	

Notes:

1. This list represents counties with no monitored ozone air pollution in unhealthful ranges using the Air Quality Index based on 2008 NAAQS.

Health Effects of Ozone and Particle Pollution

Two types of air pollution dominate in the U.S.: ozone and particle pollution.[1] These two pollutants threaten the health and the lives of millions of Americans. Thanks to the Clean Air Act, the U.S. has far less of both pollutants now than in the past. Still, nearly 150 million people live in counties where monitors show unhealthy levels of one or both—meaning the air a family breathes could shorten life, cause lung cancer or have other harmful effects.

So what are particle pollution and ozone?

Particle Pollution

Ever look at dirty tailpipe exhaust?

The dirty, smoky part of that stream of exhaust is made of particle pollution. Overwhelming evidence shows that particle pollution—like that coming from that exhaust smoke—can kill. Particle pollution can increase the risk of heart disease, lung cancer and asthma attacks and can interfere with the growth and work of the lungs.

What Is Particle Pollution?

Particle pollution refers to a mix of tiny solid and liquid particles that are in the air we breathe. Many of the particles are so small as to be invisible, but when levels are high, the air becomes opaque. Nothing about particle pollution is simple. In fact, it is so dangerous that it can shorten your life.

Size matters. Particles themselves are different sizes. Some are one-tenth the diameter of a strand of hair. Many are even tinier; some are so small they can only be seen with an electron microscope. Because of their size, you cannot see the individual particles. You can only see the haze that forms when millions of particles blur the spread of sunlight.

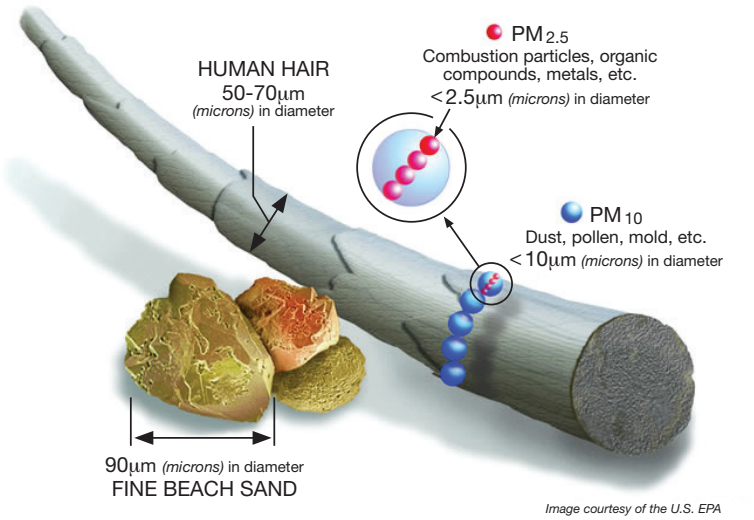


Image courtesy of the U.S. EPA

Researchers categorize particles according to size, grouping them as coarse, fine and ultrafine. Coarse particles (shown as blue dots in the illustration) fall between 2.5 microns and 10 microns in diameter and are called $PM_{10-2.5}$. Fine particles (shown as pink dots in the illustration) are 2.5 microns in diameter or smaller and are called $PM_{2.5}$. Ultrafine particles (not shown) are smaller than 0.1 micron in diameter[2] and are small enough to pass through the lung tissue into the blood stream, circulating like the oxygen molecules themselves. No matter what the size, particles can harm your health.

The differences in size make a big difference in where particles affect us. Our natural defenses help us to cough or sneeze some coarse particles out of our bodies. However, those defenses do not keep out smaller fine or ultrafine particles. These particles get trapped in the lungs, while the smallest are so minute that they can pass through the lungs into the bloodstream, just like the essential oxygen molecules we need to survive.

"A mixture of mixtures." Because particles form in so many ways, they can be composed of many different compounds. Although we often think of particles as solids, not all are. Some are liquid; some are solids suspended in liquids. As EPA put it, particles are really "a mixture of mixtures."[3]

The mixtures differ between different regions in the United States and in different times of the year. Much of that comes from the sources that produce the particles. For example, nitrate particles from motor vehicle exhaust form a larger proportion of the unhealthful mix in the winter in western states, especially California and portions of the Midwest. By contrast, eastern states have more sulfate particles than the West on average, largely due to the high levels of sulfur dioxide emitted by large, coal-fired power plants.[4]

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:

- Infants, children and teens;[5]
- People with lung disease, especially asthma, but also people with chronic obstructive pulmonary disease (COPD);[6]
- People with cardiovascular disease[7];
- People of color[8];
- Current or former smokers[9];
- People with low incomes;[10] and
- People who are obese.[11]

People with lung cancer also appear to be at higher risk from particle pollution, according to a 2016 study of more than 350,000 patients in California. Researchers looked at the exposure they experienced between 1988 and 2011 and found that where higher concentrations of particle pollution existed, people with lung cancer had poorer survival.[12]

EPA had concluded in the past that people with diabetes are also at higher risk of harm from particle pollution. In their most recent review of people at risk, they revised that decision. The evidence of increased risk remains strong, especially given the increased risk of cardiovascular disease from diabetes. Research has found evidence that long-term exposure to particle pollution may increase the risk of developing diabetes. Two independent reviews of published research found that particle pollution may increase the risk of developing type 2 diabetes mellitus.[13]

What Can Particles Do to Your Health?

Particle pollution can be very dangerous to breathe depending on the level. Breathing particle pollution may trigger illness, hospitalization and premature death, risks that are showing up in new studies that validate earlier research.

Thanks to steps taken to reduce particle pollution, good news is growing from researchers who study the drop in year-round levels of particle pollution.

- Looking at air quality in 545 counties in the U.S. between 2000 and 2007, researchers found that people had approximately four months added to their life expectancy on average due to cleaner air. Women and people who lived in urban and densely populated counties benefited the most.[14]
- Another long-term study of people in six U.S. cities tracked from 1974 to 2009 added more evidence of the benefits. The findings suggest that cleaning up particle pollution had almost immediate health benefits. The researchers estimated that the U.S. could prevent approximately 34,000 premature deaths a year if the nation could lower annual levels of particle pollution by 1 $\mu g/m^3$.[15]

These studies add to the growing research that cleaning up air pollution improves life and health.

Short-Term Exposure Can Be Deadly

First, short-term exposure to particle pollution can kill.[16] Peaks or spikes in particle pollution can last from hours to days. Premature deaths from breathing these particles can occur on the very day that particle levels are high, or within one to two months afterward. Particle pollution does not just make people die a few days earlier than they might otherwise—these deaths would not have occurred so early if the air were cleaner.

Even low levels of particles can be deadly. A 2016 study found that people aged 65 and older in New England faced a higher risk of premature death from particle pollution, even in places that met current standards for short-term particle pollution.[17] Another study in 2017 looked more closely at Boston and found a similar higher risk of premature death from particle pollution in a city that meets current limits on short-term particle pollution.[18] Looking nationwide in a 2017 study, researchers found more evidence that older adults faced a higher risk of premature death even when levels of short-term particle pollution remained well below the current national standards. This was consistent whether the older adults lived in cities, suburbs or rural areas.[19] Some of the strongest research has documented that short-term exposure to particle pollution causes premature death from respiratory and cardiovascular causes.[20]

Particle pollution also has many other harmful effects, ranging from decreased lung function to heart attacks. Extensive research has linked short-term increases in particle pollution to:

- increased mortality in infants;[21]
- increased hospital admissions for cardiovascular disease, including heart attacks and ischemic heart disease;[22]
- increased hospital admissions and emergency department visits for COPD;[23]
- increased hospitalization for asthma among children;[24] and
- increased severity of asthma attacks in children.[25]

A 2008 study of lifeguards in Galveston, TX, provided evidence of the impact of short-term exposure to particle pollution on healthy, active adults. Testing the breathing capacity of these outdoor workers several times a day, researchers found that many lifeguards had reduced lung volume when fine particle levels were high. Because of this research, Galveston became the first city in the nation to install an air quality warning flag system on the beach.[26]

Year-Round Exposure

Breathing high levels of particle pollution day in and day out can also be deadly, as landmark studies in the 1990s conclusively showed[27] and as later studies verified.[28] Recent research has confirmed that long-term exposure to particle pollution still kills, even with the declining levels in the U.S. since 2000[29] and even in areas, such as New England, that currently meet the official limit, or standard, for year-round particle pollution.[30]

In 2013, the International Agency for Research on Cancer (known as IARC), part of the World Health Organization, concluded that particle pollution causes lung cancer. The IARC based its decision on the review of multiple studies from the U.S., Europe, and Asia and the presence of carcinogens on the particles.[31]

Research has also linked year-round exposure to particle pollution to:

- development of asthma in children;[32]
- worsening of COPD in adults;[33]
- slowed lung function growth in children and teenagers;[34]

- increased risk of death from cardiovascular disease;[35] and
- increased risk of heart attacks and strokes.[36]

Studies examining the impact on the nervous system of long-term exposure to particle pollution have found links to cognitive affects in adults including reduced brain volume, cognitive decrements and dementia.[37] Scientists have found evidence that particle pollution may impact pregnancy and birth outcomes, such as preterm birth, low birth weight and fetal and infant mortality.[38]

The EPA is conducting their new review of the current research on particle pollution. Their findings from the last review, completed in December 2019,[39] are highlighted in the box below.

EPA Concludes Fine Particle Pollution Poses Serious Health Threats (2019)

- Causes early death (both short-term and long-term exposure)
- Causes cardiovascular harm (e.g., heart attacks, strokes, heart disease, congestive heart failure)
- Likely to cause respiratory harm (e.g., worsened asthma, worsened COPD, inflammation)
- Likely to cause cancer
- Likely to cause harm to the nervous system (e.g. reduced brain volume, cognitive effects)
- May cause reproductive and developmental harm

—U.S. Environmental Protection Agency, Integrated Science Assessment for Particulate Matter, December 2019. EPA 600/R-19/188

Where Does Particle Pollution Come From?

Particle pollution forms through two separate processes—mechanical and chemical.

Mechanical processes break down bigger bits into smaller bits with the material remaining essentially the same, only becoming smaller. Dust storms, construction and demolition, mining operations, and agriculture are among the activities that produce particles. Tire, brake pad and road wear can also create particles.

Combustion of carbon-based fuels generates most of the fine particles in our atmosphere. Burning wood in residential fireplaces and wood stoves as well as wildfires, agricultural fires and prescribed fires are some of the largest sources. Wildfires are growing, particularly in the Mountain West because of climate change. These processes create about 36 percent of fine particles.[40] Burning fossil fuels in factories, power plants, diesel- and gasoline-powered motor vehicles (cars and trucks) and equipment emits a large part of the raw materials for fine particles.

Chemical processes in the atmosphere create most of the tiniest fine and ultrafine particles in the air. Burning fuels, other human activity and natural sources emit gases that form particles in the air. These gases can oxidize and then condense to become a particle of a simple chemical compound. Or they can react with other gases or particles in the atmosphere to form a particle of a different or of multiple chemical compounds. Particles formed by this latter process come from the reaction of elemental carbon (soot), heavy metals, sulfur dioxide (SO_2), nitrogen oxides (NO_x), ammonia (NH_3) and volatile organic compounds with water and other compounds in the atmosphere.[41]

Are Some Particles More Dangerous Than Others?

With so many sources of particles, researchers want to know if some particles pose greater risk than others. Researchers are exploring possible differences in health effects of the sizes of particles and particles from different sources, such as diesel particles from trucks and buses or sulfates from coal-fired power plants. Recent studies have tried to answer this question. So far, the answers are complicated.

Each particle may have many different components. The building blocks of each can include several biological and chemical components. Bacteria, pollen and other biological ingredients can combine in the particle with chemical agents, such as heavy metals, elemental carbon, dust and secondary species like sulfates and nitrates. These combinations mean that particles can have complex effects on the body.[42]

Some studies have found that different kinds of particles may have greater risk for different health outcomes.[43,44,45]

Other studies have identified the challenges of exploring all the kinds of particles and their health effects with the limited monitoring across the nation.[46,47] Some particles serve as carriers for other chemicals that are also toxic, and the combination may worsen the impact.[48,49]

The best evidence shows that having less of all types of particles in the air leads to better health and longer lives.

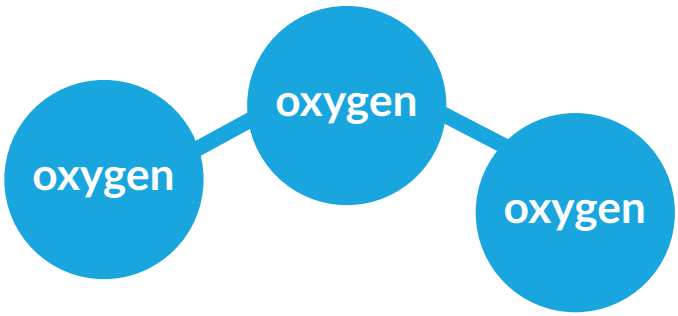
Ozone

It may be hard to imagine that pollution could be invisible, but ozone begins that way. As ozone concentrates and mixes with other pollutants, we often call it by its older, more common name—smog. It is currently one of the least well-controlled pollutants in the United States.[50] And it is also one of the most dangerous.

Scientists have studied the effects of ozone on health for decades. Hundreds of studies have confirmed that ozone harms people at levels currently found in the United States. In the last decade, we have learned that it can also be deadly.

What Is Ozone?

Ozone (O_3) is a gas molecule composed of three oxygen atoms. Often called "smog," ozone is harmful to breathe. Ozone aggressively attacks lung tissue by reacting chemically with it. When ozone is present, there are other harmful pollutants created by the same processes that make ozone.



The ozone layer found high in the upper atmosphere (the stratosphere) shields us from much of the sun's ultraviolet radiation. However, ozone air pollution at ground level where we can breathe it (in the troposphere) causes serious health problems.

Where Does Ozone Come From?

Ozone develops in the atmosphere from gases that come out of tailpipes, smokestacks and many other sources. When these gases come in contact with sunlight, they react and form ozone smog.

The essential raw ingredients for ozone are nitrogen oxides (NOx) and volatile organic compounds (VOCs). They are produced primarily when fossil fuels like gasoline, oil or coal are burned or when some chemicals, like solvents, evaporate. NOx is emitted from power plants, motor vehicles and other sources of high-heat combustion. VOCs are emitted from motor vehicles, chemical plants, refineries, factories, gas stations, paint and other sources.[51]

If the ingredients are present under the right conditions, they react to form ozone. Sunlight is key. And because the reaction takes place in the atmosphere, the ozone often shows up downwind of the sources of the original gases. In addition, winds can carry ozone far from where it formed, even internationally across borders and across the oceans.

You may have wondered why "ozone action day" warnings are sometimes followed by recommendations to avoid activities such as mowing your lawn or driving your car. Lawn mower exhaust and gasoline vapors contain nitrogen oxides (NOx) and volatile organic compounds (VOCs) that are key to the formation of ozone in the presence of heat and sunlight.

Who Is at Risk from Breathing Ozone?

Anyone who spends time outdoors where ozone pollution levels are high may be at risk. Four groups of people are especially vulnerable to the effects of breathing ozone:

- children and teens[52];
- anyone 65 and older[53];
- people with existing lung diseases, such as asthma and chronic obstructive pulmonary disease (also known as COPD, which includes emphysema and chronic bronchitis[54]; and
- people who work or exercise outdoors.[55]

In addition, some evidence suggests that other groups—including women, people who suffer from obesity and people with low incomes—may also face higher risk from ozone.[56] More research is needed to confirm these findings.

The impact on your health can depend on many factors, however. For example, the risks are greater if ozone levels are higher, if you are breathing faster because you're working or exercising outdoors or if you spend more time outdoors.

Again, the impact of even short-term exposure to ozone pollution on healthy adults was demonstrated in the Galveston lifeguard study. In addition to the harmful effects of particle pollution, lifeguards had greater obstruction of their airways at the end of the day when ozone levels were high.[57]

How Ozone Pollution Harms Your Health

Premature death. Breathing ozone can shorten your life. Strong evidence exists of the deadly impact of ozone from large studies conducted in cities across the U.S., in Europe and in Asia. Researchers repeatedly found that the risk of premature death increased with higher levels of ozone.[58] Newer research has confirmed that ozone increased the risk of premature death even when other pollutants also are present.[59]

Immediate breathing problems. Many areas in the United States produce enough 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, wheezing and coughing;
- asthma attacks;
- increased risk of 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.[60,61,62]

Long-term exposure risks. New studies warn of serious effects from breathing ozone over longer periods. With more long-term data, scientists are finding that long-term exposure—that is, for periods longer than eight hours, including days, months or years—may increase the risk of early death.

- Examining the records from a long-term national database, researchers found a higher risk of death from respiratory diseases associated with increases in ozone.[63]
- New York researchers looking at hospital records for children's asthma found that the risk of admission to hospitals for asthma increased with chronic exposure to ozone. Younger children and children from low-income families were more likely than other children to need hospital admissions even during the same time periods.[64]
- California researchers analyzing data from their long-term Southern California Children's Health Study found that some children with certain genes were more likely to develop asthma as adolescents in response to the variations in ozone levels in their communities.[65]
- Studies link lower birth weight and decreased lung function in newborns to ozone levels in their community.[66] This research provides increasing evidence that ozone may harm newborns.

Breathing other pollutants in the air may make your lungs more responsive to ozone—and breathing ozone may increase your body's response to other pollutants. For example, research warns that breathing sulfur dioxide and nitrogen oxide—two pollutants common in the eastern U.S.—can make the lungs react more strongly than just breathing ozone alone. Breathing ozone may also increase the response to allergens in people with allergies. A large study published in 2009 found that children were more likely to suffer from hay fever and respiratory allergies when ozone and $PM_{2.5}$ levels were high.[67]

Research shows lower levels of ozone cause harm. EPA released their latest complete review of the current research on ozone pollution in February 2013.[68] EPA had engaged a panel of expert scientists, the Clean Air Scientific Advisory Committee, to help them assess the evidence that was brought together by EPA; in particular, they examined research published between 2006 and 2012. The experts on the committee and EPA concluded that ozone pollution posed multiple, serious threats to health. Their findings are highlighted in the box below. Based on that review, EPA strengthened the official limit on ozone, called the National Ambient Air Quality Standard, in 2015.

However, new research provides evidence that ozone can cause serious harm even at much lower levels. In a 2017 scientific paper, researchers provided further evidence in a nationwide study that older adults faced a higher risk of premature death even when levels of ozone pollution remained well below the current national standard.[69]

EPA Concludes Ozone Pollution Poses Serious Health Threats (2013)

- Causes respiratory harm (e.g., worsened asthma, worsened COPD, inflammation)
- Likely to cause early death (both short-term and long-term exposure)
- Likely to cause cardiovascular harm (e.g., heart attacks, strokes, heart disease, congestive heart failure)
- May cause harm to the central nervous system
- May cause reproductive and developmental harm

—U.S. Environmental Protection Agency, *Integrated Science Assessment for Ozone and Related Photochemical Oxidants*, 2013. EPA/600/R-10/076F.

Focusing on Children's Health

Children face special risks from air pollution because their lungs are growing and because they are so active and breathe in a great deal of air.

Just like the arms and legs, the largest portion of a child's lungs will grow long after he or she is born. Eighty percent of their tiny air sacs develop after birth. Those sacs, called the alveoli, are where the life-sustaining transfer of oxygen to the blood takes place. The lungs and their alveoli aren't fully grown until children become adults.[70] In addition, the body's defenses that help adults fight off infections are still developing in young bodies.[71] Children have more respiratory infections than adults, which also seems to increase their susceptibility to air pollution.[72]

Furthermore, children don't behave like adults, and their behavior also affects their vulnerability. They are outside for longer periods and are usually more active when outdoors. Consequently, they inhale more polluted outdoor air than adults typically do.[73]

Air Pollution Affects Children Before They Are Born

Several studies have found air pollution linked to harm to children while they are still in the womb. A large study in California found that higher particle pollution levels increased the risk of preterm birth.[74] Pregnant women exposed to even low levels of particle pollution had higher risk for preterm birth in a Boston study.[75] Preterm births occurred more frequently when particle pollution spiked, as an Australian study found, even when they controlled for other risk factors.[76]

Air Pollution Limits Lung Growth in Children

The Southern California Children's Health study looked at the long-term effects of air pollution on children and teenagers. Tracking 1,759 children who were between ages 10 and 18 from 1993 to 2001, researchers found that those who grew up in more polluted areas face the increased risk of having reduced lung growth, which may never recover to their full capacity. The average drop in lung function was similar to the impact of growing up in a home with parents who smoked.[77]

Community health studies are pointing to less obvious, but serious effects from year-round exposure to ozone, especially for children. Scientists followed 500 Yale University students and determined that living just four years in a region with high levels of ozone and related co-pollutants was associated with diminished lung function and frequent reports of respiratory symptoms.[78] Another earlier report from the Children's Health study of 3,300 schoolchildren in Southern California found reduced lung function in girls with asthma and boys who spent more time outdoors in areas with high levels of ozone.[79]

Cleaning Up Pollution Can Reduce Risk to Children

There is also real-world evidence that reducing air pollution can help protect children.

A 2015 follow-up to the Southern California Children's Health study showed that reducing pollution could improve children's health. They compared the children who had been part of their earlier studies to a new group of 863 children living in the same area, but growing up between 2007 and 2011, when the air in Southern California was much cleaner. Children growing up in the cleaner air had much greater lung function growth, a benefit that may help them throughout their lives. As the researchers noted, their study suggested that "all children have the potential to benefit from improvements in air quality."[80]

Further evidence that cleaner air provides real benefits to children's health came in a 2016 report from the same study exploring changes to 4,602 children's respiratory symptoms such as coughing, congestion and phlegm. The study looked at the changes in these symptoms in three groups of children living in Southern California over different periods of time when air quality also differed (1993-2001, 1996-2004, and 2003-2012). As air quality improved, the children in the study suffered fewer bronchial symptoms

whether they had asthma or not. In communities where the air quality improved the most, the children experienced even fewer symptoms.[81]

So, does cleaning up the air really improve children's health? In 2017, the researchers reviewed these long-term studies of children in Southern California and the impact of improvements in air quality on their health. They concluded that the 20 years of collected data provided strong evidence of the potential to improve children's health by reducing some of the most common outdoor air pollutants.[82]

The U.S. is not alone in this finding. In Switzerland, particle pollution dropped during a period in the 1990s. Researchers there tracked 9,000 children over a nine-year period, following their respiratory symptoms. After taking other factors such as family characteristics and indoor air pollution into account, the researchers noted that during the years with less pollution, the children had fewer episodes of chronic cough, bronchitis, common cold and conjunctivitis symptoms.[83]

Disparities in the Impact of Air Pollution

The burden of air pollution is not evenly shared. Poorer people and some racial and ethnic groups are among those who often face higher exposure to pollutants and who may experience greater responses to such pollution. Many studies have explored the differences in harm from air pollution to racial or ethnic groups and people who are in a low socioeconomic position, have less education, or live nearer to major sources of pollution,[84] including a workshop the American Lung Association held in 2001 that focused on urban air pollution and health inequities.[85] The most recent EPA review of the research on the health effects of particle pollution concluded that nonwhite populations, especially blacks, faced higher risk from particle pollution.[86]

Many studies have looked at differences in the impact of air pollution on premature death. Recent studies have looked at the mortality in the Medicaid population and found that those who live in predominately black or African American communities suffered greater risk of premature death from particle pollution than those who live in communities that are predominately white.[87] Another large study found that Hispanics and Asians, but especially blacks, had a higher risk of premature death from particle pollution than whites did. This study found that income did not drive the differences. Higher-income blacks who had higher income than many whites still faced greater risk than those whites, suggesting that the impact of other factors such as chronic stress as a result of discrimination may be playing a role.[88] Other researchers have found greater risk for African Americans from hazardous air pollutants, including those pollutants that also come from traffic sources.[89] Due to decades of residential segregation, African Americans tend to live where there is greater exposure to air pollution.[90]

Socioeconomic position also appears tied to greater harm from air pollution. Multiple large studies show evidence of that link. Low socioeconomic status consistently increased the risk of premature death from fine particle pollution among 13.2 million Medicare recipients studied in the largest examination of particle pollution-related mortality nationwide.[91] In a 2008 study that found greater risk for premature death for communities with higher African American populations, researchers also found greater risk for people living in areas with higher unemployment or higher use of public transportation.[92] A 2008 study of Washington, DC, found that while poor air quality and worsened asthma went hand in hand in areas where Medicaid enrollment was high, the areas with the highest Medicaid enrollment did not always have the strongest association of high air pollution and asthma attacks.[93] A 2016 study of New Jersey residents found that the risk of dying early from long-term exposure to particle pollution was higher in communities with larger African American populations, lower home values and lower median income.[94] Studies of Atlanta, GA, found that particle pollution increased the risk of asthma attacks for zip codes where poverty was high and among people eligible for Medicaid.[95]

Scientists have speculated that there are three broad reasons why disparities may exist. 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 tend to 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; and 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, people of color 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.

People of color also may be more likely to live in counties with higher levels of pollution. Non-Hispanic blacks and Hispanics were more likely to live in counties that had worse problems with particle pollution, researchers found in a 2011 analysis. Non-Hispanic blacks were also more likely to live in counties with worse ozone pollution. Income groups, by contrast, differed little in these exposures. However, since few rural counties have monitors, the primarily older, non-Hispanic white residents of those counties lack information about the air quality in their communities.[96]

Unemployed people, those with low income or low education and non-Hispanic blacks were found to be more likely to live in areas with higher exposures to particle pollution in a 2012 study. However, the different racial/ethnic and income groups were often breathing very different kinds of particles; the different composition and structure of these particles may have different health impacts.[97]

Highways May Be Especially Dangerous for Breathing

Being in heavy traffic or living near a road with heavy traffic may be risky compared with being in other places in a community. Growing evidence shows that many different pollutants along busy highways may be higher than in the community as a whole, increasing the risk of harm to people who live or work near busy roads.

The number of people living "next to a busy road" may include 30 to 45 percent of the urban population in North America, according to the most recent comprehensive review of the evidence. In January 2010, the Health Effects Institute published a major review of the evidence put together by a panel of expert scientists. The panel looked at over 700 studies from around the world, examining the health effects of traffic pollution. They concluded that traffic pollution causes asthma attacks in children, and may cause a wide range of other effects including the onset of childhood asthma, impaired lung function, premature death and death from cardiovascular diseases, and cardiovascular morbidity. The area most affected, they concluded, was roughly the band within 0.2 to 0.3 miles (300 to 500 meters) of the highway.[98]

Children and teenagers are among the most vulnerable—though not the only ones at risk. A Danish study found that long-term exposure to traffic air pollution may increase the risk of developing chronic obstructive pulmonary disease (COPD). They found that those most at risk were people who already had asthma or diabetes.[99] Studies have found increased risk of premature death from living near a major highway or an urban road.[100] Another study found an increase in risk of heart attacks from being in traffic, whether driving or taking public transportation.[101] Urban women in a Boston study experienced decreased lung function associated with traffic-related pollution.[102]

Adults living closer to the road—within 300 meters—may risk dementia. In 2017, a study of residents of Ontario, Canada, found that those who lived close to heavy traffic had a higher risk of dementia, although not for Parkinson's disease or multiple sclerosis. Researchers found the strongest association among those who lived closest to the

roads (less than 50 meters), who had never moved and who lived in major cities.[103] A study of older men in 2011 also found that long-term exposure to traffic pollution increased their risk of having poor cognition.[104]

How to Protect Yourself from Ozone and Particle Pollution

To minimize your exposure to ozone and particle pollution:

- Pay attention to forecasts for high air pollution days to know when to take precautions;
- Avoid exercising near high-traffic areas;
- Avoid exercising outdoors when pollution levels are high, or substitute an activity that requires less exertion;
- Do not let anyone smoke indoors and support measures to make all places smoke-free;
- Reduce the use of fireplaces and wood-burning stoves; and
- Consider getting a portable air cleaner with a HEPA filter if you live in an area prone to wildfire smoke (do not get an air cleaner that generates ozone).

Bottom line: Help yourself and everyone else breathe easier. Support national, state and local efforts to clean up sources of pollution. Your life and the life of someone you love may depend on it.

Endnotes

1 Ozone and particle pollution are the most widespread, but they aren't the only serious air pollutants. Others include carbon monoxide, lead, nitrogen dioxide and sulfur dioxide, as well as scores of toxins such as mercury, arsenic, benzene, formaldehyde and acid gases. However, the monitoring networks are not as widespread nationwide for these other pollutants.

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Statistical Methodology: The Air Quality Data

Data Sources

Ozone and short-term particle pollution. 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 the Aerometric Information Retrieval System (AIRS) database. The American Lung Association contracted with Dr. Allen S. Lefohn, A.S.L. & Associates, Helena, MT, to characterize the hourly averaged ozone concentration information and the 24-hour averaged $PM_{2.5}$ concentration information for the three-year period for 2016-2018 for each monitoring site.

Year-round particle pollution. Design values for the annual $PM_{2.5}$ concentrations by county for the period 2016-2018 were retrieved from data posted on **December 3, 2019**, at the U.S. Environmental Protection Agency's website at https://www.epa.gov/sites/production/files/2019-12/pm25_designvalues_20162018_final_12_03_19.xlsx. One exception is the design value for Whatcom County, WA, where that the value is based on the combined design value determined by the state and EPA using data from two monitors. That design value was provided by the State of Washington in email communication.

Ozone Data Analysis

The 2016, 2017 and 2018 AQS hourly ozone data were used to calculate the daily 8-hour maximum concentration for each ozone-monitoring site. The hourly averaged ozone data were downloaded on June 26, 2019, following the close of the authorized period for quality review and assurance certification of data. Only the hourly average ozone concentrations derived from FRM and FEM monitors were used in the analysis. The data were considered for a three-year period for the same reason that the EPA uses three years of data to determine compliance with the ozone standard: to prevent a situation in any single year, where anomalies of weather or other factors create air pollution levels that inaccurately reflect the normal conditions. The highest 8-hour daily maximum concentration in each county for 2016, 2017 and 2018, based on the EPA-defined ozone season, was identified.

