



**Healthy air is essential to life. Unfortunately, polluted indoor and outdoor air places millions of Americans at risk, threatening not only health, but lives. Various airborne pollutants may aggravate existing lung disease; contribute to the development of lung cancer; contribute to chronic cardiovascular problems, potentially causing heart attacks and strokes; and play a role in central nervous system and developmental problems, including low birth weight. These adverse health effects worsen health inequities, posing a disproportionate risk to low-income populations in areas where transportation systems, zoning laws, and industrial policies increase exposure burdens. According to the American Lung Association’s 2016 *State of the Air* report, more than half of all US residents—over 166 million people—live in areas with unhealthy air.<sup>1</sup>**

## *The Problem*

Ground-level ozone, often referred to as smog, is perhaps the form of air pollution most familiar to Americans. Ozone, generally, is also the single most widespread air pollutant in the United States, created by chemical reactions between nitrogen oxides and volatile organic compounds in the presence of sunlight. A second major air pollutant—and the most dangerous—is particulate matter, also known as particle pollution. Particle pollution is associated with heart attacks, strokes, and various forms of lung cancer.

Both ozone and particle pollution trigger asthma attacks and shorten lives. Approximately 7 million US children from birth to age 17 have asthma, with poor and minority children suffering a greater burden of the disease.<sup>2</sup> Asthma often persists into adulthood and imposes a high societal cost: medical expenses associated with childhood and adult asthma were estimated to be \$50 billion in 2007.<sup>3</sup>

Other concerning outdoor pollutants include nitrogen oxides, sulfur dioxide, lead, and carbon monoxide. In addition, more than 180 other air pollutants, including acid gases, arsenic, dioxins, formaldehyde, and mercury, are emitted from sources across the county. Some of these, such as dioxins and formaldehyde, are recognized carcinogens. Others, like carbon dioxide and methane, are powerful climate change agents.

As is the case with so many pollutants, where one lives matters. Air pollution differs not only among communities, but also within communities. Living near a major source of pollution, such as an oil or gas refinery, a busy highway, or a power plant may impact life expectancy and susceptibility to chronic illnesses, like cardiovascular disease.

The Clean Air Act has helped drive the cleanup of air pollution; since 1970 emissions of many priority pollutants have been cut by 70 percent.<sup>4</sup> This success is due, in large part, to the development of national limits called National Ambient Air Quality Standards mandated by the Clean Air Act. These standards set limits on the concentration of six airborne pollutants considered harmful to health and the environment: carbon monoxide, lead, nitrogen dioxide, ozone, particle pollution, and sulfur dioxide. Another key tool has been the design of limits on emissions from sources of other toxic air pollutants. EPA has worked with state, local, and tribal governments to implement all of these standards and has now begun a similar effort to tackle climate change. The agency's Clean Power Plan, for example, sets interim and final emission rates for carbon pollution from power plants. Although the rule is currently under judicial review, some jurisdictions are continuing work to meet these carbon emission standards.

### *Indoor Air*

Americans spend much of their time indoors, often in buildings where they work, study, receive child care, shop, recreate, or dine. Although many industrial and occupational exposures are limited by law, not all harmful exposures are restricted, or even reviewed in many indoor areas. For example, not all restaurants and bars are smoke free, so wait staff, cooks, and cleaning crews are potentially exposed for hours at a time to the long lists of toxicants in tobacco smoke. Radon or mold in school classrooms and child care facilities can threaten the health of teachers, administrators, and maintenance staff, as well as students including young children. Americans need protection from recognized indoor air pollutants in all the places where they spend time.

### *Cleaner Air Improves Life Expectancy and Health*

Cleaner air means longer lives and better health. Research shows that life expectancy is greater in areas where air pollution levels, and especially levels of particle pollution, are lower.<sup>5,6</sup> One study, for example, found that children raised in California between 2007 and 2011, after air pollution levels had fallen in the state, had better lung function than two earlier cohorts of California children. This, in turn, reduced their risk of lifelong breathing difficulty.<sup>7</sup>

### *Vulnerable People and Places*

Advanced age and pre-existing conditions, such as asthma, cardiovascular disease, or diabetes, place people at increased risk for the adverse impacts associated with air pollution exposure.<sup>8</sup> Children, whose lungs continue to develop until the teen years, are also at elevated risk. Moreover, since children tend to spend more time outdoors than adults, they have potentially greater exposure to outdoor pollutants.<sup>9</sup> Pregnant women exposed to high levels of air pollution may be at risk for

premature births or low birthweight infants.<sup>10</sup> However, even healthy adults who suffer air pollution exposure can experience measurable harm.<sup>11</sup>

