

Air Quality, Climate Change and Health



Climate change is reducing air quality in many ways. In this brief we focus on the impact of climate change on air quality and health in California and the U.S.

Air quality and health in California

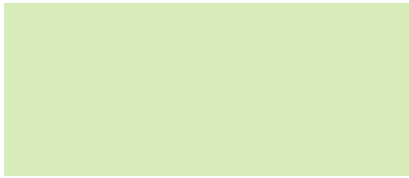
- California has a serious air pollution problem, despite great progress over the last few decades.¹
 - California has 7 of the top 10 most polluted cities for year-round particle pollution.
 - Los Angeles has been ranked the No. 1 most ozone-polluted city for at least the past 16 years.
- In 2010, about 13% of California adults and children had been diagnosed with asthma at some point in their lifetime. Each year there are nearly 200,000 new cases of asthma in California, and the incidence is increasing.²
- 40% of Californians, nearly twice the national average, live within about 1/3 of a mile of a busy roadway, where air pollution levels are higher.³
- Poor air quality limits physical activity, which is important for cardiovascular health, obesity prevention and mental health or stress reduction.

Climate change worsens air quality

- Climate change makes it ever more difficult to attain national air quality standards for ground-level ozone, a major component of smog.
 - Climate change is causing higher temperatures, which increase ozone formation, and increasing the frequency of stagnation events that create the worst ozone episodes.⁴ Recent studies suggest that increased ozone levels due to climate change could result in thousands of additional illnesses and deaths per year in coming decades.⁵
- Climate change is increasing the frequency and intensity of wildfires. Smoke from wildfires — laden with fine particulate matter (PM_{2.5}) — spreads over very long distances, and is associated with increased risks of premature deaths, ED visits, and hospitalizations — especially for respiratory and cardiovascular disease.⁶ See [Wildfires, Climate Change and Health](#).
- The five smoggiest cities in California are also projected to have the greatest climate change-related ozone increases. They also have the highest densities of low-income communities and communities of color.⁷
- As climate change brings increased storms and excess rainfall, excess moisture in homes leads to mold production that can exacerbate asthma and other respiratory illness. See [Rainfall & Storms, Climate Change and Health](#).
- Drought — also increasing in frequency and severity due to climate change — dries out the soil and increases dust levels, causing respiratory irritation. See [Drought, Climate Change and Health](#).

? DID YOU KNOW?

Los Angeles has been ranked the No. 1 most ozone-polluted city for at least the past 16 years.



FAST FACT:

Air pollution can cause permanent damage to the developing respiratory systems of children.

- With higher temperatures and more extreme heat days, air conditioner use increases. The associated greater energy demand increases air pollution from fossil-fuel based electricity production. See [Extreme Heat, Climate Change and Health](#).

Climate change, air quality and health equity

Social and economic inequities, as well as individual characteristics, place some individuals and communities at greater risk than others for the air quality “penalty” due to climate change:

- **Race and Place:** Low-income communities and communities of color are more likely to have neighborhood characteristics that increase exposure to climate change-related air pollution, such as proximity to polluting industries, lack of green space, and urban heat islands.
 - African-Americans are disproportionately affected by asthma in California: compared to Whites, they experience 40% higher prevalence rates, four times higher emergency room and hospitalization rates, and twice the asthma death rates.⁸
- **Poverty** increases the risks of asthma. Those living in areas with a median household income of \$20,000 or less experience rates of emergency room visits and hospitalizations for asthma that are four times higher than those in areas with a median income greater than \$100,000.⁹
 - Low-income households, people of color, and non-English speaking and foreign-born persons are more likely to live near busy roadways, and therefore face worse air quality.
- **Age:** Air pollution can cause permanent damage to the developing respiratory systems of children.
- **Chronic illness:** Individuals with pre-existing chronic conditions, such as asthma, other respiratory disease, and cardiovascular disease, are at greater risk of disease exacerbations and complications due to air pollution.
- **Health insurance:** lack of adequate coverage and health care can result in poorly managed disease for those with respiratory or cardiovascular illness.

What can physicians do to address climate change and air quality?

- Talk to patients about how climate change worsens air quality, and what they can do to minimize the impact on health.
 - Advise patients with asthma or other respiratory illness to check the Air Quality Index <http://airnow.gov/index.cfm?action=aqibasics.aqi> for unsafe ozone and particulate levels.
 - Talk to patients about how to adjust their activities and recreation when air quality is bad.
 - For patients who smoke (or whose family members smoke), encourage them to quit and provide resource support.
- Educate your colleagues and communities on the links between climate change, air quality and health, and what strategies can reduce the risks of both.