The current national ambient air quality standard for ozone is 70 parts per billion (ppb) measured over eight hours. EPA's Air Quality Index reflects the 70 ppb standard. A.S.L. & Associates prepared a table by county that summarized, for each of the three years, the number of days the ozone level was within the ranges identified by EPA based on the EPA Air Quality Index:

8-hour Ozone Concentration	Air Quality Index Levels
0-54 ppb	Good (Green)
55-70 ppb	Moderate (Yellow)
71-85 ppb	Unhealthy for Sensitive Groups (Orange)
86-105 ppb	Unhealthy (Red)
106-200 ppb	Very Unhealthy (Purple)
>200 ppb	Hazardous (Maroon)

The goal of this report was to identify the number of days that 8-hour daily maximum concentrations in each county occurred within the defined ranges. This approach provided an indication of the level of pollution for all monitored days, not just those days that fell under the requirements for attaining the national ambient air quality standards. Therefore, no data capture criteria were applied to eliminate monitoring sites or to require a number of valid days for the ozone season.

The daily maximum 8-hour average concentration for a given day is derived from the highest of the 17 consecutive 8-hour averages beginning with the 8-hour period from 7:00 a.m. to 3:00 p.m. and ending with the 8-hour period from 11:00 p.m. to 7:00 a.m. the following day. This follows the process EPA uses for the current ozone standard adopted in 2015, but differs from the form used under the previous 0.075 ppm 8-hour average ozone standard that was established in 2008. All valid days of data within the ozone season were used in the analysis. However, for computing an 8-hour average, at least 75 percent of the hourly concentrations (i.e., six to eight hours) had to be available for the 8-hour period. In addition, an 8-hour daily maximum average was identified if valid 8-hour averages were available for at least 75 percent of possible hours in the day (i.e., at least 13 of the possible 17 8-hour averages). Because the EPA includes days with inadequate data (i.e., not 75 percent complete) if the standard value is exceeded, our data capture methodology also included the site's 8-hour value if at least one valid 8-hour period was available and it was 71 ppb or higher.

As instructed by the Lung Association, A.S.L. & Associates included the exceptional and natural events that were identified in the database and identified for the Lung Association the dates and monitoring sites that experienced such events. Some data have been flagged by the state or local air pollution control agency to indicate that they had raised issues with EPA about those data. For each day across all sites within a specific county, the highest daily maximum 8-hour average ozone concentration was recorded and then the results were summarized by county for the number of days the ozone levels were within the ranges identified above.

Following receipt of the above information, the American Lung Association identified the number of days each county with at least one ozone monitor experienced air quality designated as orange (Unhealthy for Sensitive Groups), red (Unhealthy), or purple (Very Unhealthy).

Short-Term Particle Pollution Data Analysis

A.S.L. & Associates identified the maximum daily 24-hour AQS $PM_{2.5}$ concentration for each county in 2016, 2017 and 2018 with monitoring information. The 24-hour $PM_{2.5}$ data were downloaded on August 7, 2019, following the close of the authorized period for quality review and assurance certification of data. In addition, on August 7, 2019, hourly averaged $PM_{2.5}$ concentration data were characterized into 24-hour average $PM_{2.5}$ values by EPA and provided to A.S.L. & Associates. Using these results, A.S.L. & Associates prepared a table by county that summarized, for each of the three years, the number of days the maximum of the daily $PM_{2.5}$ concentration was within the ranges identified by EPA based on the EPA Air Quality Index, as adopted by EPA on December 14, 2012:

24-hour $PM_{2.5}$ Concentration	Air Quality Index Levels
0.0 µg/m^3 to 12.0 µg/m^3	Good (Green)
12.1 µg/m^3 to 35.4 µg/m^3	Moderate (Yellow)
35.5 µg/m^3 to 55.4 µg/m^3	Unhealthy for Sensitive Groups (Orange)
55.5 µg/m^3 to 150.4 µg/m^3	Unhealthy (Red)
150.5 µg/m^3 to 250.4 µg/m^3	Very Unhealthy (Purple)
equal to or greater than 250.5 µg/m^3	Hazardous (Maroon)

All previous data collected for 24-hour average $PM_{2.5}$ were characterized using the AQI thresholds listed above.

The goal of this report was to identify the number of days that the maximum in each county of the *daily* $PM_{2.5}$ concentration occurred within the defined ranges. This approach provided an indication of the level of pollution for all monitored days, not just those days that fell under the requirements for attaining the national ambient air quality standards. Therefore, no data capture criteria were used to eliminate monitoring sites. Both 24-hour averaged PM data and hourly averaged PM data averaged over 24 hours were used. Included in the analysis are data collected using only FRM and FEM methods, which reported hourly and 24-hour averaged data. As instructed by the Lung Association, A.S.L. & Associates included the exceptional and natural events that were identified in the database and identified for the Lung Association the dates and monitoring sites that experienced such events. Some data have been flagged by the state or local air pollution control agency to indicate that they had raised issues with EPA about those data. For each day across all sites within a specific county, the highest daily maximum 24-hour $PM_{2.5}$ concentration was recorded and then the results were summarized by county for the number of days the concentration levels were within the ranges identified above.

Following receipt of the above information, the American Lung Association identified the number of days each county with at least one $PM_{2.5}$ monitor experienced air quality designated as orange (Unhealthy for Sensitive Groups), red (Unhealthy), purple (Very Unhealthy) or maroon (Hazardous).

Description of County Grading System

Ozone and Short-Term Particle Pollution (24-hour $PM_{2.5}$)

The grades for ozone and short-term particle pollution (24-hour $PM_{2.5}$) were based on a weighted average for each county. To determine the weighted average, the Lung Association followed these steps:

1. First, assigned weighting factors to each category of the Air Quality Index. The number of orange days experienced by each county received a factor of 1; red days, a factor of 1.5; purple days, a factor of 2; and maroon days, a factor of 2.5. This allowed days where the air pollution levels were higher to receive greater weight.
2. Next, multiplied the total number of days within each category by their assigned factor, and then summed all the categories to calculate a total.
3. Finally, divided the total by 3 to determine the weighted average, since the monitoring data were collected over a three-year period.

The weighted average determined each county's grades for ozone and 24-hour $PM_{2.5}$.

- All counties with a weighted average of zero (corresponding to no exceedances of the standard over the three-year period) were given a grade of "A."
- For ozone, an "F" grade was set to generally correlate with the number of unhealthy air days that would place a county in nonattainment for the ozone standard.
- For short-term particle pollution, fewer unhealthy air days are required for an F than for nonattainment under the $PM_{2.5}$ standard. The national air quality standard is set to allow two percent of the days during the three years to exceed 35 $\mu g/m^3$ (called a "98th percentile" form) before violating the standard. That would be roughly 21 unhealthy days in three years. The grading used in this report would allow only about one percent of the days to be over 35 $\mu g/m^3$ (called a "99th percentile" form) of the $PM_{2.5}$. The American Lung Association supports using the tighter limits in a 99th percentile form as a more appropriate standard that is intended to protect the public from short-term episodes or spikes in pollution.

Grading System		
Grade	**Weighted Average**	**Approximate Number of Allowable Orange/Red/Purple/Maroon days**
A	0.0	None
B	0.3 to 0.9	1 to 2 orange days with no red
C	1.0 to 2.0	3 to 6 days over the standard: 3 to 5 orange with no more than 1 red OR 6 orange with no red
D	2.1 to 3.2	7 to 9 days over the standard: 7 total (including up to 2 red) to 9 orange with no red
F	3.3 or higher	9 days or more over the standard: 10 orange days or 9 total including at least 1 or more red, purple or maroon

Weighted averages allow comparisons to be drawn based on severity of air pollution. For example, if one county had nine orange days and no red days, it would earn a weighted average of 3.0 and a D grade. However, another county that had only eight orange days but also two red days, which signify days with more serious air pollution, would receive an F. That second county would have a weighted average of 3.7.

Note that this system differs significantly from the methodology EPA uses to determine violations of both the ozone and the 24-hour $PM_{2.5}$ standards. EPA determines whether a county violates the standard based on the fourth maximum daily 8-hour ozone reading each year averaged over three years. Multiple days of unhealthy air beyond the highest four in each year are not considered. By contrast, the system used in this report recognizes when a community's air quality repeatedly results in unhealthy air throughout the three years. Consequently, some counties will receive grades of F in this report, showing repeated instances of unhealthy air, while still meeting the EPA's 2015 ozone standard. The American Lung Association's position is that the evidence shows that the 2015 ozone standard, although stronger than the 2008 standard, still fails to adequately protect public health.

The Lung Association calculates the county population at risk from these pollutants based on the population from the entire county where the monitor is located. The Lung Association then calculates the metropolitan population at risk based upon the largest metropolitan area that contains that county. Not only do people from that county or metropolitan area circulate within the county and the metropolitan area, the air pollution circulates to that monitor through the county and metropolitan area.

Counties were ranked by weighted average. Metropolitan areas were ranked by the highest weighted average among the counties within a given Metropolitan Statistical Area as of 2019 as defined by the White House Office of Management and Budget (OMB).

Year-Round Particle Pollution (Annual $PM_{2.5}$)

Since no comparable Air Quality Index exists for year-round particle pollution (annual $PM_{2.5}$), the grading was based on the 2012 National Ambient Air Quality Standard for annual $PM_{2.5}$ of 12 $\mu g/m^3$. Counties that EPA listed as being at or below 12 $\mu g/m^3$ were given grades of "Pass." Counties EPA listed as being at or above 12.1 $\mu g/m^3$ were given grades of "Fail." Where insufficient data existed for EPA to determine a design value, those counties received a grade of "Incomplete."

Design value is the calculated concentration of a pollutant based on the form of the national ambient air quality standard and is used by EPA to determine whether the air quality in a county meets the standard. Counties were ranked by design value. Metropolitan areas were ranked by the highest design value among the counties within a given Metropolitan Statistical Area as of 2019 as defined by the OMB.

The Lung Association received critical assistance from members of the National Association of Clean Air Agencies and the Association of Air Pollution Control Agencies. With their assistance, all state and local agencies were provided the opportunity to review and comment on the data in draft tabular form. The Lung Association reviewed all discrepancies with the agencies and, if needed, with Dr. Lefohn at A.S.L. & Associates. The American Lung Association wishes to express its continued appreciation to the state and local air directors for their willingness to assist in ensuring that the characterized data used in this report are correct.

Calculations of Populations at Risk

Presently county-specific measurements of the number of persons with chronic conditions are not generally available. To assess the magnitude of chronic conditions at the state and county levels, we have employed a synthetic estimation technique originally developed by the U.S. Census Bureau. This method uses age-specific national and state estimates of self-reported conditions to project disease prevalence to the county level. The exception to this is poverty, for which estimates are available at the county level.

Population Estimates

The Lung Association includes the total county population in discussions of populations at risk from exposure to pollution in each county. The Lung Association uses that conservative count based on several factors: the recognized limited number and locations of monitors in most counties and metropolitan areas; the movement of the population both in daily activities, including outdoor activities, such as exercise or work; and the transport of emission from sources into and across the county to reach the monitor.

Not only do people from that county or metropolitan area circulate within the county and the metropolitan area, the air pollution circulates to that monitor through the county and metropolitan area. For that reason, the Lung Association calculates the county population at risk from these pollutants based on the population from the entire county where the monitor is located. The Lung Association then calculates the metropolitan population at risk based upon the largest metropolitan area that contains that county.

The counties assigned to a metropolitan area follow the groupings determined by the White House Office of Management and Budget (OMB) and used by the U.S. Census Bureau. The Lung Association uses the largest definition of a metropolitan area for these groupings where at least one urban core of 50,000 people or more is present. The Metropolitan Statistical Areas and Combined Statistical Areas are used as the basis for considering populations at risk in these urban areas because they reflect the "high degree of social and economic interaction as measured by commuting ties," as OMB describes them.[1] The definitions of these areas reflect review and analysis of such patterns by these agencies.

The U.S. Census Bureau estimated data on the total population of each county in the United States for 2018. The Census Bureau also estimated the age- and race/ethnicity-specific breakdown of the population and the number of individuals living in poverty by county. These estimates are the best information on population demographics available between decennial censuses.

People of color are defined as anyone Hispanic or non-Hispanic black, Asian, American Indian/Alaska Native, Native Hawaiian and Other Pacific Islander, or two or more races.

Poverty estimates came from the Census Bureau's Small Area Income and Poverty Estimates (SAIPE) program. The program does not use direct counts or estimates from sample surveys, as these methods would not provide sufficient data for all counties.

1 Executive Office of the President, Office of Management and Budget Bulletin No. 18-04. September 14, 2018.

Instead, a model based on estimates of income or poverty from the Annual Social and Economic Supplement (ASEC) to the Current Population Survey (CPS) is used to develop estimates for all states and counties.

Prevalence Estimates

Chronic Obstructive Pulmonary Disease, Cardiovascular Disease, Asthma and Ever Smoked. In 2018, the Behavioral Risk Factor Surveillance System (BRFSS) survey found that approximately 23.1 million (9.3 percent) of adults residing in the United States and 7.2 percent of children from 30 states and Washington, DC, reported currently having asthma. Among adults in the United States in 2018, 17.2 million (6.9 percent) had ever been diagnosed with chronic obstructive pulmonary disease (COPD), 22.5 million (9.1 percent) had ever been diagnosed with cardiovascular disease, and 37.5 million (40.0 percent) had ever smoked at least 100 cigarettes.

The prevalence estimate for pediatric asthma is calculated for those younger than 18 years. Local area prevalence of pediatric asthma is estimated by applying 2018 state prevalence rates, or, if not available, the national rate from the BRFSS to pediatric county-level resident populations obtained from the U.S. Census Bureau website. Pediatric asthma data from the 2018 BRFSS were available for 30 states and Washington, DC, from the 2016 BRFSS for three states, from the 2015 BRFSS for three states, from the 2014 BRFSS for five states, from the 2012 BRFSS for two states, from the 2011 BRFSS for one state, and national data were used for the eight states[2] that had no data available. Data from earlier years were not used due to changes in the 2011 survey methodology.

The prevalence estimates for COPD, cardiovascular disease, adult asthma and ever smoked are calculated for those aged 18-44 years, 45-64 years and 65 years and older. Local area prevalence is estimated by applying age-specific state prevalence rates from the 2018 BRFSS to age-specific county-level resident populations obtained from the U.S. Census Bureau website. Cardiovascular disease included ever having been diagnosed with a heart attack, angina or coronary heart disease, or stroke.

Incidence Estimates

Lung Cancer. State- and gender-specific lung cancer incidence rates for 2016 were obtained from StateCancerProfiles.gov, a system that provides access to statistics from both the NCI's Surveillance, Epidemiology and End Results (SEER) program and the CDC's National Program of Cancer Registries.

Local area incidence of lung cancer is estimated by applying 2016 age-adjusted and sex-specific incidence rates to 2018 county populations obtained from the U.S. Census Bureau. Thereafter, the incidence estimates for each county within a state are summed to determine overall incidence.

Limitations of Estimates. Since the statistics presented by the BRFSS and SAIPE are based on a sample, they will differ (due to random sampling variability) from figures that would be derived from a complete census or case registry of people in the U.S. with these diseases. The results are also subject to reporting, non-response and processing errors. These types of errors are kept to a minimum by methods built into the survey.

Additionally, a major limitation of the BRFSS is that the information collected represents self-reports of medically diagnosed conditions, which may underestimate disease prevalence since not all individuals with these conditions have been properly diagnosed. However, the BRFSS is the best available source for information on the magnitude of chronic disease at the state level. The conditions covered in the survey may vary considerably in the accuracy and completeness with which they are reported.

2 *2016:* Arizona, Oklahoma, and Washington. *2015:* Louisiana and Texas. *2014:* Alabama, North Carolina, Tennessee, and West Virginia. *2012:* North Dakota and Wyoming. *2011:* Iowa. *National:* Alaska, Arkansas, Colorado, Delaware, Idaho, South Carolina, South Dakota, and Virginia.

Local estimates of chronic diseases and smoking are scaled in direct proportion to the base population of the county and its age distribution. No adjustments are made for other factors that may affect local prevalence (e.g., local prevalence of cigarette smokers or occupational exposures) since the health surveys that obtain such data are rarely conducted on the county level. Because the estimates do not account for geographic differences in the prevalence of chronic and acute diseases, the sum of the estimates for each of the counties in the United States may not exactly reflect the national or state estimates derived from the BRFSS.

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State Table Notes

A full explanation of the sources of data and methodology is in **Methodology**.

Notes for all state data tables

1. **Total population** is based on 2018 U.S. Census and represents the at-risk populations in counties with ozone or $PM_{2.5}$ pollution monitors; it does not represent the entire state's sensitive populations.
2. Those **18 & under** and **65 & over** are vulnerable to ozone and $PM_{2.5}$. Do not use them as population denominators for disease estimates—that will lead to incorrect estimates.
3. **Pediatric asthma** estimates are for those under 18 years of age and represent the estimated number of people who had asthma in 2018 based on the state rates when available or national rates when not (Behavioral Risk Factor Surveillance System, or BRFSS), applied to county population estimates (U.S. Census).
4. **Adult asthma** estimates are for those 18 years and older and represent the estimated number of people who had asthma during 2018 based on state rates (BRFSS) applied to county population estimates (U.S. Census).
5. **COPD** estimates are for adults 18 and over who had ever been diagnosed with chronic obstructive pulmonary disease, which includes chronic bronchitis and emphysema, based on state rates (BRFSS) applied to county population estimates (U.S. Census).
6. **Lung cance**r estimates are for all ages and represent the estimated number of people diagnosed with lung cancer in 2016 based on state rates (StateCancerProfiles.gov) applied to county population estimates (U.S. Census).
7. **Cardiovascular disease** estimates are for adults 18 and over who have been diagnosed within their lifetime, based on state rates (BRFSS) applied to county population estimates (U.S. Census). CV disease includes coronary heart disease, stroke and heart attack.
8. **Ever smoked** estimates are for adults 18 and over who have ever smoked 100 or more cigarettes based on state rates (BRFSS) applied to county population estimates (U.S. Census).
9. **Poverty estimates** include all ages and come from the U.S. Census Bureau's Small Area Income and Poverty Estimates program. The estimates are derived from a model using estimates of income or poverty from the Annual Social and Economic Supplement and the Current Population Survey, 2018.
10. **People of color** are defined as anyone Hispanic or non-Hispanic black, Asian, American Indian/Alaska Native, Native Hawaiian and Other Pacific Islander, or two or more races and are based on 2018 county population estimates (U.S Census).
11. Adding across rows does not produce valid estimates. Adding the at-risk categories (asthma, COPD, poverty, etc.) will double-count people who fall into more than one category.

Notes for all state grades tables

1. Not all counties have monitors for either ozone or particle pollution. If a county does not have a monitor, that county's name is not on the list in these tables. The decision about monitors in the county is made by the state and the U.S. Environmental Protection Agency, not by the American Lung Association.
2. **INC** (Incomplete) indicates that monitoring is underway for that pollutant in that county, but that the data are incomplete for all three years. For particle pollution, some states collected data, but experienced laboratory quality issues that meant the data could not be used for assessing pollution levels.
3. **DNC** (Data Not Collected) indicates that data on that particular pollutant are not collected in that county.
4. The **Weighted Average (Wgt. Avg)** was derived by adding the three years of individual level data (2016-2018), multiplying the sums of each level by the assigned standard weights (i.e. 1=orange, 1.5=red, 2.0=purple and 2.5=maroon) and calculating the average. Grades are assigned based on the weighted averages as follows: A=0.0, B=0.3-0.9, C=1.0-2.0, D=2.1-3.2, F=3.3+.
5. The **design value** is the calculated concentration of a pollutant based on the form of the National Ambient Air Quality Standard. EPA uses the design values to determine whether the air quality in a county meets the standard. The numbers refer to micrograms per cubic meter, or $\mu g/m^3$. Design values for the annual $PM_{2.5}$ concentrations by county for the period 2016-2018 were retrieved from data posted on **December 3, 2019**, at the U.S. Environmental Protection Agency's website at https://www.epa.gov/sites/production/files/2019-12/pm25_designvalues_20162018_final_12_03_19.xlsx. One exception is the design value for Whatcom County, WA, where that value is based on the combined design value determined by the state and EPA using data from two monitors. That design value was provided by the State of Washington in email communication.
6. The annual average National Ambient Air Quality Standard for $PM_{2.5}$ is 12 $\mu g/m^3$ as of December 14, 2012. Counties with design values of 12 or lower received a grade of "Pass." Counties with design values of 12.1 or higher received a grade of "Fail."

ALABAMA

American Lung Association in Alabama

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Baldwin	218,022	47,110	44,571	6,217	18,036	18,817	143	24,290	75,937	21,069	36,821
Clay	13,275	2,688	2,751	355	1,118	1,173	9	1,512	4,711	2,285	2,585
Colbert	54,762	11,370	10,914	1,501	4,577	4,692	36	6,030	19,204	7,459	11,830
DeKalb	71,385	17,188	12,322	2,268	5,726	5,719	47	7,237	23,873	14,975	14,186
Elmore	81,887	18,211	12,400	2,403	6,739	6,460	54	7,997	27,836	8,559	22,116
Etowah	102,501	21,997	19,487	2,903	8,499	8,637	67	11,032	35,577	17,509	22,872
Houston	104,722	24,120	18,639	3,183	8,507	8,480	69	10,767	35,475	17,032	35,272
Jefferson	659,300	150,071	104,547	19,805	53,749	51,356	431	64,175	222,224	103,604	331,629
Madison	366,519	79,966	55,125	10,553	30,350	29,165	241	36,026	125,369	42,667	129,763
Mobile	413,757	96,711	67,041	12,763	33,472	32,375	271	40,606	138,707	84,539	179,067
Montgomery	225,763	52,774	34,173	6,965	18,255	17,182	147	21,366	75,260	43,567	150,610
Morgan	119,089	27,168	20,803	3,585	9,722	9,770	79	12,344	40,560	15,419	29,373
Russell	57,781	13,968	8,280	1,843	4,633	4,369	38	5,392	19,085	12,384	31,211
Shelby	215,707	50,645	33,087	6,684	17,480	17,010	142	21,125	72,395	16,916	48,467
Sumter	12,691	2,407	2,286	318	1,081	1,030	8	1,306	4,478	4,076	9,575
Talladega	79,828	16,918	14,370	2,233	6,651	6,682	52	8,456	27,752	14,825	29,938
Tuscaloosa	208,911	43,761	27,743	5,775	17,384	15,192	137	18,537	70,772	33,330	81,015
Totals	**3,005,900**	**677,073**	**488,539**	**89,354**	**245,979**	**238,108**	**1,972**	**298,197**	**1,019,215**	**460,215**	**1,166,330**

ALABAMA

American Lung Association in Alabama

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Baldwin	1	0	0	0.3	B	0	0	0	0	0.0	A	7.3	PASS
Clay	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.4	PASS
Colbert	1	0	0	0.3	B	0	0	0	0	0.0	A	7.5	PASS
DeKalb	0	0	0	0.0	A	1	0	0	0	0.3	B	7.6	PASS
Elmore	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Etowah	0	0	0	0.0	A	0	0	0	0	0.0	A	8.3	PASS
Houston	0	0	0	0.0	A	1	0	0	0	0.3	B	7.8	PASS
Jefferson	12	2	0	5.0	F	0	0	0	0	0.0	A	10.5	PASS
Madison	2	0	0	0.7	B	0	0	0	0	0.0	A	7.5	PASS
Mobile	5	0	0	1.7	C	0	0	0	0	0.0	A	8.1	PASS
Montgomery	1	0	0	0.3	B	0	0	0	0	0.0	A	8.6	PASS
Morgan	0	0	0	0.0	A	0	0	0	0	0.0	A	7.5	PASS
Russell	0	0	0	0.0	A	0	0	0	0	0.0	A	INC	INC
Shelby	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Sumter	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Talladega	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Tuscaloosa	1	0	0	0.3	B	0	0	0	0	0.0	A	7.8	PASS

ALASKA

American Lung Association in Alaska

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Anchorage Municipality	291,538	71,339	32,333	5,106	20,168	12,616	161	14,639	95,199	27,075	124,439
Denali Borough	2,059	384	245	27	158	104	1	122	742	135	412
Fairbanks North Star Borough	98,971	23,861	10,204	1,708	6,791	4,061	55	4,617	31,974	8,104	30,429
Juneau City and Borough	32,113	6,830	4,298	489	2,338	1,552	18	1,850	11,130	2,299	11,476
Matanuska-Susitna Borough	107,610	28,860	12,814	2,065	7,272	4,753	60	5,625	34,516	10,937	22,649
Totals	**532,291**	**131,274**	**59,894**	**9,395**	**36,727**	**23,086**	**295**	**26,854**	**173,561**	**48,550**	**189,405**

ALASKA

American Lung Association in Alaska

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Anchorage Municipality	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	5.8	PASS
Denali Borough	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Fairbanks North Star Borough	0	0	0	0.0	A	51	19	0	0	26.5	F	13.1	FAIL
Juneau City and Borough	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	6.2	PASS
Matanuska-Susitna Borough	0	0	0	0.0	A	6	1	0	0	2.5	D	5.3	PASS

ARIZONA

American Lung Association in Arizona

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Apache	71,818	19,518	10,986	1,573	5,322	3,728	32	4,820	21,136	26,435	58,801
Cochise	126,770	27,312	28,326	2,202	10,015	7,771	57	10,389	41,425	18,273	57,227
Coconino	142,854	29,454	17,855	2,374	11,338	6,940	64	8,729	43,956	20,964	65,726
Gila	53,889	10,827	15,506	873	4,363	3,814	24	5,220	18,698	10,804	20,487
La Paz	21,098	3,540	8,287	285	1,733	1,698	9	2,405	7,893	4,921	9,141
Maricopa	4,410,824	1,052,788	669,285	84,871	340,115	231,647	1,970	298,086	1,344,593	535,183	1,989,191
Mohave	209,550	35,739	63,526	2,881	17,610	15,506	94	21,258	75,665	34,411	48,373
Navajo	110,445	29,472	20,010	2,376	8,223	6,101	49	8,024	33,302	30,876	64,394
Pima	1,039,073	216,736	205,255	17,472	82,678	60,474	464	79,742	336,049	164,927	504,663
Pinal	447,138	100,778	91,129	8,124	34,832	26,058	201	34,552	142,549	54,399	194,203
Santa Cruz	46,511	12,435	8,421	1,002	3,455	2,555	21	3,361	13,995	11,287	39,600
Yavapai	231,993	37,687	73,278	3,038	19,703	17,642	103	24,260	85,109	30,060	45,569
Yuma	212,128	53,494	39,828	4,312	15,802	11,389	95	15,050	64,422	39,648	147,604
Totals	**7,124,091**	**1,629,780**	**1,251,692**	**131,385**	**555,189**	**395,322**	**3,183**	**515,896**	**2,228,791**	**982,188**	**3,244,979**

ARIZONA

American Lung Association in Arizona

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Apache	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	INC	INC
Cochise	2	0	0	0.7	B	0	0	0	0	0.0	A	INC	INC
Coconino	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Gila	30	1	0	10.5	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
La Paz	6	0	0	2.0	C	0	0	0	0	0.0	A	4.3	PASS
Maricopa	112	5	0	39.8	F	13	2	2	0	6.7	F	9.9	PASS
Mohave	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Navajo	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Pima	14	0	0	4.7	F	1	0	0	0	0.3	B	6.5	PASS
Pinal	44	1	0	15.2	F	30	3	0	0	11.5	F	13.0	FAIL
Santa Cruz	DNC	DNC	DNC	DNC	DNC	3	4	0	0	3.0	D	9.1	PASS
Yavapai	6	0	0	2.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Yuma	18	0	0	6.0	F	5	0	0	0	1.7	C	8.5	PASS

ARKANSAS

American Lung Association in Arkansas

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Arkansas	17,769	4,074	3,484	292	1,344	1,446	14	1,943	6,521	3,120	5,427
Ashley	20,046	4,582	4,081	328	1,514	1,653	16	2,230	7,378	3,876	6,354
Clark	22,061	4,184	3,687	299	1,765	1,641	17	2,206	8,328	3,838	6,963
Craighead	108,558	27,090	15,030	1,939	8,093	7,489	85	9,854	37,974	18,768	26,491
Crittenden	48,342	13,076	6,838	936	3,503	3,436	38	4,484	16,586	9,056	28,292
Garland	99,154	19,941	23,632	1,427	7,693	8,653	77	11,919	37,920	19,844	18,046
Jackson	16,811	3,381	3,051	242	1,324	1,349	13	1,798	6,344	3,732	3,934
Newton	7,805	1,502	2,069	107	609	719	6	999	3,040	1,340	506
Polk	20,049	4,567	4,611	327	1,504	1,705	16	2,342	7,422	3,962	2,477
Pulaski	392,680	91,009	61,075	6,513	29,892	29,262	305	38,546	141,761	64,312	188,759
Union	39,126	9,419	7,017	674	2,926	3,083	31	4,101	14,109	7,000	15,358
Washington	236,961	57,728	27,809	4,132	17,895	15,419	186	20,080	82,763	34,741	69,366
Totals	**1,029,362**	**240,553**	**162,384**	**17,216**	**78,062**	**75,854**	**802**	**100,501**	**370,147**	**173,589**	**371,973**

ARKANSAS

American Lung Association in Arkansas

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Arkansas	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	8.1	PASS
Ashley	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	8.2	PASS
Clark	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Craighead	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Crittenden	6	1	0	2.5	D	0	0	0	0	0.0	A	8.4	PASS
Garland	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	8.4	PASS
Jackson	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	8.1	PASS
Newton	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Polk	0	0	0	0.0	A	0	0	0	0	0.0	A	8.3	PASS
Pulaski	3	0	0	1.0	C	0	0	0	0	0.0	A	9.7	PASS
Union	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	8.9	PASS
Washington	0	0	0	0.0	A	0	0	0	0	0.0	A	8.1	PASS

CALIFORNIA

American Lung Association in California

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Alameda	1,666,753	342,510	230,510	21,146	112,623	59,859	645	86,118	438,363	147,394	1,148,783
Amador	39,383	5,914	10,633	365	2,936	1,919	15	2,945	11,929	4,130	8,898
Butte	231,256	46,213	42,992	2,853	15,844	9,018	90	13,309	62,372	42,016	65,598
Calaveras	45,602	7,721	12,553	477	3,340	2,233	18	3,448	13,649	5,454	8,802
Colusa	21,627	5,907	3,163	365	1,344	745	8	1,087	5,273	2,350	14,202
Contra Costa	1,150,215	259,791	181,443	16,039	76,494	43,209	445	63,410	301,667	88,980	652,755
Del Norte	27,828	5,854	5,018	361	1,890	1,092	11	1,616	7,478	5,065	10,472
El Dorado	190,678	37,821	40,389	2,335	13,335	8,279	74	12,506	53,670	15,401	42,700
Fresno	994,400	281,819	122,113	17,399	60,395	31,587	385	45,226	234,129	208,627	705,643
Glenn	28,047	7,453	4,453	460	1,767	1,003	11	1,476	6,967	4,271	13,812
Humboldt	136,373	26,184	24,380	1,617	9,423	5,297	53	7,783	37,018	27,002	35,274
Imperial	181,827	51,765	23,580	3,196	11,043	5,862	71	8,440	42,925	37,014	162,999
Inyo	17,987	3,681	4,210	227	1,249	792	7	1,206	5,040	2,172	6,877
Kern	896,764	259,180	98,347	16,001	53,894	27,503	348	39,003	208,055	177,021	596,328
Kings	151,366	40,964	15,516	2,529	9,283	4,580	59	6,416	35,590	25,481	103,277
Lake	64,382	13,490	14,635	833	4,442	2,804	25	4,261	17,916	11,689	19,519
Los Angeles	10,105,518	2,188,893	1,375,957	135,136	673,459	358,245	3,911	515,500	2,622,021	1,409,155	7,466,160
Madera	157,672	43,339	22,051	2,676	9,745	5,298	61	7,688	38,068	30,201	104,594
Marin	259,666	51,925	57,943	3,206	18,183	11,518	100	17,499	73,506	16,742	74,122
Mariposa	17,471	2,828	4,882	175	1,289	859	7	1,325	5,259	2,569	3,551
Mendocino	87,606	18,713	19,366	1,155	5,988	3,712	34	5,617	24,035	15,140	30,951
Merced	274,765	80,588	30,845	4,975	16,418	8,420	107	11,965	63,423	56,863	200,196
Mono	14,250	2,608	2,253	161	999	558	6	815	3,932	1,312	4,944
Monterey	435,594	113,834	59,201	7,028	27,378	14,688	169	21,215	106,690	55,614	306,813
Napa	139,417	28,800	26,665	1,778	9,552	5,640	54	8,403	37,970	11,829	66,865
Nevada	99,696	17,071	27,380	1,054	7,266	4,821	39	7,432	29,614	10,171	15,030
Orange	3,185,968	698,788	470,387	43,141	212,780	117,068	1,233	170,329	834,500	330,559	1,907,489
Placer	393,149	87,441	76,906	5,398	26,478	15,911	152	23,831	105,669	27,596	109,849
Plumas	18,804	3,173	5,345	196	1,378	927	7	1,435	5,635	2,317	3,123
Riverside	2,450,758	616,126	353,122	38,038	156,550	85,478	949	124,180	612,354	307,511	1,600,121
Sacramento	1,540,975	363,909	217,601	22,467	100,345	54,282	596	78,584	391,898	217,138	859,537
San Benito	61,537	15,827	7,937	977	3,896	2,089	24	3,013	15,205	5,294	40,928
San Bernardino	2,171,603	572,278	251,361	35,331	135,544	70,099	841	99,838	524,916	317,514	1,564,843
San Diego	3,343,364	722,408	469,454	44,599	222,727	118,450	1,296	170,564	866,445	372,148	1,832,022
San Francisco	883,305	118,692	138,249	7,328	64,765	34,033	343	48,859	251,054	87,596	527,131
San Joaquin	752,660	204,316	95,916	12,614	46,649	24,840	292	35,760	181,645	105,351	519,021
San Luis Obispo	284,010	50,000	57,040	3,087	20,105	11,680	110	17,346	79,503	34,200	89,147
San Mateo	769,545	158,383	123,921	9,778	52,381	29,308	298	42,903	206,033	51,830	470,051
Santa Barbara	446,527	98,787	68,465	6,099	29,547	15,916	173	23,056	115,063	54,029	249,761
Santa Clara	1,937,570	424,427	261,131	26,203	128,742	68,463	752	98,491	501,284	139,074	1,335,966

CALIFORNIA (cont.)