Where one lives further exacerbates the risk to their health. Low-income individuals face a higher risk, as they often live or work in communities near major sources of pollution, like industrial plants. In addition, they may have pre-existing conditions caused or exacerbated by air pollution and fewer resources to secure medical care.<sup>12</sup>

Thirty to 45 percent of the North American population now lives near a major highway or road. The pollution from vehicular traffic is linked to increased risk of developing asthma and decreased life expectancy.<sup>13</sup> Children living within 200 meters of a high traffic roadway have significantly higher rates of pediatric asthma.<sup>14</sup> While some choose to live close to major roads, others do so because they have limited housing options due to high costs or discrimination in the housing market.

### *Clean Air and Climate Change*

Climate change threatens clean air and the public's health. Climate events, like drought and severe rainfall, worsen particulate matter pollution and contribute to the high number of days with unclean air. Warmer temperatures increase the risk of ozone formation, make cleaning up ozone even harder, and cause additional heat-related health problems.<sup>15, 16</sup>

### *Opportunities for Action*

- 1) Protect and enforce the Clean Air Act, one of the nation's most successful public health laws.
- 2) Strengthen outdated particulate matter standards and implement the 2015 ozone standards.
- 3) Encourage EPA to use the best available science to establish National Ambient Air Quality Standards that sufficiently protect the health of US residents, including vulnerable populations (e.g., children, the elderly, low-income groups, those with asthma or cardio-pulmonary diseases, etc.).
- 4) Adopt national steps to reduce emissions of methane and volatile organic compounds from existing oil facilities, gas facilities, and other sources.
- 5) Embolden each state to adopt a Clean Power Plan to reduce carbon pollution and mitigate climate change.
- 6) Adopt comprehensive smoke-free protections for all workers in all states, including workers in bars and restaurants.
- 7) Ensure that research continues through EPA and the National Institute for Occupational Safety Health to provide more information and assistance to employers and employees on indoor air pollutants in workplace settings.
- 8) Increase funding to state, local, and tribal governments to promote healthy air.
- 9) Support capacity-building efforts in state, local, and tribal health departments to enable them to monitor and address the health effects of air pollution and climate change.

- 10) Promote environmental justice through the development of policies and programs that reduce exposure to air pollution and decrease the impacts of climate change.
- 11) Educate the public about the connections between individual lifestyle behaviors and exposure to and production of air pollutants, including greenhouse gases.
- 12) Foster collaboration among state, local, and tribal air agencies to reduce air pollution and its associated ills.

*For more information, visit:*

#### American Lung Association

- 2016 State of the Air report: [www.lung.org/our-initiatives/healthy-air/sota/key-findings/](http://www.lung.org/our-initiatives/healthy-air/sota/key-findings/)

#### Centers for Disease Control and Prevention, National Center for Environmental Health

- National Asthma Control Program: <http://www.cdc.gov/asthma/nacp.htm>
- Air Pollutions and Respiratory Health Program: <http://www.cdc.gov/nceh/airpollution/>
- National Environmental Health Tracking Network
  - Outdoor Air Data: <https://ephtracking.cdc.gov/showAirLanding.action>
  - Asthma Data: <https://ephtracking.cdc.gov/showAsthma>
  - Carbon Monoxide Poisoning Data: <https://ephtracking.cdc.gov/showCarbonMonoxideLanding>

#### National Association of County and City Health Officials

- Air quality position paper: <http://www.naccho.org/uploads/downloadable-resources/04-08-Ambient-Air-Quality.pdf>

#### President's Task Force on Environmental Health Risks and Safety Risks to Children

- Coordinated Federal Action Plan to Reduce Racial and Ethnic Asthma Disparities: [https://www.epa.gov/sites/production/files/2014-08/documents/federal\\_asthma\\_disparities\\_action\\_plan.pdf](https://www.epa.gov/sites/production/files/2014-08/documents/federal_asthma_disparities_action_plan.pdf)

#### US Global Climate Change Research Program

- Impacts of Climate Change on Human Health in the United States: [health2016.globalchange.gov](http://health2016.globalchange.gov)

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