American Lung Association in California

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Santa Cruz	274,255	52,852	45,127	3,263	18,926	10,493	106	15,327	74,236	32,027	118,323
Shasta	180,040	38,584	37,553	2,382	12,262	7,457	70	11,216	49,022	26,919	36,805
Siskiyou	43,724	8,802	11,160	543	3,062	1,998	17	3,066	12,428	7,396	10,636
Solano	446,610	98,740	70,430	6,096	29,805	16,651	173	24,365	117,186	34,281	278,552
Sonoma	499,942	98,196	98,714	6,062	34,723	20,633	193	30,806	138,211	48,846	184,266
Stanislaus	549,815	148,801	72,319	9,187	34,134	18,290	213	26,395	133,042	84,744	323,635
Sutter	96,807	25,059	14,902	1,547	6,142	3,434	37	5,029	24,137	13,011	52,946
Tehama	63,916	15,363	12,389	948	4,205	2,533	25	3,797	16,786	10,749	20,718
Tulare	465,861	142,848	53,292	8,819	27,348	14,170	181	20,216	105,845	102,451	335,036
Tuolumne	54,539	9,158	14,279	565	3,969	2,562	21	3,923	16,064	6,417	11,026
Ventura	850,967	194,553	132,387	12,011	56,290	31,535	329	46,171	221,522	76,206	468,345
Yolo	220,408	46,233	27,535	2,854	14,649	7,339	85	10,357	56,245	42,311	118,464
Totals	**39,422,802**	**8,958,610**	**5,647,400**	**553,079**	**2,596,984**	**1,405,179**	**15,267**	**2,034,564**	**10,142,484**	**4,951,178**	**24,936,906**

CALIFORNIA

American Lung Association in California

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Alameda	20	3	1	8.8	F	10	13	2	0	11.2	F	12.0	PASS
Amador	15	0	0	5.0	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Butte	48	3	0	17.5	F	13	4	2	2	9.3	F	10.1	PASS
Calaveras	41	3	0	15.2	F	15	5	0	0	7.5	F	INC	INC
Colusa	0	0	0	0.0	A	12	16	0	0	12.0	F	8.5	PASS
Contra Costa	8	0	0	2.7	D	11	12	2	0	11.0	F	10.5	PASS
Del Norte	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	INC	INC
El Dorado	87	21	1	40.2	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Fresno	191	43	1	85.8	F	73	27	0	0	37.8	F	15.0	FAIL
Glenn	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Humboldt	1	0	0	0.3	B	4	0	0	0	1.3	C	7.4	PASS
Imperial	56	2	0	19.7	F	19	2	0	0	7.3	F	12.6	FAIL
Inyo	32	0	0	10.7	F	10	9	3	0	9.8	F	7.2	PASS
Kern	257	35	0	103.2	F	64	29	0	0	35.8	F	17.8	FAIL
Kings	111	5	0	39.5	F	68	27	0	0	36.2	F	16.8	FAIL
Lake	0	0	0	0.0	A	2	2	1	0	2.3	D	6.1	PASS
Los Angeles	207	68	12	111.0	F	31	7	0	0	13.8	F	12.7	FAIL
Madera	84	6	0	31.0	F	41	7	0	0	17.2	F	12.8	FAIL
Marin	0	0	0	0.0	A	8	12	1	0	9.3	F	9.1	PASS
Mariposa	60	5	0	22.5	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Mendocino	0	0	0	0.0	A	19	7	1	1	11.3	F	9.1	PASS
Merced	63	2	0	22.0	F	41	12	0	0	19.7	F	13.4	FAIL
Mono	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Monterey	0	0	0	0.0	A	9	10	0	0	8.0	F	6.3	PASS
Napa	2	0	0	0.7	B	10	13	2	0	11.2	F	INC	INC
Nevada	110	29	0	51.2	F	8	5	0	0	5.2	F	6.5	PASS
Orange	45	4	0	17.0	F	14	1	0	0	5.2	F	8.0	PASS
Placer	95	14	3	40.7	F	9	4	1	0	5.7	F	8.7	PASS
Plumas	DNC	DNC	DNC	DNC	DNC	32	11	0	0	16.2	F	14.7	FAIL
Riverside	244	99	12	138.8	F	21	4	0	0	9.0	F	13.9	FAIL
Sacramento	60	10	0	25.0	F	18	4	5	0	11.3	F	10.4	PASS
San Benito	7	0	0	2.3	D	11	0	0	0	3.7	F	5.5	PASS
San Bernardino	220	146	42	174.3	F	22	5	0	0	9.8	F	14.7	FAIL
San Diego	118	8	0	43.3	F	6	0	0	0	2.0	C	9.3	PASS
San Francisco	0	0	0	0.0	A	9	11	1	0	9.2	F	9.6	PASS
San Joaquin	32	1	0	11.2	F	45	9	3	0	21.5	F	13.8	FAIL
San Luis Obispo	19	1	0	6.8	F	2	0	0	0	0.7	B	8.9	PASS
San Mateo	1	1	0	0.8	B	7	12	0	0	8.3	F	9.3	PASS
Santa Barbara	5	0	0	1.7	C	6	8	1	0	6.7	F	8.1	PASS
Santa Clara	4	3	0	2.8	D	14	11	0	0	10.2	F	10.7	PASS

CALIFORNIA (cont.)

American Lung Association in California

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Santa Cruz	1	0	0	0.3	B	8	5	0	0	5.2	F	6.9	PASS
Shasta	42	2	0	15.0	F	1	5	0	0	2.8	D	9.6	PASS
Siskiyou	4	0	0	1.3	C	17	23	0	0	17.2	F	10.1	PASS
Solano	5	1	0	2.2	D	7	14	1	0	10.0	F	10.8	PASS
Sonoma	1	0	0	0.3	B	4	11	2	0	8.2	F	7.0	PASS
Stanislaus	82	9	0	31.8	F	54	16	1	0	26.7	F	14.2	FAIL
Sutter	50	0	0	16.7	F	11	0	0	0	3.7	F	9.2	PASS
Tehama	57	7	0	22.5	F	13	16	0	0	12.3	F	INC	INC
Tulare	242	49	0	105.2	F	19	9	0	0	10.8	F	16.1	FAIL
Tuolumne	83	8	0	31.7	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Ventura	39	3	0	14.5	F	4	4	3	2	7.0	F	11.0	PASS
Yolo	8	0	0	2.7	D	1	2	1	0	2.0	C	9.3	PASS

COLORADO

American Lung Association in Colorado

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Adams	511,868	135,776	53,587	9,717	34,100	15,049	208	19,585	150,229	46,711	257,963
Arapahoe	651,215	153,397	85,065	10,979	44,914	21,361	264	28,479	200,921	52,474	261,137
Archuleta	13,765	2,485	3,585	178	995	642	6	929	4,781	1,525	3,193
Boulder	326,078	61,951	46,486	4,434	23,860	11,305	132	15,118	106,582	30,699	73,061
Chaffee	20,027	3,009	5,084	215	1,510	924	8	1,327	7,151	2,023	2,962
Clear Creek	9,605	1,448	1,953	104	723	420	4	586	3,391	686	1,130
Delta	30,953	6,197	8,024	444	2,188	1,401	13	2,034	10,484	4,429	5,839
Denver	716,492	139,926	84,216	10,014	52,557	22,264	291	28,952	229,276	82,104	326,156
Douglas	342,776	88,978	40,935	6,368	22,775	11,168	139	14,826	102,766	8,975	61,999
El Paso	713,856	172,064	91,063	12,315	49,015	22,736	290	30,212	217,978	68,538	222,362
Garfield	59,770	15,072	7,858	1,079	4,023	1,962	24	2,628	18,101	4,946	19,175
Grand	15,525	2,609	2,732	187	1,152	623	6	856	5,310	1,219	2,000
Gunnison	17,246	2,931	2,236	210	1,299	578	7	760	5,727	1,678	2,220
Jefferson	580,233	114,515	95,477	8,196	41,776	21,576	235	29,476	190,255	39,799	127,678
La Plata	56,310	10,684	9,668	765	4,090	2,139	23	2,935	18,677	5,005	12,182
Larimer	350,518	68,703	54,938	4,917	25,460	12,323	142	16,693	114,131	36,054	61,373
Mesa	153,207	33,045	29,238	2,365	10,759	5,864	62	8,192	49,537	21,463	28,885
Moffat	13,188	3,418	2,020	245	875	457	5	625	3,997	1,614	2,590
Montezuma	26,158	5,756	5,785	412	1,811	1,087	11	1,550	8,541	4,235	7,318
Montrose	42,214	9,120	9,836	653	2,935	1,796	17	2,578	13,903	4,854	10,177
Park	18,556	2,810	3,793	201	1,389	835	8	1,167	6,578	1,487	2,052
Pueblo	167,529	37,623	30,988	2,693	11,628	6,320	68	8,807	53,520	28,127	80,496
Rio Blanco	6,336	1,506	985	108	433	224	3	306	1,974	653	977
San Miguel	8,191	1,438	1,201	103	605	305	3	410	2,746	702	1,152
Weld	314,305	82,497	38,224	5,904	20,952	9,752	127	12,935	93,286	32,314	108,618
Totals	**5,165,921**	**1,156,958**	**714,977**	**82,803**	**361,827**	**173,114**	**2,095**	**231,967**	**1,619,841**	**482,314**	**1,682,695**

COLORADO

American Lung Association in Colorado

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Adams	3	0	0	1.0	C	2	0	0	0	0.7	B	INC	INC
Arapahoe	27	1	0	9.5	F	1	0	0	0	0.3	B	6.0	PASS
Archuleta	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Boulder	38	1	0	13.2	F	3	0	0	0	1.0	C	7.0	PASS
Chaffee	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Clear Creek	21	2	0	8.0	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Delta	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC
Denver	10	0	0	3.3	F	5	0	0	0	1.7	C	9.2	PASS
Douglas	53	4	0	19.7	F	3	1	0	0	1.5	C	6.2	PASS
El Paso	11	0	0	3.7	F	2	0	0	0	0.7	B	6.0	PASS
Garfield	2	1	0	1.2	C	0	0	0	0	0.0	A	INC	INC
Grand	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Gunnison	2	1	0	1.2	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Jefferson	80	5	0	29.2	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
La Plata	16	0	0	5.3	F	5	9	1	0	6.8	F	8.4	PASS
Larimer	42	4	0	16.0	F	1	1	0	0	0.8	B	7.3	PASS
Mesa	4	0	0	1.3	C	1	0	0	0	0.3	B	5.9	PASS
Moffat	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Montezuma	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Montrose	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Park	4	0	0	1.3	C	2	0	0	0	0.7	B	INC	INC
Pueblo	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	5.5	PASS
Rio Blanco	2	0	0	0.7	B	0	0	0	0	0.0	A	7.9	PASS
San Miguel	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Weld	14	0	0	4.7	F	6	1	0	0	2.5	D	9.1	PASS

CONNECTICUT

American Lung Association in Connecticut

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Fairfield	943,823	212,038	149,918	20,593	76,126	39,383	560	54,861	291,103	92,971	363,243
Hartford	892,697	187,304	152,874	18,191	72,903	37,913	530	53,407	280,026	96,957	351,528
Litchfield	181,111	32,933	38,502	3,198	15,522	8,888	108	12,862	61,124	12,441	21,609
Middlesex	162,682	28,777	33,067	2,795	13,956	7,758	97	11,147	54,545	10,556	26,484
New Haven	857,620	173,046	148,886	16,806	70,700	36,755	509	51,816	271,621	96,563	322,987
New London	266,784	51,733	48,611	5,024	22,251	11,781	159	16,711	85,901	25,063	65,967
Tolland	150,921	26,160	23,845	2,541	12,817	6,287	90	8,681	48,503	10,835	23,699
Windham	117,027	23,202	19,418	2,253	9,739	5,032	70	7,025	37,262	13,135	20,797
Totals	**3,572,665**	**735,193**	**615,121**	**71,401**	**294,014**	**153,797**	**2,120**	**216,509**	**1,130,084**	**358,521**	**1,196,314**

CONNECTICUT

American Lung Association in Connecticut

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Fairfield	42	18	0	23.0	F
Hartford	10	1	0	3.8	F
Litchfield	12	1	0	4.5	F
Middlesex	26	3	0	10.2	F
New Haven	31	9	0	14.8	F
New London	21	3	0	8.5	F
Tolland	12	0	0	4.0	F
Windham	13	1	0	4.8	F

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Fairfield	0	0	0	0	0.0	A	8.1	PASS
Hartford	0	0	0	0	0.0	A	7.5	PASS
Litchfield	1	0	0	0	0.3	B	4.2	PASS
Middlesex	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
New Haven	0	0	0	0	0.0	A	6.8	PASS
New London	0	0	0	0	0.0	A	INC	INC
Tolland	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Windham	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC

DELAWARE

American Lung Association in Delaware

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Kent	178,550	40,805	30,483	2,920	14,080	9,420	121	11,922	57,685	23,966	69,754
New Castle	559,335	120,227	87,028	8,605	45,228	29,593	380	36,633	183,147	62,976	241,696
Sussex	229,286	42,584	63,575	3,048	18,083	15,036	156	20,944	82,503	27,750	56,660
Totals	**967,171**	**203,616**	**181,086**	**14,573**	**77,392**	**54,049**	**656**	**69,499**	**323,336**	**114,692**	**368,110**

DELAWARE

American Lung Association in Delaware

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Kent	5	0	0	1.7	C
New Castle	22	1	0	7.8	F
Sussex	8	0	0	2.7	D

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Kent	0	0	0	0	0.0	A	INC	INC
New Castle	3	0	0	0	1.0	C	INC	INC
Sussex	0	0	0	0	0.0	A	6.7	PASS

DISTRICT OF COLUMBIA

American Lung Association in the District of Columbia

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
District of Columbia	702,455	127,494	85,303	13,885	67,121	30,357	275	36,404	199,495	107,806	442,187
Totals	**702,455**	**127,494**	**85,303**	**13,885**	**67,121**	**30,357**	**275**	**36,404**	**199,495**	**107,806**	**442,187**

DISTRICT OF COLUMBIA

American Lung Association in the District of Columbia

	HIGH OZONE DAYS 2016–2018				
County	Orange	Red	Purple	Wgt. Avg.	Grade
District of Columbia	14	1	0	5.2	F

	HIGH PARTICLE POLLUTION DAYS 2016–2018							
	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
District of Columbia	2	0	0	0	0.7	B	9.0	PASS

FLORIDA

American Lung Association in Florida

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Alachua	269,956	48,541	37,836	3,616	19,164	15,388	151	18,802	86,310	50,922	105,796
Baker	28,355	6,715	4,015	500	1,908	1,641	16	2,082	8,806	3,944	5,448
Bay	185,287	39,761	31,678	2,962	12,837	11,548	104	15,034	60,251	24,276	44,216
Brevard	596,849	108,913	141,345	8,114	43,092	42,603	334	58,240	209,867	64,854	154,762
Broward	1,951,260	412,789	324,313	30,754	135,830	121,311	1,090	157,257	635,762	244,310	1,256,553
Citrus	147,929	22,036	53,705	1,642	11,016	12,524	83	18,233	56,902	22,082	18,173
Collier	378,488	64,794	121,935	4,827	27,352	29,654	212	42,379	138,432	39,689	141,797
Columbia	70,503	15,312	13,314	1,141	4,853	4,472	40	5,904	22,990	11,340	19,550
Duval	950,181	214,676	133,483	15,994	64,667	54,910	530	69,179	297,059	134,476	450,723
Escambia	315,534	65,784	53,148	4,901	21,910	19,334	177	24,935	102,101	43,832	113,022
Flagler	112,067	18,884	34,428	1,407	8,183	8,789	62	12,492	41,244	11,450	28,218
Highlands	105,424	17,970	37,222	1,339	7,586	8,495	59	12,315	38,936	21,577	35,445
Hillsborough	1,436,888	323,986	205,315	24,138	97,850	83,443	803	105,402	450,198	207,358	743,667
Holmes	19,477	3,938	3,871	293	1,369	1,279	11	1,701	6,519	4,232	2,638
Indian River	157,413	25,219	52,019	1,879	11,568	12,687	88	18,204	58,831	16,775	39,052
Lake	356,495	68,268	95,109	5,086	25,249	25,793	199	35,876	124,638	40,582	109,098
Lee	754,610	132,623	215,894	9,881	54,399	56,536	422	79,279	270,457	90,400	250,391
Leon	292,502	54,472	39,155	4,058	20,635	16,477	163	20,048	92,747	57,656	127,693
Liberty	8,457	1,512	1,229	113	611	515	5	646	2,798	1,523	2,436
Manatee	394,855	72,121	108,173	5,373	28,333	29,240	220	40,840	140,444	40,662	114,856
Marion	359,977	66,922	104,178	4,986	25,605	26,824	201	37,756	127,728	52,818	107,688
Martin	160,912	26,388	49,690	1,966	11,817	12,698	90	18,050	59,572	16,824	35,430
Miami-Dade	2,761,581	558,250	448,112	41,591	194,215	171,072	1,542	220,114	904,339	436,103	2,401,789
Okaloosa	207,269	46,083	33,189	3,433	14,141	12,360	116	15,854	65,662	25,612	55,655
Orange	1,380,645	305,917	164,820	22,791	94,243	76,289	772	93,319	425,534	211,307	831,907
Osceola	367,990	89,835	48,605	6,693	24,413	20,439	206	25,540	111,571	48,711	254,727
Palm Beach	1,485,941	283,456	355,266	21,118	105,463	103,565	830	141,344	512,309	179,359	682,305
Pasco	539,630	109,651	122,105	8,169	37,833	36,867	301	50,087	183,202	67,164	141,208
Pinellas	975,280	157,672	241,641	11,747	72,125	71,655	544	98,212	351,963	112,593	255,246
Polk	708,009	156,487	143,142	11,659	48,289	45,154	396	60,146	230,084	109,018	297,726
St. Lucie	321,128	63,294	77,503	4,716	22,646	22,443	179	30,756	110,409	38,398	139,092
Santa Rosa	179,349	39,352	28,645	2,932	12,372	10,983	101	14,184	57,775	16,404	31,748
Sarasota	426,718	60,616	156,509	4,516	31,975	36,276	238	52,791	165,020	43,389	72,475
Seminole	467,832	98,309	72,533	7,324	32,569	28,403	261	36,334	151,087	46,050	189,106
Volusia	547,538	96,836	133,733	7,214	39,636	39,194	306	53,638	193,067	70,499	157,810
Wakulla	32,461	6,945	5,086	517	2,260	2,002	18	2,581	10,546	3,543	6,473
Totals	**19,454,790**	**3,884,327**	**3,891,944**	**289,390**	**1,368,014**	**1,272,860**	**10,867**	**1,689,555**	**6,505,159**	**2,609,732**	**9,423,919**

FLORIDA

American Lung Association in Florida

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Alachua	1	0	0	0.3	B	0	0	0	0	0.0	A	6.3	PASS
Baker	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Bay	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Brevard	1	0	0	0.3	B	0	0	0	0	0.0	A	5.7	PASS
Broward	5	0	0	1.7	C	0	0	0	0	0.0	A	6.6	PASS
Citrus	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Collier	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Columbia	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Duval	1	0	0	0.3	B	1	0	0	0	0.3	B	INC	INC
Escambia	3	0	0	1.0	C	0	0	0	0	0.0	A	7.4	PASS
Flagler	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Highlands	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Hillsborough	9	1	0	3.5	F	0	0	0	0	0.0	A	7.9	PASS
Holmes	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Indian River	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lake	4	0	0	1.3	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lee	1	0	0	0.3	B	1	0	0	0	0.3	B	6.6	PASS
Leon	0	0	0	0.0	A	0	0	0	0	0.0	A	7.3	PASS
Liberty	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Manatee	4	0	0	1.3	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Marion	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Martin	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Miami-Dade	7	0	0	2.3	D	1	0	0	0	0.3	B	8.0	PASS
Okaloosa	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Orange	3	1	0	1.5	C	0	0	0	0	0.0	A	7.2	PASS
Osceola	4	0	0	1.3	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Palm Beach	2	0	0	0.7	B	0	0	0	0	0.0	A	6.4	PASS
Pasco	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Pinellas	1	0	0	0.3	B	0	0	0	0	0.0	A	7.3	PASS
Polk	6	0	0	2.0	C	0	0	0	0	0.0	A	6.9	PASS
St. Lucie	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Santa Rosa	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Sarasota	2	0	0	0.7	B	0	0	0	0	0.0	A	6.7	PASS
Seminole	4	0	0	1.3	C	0	0	0	0	0.0	A	6.2	PASS
Volusia	0	0	0	0.0	A	0	0	0	0	0.0	A	6.6	PASS
Wakulla	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC

GEORGIA

American Lung Association in Georgia

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Bibb	153,095	37,623	23,876	2,852	10,333	8,813	95	11,232	43,798	36,326	95,172
Chatham	289,195	61,279	44,478	4,645	20,274	16,743	181	21,065	85,672	39,488	149,834
Chattooga	24,790	5,555	4,354	421	1,731	1,540	16	1,998	7,379	4,575	4,353
Clarke	127,330	21,989	13,959	1,667	9,179	6,433	79	7,441	38,080	31,645	57,196
Clayton	289,615	80,559	26,997	6,107	18,739	14,223	180	16,817	77,506	50,072	261,809
Cobb	756,865	178,546	92,777	13,534	52,002	41,860	474	51,282	217,167	67,585	367,250
Coffee	43,093	10,534	5,930	799	2,914	2,395	27	2,987	12,256	9,505	18,230
Columbia	154,291	39,147	20,833	2,967	10,335	8,547	97	10,665	43,446	10,858	49,193
Coweta	145,864	35,765	20,242	2,711	9,959	8,433	91	10,593	41,875	14,844	42,590
Dawson	25,083	5,186	5,045	393	1,797	1,672	16	2,214	7,720	2,168	2,016
DeKalb	756,558	174,942	94,120	13,261	52,017	41,366	471	50,572	217,418	106,598	535,786
Dougherty	91,243	21,222	14,027	1,609	6,229	5,187	56	6,556	26,366	25,104	68,944
Douglas	145,331	37,605	16,774	2,851	9,725	7,854	91	9,601	40,542	18,113	88,809
Floyd	97,927	22,702	16,390	1,721	6,739	5,857	61	7,536	28,659	19,427	28,490
Fulton	1,050,114	229,407	122,730	17,390	73,347	57,077	657	68,864	305,399	137,929	633,490
Glynn	85,219	18,521	17,247	1,404	5,993	5,553	53	7,372	25,802	13,913	31,187
Gwinnett	927,781	249,129	93,264	18,885	61,212	47,918	582	57,458	253,730	84,763	590,670
Hall	202,148	51,265	30,106	3,886	13,547	11,528	127	14,625	57,279	26,249	80,340
Henry	230,220	58,952	26,816	4,469	15,487	12,578	144	15,405	64,571	17,086	134,022
Houston	155,469	39,714	19,762	3,010	10,388	8,453	97	10,447	43,529	18,519	69,011
Lowndes	116,321	27,869	14,366	2,113	7,807	5,993	73	7,267	32,673	28,539	54,131
Murray	39,921	9,891	5,931	750	2,710	2,329	25	2,956	11,447	5,987	7,194
Muscogee	194,160	48,112	26,004	3,647	13,016	10,521	122	13,041	54,699	37,759	116,402
Paulding	164,044	42,844	17,394	3,248	10,946	8,682	103	10,487	45,455	12,654	49,499
Pike	18,634	4,359	2,969	330	1,291	1,131	12	1,450	5,469	1,947	2,410
Richmond	201,554	46,063	28,342	3,492	13,849	11,249	126	13,995	58,280	41,554	132,321
Rockdale	90,594	22,370	13,059	1,696	6,175	5,294	56	6,695	26,023	11,803	63,255
Sumter	29,733	6,728	4,979	510	2,051	1,760	18	2,258	8,724	7,208	18,073
Walker	69,410	15,094	12,876	1,144	4,893	4,428	44	5,794	20,924	10,542	6,459
Washington	20,386	4,398	3,540	333	1,440	1,273	13	1,646	6,126	4,787	11,732
Wilkinson	9,036	2,053	1,751	156	632	588	6	778	2,712	2,062	3,908
Totals	**6,705,024**	**1,609,423**	**840,938**	**121,999**	**456,759**	**367,277**	**4,192**	**451,097**	**1,910,727**	**899,609**	**3,773,776**

GEORGIA

American Lung Association in Georgia

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Bibb	3	0	0	1.0	C	3	0	0	0	1.0	C	9.3	PASS
Chatham	0	0	0	0.0	A	1	0	0	0	0.3	B	7.8	PASS
Chattooga	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Clarke	3	0	0	1.0	C	0	1	0	0	0.5	B	8.1	PASS
Clayton	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	9.1	PASS
Cobb	2	1	0	1.2	C	1	0	0	0	0.3	B	8.7	PASS
Coffee	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Columbia	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Coweta	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Dawson	6	0	0	2.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
DeKalb	8	0	0	2.7	D	1	1	0	0	0.8	B	8.6	PASS
Dougherty	DNC	DNC	DNC	DNC	DNC	1	1	0	0	0.8	B	8.8	PASS
Douglas	6	2	0	3.0	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Floyd	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Fulton	21	1	0	7.5	F	1	0	0	0	0.3	B	10.1	PASS
Glynn	0	0	0	0.0	A	2	0	0	0	0.7	B	7.2	PASS
Gwinnett	6	0	0	2.0	C	1	0	0	0	0.3	B	9.0	PASS
Hall	DNC	DNC	DNC	DNC	DNC	1	1	0	0	0.8	B	7.9	PASS
Henry	13	1	0	4.8	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Houston	DNC	DNC	DNC	DNC	DNC	3	0	0	0	1.0	C	8.3	PASS
Lowndes	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	7.4	PASS
Murray	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Muscogee	1	0	0	0.3	B	2	0	0	0	0.7	B	9.2	PASS
Paulding	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC
Pike	6	0	0	2.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Richmond	1	0	0	0.3	B	4	1	0	0	1.8	C	9.5	PASS
Rockdale	12	0	0	4.0	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Sumter	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Walker	DNC	DNC	DNC	DNC	DNC	0	1	0	0	0.5	B	8.8	PASS
Washington	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	7.9	PASS
Wilkinson	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC

HAWAII

American Lung Association in Hawaii

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Hawaii	200,983	43,553	42,032	4,444	14,524	6,922	92	13,054	62,784	30,903	140,018
Honolulu	980,080	207,765	173,793	21,200	71,769	30,825	449	56,918	302,694	73,345	803,626
Kauai	72,133	15,749	14,539	1,607	5,211	2,448	33	4,599	22,446	6,021	50,931
Maui	167,207	36,347	30,566	3,709	12,147	5,506	76	10,237	51,886	14,130	116,808
Totals	**1,420,403**	**303,414**	**260,930**	**30,960**	**103,651**	**45,701**	**650**	**84,808**	**439,810**	**124,399**	**1,111,383**

HAWAII

American Lung Association in Hawaii

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Hawaii	DNC	DNC	DNC	DNC	DNC
Honolulu	0	0	0	0.0	A
Kauai	DNC	DNC	DNC	DNC	DNC
Maui	DNC	DNC	DNC	DNC	DNC

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Hawaii	16	2	0	0	6.3	F	12.3	FAIL
Honolulu	0	0	0	0	0.0	A	3.6	PASS
Kauai	0	0	0	0	0.0	A	2.9	PASS
Maui	1	0	0	0	0.3	B	4.1	PASS

IDAHO

American Lung Association in Idaho

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Ada	469,966	111,737	67,792	7,997	30,846	19,607	227	27,145	135,509	44,434	73,002
Bannock	87,138	22,849	12,400	1,635	5,520	3,423	42	4,789	24,104	11,768	14,350
Benewah	9,226	2,084	2,073	149	609	472	4	703	2,881	1,342	1,414
Butte	2,611	626	612	45	168	131	1	200	801	392	226
Canyon	223,499	63,627	30,762	4,554	13,744	8,652	108	12,057	60,254	25,416	66,818
Franklin	13,726	4,380	1,943	313	802	523	7	738	3,560	1,194	1,228
Idaho	16,513	3,259	4,606	233	1,118	917	8	1,429	5,439	2,587	1,538
Jerome	24,015	7,394	3,117	529	1,431	904	12	1,250	6,274	2,974	9,335
Lemhi	7,961	1,488	2,409	106	544	458	4	726	2,679	1,154	533
Shoshone	12,796	2,630	2,923	188	866	662	6	988	4,079	2,371	1,140
Totals	**867,451**	**220,074**	**128,637**	**15,751**	**55,647**	**35,748**	**419**	**50,025**	**245,580**	**93,632**	**169,584**

IDAHO

American Lung Association in Idaho

	HIGH OZONE DAYS 2016–2018				
County	Orange	Red	Purple	Wgt. Avg.	Grade
Ada	20	0	0	6.7	F
Bannock	DNC	DNC	DNC	DNC	DNC
Benewah	DNC	DNC	DNC	DNC	DNC
Butte	3	0	0	1.0	C
Canyon	DNC	DNC	DNC	DNC	DNC
Franklin	DNC	DNC	DNC	DNC	DNC
Idaho	INC	INC	INC	INC	INC
Jerome	DNC	DNC	DNC	DNC	DNC
Lemhi	DNC	DNC	DNC	DNC	DNC
Shoshone	DNC	DNC	DNC	DNC	DNC

	HIGH PARTICLE POLLUTION DAYS 2016–2018							
	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Ada	6	1	0	0	2.5	D	7.7	PASS
Bannock	2	3	0	0	2.2	D	INC	INC
Benewah	22	5	2	0	11.2	F	INC	INC
Butte	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Canyon	7	1	0	0	2.8	D	9.4	PASS
Franklin	7	2	0	0	3.3	F	INC	INC
Idaho	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Jerome	10	1	0	0	3.8	F	INC	INC
Lemhi	11	4	0	0	5.7	F	11.4	PASS
Shoshone	29	6	1	0	13.3	F	11.2	PASS

ILLINOIS

American Lung Association in Illinois

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Adams	65,691	14,779	13,290	887	4,405	3,716	42	4,807	20,067	7,803	5,551
Champaign	209,983	39,434	26,930	2,368	14,952	9,930	133	11,800	62,828	37,121	69,623
Clark	15,596	3,540	3,097	213	1,044	883	10	1,144	4,766	1,702	562
Cook	5,180,493	1,129,672	758,167	67,835	353,721	259,528	3,271	321,077	1,538,653	701,869	3,000,419
DuPage	928,589	210,552	143,938	12,643	62,583	48,073	587	60,485	276,877	60,169	312,483
Effingham	34,208	8,104	6,043	487	2,267	1,829	22	2,336	10,181	3,277	1,520
Hamilton	8,163	1,794	1,783	108	550	481	5	628	2,537	990	321
Jersey	21,847	4,455	4,260	268	1,508	1,256	14	1,620	6,851	1,864	957
Jo Daviess	21,366	4,017	6,004	241	1,485	1,438	14	1,929	7,107	1,656	1,181
Kane	534,216	136,009	73,009	8,167	34,780	25,892	338	32,243	152,367	45,180	231,005
Lake	700,832	168,886	99,810	10,141	46,434	35,011	444	43,799	204,350	54,353	273,375
McHenry	308,570	72,396	45,024	4,347	20,605	15,817	195	19,921	91,332	18,136	59,799
McLean	172,828	37,136	22,860	2,230	11,878	8,277	109	10,040	50,773	23,366	35,797
Macon	104,712	23,150	20,960	1,390	7,061	5,902	66	7,612	32,055	17,557	24,937
Macoupin	45,313	9,644	9,006	579	3,089	2,600	29	3,363	14,083	5,740	1,834
Madison	264,461	57,756	45,485	3,468	17,974	14,239	167	18,086	80,268	35,925	40,298
Peoria	180,621	42,619	30,816	2,559	11,997	9,427	114	11,931	53,343	29,227	54,743
Randolph	32,106	6,203	5,972	372	2,250	1,806	21	2,302	10,083	3,834	4,881
Rock Island	143,477	31,963	27,672	1,919	9,665	7,949	91	10,203	43,632	19,754	41,412
St. Clair	261,059	61,073	41,261	3,667	17,419	13,467	165	16,975	77,184	38,065	100,558
Sangamon	195,348	43,347	34,887	2,603	13,202	10,622	123	13,556	59,249	25,172	38,619
Will	692,310	172,143	90,406	10,337	45,481	33,460	438	41,517	198,663	44,038	256,365
Winnebago	284,081	66,490	49,819	3,993	18,901	15,178	179	19,358	84,760	45,006	89,449
Totals	**10,405,870**	**2,345,162**	**1,560,499**	**140,823**	**703,250**	**526,778**	**6,576**	**656,731**	**3,082,010**	**1,221,804**	**4,645,689**

ILLINOIS

American Lung Association in Illinois

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Adams	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Champaign	5	0	0	1.7	C	0	0	0	0	0.0	A	7.6	PASS
Clark	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Cook	44	9	0	19.2	F	2	0	0	0	0.7	B	10.3	PASS
DuPage	15	0	0	5.0	F	0	0	0	0	0.0	A	8.8	PASS
Effingham	4	0	0	1.3	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Hamilton	3	0	0	1.0	C	0	0	0	0	0.0	A	8.4	PASS
Jersey	11	0	0	3.7	F	0	0	0	0	0.0	A	INC	INC
Jo Daviess	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Kane	14	0	0	4.7	F	0	0	0	0	0.0	A	8.4	PASS
Lake	21	2	0	8.0	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
McHenry	17	0	0	5.7	F	0	0	0	0	0.0	A	7.6	PASS
McLean	2	0	0	0.7	B	0	0	0	0	0.0	A	8.7	PASS
Macon	6	0	0	2.0	C	0	0	0	0	0.0	A	9.0	PASS
Macoupin	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Madison	25	2	0	9.3	F	1	0	0	0	0.3	B	9.9	PASS
Peoria	8	0	0	2.7	D	0	0	0	0	0.0	A	8.5	PASS
Randolph	3	0	0	1.0	C	0	0	0	0	0.0	A	8.4	PASS
Rock Island	2	0	0	0.7	B	0	0	0	0	0.0	A	INC	INC
St. Clair	9	1	0	3.5	F	0	0	0	0	0.0	A	9.7	PASS
Sangamon	4	0	0	1.3	C	0	0	0	0	0.0	A	8.6	PASS
Will	5	0	0	1.7	C	0	0	0	0	0.0	A	INC	INC
Winnebago	5	1	0	2.2	D	0	0	0	0	0.0	A	INC	INC

INDIANA

American Lung Association in Indiana

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Allen	375,351	96,407	54,718	8,390	27,609	24,979	269	29,997	125,725	49,641	99,590
Bartholomew	82,753	19,689	13,487	1,713	6,239	5,773	60	7,019	28,495	8,238	15,386
Boone	66,999	17,718	8,954	1,542	4,909	4,486	48	5,290	22,323	3,585	6,615
Brown	15,234	2,732	3,668	238	1,252	1,352	11	1,691	5,810	1,519	687
Carroll	20,127	4,451	3,949	387	1,562	1,568	14	1,932	7,188	1,756	1,201
Clark	117,360	26,376	18,524	2,295	9,035	8,391	84	10,083	41,223	12,975	20,078
Delaware	114,772	21,074	19,672	1,834	9,194	8,142	82	9,986	41,911	23,799	15,212
Dubois	42,565	10,277	7,430	894	3,218	3,145	31	3,825	14,755	3,155	4,214
Elkhart	205,560	56,565	30,282	4,923	14,750	13,493	148	16,276	67,254	23,202	52,263
Floyd	77,781	17,609	12,549	1,532	5,989	5,657	56	6,800	27,357	7,231	9,564
Greene	32,006	7,019	6,248	611	2,493	2,512	23	3,087	11,473	4,423	1,103
Hamilton	330,086	89,053	40,862	7,750	23,994	21,480	236	25,130	108,861	13,797	54,838
Hendricks	167,009	41,780	23,141	3,636	12,442	11,279	120	13,373	56,582	9,657	27,120
Henry	48,271	9,877	9,134	860	3,818	3,734	35	4,576	17,525	6,434	3,149
Howard	82,366	18,680	16,056	1,626	6,321	6,250	59	7,740	29,080	9,942	12,346
Huntington	36,240	7,812	6,230	680	2,827	2,697	26	3,268	12,934	3,532	1,985
Jackson	44,111	10,835	7,218	943	3,306	3,134	32	3,796	15,120	5,183	5,343
Johnson	156,225	38,713	22,769	3,369	11,643	10,548	112	12,630	53,005	11,784	17,578
Knox	36,895	7,921	6,582	689	2,864	2,691	27	3,302	13,112	5,447	2,785
Lake	484,411	113,194	80,104	9,851	36,859	34,784	346	42,135	168,517	74,864	222,969
LaPorte	110,007	23,561	19,692	2,050	8,582	8,225	79	10,039	39,317	16,212	23,147
Madison	129,641	28,038	23,714	2,440	10,079	9,700	93	11,892	46,215	20,908	19,694
Marion	954,670	235,211	120,358	20,470	70,986	60,620	682	71,598	321,447	160,661	431,505
Monroe	146,917	22,966	19,249	1,999	12,037	9,253	106	11,071	54,238	28,177	24,381
Morgan	70,116	15,846	11,874	1,379	5,429	5,316	50	6,391	24,863	7,339	2,850
Perry	19,102	4,013	3,590	349	1,497	1,450	14	1,782	6,869	2,167	1,160
Porter	169,594	37,424	27,803	3,257	13,131	12,330	122	14,874	59,981	14,826	29,129
Posey	25,540	5,627	4,799	490	1,987	1,980	18	2,420	9,130	2,311	1,073
St. Joseph	270,771	64,005	42,783	5,570	20,430	18,618	194	22,570	93,183	35,068	75,154
Shelby	44,593	10,170	7,644	885	3,433	3,332	32	4,029	15,724	5,065	3,495
Spencer	20,327	4,440	3,932	386	1,587	1,600	15	1,961	7,300	1,839	1,066
Sullivan	20,690	3,979	3,718	346	1,656	1,561	15	1,905	7,576	2,513	1,724
Tippecanoe	193,048	39,983	22,471	3,480	14,884	11,360	139	13,470	66,978	32,114	47,441
Vanderburgh	180,974	39,047	30,573	3,398	14,042	13,032	129	15,856	64,158	26,349	29,780
Vigo	107,386	21,965	17,517	1,912	8,404	7,483	77	9,114	38,291	18,824	15,570
Wabash	31,280	6,512	6,526	567	2,455	2,451	22	3,060	11,316	3,631	1,767
Warrick	62,567	14,921	10,947	1,299	4,744	4,620	45	5,624	21,754	4,373	4,900
Whitley	34,074	7,899	6,124	687	2,607	2,554	24	3,116	11,961	2,377	1,604
Totals	**5,127,419**	**1,203,389**	**774,891**	**104,727**	**388,291**	**351,578**	**3,677**	**422,705**	**1,768,553**	**664,918**	**1,289,466**

INDIANA

American Lung Association in Indiana

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Allen	10	0	0	3.3	F	0	0	0	0	0.0	A	8.6	PASS
Bartholomew	8	0	0	2.7	D	1	0	0	0	0.3	B	7.6	PASS
Boone	9	0	0	3.0	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Brown	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Carroll	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Clark	12	0	0	4.0	F	0	0	0	0	0.0	A	9.0	PASS
Delaware	5	0	0	1.7	C	1	0	0	0	0.3	B	7.9	PASS
Dubois	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	8.6	PASS
Elkhart	10	0	0	3.3	F	2	0	0	0	0.7	B	8.3	PASS
Floyd	16	0	0	5.3	F	0	0	0	0	0.0	A	INC	INC
Greene	7	0	0	2.3	D	0	0	0	0	0.0	A	7.9	PASS
Hamilton	10	0	0	3.3	F	1	0	0	0	0.3	B	8.1	PASS
Hendricks	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Henry	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	7.5	PASS
Howard	INC	INC	INC	INC	INC	0	0	0	0	0.0	A	8.3	PASS
Huntington	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Jackson	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Johnson	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Knox	8	0	0	2.7	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lake	12	1	0	4.5	F	2	1	1	0	1.8	C	9.4	PASS
LaPorte	16	1	0	5.8	F	0	0	0	0	0.0	A	INC	INC
Madison	7	0	0	2.3	D	1	0	0	0	0.3	B	8.3	PASS
Marion	18	0	0	6.0	F	7	1	0	0	2.8	D	10.4	PASS
Monroe	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.8	PASS
Morgan	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Perry	4	0	0	1.3	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Porter	19	0	0	6.3	F	0	1	0	0	0.5	B	7.7	PASS
Posey	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
St. Joseph	19	0	0	6.3	F	0	0	0	0	0.0	A	8.9	PASS
Shelby	7	0	0	2.3	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Spencer	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	8.4	PASS
Sullivan	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Tippecanoe	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	8.1	PASS
Vanderburgh	9	0	0	3.0	D	0	0	0	0	0.0	A	9.1	PASS
Vigo	6	0	0	2.0	C	0	0	0	0	0.0	A	9.0	PASS
Wabash	11	0	0	3.7	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Warrick	10	1	0	3.8	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Whitley	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.7	PASS

IOWA

American Lung Association in Iowa

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Black Hawk	132,408	28,810	21,719	1,658	8,216	5,752	79	7,803	42,284	20,811	25,446
Bremer	24,947	5,567	4,886	320	1,529	1,182	15	1,660	8,023	1,547	1,251
Clinton	46,518	10,602	9,160	610	2,839	2,303	28	3,224	14,995	5,727	4,059
Delaware	17,069	4,031	3,292	232	1,032	848	10	1,182	5,457	1,521	629
Harrison	14,134	3,278	2,785	189	858	706	8	988	4,543	1,347	569
Johnson	151,260	30,183	17,736	1,737	9,670	5,659	90	7,160	48,280	22,536	33,328
Lee	34,055	7,297	6,917	420	2,113	1,720	20	2,415	11,175	4,758	3,178
Linn	225,909	52,510	35,702	3,022	13,782	9,969	134	13,425	71,163	20,652	32,676
Montgomery	10,003	2,274	2,144	131	609	514	6	732	3,247	1,360	668
Muscatine	42,929	10,691	7,145	615	2,558	1,931	26	2,634	13,314	4,973	10,116
Palo Alto	8,929	2,037	1,958	117	542	449	5	645	2,884	834	638
Polk	487,204	121,315	63,631	6,983	29,203	19,715	289	25,704	148,762	47,499	111,152
Pottawattamie	93,533	22,030	16,335	1,268	5,669	4,343	56	5,959	29,594	10,760	11,737
Scott	173,283	41,080	28,142	2,365	10,501	7,756	103	10,506	54,424	21,030	35,262
Story	98,105	16,245	11,812	935	6,530	3,622	59	4,575	32,414	16,410	16,343
Van Buren	7,020	1,601	1,576	92	426	366	4	526	2,282	917	287
Warren	51,056	12,657	8,025	729	3,052	2,249	30	3,034	15,805	3,502	3,087
Woodbury	102,539	26,742	15,471	1,539	6,025	4,326	61	5,818	31,072	13,835	28,376
Totals	**1,720,901**	**398,950**	**258,436**	**22,963**	**105,155**	**73,411**	**1,023**	**97,992**	**539,718**	**200,019**	**318,802**

IOWA

American Lung Association in Iowa

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Black Hawk	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.8	PASS
Bremer	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Clinton	1	0	0	0.3	B	0	0	0	0	0.0	A	8.3	PASS
Delaware	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Harrison	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Johnson	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.6	PASS
Lee	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	8.5	PASS
Linn	4	0	0	1.3	C	1	0	0	0	0.3	B	8.0	PASS
Montgomery	0	0	0	0.0	A	0	0	0	0	0.0	A	6.5	PASS
Muscatine	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	8.3	PASS
Palo Alto	2	0	0	0.7	B	0	0	0	0	0.0	A	6.7	PASS
Polk	2	0	0	0.7	B	2	0	0	0	0.7	B	7.4	PASS
Pottawattamie	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	7.9	PASS
Scott	6	0	0	2.0	C	0	0	0	0	0.0	A	8.4	PASS
Story	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Van Buren	0	0	0	0.0	A	0	0	0	0	0.0	A	6.9	PASS
Warren	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Woodbury	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.7	PASS

KANSAS

American Lung Association in Kansas

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Johnson	597,555	145,643	86,723	11,120	44,566	30,438	337	39,886	189,480	32,334	121,136
Leavenworth	81,352	19,284	11,779	1,472	6,125	4,159	46	5,441	25,996	7,925	17,116
Neosho	15,951	3,929	3,164	300	1,167	904	9	1,243	5,151	2,271	1,604
Sedgwick	513,607	131,919	74,487	10,072	37,686	25,503	290	33,529	159,665	67,722	165,169
Shawnee	177,499	41,950	32,296	3,203	13,238	9,780	100	13,250	57,584	24,062	46,674
Sumner	22,996	5,667	4,303	433	1,685	1,287	13	1,752	7,411	3,016	2,436
Trego	2,793	500	740	38	219	190	2	270	1,005	316	151
Wyandotte	165,324	46,051	20,281	3,516	11,844	7,635	93	9,834	49,497	30,035	98,310
Totals	**1,577,077**	**394,943**	**233,773**	**30,155**	**116,530**	**79,896**	**889**	**105,206**	**495,790**	**167,681**	**452,596**

KANSAS

American Lung Association in Kansas

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Johnson	0	0	0	0.0	A	0	0	0	0	0.0	A	7.4	PASS
Leavenworth	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Neosho	0	0	0	0.0	A	0	0	0	0	0.0	A	INC	INC
Sedgwick	0	1	0	0.5	B	0	0	0	0	0.0	A	7.8	PASS
Shawnee	0	0	0	0.0	A	0	0	0	0	0.0	A	8.5	PASS
Sumner	0	0	0	0.0	A	0	0	0	0	0.0	A	7.2	PASS
Trego	0	0	0	0.0	A	0	0	0	0	0.0	A	INC	INC
Wyandotte	4	1	0	1.8	C	1	0	0	0	0.3	B	9.1	PASS

KENTUCKY

American Lung Association in Kentucky

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Bell	26,569	5,646	5,105	333	2,390	2,703	24	2,861	10,625	7,998	1,588
Boone	131,533	34,210	17,804	2,017	11,121	11,720	117	11,883	49,163	8,371	16,417
Boyd	47,240	10,048	9,221	592	4,248	4,830	42	5,124	18,895	8,229	3,249
Bullitt	81,069	17,795	12,652	1,049	7,241	7,836	72	8,043	32,032	7,596	4,649
Campbell	93,152	19,395	14,549	1,143	8,391	8,846	82	9,076	37,236	11,741	7,249
Carter	27,004	6,077	5,065	358	2,389	2,693	24	2,847	10,624	8,154	920
Christian	71,671	19,263	8,791	1,136	5,839	5,419	64	5,452	26,155	11,906	24,824
Daviess	101,104	24,735	17,128	1,458	8,700	9,528	89	9,963	38,671	15,026	12,362
Edmonson	12,274	2,253	2,546	133	1,143	1,301	11	1,387	5,090	2,110	643
Fayette	323,780	67,639	43,214	3,987	28,861	28,195	287	28,335	128,453	45,485	94,095
Greenup	35,268	7,535	7,388	444	3,167	3,674	31	3,942	14,111	5,747	1,375
Hancock	8,758	2,238	1,486	132	746	836	8	874	3,309	1,038	414
Hardin	110,356	27,155	15,397	1,601	9,475	9,877	98	10,038	41,975	14,254	26,889
Henderson	45,591	10,568	8,012	623	4,002	4,456	40	4,668	17,765	7,235	6,219
Jefferson	770,517	170,791	124,503	10,068	68,156	72,482	680	74,957	302,915	115,810	254,471
Jessamine	53,920	12,999	8,087	766	4,662	4,946	48	5,074	20,673	6,562	6,149
Livingston	9,242	1,883	2,006	111	845	1,007	8	1,082	3,756	1,268	443
McCracken	65,346	14,650	12,940	864	5,778	6,573	58	7,011	25,748	9,423	10,949
Madison	92,368	19,144	12,737	1,129	8,258	8,154	82	8,229	36,752	14,065	9,613
Morgan	13,345	2,438	2,235	144	1,243	1,331	12	1,373	5,514	3,102	994
Oldham	66,470	16,937	8,777	998	5,688	6,064	59	6,115	25,060	3,463	7,813
Perry	26,092	5,984	4,429	353	2,302	2,557	23	2,662	10,200	7,355	1,217
Pike	58,402	12,021	10,962	709	5,310	6,004	52	6,318	23,560	13,499	1,833
Pulaski	64,623	14,373	12,130	847	5,745	6,500	57	6,865	25,522	12,392	3,811
Simpson	18,529	4,466	3,056	263	1,605	1,757	16	1,827	7,123	2,271	2,775
Trigg	14,643	3,206	3,259	189	1,312	1,576	13	1,707	5,840	1,901	1,766
Warren	131,264	30,099	16,896	1,774	11,387	11,049	116	11,090	50,704	20,486	29,111
Washington	12,084	2,878	2,176	170	1,055	1,197	11	1,259	4,678	1,644	1,533
Totals	**2,512,214**	**566,426**	**392,551**	**33,391**	**221,060**	**233,114**	**2,224**	**240,062**	**982,147**	**368,131**	**533,371**

KENTUCKY

American Lung Association in Kentucky

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Bell	0	0	0	0.0	A	1	1	0	0	0.8	B	8.5	PASS
Boone	1	1	0	0.8	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Boyd	3	0	0	1.0	C	0	0	0	0	0.0	A	7.6	PASS
Bullitt	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Campbell	6	0	0	2.0	C	0	0	0	0	0.0	A	8.0	PASS
Carter	0	0	0	0.0	A	1	0	0	0	0.3	B	6.4	PASS
Christian	0	0	0	0.0	A	0	0	0	0	0.0	A	8.2	PASS
Daviess	2	1	0	1.2	C	0	0	0	0	0.0	A	8.4	PASS
Edmonson	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Fayette	0	0	0	0.0	A	0	0	0	0	0.0	A	INC	INC
Greenup	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Hancock	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Hardin	1	0	0	0.3	B	0	0	0	0	0.0	A	8.2	PASS
Henderson	6	0	0	2.0	C	1	0	0	0	0.3	B	8.8	PASS
Jefferson	24	3	0	9.5	F	0	0	0	0	0.0	A	9.4	PASS
Jessamine	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Livingston	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
McCracken	1	0	0	0.3	B	1	0	0	0	0.3	B	8.3	PASS
Madison	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Morgan	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Oldham	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Perry	0	0	0	0.0	A	0	1	0	0	0.5	B	7.6	PASS
Pike	0	0	0	0.0	A	2	0	0	0	0.7	B	7.2	PASS
Pulaski	0	0	0	0.0	A	0	0	0	0	0.0	A	7.7	PASS
Simpson	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Trigg	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Warren	0	0	0	0.0	A	0	0	0	0	0.0	A	8.1	PASS
Washington	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC

LOUISIANA

American Lung Association in Louisiana

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Ascension Parish	124,672	33,371	14,734	2,920	8,326	8,809	81	9,828	39,309	13,341	39,717
Bossier Parish	127,185	31,589	18,240	2,764	8,613	9,258	83	10,615	41,148	17,888	42,942
Caddo Parish	242,922	57,537	41,606	5,035	16,568	18,803	157	22,419	80,865	52,996	134,679
Calcasieu Parish	203,112	50,566	30,057	4,425	13,742	15,049	132	17,430	66,031	29,744	66,679
East Baton Rouge Parish	440,956	99,927	62,528	8,744	30,745	32,399	285	36,720	145,964	71,761	245,155
Iberville Parish	32,721	6,743	5,181	590	2,342	2,595	21	3,021	11,289	6,880	17,178
Jefferson Parish	434,051	95,458	74,330	8,353	30,340	34,465	281	40,959	147,899	67,200	206,828
Lafayette Parish	242,782	57,350	32,067	5,018	16,809	17,753	157	19,972	79,598	36,301	84,123
Lafourche Parish	98,115	22,793	15,168	1,994	6,789	7,561	64	8,825	32,780	15,989	22,780
Livingston Parish	139,567	35,715	18,422	3,125	9,418	10,114	91	11,477	44,810	15,562	17,575
Orleans Parish	391,006	78,086	57,760	6,833	28,256	30,204	252	34,414	134,593	90,329	270,766
Ouachita Parish	154,475	38,427	22,847	3,363	10,450	11,410	100	13,203	50,179	31,790	64,840
Pointe Coupee Parish	21,940	4,793	4,516	419	1,519	1,839	14	2,282	7,606	4,428	8,717
Rapides Parish	130,562	32,250	21,375	2,822	8,811	9,954	85	11,796	42,873	24,641	50,765
St. Bernard Parish	46,721	12,440	5,340	1,089	3,126	3,251	30	3,589	14,683	9,306	17,722
St. James Parish	21,037	4,748	3,610	415	1,461	1,677	14	2,002	7,142	3,492	10,886
St. John the Baptist Parish	43,184	10,617	6,144	929	2,950	3,256	28	3,756	14,163	7,766	28,513
St. Martin Parish	53,621	12,978	8,057	1,136	3,669	4,088	35	4,761	17,702	10,179	18,995
St. Tammany Parish	258,111	61,917	43,694	5,418	17,603	20,343	167	24,330	86,210	30,253	55,792
Tangipahoa Parish	133,777	32,761	19,230	2,867	9,110	9,843	87	11,300	43,567	23,304	49,317
Terrebonne Parish	111,021	28,090	15,984	2,458	7,492	8,238	72	9,522	35,984	18,950	36,999
West Baton Rouge Parish	26,427	6,461	3,607	565	1,809	1,955	17	2,229	8,629	3,299	11,811
Totals	**3,477,965**	**814,617**	**524,497**	**71,282**	**239,947**	**262,863**	**2,254**	**304,449**	**1,153,025**	**585,399**	**1,502,779**

LOUISIANA

American Lung Association in Louisiana

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Ascension Parish	9	0	0	3.0	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Bossier Parish	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Caddo Parish	0	0	0	0.0	A	2	0	0	0	0.7	B	10.4	PASS
Calcasieu Parish	6	0	0	2.0	C	1	0	0	0	0.3	B	7.8	PASS
East Baton Rouge Parish	18	0	0	6.0	F	4	0	0	0	1.3	C	9.1	PASS
Iberville Parish	9	0	0	3.0	D	0	1	0	0	0.5	B	8.5	PASS
Jefferson Parish	4	0	0	1.3	C	0	0	0	0	0.0	A	7.4	PASS
Lafayette Parish	1	0	0	0.3	B	0	0	0	0	0.0	A	7.9	PASS
Lafourche Parish	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Livingston Parish	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Orleans Parish	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	8.0	PASS
Ouachita Parish	0	0	0	0.0	A	0	0	0	0	0.0	A	8.0	PASS
Pointe Coupee Parish	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Rapides Parish	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	INC	INC
St. Bernard Parish	5	0	0	1.7	C	0	0	0	0	0.0	A	8.3	PASS
St. James Parish	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
St. John the Baptist Parish	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
St. Martin Parish	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
St. Tammany Parish	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Tangipahoa Parish	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.4	PASS
Terrebonne Parish	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.2	PASS
West Baton Rouge Parish	8	0	0	2.7	D	0	0	0	0	0.0	A	9.2	PASS

MAINE

American Lung Association in Maine

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Androscoggin	107,679	23,332	19,091	1,722	10,438	6,605	80	8,501	41,811	12,838	10,352
Aroostook	67,111	12,226	16,196	902	6,601	4,679	50	6,319	27,614	9,988	4,061
Cumberland	293,557	54,796	54,161	4,044	29,601	18,586	218	23,919	118,220	23,332	28,318
Franklin	29,897	5,235	6,705	386	2,998	2,038	22	2,711	12,339	4,141	1,285
Hancock	54,811	9,364	13,489	691	5,465	3,878	41	5,242	22,867	6,233	2,934
Kennebec	122,083	23,566	24,350	1,739	12,071	7,955	91	10,403	49,097	13,290	6,643
Knox	39,771	7,081	10,057	523	3,924	2,803	30	3,815	16,461	4,209	1,939
Oxford	57,618	10,624	12,483	784	5,693	3,925	43	5,202	23,565	9,490	2,785
Penobscot	151,096	27,394	28,204	2,022	15,332	9,637	113	12,413	61,257	21,154	9,578
Washington	31,490	5,938	7,687	438	3,069	2,187	23	2,964	12,864	5,613	3,324
York	206,229	38,565	42,233	2,846	20,501	13,624	154	17,877	83,647	18,133	12,164
Totals	**1,161,342**	**218,121**	**234,656**	**16,098**	**115,693**	**75,918**	**865**	**99,366**	**469,742**	**128,421**	**83,383**

MAINE

American Lung Association in Maine

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Androscoggin	0	0	0	0.0	A	0	0	0	0	0.0	A	6.1	PASS
Aroostook	0	0	0	0.0	A	0	2	0	0	1.0	C	7.0	PASS
Cumberland	2	0	0	0.7	B	0	0	0	0	0.0	A	6.6	PASS
Franklin	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Hancock	8	1	0	3.2	D	0	0	0	0	0.0	A	3.7	PASS
Kennebec	0	0	0	0.0	A	0	0	0	0	0.0	A	5.5	PASS
Knox	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Oxford	0	0	0	0.0	A	0	0	0	0	0.0	A	6.4	PASS
Penobscot	0	0	0	0.0	A	0	0	0	0	0.0	A	5.8	PASS
Washington	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
York	4	1	0	1.8	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC

MARYLAND

American Lung Association in Maryland

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Anne Arundel	576,031	128,107	84,550	9,687	42,383	25,408	315	37,074	161,525	39,231	186,967
Baltimore	828,431	178,931	142,310	13,531	60,923	38,537	451	57,147	237,801	79,482	359,919
Calvert	92,003	21,300	13,687	1,611	6,678	4,196	50	6,139	25,984	4,912	20,253
Carroll	168,429	36,532	28,378	2,763	12,380	8,057	92	11,918	48,947	9,828	19,008
Cecil	102,826	23,268	16,186	1,760	7,494	4,747	56	6,981	29,266	8,406	15,540
Charles	161,503	38,703	20,198	2,927	11,697	6,879	88	9,899	44,200	10,487	99,163
Dorchester	31,998	6,752	6,911	511	2,330	1,656	17	2,516	9,602	4,851	11,974
Frederick	255,648	59,180	36,972	4,475	18,590	11,311	140	16,499	71,306	15,552	69,902
Garrett	29,163	5,426	6,524	410	2,190	1,567	16	2,381	9,054	3,483	1,068
Harford	253,956	56,335	41,128	4,260	18,591	11,781	139	17,369	72,620	17,528	62,121
Howard	323,196	78,743	44,629	5,954	23,168	13,918	176	20,239	88,372	16,874	158,169
Kent	19,383	3,066	5,177	232	1,487	1,109	11	1,715	6,274	2,329	4,267
Montgomery	1,052,567	244,355	163,516	18,478	76,171	47,126	573	69,273	294,362	72,247	595,735
Prince George's	909,308	202,301	120,600	15,298	67,250	38,802	495	56,021	252,079	73,777	795,954
Washington	150,926	32,969	26,006	2,493	11,058	7,099	83	10,533	43,453	15,871	32,881
Baltimore City	602,495	123,177	84,387	9,315	45,538	25,702	327	37,219	169,118	109,306	435,247
Totals	**5,557,863**	**1,239,145**	**841,159**	**93,703**	**407,927**	**247,896**	**3,028**	**362,924**	**1,563,960**	**484,164**	**2,868,168**

MARYLAND

American Lung Association in Maryland

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Anne Arundel	23	0	0	7.7	F
Baltimore	33	5	1	14.2	F
Calvert	5	0	0	1.7	C
Carroll	5	0	0	1.7	C
Cecil	23	2	0	8.7	F
Charles	7	0	0	2.3	D
Dorchester	4	1	0	1.8	C
Frederick	5	0	0	1.7	C
Garrett	0	0	0	0.0	A
Harford	27	3	0	10.5	F
Howard	DNC	DNC	DNC	DNC	DNC
Kent	10	0	0	3.3	F
Montgomery	3	0	0	1.0	C
Prince George's	22	1	0	7.8	F
Washington	4	0	0	1.3	C
Baltimore City	14	1	0	5.2	F

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Anne Arundel	INC	INC	INC	INC	INC	INC	INC	INC
Baltimore	0	0	0	0	0.0	A	8.0	PASS
Calvert	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Carroll	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Cecil	0	0	0	0	0.0	A	7.8	PASS
Charles	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Dorchester	0	0	0	0	0.0	A	7.1	PASS
Frederick	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Garrett	0	0	0	0	0.0	A	5.7	PASS
Harford	1	0	0	0	0.3	B	7.6	PASS
Howard	0	0	0	0	0.0	A	9.1	PASS
Kent	0	0	0	0	0.0	A	7.0	PASS
Montgomery	0	0	0	0	0.0	A	7.0	PASS
Prince George's	0	0	0	0	0.0	A	7.0	PASS
Washington	1	0	0	0	0.3	B	7.7	PASS
Baltimore City	2	0	0	0	0.7	B	8.4	PASS

MASSACHUSETTS

American Lung Association in Massachusetts

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Barnstable	213,413	32,172	65,299	2,065	18,134	11,789	122	18,089	77,552	16,661	21,843
Berkshire	126,348	21,362	29,398	1,371	10,616	6,057	73	9,020	42,865	13,673	15,393
Bristol	564,022	116,099	95,464	7,452	45,673	23,133	324	33,362	175,717	59,147	99,268
Dukes	17,352	3,042	4,219	195	1,442	849	10	1,273	5,911	1,316	2,209
Essex	790,638	168,488	134,796	10,814	63,406	32,338	454	46,729	244,625	82,387	241,022
Franklin	70,963	12,407	15,624	796	5,921	3,326	41	4,929	23,798	7,395	6,799
Hampden	470,406	101,140	79,049	6,491	37,770	18,884	270	27,193	144,014	76,016	180,153
Hampshire	161,355	23,689	27,808	1,520	14,215	6,687	92	9,510	52,429	15,397	26,743
Middlesex	1,614,714	318,831	246,388	20,463	133,149	63,092	927	89,492	496,382	113,717	459,018
Norfolk	705,388	147,749	118,882	9,483	56,882	28,764	405	41,474	218,600	44,959	180,270
Plymouth	518,132	110,660	93,864	7,102	41,323	21,924	297	31,965	162,570	31,285	94,913
Suffolk	807,252	134,089	96,651	8,606	70,404	28,432	463	38,572	243,931	133,144	444,449
Worcester	830,839	174,732	129,978	11,215	66,986	33,064	477	47,301	255,325	72,636	198,685
Totals	**6,890,822**	**1,364,460**	**1,137,420**	**87,574**	**565,921**	**278,339**	**3,955**	**398,909**	**2,143,717**	**667,733**	**1,970,765**

MASSACHUSETTS

American Lung Association in Massachusetts

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Barnstable	10	0	0	3.3	F
Berkshire	INC	INC	INC	INC	INC
Bristol	19	1	0	6.8	F
Dukes	7	2	0	3.3	F
Essex	10	0	0	3.3	F
Franklin	3	0	0	1.0	C
Hampden	11	1	0	4.2	F
Hampshire	8	1	0	3.2	D
Middlesex	1	0	0	0.3	B
Norfolk	8	0	0	2.7	D
Plymouth	8	0	0	2.7	D
Suffolk	4	0	0	1.3	C
Worcester	11	0	0	3.7	F

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Barnstable	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Berkshire	1	0	0	0	0.3	B	5.9	PASS
Bristol	0	0	0	0	0.0	A	6.1	PASS
Dukes	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Essex	0	0	0	0	0.0	A	5.1	PASS
Franklin	0	0	0	0	0.0	A	5.2	PASS
Hampden	0	0	0	0	0.0	A	5.2	PASS
Hampshire	0	0	0	0	0.0	A	5.1	PASS
Middlesex	INC	INC	INC	INC	INC	INC	INC	INC
Norfolk	INC	INC	INC	INC	INC	INC	INC	INC
Plymouth	0	0	0	0	0.0	A	5.4	PASS
Suffolk	0	0	0	0	0.0	A	7.7	PASS
Worcester	0	0	0	0	0.0	A	5.8	PASS

MICHIGAN

American Lung Association in Michigan

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Allegan	117,327	28,372	19,414	2,436	9,909	7,890	72	8,878	40,692	12,429	13,834
Bay	103,923	21,084	21,195	1,810	9,126	7,591	63	8,849	38,136	16,044	10,502
Benzie	17,753	3,239	4,639	278	1,568	1,445	11	1,761	6,806	1,812	1,152
Berrien	154,141	33,571	30,402	2,882	13,298	10,971	94	12,758	55,419	23,151	38,978
Cass	51,653	10,646	10,862	914	4,504	3,870	32	4,523	19,009	5,727	7,086
Chippewa	37,517	6,877	6,742	590	3,414	2,594	23	2,955	13,863	5,608	11,418
Clinton	79,332	17,756	13,442	1,524	6,860	5,432	48	6,120	28,132	5,896	8,213
Genesee	406,892	91,550	71,136	7,859	35,057	27,953	247	31,730	144,190	75,251	111,832
Huron	31,166	6,005	7,813	515	2,725	2,493	19	3,015	11,787	3,876	1,506
Ingham	292,735	58,406	39,459	5,014	26,538	17,510	178	19,121	103,394	49,916	90,032
Kalamazoo	264,870	57,311	39,630	4,920	23,343	16,323	161	18,205	92,494	36,927	60,273
Kent	653,786	157,809	89,296	13,547	55,930	39,833	398	43,600	222,134	72,623	173,392
Lenawee	98,266	20,713	18,645	1,778	8,584	6,959	60	8,013	35,544	9,668	13,236
Macomb	874,759	184,009	148,636	15,796	77,026	60,680	532	68,173	315,302	95,731	187,352
Manistee	24,528	4,264	6,318	366	2,194	1,992	15	2,417	9,473	3,026	2,724
Mason	29,100	5,889	6,854	506	2,526	2,235	18	2,683	10,801	3,455	2,548
Missaukee	15,113	3,474	3,099	298	1,278	1,090	9	1,279	5,385	1,920	993
Monroe	150,439	32,193	27,262	2,764	13,122	10,737	92	12,192	54,370	14,891	13,313
Muskegon	173,588	40,082	29,524	3,441	14,864	11,642	106	13,194	60,821	26,321	41,131
Oakland	1,259,201	264,031	211,527	22,665	111,061	87,047	767	97,578	453,846	102,052	356,274
Ottawa	290,494	69,797	43,492	5,992	24,766	17,950	177	20,041	99,051	19,087	47,689
St. Clair	159,337	33,131	30,022	2,844	13,971	11,684	97	13,320	58,288	21,745	14,276
Schoolcraft	8,068	1,370	2,162	118	722	689	5	835	3,168	1,044	1,169
Tuscola	52,516	10,732	10,635	921	4,603	3,907	32	4,526	19,332	6,580	3,541
Washtenaw	370,963	68,932	51,377	5,917	34,184	22,804	226	24,914	133,546	52,258	111,106
Wayne	1,753,893	414,221	270,554	35,558	150,021	113,859	1,066	126,753	607,144	376,649	886,177
Wexford	33,466	7,761	6,388	666	2,838	2,356	20	2,724	11,838	4,318	1,848
Totals	**7,504,826**	**1,653,225**	**1,220,525**	**141,916**	**654,031**	**499,536**	**4,569**	**560,156**	**2,653,965**	**1,048,005**	**2,211,595**

MICHIGAN

American Lung Association in Michigan

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Allegan	21	0	0	7.0	F	0	0	0	0	0.0	A	7.4	PASS
Bay	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	6.9	PASS
Benzie	9	1	0	3.5	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Berrien	22	0	0	7.3	F	INC	INC	INC	INC	INC	INC	INC	INC
Cass	22	0	0	7.3	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Chippewa	1	0	0	0.3	B	0	0	0	0	0.0	A	INC	INC
Clinton	11	0	0	3.7	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Genesee	12	0	0	4.0	F	0	0	0	0	0.0	A	7.2	PASS
Huron	8	0	0	2.7	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Ingham	8	0	0	2.7	D	0	0	0	0	0.0	A	INC	INC
Kalamazoo	13	0	0	4.3	F	0	0	0	0	0.0	A	8.2	PASS
Kent	12	0	0	4.0	F	0	0	0	0	0.0	A	8.2	PASS
Lenawee	7	0	0	2.3	D	0	0	0	0	0.0	A	7.6	PASS
Macomb	20	0	0	6.7	F	0	0	0	0	0.0	A	7.6	PASS
Manistee	4	0	0	1.3	C	0	0	0	0	0.0	A	5.8	PASS
Mason	8	0	0	2.7	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Missaukee	7	0	0	2.3	D	0	0	0	0	0.0	A	5.0	PASS
Monroe	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Muskegon	13	5	0	6.8	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Oakland	16	1	0	5.8	F	0	0	0	0	0.0	A	8.1	PASS
Ottawa	11	0	0	3.7	F	INC	INC	INC	INC	INC	INC	INC	INC
St. Clair	12	1	0	4.5	F	0	0	0	0	0.0	A	8.0	PASS
Schoolcraft	11	0	0	3.7	F	INC	INC	INC	INC	INC	INC	INC	INC
Tuscola	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Washtenaw	15	0	0	5.0	F	0	0	0	0	0.0	A	8.1	PASS
Wayne	22	0	0	7.3	F	3	0	0	0	1.0	C	11.3	PASS
Wexford	7	0	0	2.3	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC

MINNESOTA

American Lung Association in Minnesota

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Anoka	353,813	84,396	49,712	4,456	22,389	11,644	197	18,783	110,424	19,568	68,706
Becker	34,371	8,391	7,052	443	2,128	1,275	19	2,197	10,905	3,764	4,775
Beltrami	46,847	11,769	7,548	621	2,886	1,515	26	2,493	14,349	8,220	13,126
Carlton	35,837	8,042	6,136	425	2,297	1,273	20	2,118	11,515	3,454	4,282
Cass	29,519	6,243	7,659	330	1,891	1,250	16	2,232	9,959	3,771	5,070
Cook	5,393	851	1,540	45	368	247	3	444	1,949	511	810
Crow Wing	64,889	14,053	14,549	742	4,154	2,548	36	4,434	21,430	8,105	3,342
Dakota	425,423	103,669	60,282	5,474	26,712	13,895	237	22,453	131,830	26,434	94,730
Goodhue	46,403	10,293	9,124	543	2,969	1,737	26	2,959	15,103	3,250	3,819
Hennepin	1,259,428	276,541	176,788	14,602	81,448	40,605	702	64,806	399,090	127,826	394,877
Lake	10,658	2,005	2,775	106	704	459	6	817	3,694	900	535
Lyon	25,629	6,615	4,060	349	1,568	834	14	1,373	7,804	3,009	4,282
Mille Lacs	26,139	6,292	4,787	332	1,634	937	15	1,582	8,269	3,163	2,924
Olmsted	156,277	38,258	24,272	2,020	9,747	5,132	87	8,399	48,374	10,908	31,602
Ramsey	550,210	128,232	79,328	6,771	34,888	17,492	307	28,089	171,376	78,160	212,529
St. Louis	199,754	38,011	38,748	2,007	13,289	7,434	111	12,510	66,986	28,232	18,071
Scott	147,381	40,458	16,035	2,136	8,936	4,371	82	6,820	43,401	7,563	28,313
Stearns	159,256	36,701	24,079	1,938	10,121	5,166	89	8,365	49,923	18,879	23,102
Washington	259,201	63,678	38,906	3,362	16,216	8,679	145	14,188	80,540	10,755	46,084
Wright	136,349	38,003	17,215	2,007	8,182	4,167	76	6,658	40,160	6,639	10,776
Totals	**3,972,777**	**922,501**	**590,595**	**48,709**	**252,527**	**130,659**	**2,216**	**211,719**	**1,247,079**	**373,111**	**971,755**

MINNESOTA

American Lung Association in Minnesota

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Anoka	1	0	0	0.3	B	1	0	0	0	0.3	B	7.3	PASS
Becker	0	0	0	0.0	A	0	0	0	0	0.0	A	4.8	PASS
Beltrami	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	5.6	PASS
Carlton	0	0	0	0.0	A	1	0	0	0	0.3	B	4.8	PASS
Cass	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Cook	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	4.4	PASS
Crow Wing	0	0	0	0.0	A	1	0	0	0	0.3	B	5.6	PASS
Dakota	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	7.1	PASS
Goodhue	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Hennepin	0	0	0	0.0	A	1	0	0	0	0.3	B	7.6	PASS
Lake	0	0	0	0.0	A	0	0	0	0	0.0	A	3.4	PASS
Lyon	0	0	0	0.0	A	1	0	0	0	0.3	B	5.2	PASS
Mille Lacs	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Olmsted	0	0	0	0.0	A	1	0	0	0	0.3	B	7.1	PASS
Ramsey	DNC	DNC	DNC	DNC	DNC	2	1	0	0	1.2	C	7.9	PASS
St. Louis	0	0	0	0.0	A	2	0	0	0	0.7	B	5.2	PASS
Scott	2	0	0	0.7	B	0	0	0	0	0.0	A	INC	INC
Stearns	1	0	0	0.3	B	0	0	0	0	0.0	A	6.0	PASS
Washington	0	0	0	0.0	A	0	0	0	0	0.0	A	6.1	PASS
Wright	4	0	0	1.3	C	1	0	0	0	0.3	B	6.6	PASS

MISSISSIPPI

American Lung Association in Mississippi

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Bolivar	31,333	7,611	4,951	495	2,288	2,286	24	2,720	10,156	8,715	21,119
DeSoto	182,001	46,709	23,468	3,040	13,002	12,828	140	14,980	57,883	16,255	67,090
Forrest	75,036	17,357	10,188	1,130	5,500	5,183	57	6,008	24,334	17,341	32,299
Grenada	21,055	5,040	3,744	328	1,560	1,636	16	1,982	6,948	4,621	9,590
Hancock	47,334	9,716	9,383	632	3,689	3,994	36	4,891	16,472	8,181	7,287
Harrison	206,650	49,416	30,904	3,216	15,154	15,124	159	17,888	67,367	40,288	75,374
Hinds	237,085	57,047	33,341	3,712	17,278	16,873	180	19,775	76,704	44,204	179,704
Jackson	143,277	33,416	22,721	2,175	10,644	10,914	110	13,025	47,427	25,348	46,723
Lauderdale	75,317	17,636	13,072	1,148	5,598	5,771	58	6,953	24,900	18,243	36,106
Lee	85,202	21,542	12,598	1,402	6,148	6,206	65	7,359	27,368	10,977	29,848
Yalobusha	12,392	2,776	2,474	181	943	1,017	9	1,249	4,203	2,208	5,206
Totals	**1,116,682**	**268,266**	**166,844**	**17,457**	**81,804**	**81,834**	**856**	**96,829**	**363,762**	**196,381**	**510,346**

MISSISSIPPI

American Lung Association in Mississippi

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Bolivar	2	0	0	0.7	B
DeSoto	3	1	0	1.5	C
Forrest	DNC	DNC	DNC	DNC	DNC
Grenada	DNC	DNC	DNC	DNC	DNC
Hancock	0	0	0	0.0	A
Harrison	4	0	0	1.3	C
Hinds	0	0	0	0.0	A
Jackson	3	0	0	1.0	C
Lauderdale	0	0	0	0.0	A
Lee	0	0	0	0.0	A
Yalobusha	0	0	0	0.0	A

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Bolivar	INC	INC	INC	INC	INC	INC	INC	INC
DeSoto	0	0	0	0	0.0	A	7.6	PASS
Forrest	1	0	0	0	0.3	B	8.6	PASS
Grenada	0	0	0	0	0.0	A	7.4	PASS
Hancock	1	0	0	0	0.3	B	7.9	PASS
Harrison	0	0	0	0	0.0	A	7.9	PASS
Hinds	1	0	0	0	0.3	B	8.7	PASS
Jackson	0	0	0	0	0.0	A	7.9	PASS
Lauderdale	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lee	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Yalobusha	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC

MISSOURI

American Lung Association in Missouri

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Andrew	17,607	4,034	3,253	339	1,274	1,282	12	1,471	6,048	1,429	1,031
Boone	180,005	36,565	22,058	3,076	13,353	11,528	124	11,540	61,440	28,584	39,027
Buchanan	88,571	19,933	14,275	1,677	6,429	6,143	61	6,759	30,171	13,117	15,402
Callaway	44,889	9,401	7,304	791	3,332	3,190	31	3,512	15,620	4,795	4,453
Cass	104,954	25,369	17,692	2,134	7,482	7,361	72	8,292	35,283	8,427	13,054
Cedar	14,165	3,411	3,308	287	996	1,079	10	1,312	4,861	2,502	782
Clay	246,365	59,326	34,771	4,991	17,598	16,394	170	17,611	81,840	17,153	47,615
Clinton	20,470	4,808	3,703	404	1,474	1,482	14	1,699	6,984	1,793	1,316
Greene	291,923	60,957	48,085	5,128	21,465	20,199	201	21,989	100,880	43,423	37,197
Jackson	700,307	164,979	104,655	13,879	50,227	47,231	483	51,219	234,543	89,787	264,030
Jasper	120,636	30,127	18,863	2,535	8,455	8,043	83	8,824	39,706	19,498	19,533
Jefferson	224,347	51,958	33,636	4,371	16,322	15,621	155	17,152	76,093	19,327	12,885
Lincoln	57,686	14,658	7,740	1,233	4,077	3,817	40	4,108	18,895	6,055	4,056
Monroe	8,664	1,895	2,023	159	630	680	6	824	3,063	1,158	630
Perry	19,150	4,470	3,472	376	1,377	1,378	13	1,574	6,531	2,040	945
St. Charles	399,182	92,666	60,779	7,796	28,873	27,490	276	30,098	134,884	22,272	52,255
Ste. Genevieve	17,888	3,880	3,485	326	1,318	1,349	12	1,569	6,275	1,720	806
St. Louis	996,945	219,527	180,210	18,469	72,771	72,009	686	81,620	344,635	102,720	342,878
Taney	55,852	11,774	12,108	991	4,084	4,223	38	4,970	19,689	8,367	6,419
St. Louis City	302,838	57,526	41,490	4,840	22,996	20,693	209	21,543	106,327	66,858	168,759
Totals	**3,912,444**	**877,264**	**622,910**	**73,803**	**284,532**	**271,189**	**2,698**	**297,687**	**1,333,768**	**461,025**	**1,033,073**

MISSOURI

American Lung Association in Missouri

	HIGH OZONE DAYS 2016–2018				
County	Orange	Red	Purple	Wgt. Avg.	Grade
Andrew	2	0	0	0.7	B
Boone	1	0	0	0.3	B
Buchanan	DNC	DNC	DNC	DNC	DNC
Callaway	1	0	0	0.3	B
Cass	2	0	0	0.7	B
Cedar	0	0	0	0.0	A
Clay	17	0	0	5.7	F
Clinton	5	0	0	1.7	C
Greene	0	0	0	0.0	A
Jackson	DNC	DNC	DNC	DNC	DNC
Jasper	0	0	0	0.0	A
Jefferson	7	0	0	2.3	D
Lincoln	5	0	0	1.7	C
Monroe	1	0	0	0.3	B
Perry	2	0	0	0.7	B
St. Charles	22	2	0	8.3	F
Ste. Genevieve	4	0	0	1.3	C
St. Louis	14	0	0	4.7	F
Taney	INC	INC	INC	INC	INC
St. Louis City	12	1	0	4.5	F

	HIGH PARTICLE POLLUTION DAYS 2016–2018							
	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Andrew	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Boone	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Buchanan	1	0	0	0	0.3	B	8.5	PASS
Callaway	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Cass	0	0	0	0	0.0	A	6.5	PASS
Cedar	0	0	0	0	0.0	A	6.9	PASS
Clay	1	0	0	0	0.3	B	6.4	PASS
Clinton	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Greene	0	0	0	0	0.0	A	7.4	PASS
Jackson	1	0	0	0	0.3	B	8.8	PASS
Jasper	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Jefferson	2	0	0	0	0.7	B	7.9	PASS
Lincoln	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Monroe	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Perry	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
St. Charles	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Ste. Genevieve	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
St. Louis	0	0	0	0	0.0	A	9.1	PASS
Taney	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
St. Louis City	0	1	0	0	0.5	B	8.5	PASS

MONTANA

American Lung Association in Montana

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Fergus	11,113	2,317	2,724	123	858	590	6	918	3,977	1,313	672
Flathead	102,106	22,475	19,949	1,198	7,936	4,941	54	7,515	35,571	11,288	7,426
Gallatin	111,876	22,425	14,146	1,195	9,178	4,293	59	6,524	38,489	9,721	9,792
Lewis and Clark	68,700	14,770	12,903	787	5,395	3,278	36	4,971	24,014	7,061	6,059
Lincoln	19,794	3,609	5,670	192	1,557	1,182	10	1,840	7,431	3,964	1,491
Missoula	118,791	22,315	18,506	1,189	9,790	5,034	62	7,707	41,975	14,719	12,853
Phillips	4,074	968	910	52	305	208	2	320	1,405	608	683
Powder River	1,716	287	466	15	139	100	1	156	651	205	113
Ravalli	43,172	8,246	11,138	439	3,398	2,415	23	3,745	15,880	6,628	3,154
Richland	10,913	2,757	1,632	147	827	467	6	696	3,600	950	1,161
Rosebud	9,063	2,624	1,431	140	648	384	5	577	2,860	1,523	4,084
Silver Bow	34,993	7,087	6,667	378	2,790	1,655	18	2,533	12,374	5,697	3,609
Yellowstone	160,137	37,629	27,117	2,005	12,325	7,093	84	10,765	54,134	17,150	22,191
Totals	**696,448**	**147,509**	**123,259**	**7,860**	**55,147**	**31,640**	**365**	**48,266**	**242,361**	**80,827**	**73,288**

MONTANA

American Lung Association in Montana

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Fergus	1	0	0	0.3	B
Flathead	0	0	0	0.0	A
Gallatin	DNC	DNC	DNC	DNC	DNC
Lewis and Clark	0	0	0	0.0	A
Lincoln	DNC	DNC	DNC	DNC	DNC
Missoula	0	0	0	0.0	A
Phillips	0	0	0	0.0	A
Powder River	3	0	0	1.0	C
Ravalli	DNC	DNC	DNC	DNC	DNC
Richland	0	0	0	0.0	A
Rosebud	0	0	0	0.0	A
Silver Bow	DNC	DNC	DNC	DNC	DNC
Yellowstone	DNC	DNC	DNC	DNC	DNC

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Fergus	10	3	0	0	4.8	F	5.0	PASS
Flathead	16	7	3	0	10.8	F	8.8	PASS
Gallatin	10	3	0	1	5.7	F	4.0	PASS
Lewis and Clark	31	15	0	0	17.8	F	9.5	PASS
Lincoln	14	18	1	0	14.3	F	12.9	FAIL
Missoula	17	12	1	0	12.3	F	10.4	PASS
Phillips	6	1	0	0	2.5	D	5.4	PASS
Powder River	6	5	0	0	4.5	F	7.6	PASS
Ravalli	34	17	0	0	19.8	F	10.0	PASS
Richland	2	1	0	0	1.2	C	INC	INC
Rosebud	6	5	0	0	4.5	F	6.2	PASS
Silver Bow	21	4	0	0	9.0	F	8.7	PASS
Yellowstone	8	1	0	0	3.2	D	INC	INC

NEBRASKA

American Lung Association in Nebraska

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Douglas	566,880	145,250	73,752	7,306	37,671	25,001	293	30,123	165,432	64,276	175,045
Hall	61,607	16,920	9,150	851	3,992	2,824	32	3,506	17,768	7,839	21,157
Knox	8,419	2,039	2,078	103	567	488	4	661	2,642	1,098	1,233
Lancaster	317,272	72,512	44,139	3,647	21,789	14,260	164	17,246	95,483	37,583	60,782
Sarpy	184,459	50,551	21,677	2,543	11,989	7,845	96	9,330	52,480	10,399	35,878
Scotts Bluff	35,989	9,001	6,849	453	2,402	1,836	19	2,372	10,884	5,021	10,234
Washington	20,667	5,017	3,673	252	1,402	1,075	11	1,370	6,350	1,423	1,170
Totals	**1,195,293**	**301,290**	**161,318**	**15,155**	**79,813**	**53,330**	**619**	**64,608**	**351,038**	**127,639**	**305,499**

NEBRASKA

American Lung Association in Nebraska

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Douglas	4	0	0	1.3	C
Hall	DNC	DNC	DNC	DNC	DNC
Knox	1	0	0	0.3	B
Lancaster	0	0	0	0.0	A
Sarpy	DNC	DNC	DNC	DNC	DNC
Scotts Bluff	DNC	DNC	DNC	DNC	DNC
Washington	DNC	DNC	DNC	DNC	DNC

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Douglas	2	0	0	0	0.7	B	8.6	PASS
Hall	0	0	0	0	0.0	A	5.9	PASS
Knox	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lancaster	0	0	0	0	0.0	A	6.7	PASS
Sarpy	2	0	0	0	0.7	B	8.9	PASS
Scotts Bluff	1	0	0	0	0.3	B	INC	INC
Washington	0	0	0	0	0.0	A	6.9	PASS

NEVADA

American Lung Association in Nevada

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Churchill	24,440	5,574	4,628	388	1,490	1,457	12	1,878	7,988	2,756	6,666
Clark	2,231,647	517,629	328,692	36,032	136,812	120,615	1,129	151,858	705,307	307,977	1,289,911
Douglas	48,467	7,917	13,808	551	3,151	3,651	25	4,868	18,082	3,457	9,541
Elko	52,460	14,298	5,943	995	3,078	2,550	27	3,168	15,484	4,276	17,530
Lyon	55,808	11,946	11,813	832	3,451	3,529	28	4,594	18,821	5,803	14,325
Washoe	465,735	100,776	76,161	7,015	29,030	26,449	236	33,558	151,502	47,627	174,026
White Pine	9,475	1,884	1,702	131	602	563	5	719	3,173	1,082	2,702
Carson City	55,414	11,243	11,261	783	3,486	3,479	28	4,507	18,826	5,952	18,435
Totals	**2,943,446**	**671,267**	**454,008**	**46,726**	**181,100**	**162,293**	**1,489**	**205,149**	**939,183**	**378,930**	**1,533,136**

NEVADA

American Lung Association in Nevada

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Churchill	9	0	0	3.0	D
Clark	89	1	0	30.2	F
Douglas	DNC	DNC	DNC	DNC	DNC
Elko	INC	INC	INC	INC	INC
Lyon	12	0	0	4.0	F
Washoe	29	0	0	9.7	F
White Pine	4	0	0	1.3	C
Carson City	7	0	0	2.3	D

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Churchill	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Clark	10	2	0	0	4.3	F	9.5	PASS
Douglas	10	4	1	0	6.0	F	6.9	PASS
Elko	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lyon	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Washoe	8	0	0	0	2.7	D	7.6	PASS
White Pine	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Carson City	6	4	0	0	4.0	F	5.8	PASS

NEW HAMPSHIRE

American Lung Association in New Hampshire

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Belknap	61,022	11,281	13,505	960	5,763	4,268	38	4,313	22,888	4,149	3,043
Cheshire	76,493	13,685	15,224	1,165	7,438	5,103	48	5,029	28,446	7,307	4,654
Coos	31,589	5,139	7,494	438	3,051	2,289	20	2,335	12,210	3,828	1,606
Grafton	89,786	14,522	18,566	1,236	8,920	6,087	57	6,022	34,067	7,427	8,431
Hillsborough	415,247	84,629	65,348	7,205	39,845	25,919	261	24,459	147,824	30,147	66,220
Merrimack	151,132	28,949	27,566	2,465	14,536	9,863	95	9,570	55,157	10,149	11,759
Rockingham	309,176	59,995	55,538	5,108	29,511	20,446	195	19,796	112,882	16,270	23,733
Totals	**1,134,445**	**218,200**	**203,241**	**18,577**	**109,064**	**73,977**	**714**	**71,525**	**413,475**	**79,277**	**119,446**

NEW HAMPSHIRE

American Lung Association in New Hampshire

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Belknap	0	0	0	0.0	A
Cheshire	1	0	0	0.3	B
Coos	4	0	0	1.3	C
Grafton	0	0	0	0.0	A
Hillsborough	4	0	0	1.3	C
Merrimack	0	0	0	0.0	A
Rockingham	7	0	0	2.3	D

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Belknap	0	0	0	0	0.0	A	4.5	PASS
Cheshire	0	0	0	0	0.0	A	5.4	PASS
Coos	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Grafton	0	0	0	0	0.0	A	5.7	PASS
Hillsborough	0	0	0	0	0.0	A	3.4	PASS
Merrimack	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Rockingham	0	0	0	0	0.0	A	5.2	PASS

NEW JERSEY

American Lung Association in New Jersey

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Atlantic	265,429	56,347	47,611	4,083	17,682	11,925	144	18,022	77,960	33,167	116,925
Bergen	936,692	198,355	161,086	14,374	62,463	41,592	509	62,335	273,792	63,403	415,338
Camden	507,078	115,090	79,408	8,340	33,052	21,467	275	31,529	143,123	64,417	221,760
Cumberland	150,972	36,107	23,053	2,617	9,656	6,237	82	9,099	41,681	21,430	81,710
Essex	799,767	188,977	108,532	13,695	51,513	32,283	434	46,181	219,471	116,246	555,679
Gloucester	291,408	63,440	46,126	4,597	19,315	12,597	158	18,633	83,879	21,869	63,727
Hudson	676,061	138,221	79,920	10,016	44,808	26,516	368	35,767	185,636	95,704	481,548
Hunterdon	124,714	24,097	23,105	1,746	8,615	5,887	68	9,062	38,312	5,317	18,604
Mercer	369,811	78,695	56,000	5,703	24,536	15,698	201	22,796	105,508	38,279	189,371
Middlesex	829,685	180,190	124,198	13,058	54,722	34,942	451	50,650	235,083	65,823	479,059
Monmouth	621,354	131,723	109,201	9,546	41,656	28,059	337	42,574	183,773	41,380	155,338
Morris	494,228	104,322	84,336	7,560	33,123	22,079	269	33,227	145,375	22,980	144,503
Ocean	601,651	144,247	135,652	10,453	38,246	27,988	327	44,170	174,990	57,366	93,692
Passaic	503,310	119,860	73,213	8,686	32,288	20,596	273	29,818	138,627	67,374	297,927
Union	558,067	130,522	80,252	9,459	36,144	23,038	303	33,451	155,253	43,279	336,018
Warren	105,779	20,815	19,230	1,508	7,229	4,892	57	7,446	31,963	7,006	20,003
Totals	**7,836,006**	**1,731,008**	**1,250,923**	**125,441**	**515,047**	**335,797**	**4,257**	**494,760**	**2,234,427**	**765,040**	**3,671,202**

NEW JERSEY

American Lung Association in New Jersey

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Atlantic	2	0	0	0.7	B	0	0	0	0	0.0	A	6.8	PASS
Bergen	25	3	0	9.8	F	1	0	0	0	0.3	B	7.6	PASS
Camden	24	0	0	8.0	F	4	0	0	0	1.3	C	10.2	PASS
Cumberland	1	0	0	0.3	B	0	0	0	0	0.0	A	INC	INC
Essex	7	1	0	2.8	D	0	0	0	0	0.0	A	8.4	PASS
Gloucester	20	0	0	6.7	F	0	0	0	0	0.0	A	INC	INC
Hudson	12	2	0	5.0	F	0	0	0	0	0.0	A	8.2	PASS
Hunterdon	13	3	0	5.8	F	0	0	0	0	0.0	A	INC	INC
Mercer	22	2	0	8.3	F	0	0	0	0	0.0	A	8.2	PASS
Middlesex	23	1	0	8.2	F	0	0	0	0	0.0	A	8.2	PASS
Monmouth	4	0	0	1.3	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Morris	10	1	0	3.8	F	0	0	0	0	0.0	A	5.9	PASS
Ocean	17	1	0	6.2	F	0	0	0	0	0.0	A	6.6	PASS
Passaic	9	0	0	3.0	D	0	0	0	0	0.0	A	7.6	PASS
Union	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	9.2	PASS
Warren	5	0	0	1.7	C	0	0	0	0	0.0	A	8.1	PASS

NEW MEXICO

American Lung Association in New Mexico

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Bernalillo	678,701	147,370	111,216	11,089	52,392	32,622	251	42,467	214,828	109,959	417,521
Doña Ana	217,522	53,231	34,338	4,005	15,959	9,644	80	12,677	65,922	52,914	158,940
Eddy	57,900	15,344	8,406	1,155	4,180	2,559	21	3,314	17,140	8,981	31,228
Lea	69,611	20,752	7,948	1,561	4,720	2,708	26	3,463	19,403	10,813	45,250
Rio Arriba	39,006	9,121	7,558	686	3,024	2,040	14	2,681	12,328	8,498	34,040
Sandoval	145,179	33,748	25,756	2,539	11,168	7,291	54	9,519	45,587	18,215	82,591
San Juan	125,043	33,054	18,685	2,487	9,072	5,622	46	7,290	37,159	28,486	77,550
Santa Fe	150,056	26,988	36,485	2,031	12,611	8,953	55	11,943	51,444	17,972	85,555
Taos	32,835	5,778	8,688	435	2,797	2,045	12	2,747	11,404	6,955	21,199
Valencia	76,456	17,911	13,502	1,348	5,862	3,819	28	4,987	23,937	12,908	51,733
Totals	**1,592,309**	**363,297**	**272,582**	**27,336**	**121,785**	**77,304**	**589**	**101,088**	**499,152**	**275,701**	**1,005,607**

NEW MEXICO

American Lung Association in New Mexico

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Bernalillo	19	0	0	6.3	F
Doña Ana	52	2	0	18.3	F
Eddy	27	3	0	10.5	F
Lea	9	0	0	3.0	D
Rio Arriba	6	0	0	2.0	C
Sandoval	13	0	0	4.3	F
San Juan	23	0	0	7.7	F
Santa Fe	3	0	0	1.0	C
Taos	DNC	DNC	DNC	DNC	DNC
Valencia	6	0	0	2.0	C

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Bernalillo	0	0	0	0	0.0	A	7.8	PASS
Doña Ana	4	1	0	0	1.8	C	8.3	PASS
Eddy	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lea	1	0	0	0	0.3	B	7.6	PASS
Rio Arriba	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Sandoval	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
San Juan	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Santa Fe	INC	INC	INC	INC	INC	INC	INC	INC
Taos	INC	INC	INC	INC	INC	INC	INC	INC
Valencia	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC

NEW YORK

American Lung Association in New York

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Albany	307,117	56,359	52,073	3,472	25,603	14,152	177	19,470	90,763	32,888	86,584
Bronx	1,432,132	354,692	183,375	21,849	110,324	57,608	825	76,621	382,917	380,470	1,301,368
Chautauqua	127,939	25,997	25,704	1,601	10,377	6,321	74	8,983	38,327	22,426	16,477
Dutchess	293,718	55,149	51,633	3,397	24,355	14,248	170	19,713	88,606	25,387	84,652
Erie	919,719	186,092	165,052	11,463	74,829	43,545	531	60,689	271,226	122,204	227,998
Essex	37,300	6,062	8,743	373	3,174	2,035	22	2,943	11,985	4,150	2,877
Franklin	50,293	9,750	8,452	601	4,141	2,352	29	3,235	14,867	7,404	9,188
Hamilton	4,434	573	1,386	35	390	283	3	426	1,556	404	230
Herkimer	61,833	12,755	12,815	786	4,993	3,104	36	4,436	18,608	8,176	3,433
Jefferson	111,755	26,798	15,276	1,651	8,690	4,474	65	6,006	29,927	12,996	20,979
Kings	2,582,830	588,975	359,246	36,281	203,969	106,513	1,489	143,029	706,976	483,632	1,642,012
Monroe	742,474	154,214	128,049	9,500	60,032	34,403	429	47,684	216,203	103,620	220,692
New York	1,628,701	233,360	268,902	14,375	142,578	74,658	939	101,452	493,938	245,347	863,489
Niagara	210,433	42,064	40,109	2,591	17,160	10,375	122	14,590	63,263	26,833	30,878
Onondaga	461,809	98,024	78,635	6,038	37,131	21,330	267	29,524	133,908	61,143	107,930
Orange	381,951	97,160	53,541	5,985	29,133	16,190	221	21,885	103,817	42,664	139,224
Oswego	117,898	24,769	19,265	1,526	9,514	5,487	68	7,534	34,420	18,209	7,229
Putnam	98,892	19,590	17,169	1,207	8,098	4,856	57	6,713	29,819	5,863	21,898
Queens	2,278,906	458,457	357,517	28,241	186,074	103,111	1,317	140,434	661,427	261,819	1,708,555
Richmond	476,179	104,038	77,053	6,409	38,014	21,741	275	29,865	136,971	55,217	189,066
Rockland	325,695	91,712	51,107	5,649	23,877	13,737	188	19,050	86,148	44,728	121,045
Saratoga	230,163	46,168	41,728	2,844	18,769	11,165	133	15,570	68,748	14,319	22,730
Steuben	95,796	20,504	18,850	1,263	7,667	4,705	55	6,675	28,430	12,069	6,125
Suffolk	1,481,093	313,019	249,756	19,282	119,280	69,976	857	96,596	434,698	105,578	485,941
Tompkins	102,793	15,006	14,900	924	8,983	4,413	59	5,865	30,343	15,146	23,650
Wayne	90,064	19,198	17,002	1,183	7,223	4,430	52	6,234	26,813	8,511	9,160
Westchester	967,612	211,912	165,008	13,054	77,133	45,070	559	62,459	280,384	78,572	453,925
Totals	**15,619,529**	**3,272,397**	**2,482,346**	**201,579**	**1,261,513**	**700,282**	**9,021**	**957,682**	**4,485,090**	**2,199,775**	**7,807,335**

NEW YORK

American Lung Association in New York

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Albany	4	0	0	1.3	C	0	0	0	0	0.0	A	6.9	PASS
Bronx	15	0	0	5.0	F	0	0	0	0	0.0	A	8.1	PASS
Chautauqua	9	0	0	3.0	D	0	0	0	0	0.0	A	6.2	PASS
Dutchess	7	1	0	2.8	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Erie	9	0	0	3.0	D	0	0	0	0	0.0	A	7.2	PASS
Essex	4	0	0	1.3	C	0	0	0	0	0.0	A	3.6	PASS
Franklin	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Hamilton	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Herkimer	4	0	0	1.3	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Jefferson	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Kings	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.8	PASS
Monroe	9	0	0	3.0	D	0	0	0	0	0.0	A	6.8	PASS
New York	15	1	0	5.5	F	1	0	0	0	0.3	B	9.5	PASS
Niagara	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Onondaga	4	0	0	1.3	C	0	0	0	0	0.0	A	5.1	PASS
Orange	2	0	0	0.7	B	0	0	0	0	0.0	A	6.2	PASS
Oswego	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Putnam	8	2	0	3.7	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Queens	19	1	0	6.8	F	0	0	0	0	0.0	A	7.0	PASS
Richmond	22	1	0	7.8	F	0	0	0	0	0.0	A	7.4	PASS
Rockland	10	0	1	4.0	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Saratoga	4	0	0	1.3	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Steuben	2	0	0	0.7	B	0	0	0	0	0.0	A	4.7	PASS
Suffolk	25	3	0	9.8	F	0	0	0	0	0.0	A	6.7	PASS
Tompkins	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Wayne	7	0	0	2.3	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Westchester	22	1	0	7.8	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC

NORTH CAROLINA

American Lung Association in North Carolina

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Alexander	37,353	7,529	7,489	865	2,813	2,646	25	3,445	13,146	4,653	5,017
Avery	17,505	2,621	3,891	301	1,399	1,303	12	1,718	6,543	2,542	2,021
Buncombe	259,103	47,834	51,828	5,497	19,891	18,001	172	23,440	92,213	28,859	42,740
Caldwell	82,029	16,490	16,302	1,895	6,189	5,874	55	7,616	28,953	12,830	10,605
Carteret	69,524	12,208	17,363	1,403	5,376	5,455	46	7,385	25,772	6,717	9,386
Caswell	22,698	4,272	4,881	491	1,736	1,681	15	2,210	8,183	3,642	8,822
Catawba	158,652	35,043	28,337	4,027	11,688	10,675	106	13,629	54,071	20,321	39,209
Cumberland	332,330	82,119	39,617	9,437	23,719	17,892	223	21,369	104,633	53,788	190,679
Davidson	166,614	36,559	30,377	4,201	12,302	11,429	111	14,624	57,137	24,694	33,811
Durham	316,739	65,824	41,470	7,564	23,795	18,507	211	22,259	105,636	41,063	181,752
Edgecombe	52,005	11,711	10,253	1,346	3,796	3,561	34	4,655	17,746	11,705	33,137
Forsyth	379,099	86,957	60,617	9,993	27,649	23,954	252	30,046	126,134	60,361	164,800
Graham	8,484	1,694	2,019	195	636	632	6	854	3,035	1,575	1,192
Granville	60,115	12,272	10,293	1,410	4,537	4,127	40	5,188	20,906	7,331	25,247
Guilford	533,670	118,897	80,949	13,663	39,284	33,087	354	41,028	177,867	79,267	267,695
Haywood	61,971	11,308	15,248	1,299	4,747	4,738	41	6,424	22,679	8,071	4,631
Jackson	43,327	7,195	8,527	827	3,396	2,912	29	3,786	15,566	6,570	8,205
Johnston	202,675	51,654	26,989	5,936	14,366	12,225	135	14,831	64,910	23,374	66,425
Lee	61,452	14,733	10,118	1,693	4,420	3,920	41	4,954	20,287	9,459	25,942
Lenoir	55,976	12,606	11,088	1,449	4,087	3,860	37	5,046	19,134	12,193	28,441
Lincoln	83,770	17,649	14,802	2,028	6,269	5,835	56	7,384	29,063	8,555	12,538
Macon	35,285	6,590	10,056	757	2,670	2,800	24	3,938	13,017	5,700	3,882
Martin	22,671	4,587	5,246	527	1,699	1,694	15	2,272	8,093	4,571	10,867
Mecklenburg	1,093,901	257,713	122,549	29,615	79,580	61,334	729	71,907	351,251	126,098	586,264
Mitchell	15,000	2,740	3,741	315	1,149	1,157	10	1,572	5,501	2,383	1,232
Montgomery	27,271	6,007	5,597	690	2,002	1,903	18	2,505	9,398	4,379	10,067
New Hanover	232,274	42,800	41,211	4,918	17,874	15,270	154	19,425	81,539	34,250	52,600
Person	39,507	8,260	7,725	949	2,952	2,804	26	3,629	13,807	5,773	13,402
Pitt	179,914	38,347	23,789	4,407	13,404	10,273	119	12,422	59,411	40,201	82,137
Rockingham	90,690	18,387	18,552	2,113	6,823	6,562	60	8,560	32,052	16,003	25,083
Rowan	141,262	31,407	24,830	3,609	10,386	9,385	95	11,958	47,925	22,298	40,038
Swain	14,245	3,148	2,729	362	1,046	957	9	1,245	4,857	2,124	5,509
Union	235,908	63,295	29,928	7,274	16,454	14,175	158	17,063	74,408	16,361	66,941
Wake	1,092,305	261,531	126,886	30,054	79,104	62,737	729	74,034	351,225	89,819	438,820
Yancey	17,903	3,269	4,607	376	1,369	1,387	12	1,900	6,577	3,153	1,405
Totals	**6,243,227**	**1,405,256**	**919,904**	**161,486**	**458,606**	**384,753**	**4,162**	**474,322**	**2,072,676**	**800,683**	**2,500,542**

NORTH CAROLINA

American Lung Association in North Carolina

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Alexander	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Avery	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Buncombe	1	0	0	0.3	B	3	4	0	0	3.0	D	7.1	PASS
Caldwell	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Carteret	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Caswell	0	0	0	0.0	A	INC	INC	INC	INC	INC	INC	INC	INC
Catawba	DNC	DNC	DNC	DNC	DNC	1	2	0	0	1.3	C	8.6	PASS
Cumberland	0	0	0	0.0	A	0	0	0	0	0.0	A	8.1	PASS
Davidson	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	8.7	PASS
Durham	0	0	0	0.0	A	1	0	0	0	0.3	B	8.6	PASS
Edgecombe	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Forsyth	5	0	0	1.7	C	0	0	0	0	0.0	A	7.5	PASS
Graham	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Granville	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Guilford	5	0	0	1.7	C	1	0	0	0	0.3	B	7.8	PASS
Haywood	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Jackson	4	0	0	1.3	C	3	2	0	0	2.0	C	7.8	PASS
Johnston	0	0	0	0.0	A	1	0	0	0	0.3	B	7.8	PASS
Lee	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lenoir	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lincoln	1	1	0	0.8	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Macon	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Martin	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Mecklenburg	14	0	0	4.7	F	0	0	0	0	0.0	A	8.8	PASS
Mitchell	DNC	DNC	DNC	DNC	DNC	1	3	0	0	1.8	C	7.0	PASS
Montgomery	0	0	0	0.0	A	0	0	0	0	0.0	A	6.3	PASS
New Hanover	0	0	0	0.0	A	0	0	0	0	0.0	A	4.9	PASS
Person	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Pitt	0	0	0	0.0	A	0	0	0	0	0.0	A	6.6	PASS
Rockingham	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Rowan	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Swain	0	0	0	0.0	A	8	4	0	0	4.7	F	8.3	PASS
Union	7	0	0	2.3	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Wake	1	0	0	0.3	B	2	0	0	0	0.7	B	7.7	PASS
Yancey	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC

NORTH DAKOTA

American Lung Association in North Dakota

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Billings	919	187	206	12	60	43	1	77	319	82	70
Burke	2,100	526	436	34	129	92	1	164	687	195	139
Burleigh	95,273	22,130	15,315	1,440	5,997	3,806	52	6,317	31,431	6,798	10,826
Cass	181,516	40,855	21,794	2,658	11,534	6,440	99	9,837	59,543	18,270	28,532
Dunn	4,332	1,032	690	67	271	178	2	296	1,425	443	811
McKenzie	13,632	4,292	1,248	279	767	428	7	637	3,957	1,240	3,078
Mercer	8,267	1,904	1,592	124	522	368	5	641	2,773	585	629
Oliver	1,952	491	433	32	120	89	1	162	641	198	133
Ward	67,744	15,964	8,640	1,039	4,245	2,424	37	3,774	21,971	7,057	11,854
Williams	35,350	10,135	3,388	659	2,069	1,144	19	1,699	10,668	2,265	7,202
Totals	**411,085**	**97,516**	**53,742**	**6,345**	**25,713**	**15,011**	**224**	**23,604**	**133,414**	**37,133**	**63,274**

NORTH DAKOTA

American Lung Association in North Dakota

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Billings	0	0	0	0.0	A	1	1	0	0	0.8	B	3.8	PASS
Burke	0	0	0	0.0	A	2	0	0	0	0.7	B	2.9	PASS
Burleigh	0	0	0	0.0	A	5	3	0	0	3.2	D	INC	INC
Cass	0	0	0	0.0	A	1	0	0	0	0.3	B	6.6	PASS
Dunn	0	0	0	0.0	A	1	1	0	0	0.8	B	INC	INC
McKenzie	0	0	0	0.0	A	1	1	0	0	0.8	B	4.2	PASS
Mercer	0	0	0	0.0	A	4	1	0	0	1.8	C	3.8	PASS
Oliver	0	0	0	0.0	A	3	1	0	0	1.5	C	5.3	PASS
Ward	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC
Williams	0	0	0	0.0	A	2	0	0	0	0.7	B	4.5	PASS

OHIO

American Lung Association in Ohio

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Allen	102,663	23,667	18,117	1,840	7,439	6,780	68	8,248	36,270	13,901	19,806
Ashtabula	97,493	21,521	18,589	1,673	7,134	6,834	65	8,424	35,277	16,353	10,409
Athens	65,818	9,568	8,671	744	5,347	3,995	43	4,498	24,854	17,237	7,036
Belmont	67,505	12,769	14,072	993	5,140	4,952	45	6,149	25,412	8,272	4,973
Butler	382,378	89,730	56,176	6,975	27,618	23,859	252	28,189	133,201	45,821	74,557
Clark	134,585	30,121	26,122	2,341	9,819	9,299	89	11,488	48,322	19,467	21,492
Clermont	205,466	47,330	33,533	3,679	14,881	13,589	136	16,359	72,814	16,745	13,589
Clinton	42,057	9,690	7,176	753	3,046	2,794	28	3,385	14,902	4,802	2,753
Cuyahoga	1,243,857	257,882	225,983	20,045	92,829	84,905	817	103,312	453,134	217,166	512,719
Delaware	204,826	53,818	28,062	4,183	14,228	12,563	135	14,821	69,173	8,271	31,771
Fayette	28,666	6,693	5,091	520	2,066	1,928	19	2,353	10,148	4,227	2,215
Franklin	1,310,300	304,643	157,391	23,680	95,292	75,398	863	85,844	450,179	198,207	490,422
Geauga	94,031	21,496	19,159	1,671	6,798	6,766	62	8,451	33,949	5,341	4,265
Greene	167,995	34,671	28,829	2,695	12,573	11,139	111	13,406	60,873	18,567	27,513
Hamilton	816,684	187,547	125,251	14,578	59,375	51,474	537	61,127	286,330	122,843	285,966
Harrison	15,174	3,183	3,227	247	1,123	1,125	10	1,410	5,618	2,285	788
Jefferson	65,767	12,596	14,173	979	4,990	4,875	43	6,091	24,750	12,052	6,313
Knox	61,893	14,061	11,231	1,093	4,502	4,151	41	5,072	22,013	8,039	2,897
Lake	230,514	46,209	46,066	3,592	17,306	16,634	152	20,569	85,597	16,970	28,285
Lawrence	59,866	13,009	11,313	1,011	4,404	4,163	39	5,117	21,690	11,093	3,181
Licking	175,769	40,733	28,906	3,166	12,710	11,580	116	13,955	62,123	15,591	17,928
Lorain	309,461	68,166	56,629	5,299	22,685	21,254	204	26,000	111,522	42,562	68,373
Lucas	429,899	98,562	70,047	7,661	31,226	27,868	283	33,461	151,668	78,398	135,938
Madison	44,413	9,117	6,863	709	3,327	2,935	30	3,481	16,146	4,215	5,188
Mahoning	229,642	45,992	48,145	3,575	17,249	16,630	151	20,712	85,227	36,520	56,113
Medina	179,146	39,987	31,990	3,108	13,073	12,354	118	15,080	64,507	11,474	11,087
Miami	106,222	24,389	19,773	1,896	7,692	7,259	70	8,921	37,861	8,329	8,482
Montgomery	532,331	117,543	95,583	9,137	39,064	35,589	350	43,324	190,400	87,187	156,334
Noble	14,354	2,634	3,951	205	1,093	1,197	10	1,558	5,585	2,109	716
Portage	162,927	30,531	26,794	2,373	12,492	10,893	107	12,973	60,319	17,564	17,391
Preble	40,997	9,174	7,893	713	2,988	2,868	27	3,543	14,778	3,936	1,535
Scioto	75,502	16,334	13,792	1,270	5,568	5,137	50	6,271	27,241	16,288	5,056
Stark	371,574	79,684	72,293	6,194	27,432	26,009	245	32,089	135,104	52,330	50,778
Summit	541,918	113,228	97,232	8,801	40,339	37,151	357	45,167	197,440	63,889	126,757
Trumbull	198,627	40,788	42,931	3,170	14,808	14,571	131	18,270	73,565	34,413	25,510
Warren	232,173	57,270	33,646	4,452	16,471	14,719	154	17,462	80,296	11,709	33,080
Washington	60,155	11,844	12,663	921	4,536	4,396	40	5,477	22,452	9,251	3,016
Wood	130,696	26,642	19,998	2,071	9,841	8,218	86	9,672	46,960	14,733	15,623
Totals	**9,233,344**	**2,032,822**	**1,547,361**	**158,010**	**678,504**	**607,854**	**6,082**	**731,724**	**3,297,695**	**1,278,157**	**2,289,855**

OHIO

American Lung Association in Ohio

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Allen	9	0	0	3.0	D	0	0	0	0	0.0	A	7.8	PASS
Ashtabula	11	0	0	3.7	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Athens	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	6.4	PASS
Belmont	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.9	PASS
Butler	23	0	0	7.7	F	0	0	0	0	0.0	A	10.5	PASS
Clark	12	0	0	4.0	F	0	0	0	0	0.0	A	8.7	PASS
Clermont	9	0	0	3.0	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Clinton	8	0	0	2.7	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Cuyahoga	20	0	0	6.7	F	0	0	0	0	0.0	A	11.0	PASS
Delaware	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Fayette	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Franklin	13	0	0	4.3	F	1	0	0	0	0.3	B	8.4	PASS
Geauga	23	0	0	7.7	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Greene	3	0	0	1.0	C	0	0	0	0	0.0	A	7.8	PASS
Hamilton	24	1	0	8.5	F	0	0	0	0	0.0	A	9.7	PASS
Harrison	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Jefferson	1	0	0	0.3	B	2	0	0	0	0.7	B	9.5	PASS
Knox	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lake	24	0	0	8.0	F	0	0	0	0	0.0	A	7.0	PASS
Lawrence	5	0	0	1.7	C	1	0	0	0	0.3	B	6.6	PASS
Licking	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lorain	4	0	0	1.3	C	0	0	0	0	0.0	A	7.5	PASS
Lucas	16	1	0	5.8	F	1	0	0	0	0.3	B	8.5	PASS
Madison	4	0	0	1.3	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Mahoning	0	0	0	0.0	A	0	0	0	0	0.0	A	7.9	PASS
Medina	1	0	0	0.3	B	0	0	0	0	0.0	A	7.6	PASS
Miami	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Montgomery	11	0	0	3.7	F	0	0	0	0	0.0	A	8.5	PASS
Noble	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Portage	0	0	0	0.0	A	0	0	0	0	0.0	A	7.3	PASS
Preble	2	0	0	0.7	B	1	0	0	0	0.3	B	7.8	PASS
Scioto	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	INC	INC
Stark	11	0	0	3.7	F	0	0	0	0	0.0	A	9.3	PASS
Summit	2	0	0	0.7	B	0	0	0	0	0.0	A	9.0	PASS
Trumbull	10	0	0	3.3	F	1	0	0	0	0.3	B	7.8	PASS
Warren	15	0	0	5.0	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Washington	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Wood	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC

OKLAHOMA

American Lung Association in Oklahoma

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Adair	22,082	5,869	3,512	575	1,680	1,432	14	1,969	7,312	5,372	13,343
Bryan	47,192	11,054	8,477	1,083	3,720	3,143	30	4,391	16,217	7,604	13,824
Caddo	28,977	7,285	4,881	714	2,241	1,908	19	2,642	9,768	5,239	12,439
Canadian	144,447	37,771	18,770	3,701	11,111	8,728	93	11,688	47,213	10,336	35,104
Carter	48,177	12,075	8,103	1,183	3,733	3,193	31	4,416	16,281	8,335	14,715
Cherokee	48,675	10,655	8,130	1,044	3,923	3,169	31	4,376	16,883	9,862	25,635
Choctaw	14,668	3,541	3,036	347	1,142	1,059	9	1,505	5,113	3,312	5,789
Cleveland	281,669	60,612	37,659	5,939	22,971	17,209	181	23,030	96,631	32,077	80,962
Comanche	120,422	28,332	15,192	2,776	9,583	7,151	78	9,524	40,239	18,303	53,129
Cotton	5,776	1,299	1,119	127	462	424	4	593	2,056	926	1,389
Creek	71,604	17,201	12,638	1,685	5,625	4,936	46	6,847	24,700	9,874	17,424
Dewey	4,894	1,324	902	130	367	326	3	459	1,622	580	910
Jefferson	6,123	1,478	1,307	145	476	443	4	633	2,135	1,473	1,385
Johnston	10,949	2,573	2,129	252	861	762	7	1,074	3,802	2,068	3,354
Kay	44,161	11,091	8,539	1,087	3,393	2,996	28	4,239	14,993	8,751	11,403
Le Flore	49,980	11,997	9,038	1,176	3,918	3,422	32	4,772	17,207	10,903	14,386
Lincoln	34,920	8,310	6,400	814	2,750	2,469	22	3,437	12,154	5,069	6,277
Love	10,134	2,461	1,935	241	789	695	7	979	3,480	1,466	2,949
McClain	39,985	10,265	6,194	1,006	3,085	2,610	26	3,566	13,385	3,592	8,477
Mayes	41,107	9,598	7,576	940	3,251	2,866	26	3,999	14,311	6,271	14,522
Nowata	10,218	2,328	1,962	228	814	735	7	1,028	3,606	1,650	3,399
Oklahoma	792,582	203,382	108,318	19,928	61,212	48,023	508	64,776	260,424	131,185	351,494
Osage	47,014	10,217	9,386	1,001	3,791	3,454	30	4,853	16,853	6,864	17,226
Ottawa	31,175	7,643	5,720	749	2,422	2,105	20	2,949	10,637	6,210	10,970
Pittsburg	43,877	9,745	8,790	955	3,504	3,109	28	4,393	15,498	8,160	13,530
Sequoyah	41,179	9,421	7,802	923	3,274	2,914	26	4,078	14,456	7,636	15,412
Tulsa	648,360	164,042	93,318	16,073	50,281	40,387	415	54,771	215,266	89,706	248,773
Washington	51,843	12,408	10,099	1,216	4,052	3,604	33	5,085	17,924	6,607	14,239
Totals	**2,742,190**	**673,977**	**410,932**	**66,039**	**214,430**	**173,273**	**1,758**	**236,072**	**920,166**	**409,431**	**1,012,459**

OKLAHOMA

American Lung Association in Oklahoma

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Adair	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Bryan	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Caddo	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Canadian	7	0	0	2.3	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Carter	INC	INC	INC	INC	INC	2	0	0	0	0.7	B	INC	INC
Cherokee	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Choctaw	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Cleveland	8	0	0	2.7	D	1	0	0	0	0.3	B	8.5	PASS
Comanche	5	0	0	1.7	C	0	0	0	0	0.0	A	7.0	PASS
Cotton	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Creek	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Dewey	7	0	0	2.3	D	2	0	0	0	0.7	B	INC	INC
Jefferson	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Johnston	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Kay	2	0	0	0.7	B	2	0	0	0	0.7	B	7.7	PASS
Le Flore	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Lincoln	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Love	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
McClain	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Mayes	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Nowata	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC
Oklahoma	16	0	0	5.3	F	0	0	0	0	0.0	A	8.6	PASS
Osage	8	0	0	2.7	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Ottawa	0	0	0	0.0	A	INC	INC	INC	INC	INC	INC	INC	INC
Pittsburg	1	0	0	0.3	B	0	0	0	0	0.0	A	8.1	PASS
Sequoyah	0	0	0	0.0	A	0	0	0	0	0.0	A	8.2	PASS
Tulsa	8	2	0	3.7	F	2	0	0	0	0.7	B	9.6	PASS
Washington	INC	INC	INC	INC	INC	1	0	0	0	0.3	B	INC	INC

OREGON

American Lung Association in Oregon

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Clackamas	416,075	89,515	75,318	6,490	38,275	23,053	210	32,094	142,169	30,022	76,734
Columbia	52,377	11,067	9,809	802	4,842	2,982	27	4,171	18,098	5,302	6,237
Crook	23,867	4,716	5,944	342	2,212	1,503	12	2,155	8,599	3,049	2,862
Harney	7,329	1,502	1,793	109	673	451	4	646	2,606	1,089	962
Jackson	219,564	45,245	48,236	3,280	20,229	12,911	111	18,265	76,940	32,137	42,944
Josephine	87,393	17,118	22,709	1,241	8,094	5,581	44	8,032	31,670	14,655	11,623
Klamath	67,653	14,706	14,340	1,066	6,153	3,903	34	5,512	23,338	12,310	15,294
Lake	7,879	1,513	1,987	110	735	503	4	722	2,864	1,360	1,233
Lane	379,611	69,868	73,392	5,065	36,150	21,366	192	29,676	133,980	67,217	70,215
Marion	346,868	85,432	54,349	6,194	30,699	17,436	176	23,937	112,048	48,997	121,561
Multnomah	811,880	152,901	109,080	11,085	77,901	40,721	411	54,594	276,833	95,543	249,344
Umatilla	77,516	19,551	12,120	1,417	6,806	3,878	39	5,328	24,864	11,557	26,729
Wasco	26,505	5,871	5,458	426	2,399	1,500	13	2,112	9,059	3,467	6,873
Washington	597,695	136,614	80,268	9,905	54,488	29,286	302	39,553	195,075	51,789	208,815
Totals	**3,122,212**	**655,619**	**514,803**	**47,533**	**289,656**	**165,074**	**1,580**	**226,797**	**1,058,144**	**378,494**	**841,426**

OREGON

American Lung Association in Oregon

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Clackamas	10	1	1	4.5	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Columbia	1	1	0	0.8	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Crook	DNC	DNC	DNC	DNC	DNC	5	5	0	0	4.2	F	9.1	PASS
Harney	DNC	DNC	DNC	DNC	DNC	6	2	0	0	3.0	D	9.8	PASS
Jackson	11	0	0	3.7	F	3	11	3	0	8.5	F	INC	INC
Josephine	DNC	DNC	DNC	DNC	DNC	0	7	0	0	3.5	F	10.3	PASS
Klamath	DNC	DNC	DNC	DNC	DNC	6	9	2	0	7.8	F	12.4	FAIL
Lake	DNC	DNC	DNC	DNC	DNC	12	7	0	0	7.5	F	INC	INC
Lane	2	2	0	1.7	C	10	4	0	1	6.2	F	9.6	PASS
Marion	6	0	0	2.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Multnomah	3	1	0	1.5	C	4	0	0	0	1.3	C	7.0	PASS
Umatilla	8	0	0	2.7	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Wasco	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Washington	4	2	0	2.3	D	6	0	0	0	2.0	C	7.4	PASS

PENNSYLVANIA

American Lung Association in Pennsylvania

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Adams	102,811	20,554	20,954	2,001	8,300	6,227	66	8,622	35,826	7,919	11,291
Allegheny	1,218,452	227,749	230,377	22,168	99,742	70,310	778	96,971	424,109	138,397	263,512
Armstrong	65,263	12,510	14,338	1,218	5,322	4,133	42	5,756	23,164	5,917	1,959
Beaver	164,742	31,988	35,412	3,114	13,373	10,199	105	14,214	57,942	18,061	17,483
Berks	420,152	93,834	72,352	9,133	32,976	23,183	269	31,654	140,195	46,762	122,246
Blair	122,492	25,017	25,445	2,435	9,809	7,349	78	10,240	42,311	17,156	6,675
Bradford	60,833	13,362	12,955	1,301	4,782	3,696	39	5,160	20,788	7,495	2,549
Bucks	628,195	128,216	117,060	12,480	50,664	37,204	402	50,819	217,670	35,350	102,058
Cambria	131,730	25,309	29,736	2,463	10,694	8,264	84	11,606	46,467	18,520	9,567
Centre	162,805	24,461	23,195	2,381	13,913	8,286	105	11,136	57,038	25,901	24,046
Chester	522,046	118,139	85,335	11,499	40,938	28,596	334	38,704	173,851	34,311	108,918
Clearfield	79,388	14,453	16,291	1,407	6,554	4,882	51	6,749	28,240	11,323	5,584
Cumberland	251,423	50,918	46,545	4,956	20,199	14,275	161	19,667	85,944	17,469	37,225
Dauphin	277,097	62,355	47,002	6,069	21,700	15,153	177	20,668	92,113	35,730	96,578
Delaware	564,751	123,908	92,607	12,061	44,571	30,589	361	41,541	188,466	47,800	190,290
Elk	30,169	5,870	6,640	571	2,456	1,935	19	2,687	10,733	2,742	817
Erie	272,061	58,156	48,900	5,661	21,578	15,252	174	20,938	91,833	39,839	42,933
Fayette	130,441	25,011	27,603	2,434	10,630	8,059	84	11,199	45,994	18,475	10,877
Franklin	154,835	34,405	30,425	3,349	12,132	8,978	99	12,455	52,182	16,759	19,006
Greene	36,506	7,075	6,896	689	2,971	2,136	24	2,935	12,694	5,334	2,389
Indiana	84,501	15,312	16,480	1,490	6,954	4,917	54	6,814	29,585	12,356	5,220
Lackawanna	210,793	43,243	42,061	4,209	16,869	12,398	135	17,208	72,434	28,929	33,043
Lancaster	543,557	127,967	97,560	12,456	41,843	29,653	348	40,927	178,138	42,131	100,253
Lawrence	86,184	17,086	18,951	1,663	6,952	5,352	55	7,490	30,187	13,319	7,038
Lebanon	141,314	32,143	27,397	3,129	10,986	8,049	90	11,180	47,133	13,802	26,209
Lehigh	368,100	83,207	61,507	8,099	28,764	19,842	235	27,070	121,744	42,991	134,641
Luzerne	317,646	62,610	63,184	6,094	25,696	18,827	203	26,071	110,264	43,839	62,210
Lycoming	113,664	23,267	21,935	2,265	9,111	6,611	73	9,135	39,007	14,054	10,740
Mercer	110,683	21,463	23,991	2,089	8,977	6,834	71	9,548	38,872	15,985	11,023
Monroe	169,507	33,306	29,181	3,242	13,828	9,821	109	13,274	58,959	20,202	59,228
Montgomery	828,604	178,218	147,124	17,347	65,743	46,770	530	63,941	280,276	47,317	204,331
Northampton	304,807	60,926	57,955	5,930	24,602	17,747	195	24,442	105,196	29,917	73,337
Philadelphia	1,584,138	343,970	216,276	33,481	125,116	77,536	1,009	103,994	517,325	372,322	1,039,969
Somerset	73,952	13,224	16,535	1,287	6,115	4,706	48	6,574	26,551	8,289	4,324
Susquehanna	40,589	7,498	9,604	730	3,335	2,676	26	3,752	14,634	5,128	1,525
Tioga	40,763	8,140	8,983	792	3,280	2,522	26	3,534	14,236	5,894	1,601
Washington	207,346	40,332	42,617	3,926	16,847	12,623	133	17,492	72,688	18,274	16,532
Westmoreland	350,611	64,117	79,652	6,241	28,867	22,565	224	31,543	125,835	31,749	21,836
York	448,273	99,020	78,216	9,638	35,336	25,144	287	34,297	150,669	38,582	76,751
Totals	**11,421,224**	**2,378,339**	**2,049,277**	**231,498**	**912,526**	**643,300**	**7,304**	**882,008**	**3,881,295**	**1,356,340**	**2,965,814**

PENNSYLVANIA

American Lung Association in Pennsylvania

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Adams	7	0	0	2.3	D	1	0	0	0	0.3	B	7.6	PASS
Allegheny	23	1	0	8.2	F	26	2	0	0	9.7	F	12.6	FAIL
Armstrong	6	0	0	2.0	C	0	0	0	0	0.0	A	9.3	PASS
Beaver	12	0	0	4.0	F	1	0	0	0	0.3	B	9.1	PASS
Berks	13	0	0	4.3	F	4	0	0	0	1.3	C	8.5	PASS
Blair	2	0	0	0.7	B	1	0	0	0	0.3	B	8.1	PASS
Bradford	0	0	0	0.0	A	0	0	0	0	0.0	A	7.0	PASS
Bucks	30	3	0	11.5	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Cambria	0	0	0	0.0	A	0	0	0	0	0.0	A	9.7	PASS
Centre	2	0	0	0.7	B	2	0	0	0	0.7	B	8.1	PASS
Chester	15	0	0	5.0	F	0	0	0	0	0.0	A	9.7	PASS
Clearfield	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Cumberland	DNC	DNC	DNC	DNC	DNC	2	0	0	0	0.7	B	8.1	PASS
Dauphin	5	0	0	1.7	C	3	0	0	0	1.0	C	8.6	PASS
Delaware	11	0	0	3.7	F	2	0	0	0	0.7	B	10.7	PASS
Elk	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Erie	3	0	0	1.0	C	0	0	0	0	0.0	A	8.1	PASS
Fayette	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC
Franklin	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Greene	1	0	0	0.3	B	0	0	0	0	0.0	A	6.2	PASS
Indiana	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lackawanna	4	0	0	1.3	C	0	0	0	0	0.0	A	8.3	PASS
Lancaster	9	0	0	3.0	D	6	0	0	0	2.0	C	9.8	PASS
Lawrence	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lebanon	7	0	0	2.3	D	3	0	0	0	1.0	C	9.3	PASS
Lehigh	8	0	0	2.7	D	1	0	0	0	0.3	B	9.0	PASS
Luzerne	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lycoming	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Mercer	8	0	0	2.7	D	0	0	0	0	0.0	A	9.3	PASS
Monroe	5	0	0	1.7	C	0	0	0	0	0.0	A	INC	INC
Montgomery	19	0	0	6.3	F	INC	INC	INC	INC	INC	INC	INC	INC
Northampton	13	0	0	4.3	F	2	0	0	0	0.7	B	8.4	PASS
Philadelphia	28	3	0	10.8	F	0	0	0	0	0.0	A	10.1	PASS
Somerset	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Susquehanna	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Tioga	2	0	0	0.7	B	0	0	0	0	0.0	A	7.7	PASS
Washington	5	0	0	1.7	C	0	0	0	0	0.0	A	8.5	PASS
Westmoreland	7	0	0	2.3	D	0	0	0	0	0.0	A	8.7	PASS
York	6	0	0	2.0	C	0	0	0	0	0.0	A	9.3	PASS

RHODE ISLAND

American Lung Association in Rhode Island

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Kent	163,861	30,623	30,962	2,407	15,783	9,707	113	13,087	57,341	12,620	19,509
Providence	636,084	130,676	97,217	10,272	59,838	33,355	439	44,070	210,372	98,431	248,891
Washington	126,179	20,842	26,164	1,638	12,462	7,734	87	10,569	45,415	9,507	11,430
Totals	**926,124**	**182,141**	**154,343**	**14,318**	**88,083**	**50,796**	**640**	**67,726**	**313,129**	**120,558**	**279,830**

RHODE ISLAND

American Lung Association in Rhode Island

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Kent	16	0	0	5.3	F	0	0	0	0	0.0	A	5.0	PASS
Providence	16	0	0	5.3	F	0	0	0	0	0.0	A	8.8	PASS
Washington	12	2	0	5.0	F	0	0	0	0	0.0	A	5.1	PASS

SOUTH CAROLINA

American Lung Association in South Carolina

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Abbeville	24,541	4,924	5,343	352	1,769	1,736	15	2,238	8,735	4,545	7,624
Aiken	169,401	36,849	32,901	2,637	11,999	11,369	103	14,426	58,536	25,095	57,686
Anderson	200,482	45,852	36,185	3,282	14,036	13,075	121	16,433	68,045	28,843	45,645
Berkeley	221,091	52,749	30,410	3,775	15,382	13,089	135	15,752	72,505	27,687	80,553
Charleston	405,905	79,933	66,621	5,721	29,612	25,751	246	31,548	140,850	55,971	142,289
Cherokee	57,078	13,140	9,598	940	3,999	3,645	35	4,529	19,241	9,394	15,558
Chesterfield	45,754	10,032	8,395	718	3,249	3,070	28	3,867	15,796	9,453	18,154
Colleton	37,660	8,390	7,595	600	2,647	2,562	23	3,277	12,998	7,440	16,190
Darlington	66,802	14,817	12,678	1,060	4,713	4,459	40	5,644	22,963	15,356	30,255
Edgefield	27,052	4,894	5,074	350	2,014	1,866	17	2,337	9,741	4,489	11,716
Florence	138,159	32,590	23,471	2,332	9,591	8,729	83	10,871	46,178	24,375	66,992
Greenville	514,213	118,364	81,136	8,471	36,044	31,886	312	39,169	171,994	55,837	163,199
Horry	344,147	61,715	82,431	4,417	25,384	25,499	209	33,265	126,421	48,595	77,287
Lexington	295,032	68,294	46,581	4,888	20,688	18,574	179	22,867	98,995	36,432	75,300
Oconee	78,374	15,615	18,196	1,118	5,647	5,684	48	7,409	28,123	11,159	12,423
Pickens	124,937	23,712	20,660	1,697	9,181	7,896	76	9,657	43,583	19,471	18,028
Richland	414,576	88,630	52,790	6,343	29,740	23,817	251	28,023	138,156	64,210	239,888
Spartanburg	313,888	72,501	50,812	5,189	21,970	19,654	190	24,257	105,176	41,706	100,392
York	274,118	66,495	39,236	4,759	19,001	16,696	166	20,296	90,243	26,453	81,682
Totals	**3,753,210**	**819,496**	**630,113**	**58,651**	**266,667**	**239,056**	**2,277**	**295,868**	**1,278,280**	**516,511**	**1,260,861**

SOUTH CAROLINA

American Lung Association in South Carolina

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Abbeville	INC	INC	INC	INC	INC
Aiken	0	0	0	0.0	A
Anderson	0	0	0	0.0	A
Berkeley	0	0	0	0.0	A
Charleston	1	0	0	0.3	B
Cherokee	INC	INC	INC	INC	INC
Chesterfield	1	0	0	0.3	B
Colleton	0	0	0	0.0	A
Darlington	0	0	0	0.0	A
Edgefield	1	0	0	0.3	B
Florence	DNC	DNC	DNC	DNC	DNC
Greenville	1	0	0	0.3	B
Horry	0	0	0	0.0	A
Lexington	DNC	DNC	DNC	DNC	DNC
Oconee	1	0	0	0.3	B
Pickens	1	0	0	0.3	B
Richland	5	0	0	1.7	C
Spartanburg	3	0	0	1.0	C
York	5	0	0	1.7	C

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Abbeville	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Aiken	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Anderson	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Berkeley	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Charleston	1	2	0	0	1.3	C	7.2	PASS
Cherokee	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Chesterfield	0	0	0	0	0.0	A	INC	INC
Colleton	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Darlington	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Edgefield	1	1	0	0	0.8	B	8.2	PASS
Florence	0	0	0	0	0.0	A	INC	INC
Greenville	3	2	0	0	2.0	C	8.3	PASS
Horry	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Lexington	0	2	0	0	1.0	C	8.5	PASS
Oconee	0	0	0	0	0.0	A	INC	INC
Pickens	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Richland	0	2	0	0	1.0	C	7.8	PASS
Spartanburg	0	0	0	0	0.0	A	8.0	PASS
York	INC	INC	INC	INC	INC	INC	INC	INC

SOUTH DAKOTA

American Lung Association in South Dakota

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Brookings	35,232	7,223	4,195	517	2,227	985	21	1,873	12,098	3,744	3,614
Brown	39,316	9,416	6,747	674	2,348	1,375	23	2,753	13,167	4,195	5,537
Codington	28,015	6,724	4,949	481	1,669	1,013	17	2,032	9,404	3,115	2,082
Custer	8,726	1,343	2,621	96	568	450	5	953	3,335	853	830
Hughes	17,650	4,251	3,057	304	1,051	632	10	1,264	5,914	1,590	3,212
Jackson	3,307	1,105	442	79	173	97	2	192	967	1,070	2,003
Meade	28,294	6,463	4,316	463	1,721	940	17	1,849	9,567	2,309	3,665
Minnehaha	192,876	49,051	25,229	3,511	11,371	5,934	114	11,455	62,848	18,035	35,825
Pennington	111,729	25,603	20,087	1,832	6,753	4,072	66	8,179	38,016	14,567	22,323
Union	15,619	3,779	2,832	270	927	574	9	1,155	5,238	915	1,257
Totals	**480,764**	**114,958**	**74,475**	**8,227**	**28,810**	**16,073**	**284**	**31,703**	**160,553**	**50,393**	**80,348**

SOUTH DAKOTA

American Lung Association in South Dakota

	HIGH OZONE DAYS 2016–2018				
County	Orange	Red	Purple	Wgt. Avg.	Grade
Brookings	2	0	0	0.7	B
Brown	DNC	DNC	DNC	DNC	DNC
Codington	DNC	DNC	DNC	DNC	DNC
Custer	0	0	0	0.0	A
Hughes	DNC	DNC	DNC	DNC	DNC
Jackson	0	0	0	0.0	A
Meade	0	0	0	0.0	A
Minnehaha	4	0	0	1.3	C
Pennington	DNC	DNC	DNC	DNC	DNC
Union	2	0	0	0.7	B

	HIGH PARTICLE POLLUTION DAYS 2016–2018							
	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Brookings	0	0	0	0	0.0	A	4.6	PASS
Brown	1	0	0	0	0.3	B	6.0	PASS
Codington	1	0	0	0	0.3	B	6.8	PASS
Custer	2	1	0	0	1.2	C	3.6	PASS
Hughes	1	0	0	0	0.3	B	4.0	PASS
Jackson	3	0	0	0	1.0	C	3.7	PASS
Meade	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Minnehaha	0	0	0	0	0.0	A	5.9	PASS
Pennington	6	1	0	0	2.5	D	6.8	PASS
Union	2	0	0	0	0.7	B	6.2	PASS

TENNESSEE

American Lung Association in Tennessee

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Anderson	76,482	16,078	15,356	1,566	6,003	6,909	55	8,161	27,938	12,433	8,366
Blount	131,349	26,559	26,575	2,587	10,429	12,028	95	14,202	48,512	12,816	12,028
Claiborne	31,756	6,060	6,334	590	2,544	2,896	23	3,399	11,836	7,129	1,496
Davidson	692,587	144,027	84,795	14,027	52,537	52,557	501	56,480	242,197	102,623	303,675
DeKalb	20,138	4,351	3,699	424	1,571	1,789	15	2,082	7,280	3,435	2,531
Dyer	37,320	8,927	6,566	869	2,806	3,149	27	3,653	13,019	6,735	7,549
Hamilton	364,286	75,645	64,030	7,367	28,313	31,175	264	35,859	131,428	46,021	105,494
Jefferson	54,012	10,618	10,818	1,034	4,328	4,995	39	5,881	20,102	7,241	4,307
Knox	465,289	97,591	73,661	9,505	35,804	38,307	337	43,213	165,829	59,817	82,453
Lawrence	43,734	10,932	7,794	1,065	3,248	3,676	32	4,287	15,084	7,643	2,822
Loudon	53,054	10,295	14,026	1,003	4,279	5,223	39	6,482	20,171	4,754	6,681
McMinn	53,285	11,306	10,458	1,101	4,177	4,802	39	5,651	19,413	8,307	5,825
Madison	97,605	21,872	16,615	2,130	7,444	8,212	70	9,430	34,515	16,631	43,222
Maury	94,340	22,094	15,014	2,152	7,114	7,808	68	8,886	32,888	10,032	19,819
Montgomery	205,950	54,985	19,005	5,355	14,325	13,727	150	14,232	65,815	24,251	76,668
Putnam	78,843	16,455	13,134	1,603	6,043	6,452	57	7,334	28,094	10,996	9,378
Roane	53,140	9,981	12,108	972	4,337	5,169	39	6,222	20,223	7,779	3,928
Sevier	97,892	20,173	19,341	1,965	7,742	8,916	71	10,492	35,969	13,466	10,050
Shelby	935,764	232,721	127,099	22,665	68,612	72,650	675	80,599	316,259	198,554	602,781
Sullivan	157,668	30,362	34,529	2,957	12,684	14,830	114	17,731	59,195	25,549	10,570
Sumner	187,149	43,922	29,664	4,278	14,164	15,653	136	17,819	65,383	16,426	30,336
Williamson	231,729	63,088	30,480	6,144	16,798	18,454	168	20,589	76,951	8,794	36,349
Wilson	140,625	33,332	22,065	3,246	10,622	11,749	102	13,362	49,002	10,888	21,561
Totals	**4,303,997**	**971,374**	**663,166**	**94,604**	**325,922**	**351,123**	**3,116**	**396,045**	**1,507,103**	**622,320**	**1,407,889**

TENNESSEE

American Lung Association in Tennessee

HIGH OZONE DAYS 2016–2018

County	Orange	Red	Purple	Wgt. Avg.	Grade
Anderson	0	0	0	0.0	A
Blount	5	0	0	1.7	C
Claiborne	1	0	0	0.3	B
Davidson	8	1	0	3.2	D
DeKalb	0	0	0	0.0	A
Dyer	DNC	DNC	DNC	DNC	DNC
Hamilton	5	0	0	1.7	C
Jefferson	3	0	0	1.0	C
Knox	3	0	0	1.0	C
Lawrence	DNC	DNC	DNC	DNC	DNC
Loudon	8	0	0	2.7	D
McMinn	DNC	DNC	DNC	DNC	DNC
Madison	DNC	DNC	DNC	DNC	DNC
Maury	DNC	DNC	DNC	DNC	DNC
Montgomery	DNC	DNC	DNC	DNC	DNC
Putnam	DNC	DNC	DNC	DNC	DNC
Roane	DNC	DNC	DNC	DNC	DNC
Sevier	6	0	0	2.0	C
Shelby	17	1	0	6.2	F
Sullivan	3	0	0	1.0	C
Sumner	2	0	0	0.7	B
Williamson	2	0	0	0.7	B
Wilson	2	0	0	0.7	B

HIGH PARTICLE POLLUTION DAYS 2016–2018

	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Anderson	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Blount	1	2	0	0	1.3	C	7.8	PASS
Claiborne	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Davidson	2	0	0	0	0.7	B	8.4	PASS
DeKalb	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Dyer	0	0	0	0	0.0	A	6.9	PASS
Hamilton	0	1	0	0	0.5	B	8.3	PASS
Jefferson	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Knox	2	3	0	0	2.2	D	9.3	PASS
Lawrence	0	0	0	0	0.0	A	6.6	PASS
Loudon	0	2	0	0	1.0	C	7.4	PASS
McMinn	0	1	0	0	0.5	B	8.1	PASS
Madison	0	0	0	0	0.0	A	6.7	PASS
Maury	0	0	0	0	0.0	A	6.9	PASS
Montgomery	0	0	0	0	0.0	A	7.9	PASS
Putnam	0	0	0	0	0.0	A	7.2	PASS
Roane	0	1	0	0	0.5	B	7.6	PASS
Sevier	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Shelby	0	0	0	0	0.0	A	8.4	PASS
Sullivan	1	0	0	0	0.3	B	7.3	PASS
Sumner	0	0	0	0	0.0	A	7.4	PASS
Williamson	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Wilson	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC

TEXAS

American Lung Association in Texas

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Bell	355,642	98,517	38,585	7,796	19,075	14,784	176	21,459	90,216	44,865	196,139
Bexar	1,986,049	507,669	240,621	40,173	110,192	88,909	983	129,620	525,960	334,215	1,442,742
Bowie	94,324	22,392	15,605	1,772	5,410	4,910	47	7,256	26,496	16,794	34,759
Brazoria	370,200	97,945	43,678	7,751	20,416	16,784	184	24,485	98,047	36,342	199,319
Brewster	9,267	1,744	2,144	138	568	574	5	859	2,847	1,475	4,601
Cameron	423,908	128,553	57,415	10,173	22,072	18,937	209	27,830	106,653	117,193	386,787
Collin	1,005,146	260,476	110,655	20,612	55,957	45,454	497	66,141	268,418	64,180	442,771
Dallas	2,637,772	689,692	283,154	54,576	145,314	114,140	1,305	165,674	690,633	368,310	1,882,256
Denton	859,064	211,996	87,414	16,776	48,448	37,934	425	54,957	230,539	62,151	357,924
Ector	162,124	48,856	15,760	3,866	8,401	6,381	81	9,232	39,595	20,485	110,649
Ellis	179,436	47,950	22,981	3,794	9,893	8,426	89	12,341	47,889	15,609	71,985
El Paso	840,758	228,000	103,092	18,042	45,680	37,224	416	54,345	218,435	169,120	742,873
Galveston	337,890	81,893	48,605	6,480	19,293	16,919	167	24,872	93,965	40,109	145,198
Gregg	123,707	31,951	19,016	2,528	6,889	6,126	61	9,034	33,583	18,108	53,082
Harris	4,698,619	1,251,684	494,264	99,047	257,086	201,143	2,328	291,795	1,220,954	767,367	3,331,840
Harrison	66,726	16,865	11,277	1,335	3,765	3,506	33	5,194	18,563	9,584	24,559
Hidalgo	865,939	281,965	96,025	22,312	43,404	34,745	428	50,647	206,610	256,985	813,576
Hood	60,537	12,905	14,870	1,021	3,624	3,874	30	5,825	18,450	6,108	9,997
Hunt	96,493	23,183	15,282	1,835	5,529	5,001	48	7,381	27,097	12,715	28,005
Jefferson	255,001	61,181	36,809	4,841	14,538	12,545	127	18,429	70,443	44,682	153,437
Johnson	171,361	44,541	24,219	3,525	9,548	8,358	85	12,288	46,465	17,965	49,428
Kaufman	128,622	35,656	15,367	2,822	6,979	5,805	64	8,480	33,601	14,539	48,638
Kleberg	31,129	7,540	4,029	597	1,739	1,363	16	1,986	8,213	7,369	24,948
Lubbock	307,412	73,288	38,200	5,799	17,342	13,670	152	19,906	82,197	52,037	144,425
McLennan	254,607	62,861	36,615	4,974	14,300	12,114	126	17,783	68,872	46,457	112,971
Maverick	58,485	18,246	6,916	1,444	2,996	2,445	29	3,571	14,321	14,859	56,911
Montgomery	590,925	155,734	77,263	12,323	32,775	28,127	293	41,232	158,939	54,400	206,109
Navarro	49,565	13,139	8,429	1,040	2,751	2,582	25	3,829	13,586	9,739	22,112
Nueces	362,265	88,977	52,215	7,041	20,476	17,631	179	25,902	99,120	57,694	257,166
Orange	83,572	20,764	13,466	1,643	4,739	4,328	41	6,396	23,270	11,101	16,403
Parker	138,371	34,364	21,302	2,719	7,876	7,176	69	10,589	38,720	11,289	23,629
Polk	50,031	10,088	9,422	798	3,035	2,924	25	4,342	15,111	6,834	14,622
Potter	119,648	32,848	14,922	2,599	6,489	5,377	60	7,862	31,166	22,262	67,678
Randall	136,271	32,501	20,536	2,572	7,765	6,729	67	9,898	37,611	11,343	39,839
Rockwall	100,657	27,150	12,594	2,148	5,543	4,733	50	6,930	26,873	5,125	29,939
Smith	230,221	56,582	38,010	4,477	13,044	11,827	114	17,486	63,841	33,744	93,682
Tarrant	2,084,931	549,063	235,187	43,448	114,981	92,803	1,030	135,089	549,979	248,032	1,127,499
Travis	1,248,743	270,726	123,395	21,423	72,560	53,877	621	77,667	340,744	146,724	638,924
Victoria	92,035	23,330	14,822	1,846	5,156	4,636	45	6,849	25,181	13,855	51,251
Webb	275,910	90,830	26,087	7,187	13,761	10,588	136	15,337	65,071	69,860	266,071
Totals	**21,943,363**	**5,753,645**	**2,550,248**	**455,293**	**1,209,410**	**975,407**	**10,864**	**1,420,798**	**5,778,268**	**3,261,625**	**13,724,744**

TEXAS

American Lung Association in Texas

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Bell	10	0	0	3.3	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Bexar	19	1	0	6.8	F	1	0	0	0	0.3	B	8.1	PASS
Bowie	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	INC	INC
Brazoria	13	2	0	5.3	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Brewster	0	0	0	0.0	A	INC	INC	INC	INC	INC	INC	INC	INC
Cameron	0	0	0	0.0	A	1	0	0	0	0.3	B	9.9	PASS
Collin	27	0	0	9.0	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Dallas	23	1	0	8.2	F	3	2	0	0	2.0	C	8.9	PASS
Denton	33	1	0	11.5	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Ector	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Ellis	8	0	0	2.7	D	1	0	0	0	0.3	B	8.4	PASS
El Paso	28	2	0	10.3	F	1	0	0	0	0.3	B	9.1	PASS
Galveston	20	0	1	7.3	F	1	0	0	0	0.3	B	6.6	PASS
Gregg	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Harris	50	10	1	22.3	F	3	0	0	0	1.0	C	10.2	PASS
Harrison	0	0	0	0.0	A	1	0	0	0	0.3	B	8.5	PASS
Hidalgo	0	0	0	0.0	A	4	0	0	0	1.3	C	10.7	PASS
Hood	9	0	0	3.0	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Hunt	3	1	0	1.5	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Jefferson	12	1	0	4.5	F	INC	INC	INC	INC	INC	INC	INC	INC
Johnson	19	1	0	6.8	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Kaufman	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Kleberg	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Lubbock	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
McLennan	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Maverick	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Montgomery	21	1	0	7.5	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Navarro	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Nueces	0	0	0	0.0	A	0	0	0	0	0.0	A	9.1	PASS
Orange	7	0	0	2.3	D	INC	INC	INC	INC	INC	INC	INC	INC
Parker	6	2	0	3.0	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Polk	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Potter	DNC	DNC	DNC	DNC	DNC	INC	INC	INC	INC	INC	INC	INC	INC
Randall	11	0	0	3.7	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Rockwall	6	0	0	2.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Smith	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Tarrant	34	4	0	13.3	F	0	0	0	0	0.0	A	8.6	PASS
Travis	10	0	0	3.3	F	4	0	0	0	1.3	C	9.8	PASS
Victoria	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Webb	0	0	0	0.0	A	INC	INC	INC	INC	INC	INC	INC	INC

UTAH

American Lung Association in Utah

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Box Elder	54,950	17,430	7,109	957	3,530	1,692	14	2,478	9,591	3,986	7,168
Cache	127,068	38,511	12,009	2,113	8,181	3,394	32	4,570	21,648	15,830	21,173
Carbon	20,269	5,227	3,530	287	1,424	731	5	1,119	3,912	2,853	3,437
Davis	351,713	112,970	35,317	6,200	22,328	9,983	90	13,898	60,011	19,798	58,000
Duchesne	19,964	6,720	2,408	369	1,244	587	5	852	3,370	2,335	3,002
Garfield	5,080	1,183	1,175	65	372	208	1	335	1,036	551	604
Iron	52,775	15,317	6,700	841	3,498	1,606	13	2,310	9,418	7,444	7,456
Salt Lake	1,152,633	312,889	125,157	17,171	78,549	35,187	294	49,059	211,172	102,660	338,240
San Juan	15,449	4,719	2,187	259	1,014	502	4	747	2,772	3,419	8,706
Tooele	69,907	22,807	6,403	1,252	4,409	1,955	18	2,687	11,849	4,744	11,984
Uintah	35,438	11,754	3,855	645	2,219	1,016	9	1,442	5,985	4,031	6,636
Utah	622,213	207,710	48,050	11,399	38,230	15,362	159	20,064	100,766	57,136	111,686
Washington	171,700	44,808	36,844	2,459	12,001	6,463	44	10,322	33,138	16,435	27,119
Weber	256,359	72,484	29,897	3,978	17,237	7,912	65	11,229	46,518	23,839	62,335
Totals	**2,955,518**	**874,529**	**320,641**	**47,993**	**194,234**	**86,599**	**753**	**121,112**	**521,185**	**265,061**	**667,546**

UTAH

American Lung Association in Utah

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Box Elder	7	1	0	2.8	D	16	1	0	0	5.8	F	7.7	PASS
Cache	2	0	0	0.7	B	26	4	0	0	10.7	F	7.6	PASS
Carbon	5	0	0	1.7	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Davis	39	1	0	13.5	F	15	0	0	0	5.0	F	8.3	PASS
Duchesne	19	6	0	9.3	F	4	0	0	0	1.3	C	6.3	PASS
Garfield	INC	INC	INC	INC	INC	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Iron	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC	INC
Salt Lake	74	2	0	25.7	F	27	5	0	0	11.5	F	8.8	PASS
San Juan	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Tooele	27	1	0	9.5	F	7	0	0	0	2.3	D	7.0	PASS
Uintah	11	11	4	11.8	F	0	0	0	0	0.0	A	INC	INC
Utah	35	2	0	12.7	F	22	10	0	0	12.3	F	8.3	PASS
Washington	2	0	0	0.7	B	0	0	0	0	0.0	A	5.2	PASS
Weber	40	1	0	13.8	F	18	3	0	0	7.5	F	8.3	PASS

VERMONT

American Lung Association in Vermont

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Bennington	35,631	6,756	8,162	594	3,459	1,970	22	2,515	13,048	3,905	2,237
Chittenden	164,572	29,165	24,673	2,565	16,693	7,144	100	8,950	58,135	16,039	19,535
Rutland	58,672	10,438	12,955	918	5,799	3,220	36	4,097	21,696	5,842	2,844
Totals	**258,875**	**46,359**	**45,790**	**4,078**	**25,951**	**12,335**	**157**	**15,562**	**92,878**	**25,786**	**24,616**

VERMONT

American Lung Association in Vermont

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Bennington	3	0	0	1.0	C	0	0	0	0	0.0	A	5.4	PASS
Chittenden	0	0	0	0.0	A	0	0	0	0	0.0	A	5.7	PASS
Rutland	0	0	0	0.0	A	0	0	0	0	0.0	A	6.9	PASS

VIRGINIA

American Lung Association in Virginia

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Albemarle	108,718	21,528	20,248	1,541	7,402	5,761	62	7,598	33,294	8,912	25,438
Arlington	237,521	42,959	25,209	3,075	16,811	10,477	137	12,482	70,137	14,842	92,122
Caroline	30,772	7,079	5,050	507	2,023	1,573	18	2,046	9,070	2,930	11,221
Charles City	6,941	1,052	1,708	75	497	450	4	617	2,358	851	3,976
Chesterfield	348,556	82,795	52,028	5,926	22,775	17,231	200	22,099	101,027	26,093	135,536
Fairfax	1,150,795	269,162	154,840	19,264	75,830	55,228	663	69,580	331,792	69,377	572,332
Fauquier	70,675	16,513	11,620	1,182	4,632	3,700	41	4,821	20,927	4,260	14,578
Frederick	88,355	20,386	15,264	1,459	5,793	4,610	51	6,050	26,189	6,107	15,357
Giles	16,844	3,486	3,681	249	1,127	971	10	1,320	5,258	2,064	916
Hanover	107,239	23,572	19,032	1,687	7,135	5,786	62	7,612	32,443	5,509	17,456
Henrico	329,261	74,272	51,045	5,316	21,816	16,448	188	21,162	96,753	29,502	155,803
Loudoun	406,850	115,028	37,802	8,232	25,338	17,141	234	20,642	107,899	14,700	181,773
Madison	13,295	2,706	2,959	194	894	783	8	1,067	4,192	1,330	2,060
Prince Edward	22,950	3,767	3,779	270	1,635	1,148	13	1,467	7,110	3,782	8,956
Prince William	468,011	127,210	46,319	9,104	29,535	19,997	270	24,216	125,932	29,545	271,371
Roanoke	94,073	18,648	20,151	1,335	6,372	5,386	54	7,282	29,518	6,145	13,644
Rockbridge	22,752	3,985	5,909	285	1,571	1,431	13	1,991	7,502	2,670	1,850
Rockingham	81,244	17,785	15,472	1,273	5,384	4,367	47	5,811	24,549	6,909	9,513
Stafford	149,960	39,088	15,674	2,798	9,603	6,614	87	8,062	41,164	7,822	59,400
Wythe	28,754	5,672	6,213	406	1,951	1,677	17	2,270	9,087	4,391	1,841
Bristol City	16,482	3,323	3,476	238	1,111	927	9	1,250	5,126	3,324	2,002
Hampton City	134,313	28,086	20,745	2,010	9,084	6,645	77	8,504	39,923	19,954	83,471
Lynchburg City	82,126	15,946	11,823	1,141	5,651	3,731	47	4,677	24,116	14,789	30,887
Norfolk City	244,076	47,785	27,334	3,420	16,914	10,590	142	12,740	70,764	41,471	138,496
Richmond City	228,783	40,064	30,172	2,867	16,219	10,813	131	13,347	69,163	48,424	133,599
Salem City	25,643	5,115	4,836	366	1,743	1,382	15	1,828	7,886	2,280	3,845
Suffolk City	91,185	22,132	13,164	1,584	5,924	4,454	52	5,689	26,212	9,846	46,396
Virginia Beach City	450,189	99,573	64,004	7,126	30,059	21,541	259	27,256	131,107	33,084	174,180
Totals	**5,056,363**	**1,158,717**	**689,557**	**82,929**	**334,827**	**240,861**	**2,908**	**303,486**	**1,460,496**	**420,913**	**2,208,019**

VIRGINIA

American Lung Association in Virginia

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Albemarle	1	0	0	0.3	B	0	0	0	0	0.0	A	6.5	PASS
Arlington	12	0	0	4.0	F	1	0	0	0	0.3	B	7.5	PASS
Caroline	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Charles City	2	0	0	0.7	B	0	0	0	0	0.0	A	6.6	PASS
Chesterfield	1	0	0	0.3	B	0	0	0	0	0.0	A	INC	INC
Fairfax	7	0	0	2.3	D	1	0	0	0	0.3	B	6.8	PASS
Fauquier	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Frederick	0	0	0	0.0	A	0	0	0	0	0.0	A	7.4	PASS
Giles	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Hanover	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Henrico	4	1	0	1.8	C	0	0	0	0	0.0	A	7.1	PASS
Loudoun	1	0	0	0.3	B	0	0	0	0	0.0	A	7.1	PASS
Madison	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Prince Edward	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Prince William	3	0	0	1.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Roanoke	0	0	0	0.0	A	0	0	0	0	0.0	A	6.7	PASS
Rockbridge	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Rockingham	1	0	0	0.3	B	0	0	0	0	0.0	A	7.0	PASS
Stafford	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Wythe	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Bristol City	DNC	DNC	DNC	DNC	DNC	1	0	0	0	0.3	B	7.3	PASS
Hampton City	2	0	0	0.7	B	0	0	0	0	0.0	A	6.2	PASS
Lynchburg City	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	6.5	PASS
Norfolk City	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	6.7	PASS
Richmond City	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	INC	INC
Salem City	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.2	PASS
Suffolk City	2	0	0	0.7	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Virginia Beach City	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	6.7	PASS

WASHINGTON

American Lung Association in Washington

		AT-RISK GROUPS									
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Benton	201,877	54,000	30,097	3,947	14,191	7,540	109	11,647	56,098	19,597	61,006
Chelan	77,036	18,022	14,696	1,317	5,705	3,281	41	5,208	22,956	8,283	25,025
Clallam	76,737	13,055	22,720	954	6,220	4,140	41	6,931	25,971	9,968	13,411
Clark	481,857	115,356	74,530	8,432	35,315	19,006	259	29,262	139,895	41,980	106,021
King	2,233,163	452,859	295,110	33,103	169,665	83,663	1,202	125,808	660,298	202,628	918,713
Kitsap	269,805	55,252	48,094	4,039	20,627	11,319	145	17,733	82,143	23,613	64,009
Kittitas	47,364	8,096	7,592	592	3,720	1,867	25	2,890	14,557	7,049	7,694
Okanogan	42,132	9,769	9,094	714	3,150	1,916	23	3,087	12,841	7,049	14,878
Pierce	891,299	209,270	123,135	15,297	65,285	33,364	479	50,668	255,881	76,391	300,347
Skagit	128,206	27,977	26,591	2,045	9,695	5,695	69	9,131	39,219	12,239	33,368
Snohomish	814,901	184,547	109,768	13,490	60,643	31,252	439	47,028	237,856	60,590	253,858
Spokane	514,631	114,051	83,279	8,337	38,439	20,536	277	31,830	152,153	65,365	80,882
Stevens	45,260	9,761	10,542	714	3,486	2,207	24	3,565	14,335	6,045	6,148
Thurston	286,419	61,378	49,514	4,487	21,625	11,787	154	18,417	85,986	24,459	72,841
Whatcom	225,685	43,910	39,158	3,210	17,350	9,201	121	14,405	68,644	32,753	48,048
Yakima	251,446	74,480	34,524	5,444	16,911	8,764	135	13,490	66,527	40,961	144,155
Totals	**6,587,818**	**1,451,783**	**978,444**	**106,123**	**492,026**	**255,539**	**3,544**	**391,100**	**1,935,360**	**638,970**	**2,150,404**

WASHINGTON

American Lung Association in Washington

	HIGH OZONE DAYS 2016–2018				
County	Orange	Red	Purple	Wgt. Avg.	Grade
Benton	16	0	0	5.3	F
Chelan	DNC	DNC	DNC	DNC	DNC
Clallam	0	0	0	0.0	A
Clark	4	0	0	1.3	C
King	12	6	0	7.0	F
Kitsap	DNC	DNC	DNC	DNC	DNC
Kittitas	DNC	DNC	DNC	DNC	DNC
Okanogan	DNC	DNC	DNC	DNC	DNC
Pierce	4	0	0	1.3	C
Skagit	0	0	0	0.0	A
Snohomish	DNC	DNC	DNC	DNC	DNC
Spokane	5	0	0	1.7	C
Stevens	DNC	DNC	DNC	DNC	DNC
Thurston	2	1	0	1.2	C
Whatcom	2	0	0	0.7	B
Yakima	DNC	DNC	DNC	DNC	DNC

	HIGH PARTICLE POLLUTION DAYS 2016–2018							
	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Benton	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Chelan	INC	INC	INC	INC	INC	INC	INC	INC
Clallam	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Clark	9	3	0	0	4.5	F	7.5	PASS
King	11	7	0	0	7.2	F	8.4	PASS
Kitsap	6	3	0	0	3.5	F	4.6	PASS
Kittitas	17	6	2	0	10.0	F	8.1	PASS
Okanogan	7	22	1	1	14.8	F	INC	INC
Pierce	9	9	0	0	7.5	F	7.7	PASS
Skagit	3	3	0	0	2.5	D	5.8	PASS
Snohomish	21	7	0	0	10.5	F	7.4	PASS
Spokane	13	7	4	0	10.5	F	9.6	PASS
Stevens	INC	INC	INC	INC	INC	INC	INC	INC
Thurston	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Whatcom	6	3	0	0	3.5	F	5.1	PASS
Yakima	25	15	3	0	17.8	F	9.8	PASS

WEST VIRGINIA

American Lung Association in West Virginia

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Berkeley	117,123	27,230	17,175	2,564	11,106	13,146	90	12,598	44,556	13,275	18,798
Brooke	22,203	3,930	5,290	370	2,254	2,944	17	3,065	9,087	2,930	960
Cabell	93,224	18,395	17,542	1,732	9,088	10,935	71	10,978	36,949	17,242	9,240
Gilmer	8,026	1,150	1,405	108	832	963	6	942	3,388	1,521	1,521
Greenbrier	34,786	6,747	8,099	635	3,462	4,526	27	4,707	13,947	5,389	2,629
Hancock	29,094	5,507	6,722	518	2,928	3,844	22	3,977	11,751	3,788	1,887
Harrison	67,554	14,434	13,140	1,359	6,564	8,245	52	8,303	26,388	11,089	3,999
Kanawha	180,454	36,012	37,272	3,390	17,804	22,511	138	22,891	71,723	30,248	22,283
Marion	56,097	11,260	10,963	1,060	5,486	6,757	43	6,819	22,200	9,084	3,920
Marshall	30,785	5,950	6,886	560	3,077	3,999	24	4,117	12,362	4,200	1,036
Monongalia	106,420	17,326	13,448	1,631	10,630	11,212	82	10,415	43,605	18,156	12,690
Ohio	41,755	7,937	9,105	747	4,149	5,265	32	5,413	16,774	4,953	3,266
Tucker	6,955	1,077	1,821	101	729	978	5	1,030	2,930	907	192
Wood	84,203	17,621	17,209	1,659	8,236	10,477	64	10,640	33,099	12,449	4,141
Totals	**878,679**	**174,576**	**166,077**	**16,436**	**86,344**	**105,803**	**672**	**105,894**	**348,757**	**135,231**	**86,562**

WEST VIRGINIA

American Lung Association in West Virginia

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Berkeley	1	0	0	0.3	B	0	0	0	0	0.0	A	8.4	PASS
Brooke	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	8.9	PASS
Cabell	3	0	0	1.0	C	0	0	0	0	0.0	A	7.9	PASS
Gilmer	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Greenbrier	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Hancock	1	0	0	0.3	B	0	0	0	0	0.0	A	8.1	PASS
Harrison	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.4	PASS
Kanawha	4	0	0	1.3	C	0	0	0	0	0.0	A	8.0	PASS
Marion	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	INC	INC
Marshall	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	9.1	PASS
Monongalia	0	0	0	0.0	A	0	0	0	0	0.0	A	7.2	PASS
Ohio	4	0	0	1.3	C	0	0	0	0	0.0	A	7.9	PASS
Tucker	1	0	0	0.3	B	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Wood	1	0	0	0.3	B	0	0	0	0	0.0	A	7.9	PASS

WISCONSIN

American Lung Association in Wisconsin

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Ashland	15,600	3,409	3,055	288	1,106	688	9	1,008	5,289	2,356	2,770
Brown	263,378	62,704	39,133	5,291	18,474	10,344	155	14,360	85,354	21,944	50,989
Columbia	57,358	12,182	10,250	1,028	4,125	2,509	34	3,570	19,536	4,255	4,325
Dane	542,364	110,624	74,433	9,334	39,978	20,486	320	28,078	180,405	57,062	112,124
Dodge	87,847	17,436	15,497	1,471	6,440	3,857	52	5,459	30,355	7,283	9,064
Door	27,610	4,489	8,215	379	2,040	1,508	16	2,383	10,381	2,289	1,729
Eau Claire	104,534	21,327	16,374	1,800	7,656	4,078	62	5,768	34,984	12,906	10,793
Fond du Lac	103,066	22,030	19,083	1,859	7,382	4,488	61	6,473	35,010	9,513	11,054
Forest	8,991	1,751	2,064	148	651	435	5	652	3,186	1,294	1,912
Grant	51,554	10,762	8,895	908	3,733	2,096	31	3,020	17,323	6,595	2,645
Jefferson	85,129	17,958	14,436	1,515	6,152	3,632	50	5,123	28,874	6,701	8,972
Kenosha	169,290	38,674	23,925	3,263	12,062	6,735	100	9,173	55,586	19,819	41,338
Kewaunee	20,383	4,385	4,168	370	1,448	930	12	1,366	6,989	1,472	1,176
La Crosse	118,230	23,386	19,399	1,973	8,710	4,767	70	6,773	40,093	12,334	12,189
Manitowoc	79,074	16,260	16,193	1,372	5,689	3,654	47	5,346	27,450	8,124	7,699
Marathon	135,428	30,846	23,980	2,603	9,542	5,763	80	8,252	45,138	10,027	15,552
Milwaukee	948,201	227,422	129,003	19,190	66,630	35,206	558	48,385	303,032	177,263	464,911
Outagamie	187,365	44,129	27,589	3,724	13,195	7,426	111	10,252	61,012	13,196	23,793
Ozaukee	89,147	18,995	17,603	1,603	6,365	4,025	53	5,862	30,559	3,674	7,944
Racine	196,584	45,351	32,460	3,827	13,852	8,200	116	11,550	65,051	24,084	55,689
Rock	163,129	37,701	27,022	3,181	11,486	6,747	96	9,539	53,847	17,477	28,620
Sauk	64,249	14,644	11,900	1,236	4,514	2,766	38	4,005	21,463	5,416	5,915
Sheboygan	115,456	25,431	20,789	2,146	8,211	4,980	68	7,138	38,889	8,432	18,681
Taylor	20,412	4,776	3,905	403	1,419	905	12	1,312	6,826	2,072	929
Vilas	21,938	3,711	6,758	313	1,602	1,230	13	1,949	8,256	2,359	3,337
Walworth	103,718	21,406	18,334	1,806	7,523	4,444	61	6,344	35,358	10,114	15,220
Waukesha	403,072	86,695	75,190	7,315	28,805	17,877	238	25,691	137,354	19,937	47,618
Totals	**4,183,107**	**928,484**	**669,653**	**78,344**	**298,787**	**169,775**	**2,467**	**238,831**	**1,387,600**	**467,998**	**966,988**

WISCONSIN

American Lung Association in Wisconsin

	HIGH OZONE DAYS 2016–2018					HIGH PARTICLE POLLUTION DAYS 2016–2018							
						24-Hour						Annual	
County	Orange	Red	Purple	Wgt. Avg.	Grade	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Ashland	0	0	0	0.0	A	0	0	0	0	0.0	A	4.2	PASS
Brown	4	0	0	1.3	C	0	0	0	0	0.0	A	6.4	PASS
Columbia	4	0	0	1.3	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Dane	1	0	0	0.3	B	1	0	0	0	0.3	B	8.1	PASS
Dodge	5	0	0	1.7	C	2	0	0	0	0.7	B	6.8	PASS
Door	15	0	0	5.0	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Eau Claire	1	0	0	0.3	B	0	0	0	0	0.0	A	6.8	PASS
Fond du Lac	4	0	0	1.3	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Forest	0	0	0	0.0	A	0	0	0	0	0.0	A	4.2	PASS
Grant	DNC	DNC	DNC	DNC	DNC	0	0	0	0	0.0	A	7.3	PASS
Jefferson	6	0	0	2.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Kenosha	34	5	0	13.8	F	0	0	0	0	0.0	A	7.1	PASS
Kewaunee	11	1	0	4.2	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
La Crosse	0	0	0	0.0	A	0	0	0	0	0.0	A	6.8	PASS
Manitowoc	16	2	0	6.3	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Marathon	0	0	0	0.0	A	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Milwaukee	15	2	0	6.0	F	0	0	0	0	0.0	A	8.0	PASS
Outagamie	3	0	0	1.0	C	0	0	0	0	0.0	A	6.3	PASS
Ozaukee	21	3	0	8.5	F	0	0	0	0	0.0	A	6.3	PASS
Racine	28	3	0	10.8	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Rock	6	0	0	2.0	C	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Sauk	2	0	0	0.7	B	0	0	0	0	0.0	A	6.5	PASS
Sheboygan	32	4	0	12.7	F	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Taylor	0	0	0	0.0	A	0	0	0	0	0.0	A	5.5	PASS
Vilas	0	0	0	0.0	A	0	0	0	0	0.0	A	4.5	PASS
Walworth	7	0	0	2.3	D	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Waukesha	3	0	0	1.0	C	0	0	0	0	0.0	A	8.3	PASS

WYOMING

American Lung Association in Wyoming

				AT-RISK GROUPS							
				Lung Diseases							
County	Total Population	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	COPD	Lung Cancer	Heart Disease	Ever Smoked	Poverty	People of Color
Albany	38,601	6,287	4,530	540	2,795	1,629	17	2,041	14,217	7,451	6,920
Big Horn	11,881	3,003	2,495	258	773	650	5	843	4,060	1,519	1,463
Campbell	46,140	12,611	4,642	1,083	2,912	1,944	21	2,333	14,942	4,200	5,814
Carbon	14,971	3,419	2,563	294	1,005	766	7	969	5,222	1,894	3,412
Converse	13,640	3,354	2,267	288	895	699	6	876	4,662	1,287	1,571
Fremont	39,531	10,104	7,222	868	2,561	2,041	18	2,605	13,369	6,070	12,039
Goshen	13,376	2,685	2,934	231	931	769	6	997	4,878	1,567	1,952
Johnson	8,460	1,854	2,004	159	576	506	4	659	3,038	859	737
Laramie	98,976	23,032	15,864	1,979	6,600	4,891	45	6,161	34,216	8,839	21,278
Natrona	79,115	19,040	12,180	1,636	5,222	3,850	36	4,826	27,052	7,677	10,602
Park	29,324	6,039	6,805	519	2,028	1,733	13	2,256	10,669	2,921	2,664
Sheridan	30,233	6,462	6,347	555	2,069	1,704	14	2,196	10,842	2,551	2,575
Sublette	9,813	2,209	1,911	190	662	540	4	688	3,464	658	1,077
Sweetwater	43,051	11,290	5,214	970	2,759	1,909	19	2,338	14,206	3,540	8,906
Teton	23,081	4,239	3,558	364	1,637	1,177	10	1,464	8,461	1,443	4,269
Uinta	20,299	5,844	2,858	502	1,257	933	9	1,161	6,514	2,010	2,558
Weston	6,967	1,447	1,429	124	481	401	3	511	2,522	777	700
Totals	**527,459**	**122,919**	**84,823**	**10,561**	**35,162**	**26,143**	**238**	**32,923**	**182,333**	**55,263**	**88,537**

WYOMING

American Lung Association in Wyoming

	HIGH OZONE DAYS 2016–2018				
County	Orange	Red	Purple	Wgt. Avg.	Grade
Albany	4	0	0	1.3	C
Big Horn	0	0	0	0.0	A
Campbell	2	0	0	0.7	B
Carbon	0	0	0	0.0	A
Converse	0	0	0	0.0	A
Fremont	0	0	0	0.0	A
Goshen	INC	INC	INC	INC	INC
Johnson	INC	INC	INC	INC	INC
Laramie	1	0	0	0.3	B
Natrona	0	0	0	0.0	A
Park	INC	INC	INC	INC	INC
Sheridan	INC	INC	INC	INC	INC
Sublette	7	0	0	2.3	D
Sweetwater	2	0	0	0.7	B
Teton	0	0	0	0.0	A
Uinta	1	0	0	0.3	B
Weston	1	0	0	0.3	B

	HIGH PARTICLE POLLUTION DAYS 2016–2018							
	24-Hour						Annual	
County	Orange	Red	Purple	Maroon	Wgt. Avg.	Grade	Design Value	Pass/ Fail
Albany	0	1	0	0	0.5	B	4.6	PASS
Big Horn	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Campbell	3	3	0	0	2.5	D	4.5	PASS
Carbon	INC	INC	INC	INC	INC	INC	INC	INC
Converse	1	0	0	0	0.3	B	INC	INC
Fremont	2	0	0	0	0.7	B	7.2	PASS
Goshen	INC	INC	INC	INC	INC	INC	INC	INC
Johnson	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Laramie	1	2	0	0	1.3	C	4.4	PASS
Natrona	2	0	0	0	0.7	B	5.0	PASS
Park	2	0	0	0	0.7	B	4.3	PASS
Sheridan	4	1	0	0	1.8	C	7.2	PASS
Sublette	2	0	0	0	0.7	B	5.3	PASS
Sweetwater	0	0	0	0	0.0	A	5.3	PASS
Teton	2	0	0	0	0.7	B	4.8	PASS
Uinta	DNC	DNC	DNC	DNC	DNC	DNC	DNC	DNC
Weston	INC	INC	INC	INC	INC	INC	INC	INC

About the American Lung Association

The American Lung Association is the leading organization working to save lives by improving lung health and preventing lung disease through education, advocacy and research. The work of the American Lung Association is focused on four strategic imperatives: to defeat lung cancer; to champion clean air for all; to improve the quality of life for those with lung disease and their families; and to create a tobacco-free future. For more information about the American Lung Association, a holder of the coveted 4-star rating from Charity Navigator and a Gold-Level GuideStar Member, or to support the work it does, call 1-800-LUNGUSA (1-800-586-4872) or visit: Lung.org.

American Lung Association®