Reduce Carbon Pollution, Expand Clean Energy¹⁰

In August 2015, President Obama and the EPA established [The Clean Power Plan \(CPP\)](#), which lays out regulatory standards on existing power plants to cut emissions by 32% of 2005 levels by the year 2030. Under the plan, solar and wind energy capacity is expected to double by 2030, compared to 2013 levels. The Clean Power Plan will lead to climate and health benefits, including avoiding 2,700 to 6,600 premature deaths and 140,000 to 150,000 asthma attacks in children.



- Advocate for strategies that simultaneously reduce greenhouse gas emissions and air pollution:
 - Clean transportation policies. For more, see [Transportation, Climate Change and Health](#)
 - Investment in public transit and pedestrian and bicycle infrastructure to reduce vehicle miles traveled
 - Improved vehicle fuel efficiency standards
 - Requirements to increase the use of renewable fuels
 - Electric vehicle infrastructure and programs to allow lower-income residents to purchase EVs
 - Strategies to reduce diesel emissions, including clean freight strategies
 - Policies to hasten transition to clean and renewable energy and increase energy efficiency. For more, see [Energy, Climate Change and Health](#)
 - Targets and subsidies for renewable energy and energy efficiency. See the box below for California's renewable energy and energy efficiency targets.
 - Elimination of subsidies for fossil fuels
 - Programs to allow lower-income homeowners and renters to benefit from rooftop solar and energy efficiency
 - Tighter regulations on emissions of carbon and toxic air pollutants from power plants and other industrial emitters
 - Urban heat island reduction strategies such as tree planting and other urban greening, cool roofs, and cool pavements. Trees reduce air pollution levels and cooling strategies reduce temperatures and related ozone production. See [Urban Greening & Green Infrastructure, Climate Change, and Health](#)
- Support policies and programs in your community and in your health system that authentically engage and partner with community residents in addressing climate and health problems. Address social and economic inequities and vulnerabilities for air pollution, for individuals and communities.
 - Advocate that emissions credits and other revenues be strategically invested in disadvantaged and low-income communities.
 - Connect patients to social services and resources to ensure adequate health care coverage for better maintenance of respiratory health.

California's Clean Energy Plan¹¹

In 2015, California enacted ambitious new targets for clean energy. SB 350 commits the state to:

- Increase the amount of electricity derived from [renewable energy](#) from 1/3 to 50% by 2030
- Double [energy efficiency](#) in existing buildings by 2030

The proposal to reduce petroleum use by 50% by 2030 was thwarted by the oil industry. However, new legislation passed in August 2016 sets targets for reduced emissions of short-lived climate pollutants (SLCPs) — black carbon, methane, and fluorinated gases. See [Climate Change 101](#) for more information on SLCPs.



? DID YOU KNOW?

Smoke from wildfires — laden with fine particulate matter— spreads over very long distances, and is associated with increased risks of premature deaths, ER visits, and hospitalizations.

For More Information

- California Air Resources Board Short Lived Climate Pollutants Reduction Strategy <http://www.arb.ca.gov/cc/shortlived/shortlived.htm>
- American Lung Association State of the Air Report: <http://www.lung.org/our-initiatives/healthy-air/sota/>
- EPA Clean Power Plan site and Factsheet: <https://www.epa.gov/cleanpowerplan/clean-power-plan-protects-our-environment-health-economy>
- CA Governor's Climate Change Pillars: 2030 Greenhouse Gas Reduction Goals Factsheets: <http://www.arb.ca.gov/cc/pillars/pillars.htm#factsheets>
- Sneezing and Wheezing-NRDC report on climate change, allergies, asthma and air quality: <https://www.nrdc.org/sites/default/files/sneezing-report-2015.pdf>

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Citations

- ¹ American Lung Association. (2016). State of the Air 2016. Available at <http://www.lung.org/our-initiatives/healthy-air/sota/>
- ² Milet M, Lutzker L, Flattery J. *Asthma in California: A Surveillance Report*. Richmond, CA: California Department of Public Health, Environmental Health Investigations Branch, May 2013.
- ³ Rowangould, G.M. (2013). A census of the US near-roadway population: Public health and environmental justice considerations. *Transportation Research Part D: Transport and Environment*, 25, 59-67.
- ⁴ Fann, N., T. Brennan, P. Dolwick, J.L. Gamble, V. Ilacqua, L. Kolb, C.G. Nolte, T.L. Spero, and L. Ziska, 2016: Ch. 3: Air Quality Impacts. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. U.S. Global Change Research Program, Washington, DC, 69–98.
- ⁵ Ibid.
- ⁶ US Global Change Research Project (2014). National Climate Assessment: Climate Change Impacts in the United States. Washington, D.C. <http://nca2014.globalchange.gov>
- ⁷ Morello-Frosch, R., Pastor, M., Sadd, J., Shonkoff, S. (n.d.) *The climate gap: Inequalities in how climate change hurts Americans & how to close the gap*. Available at University of California Program for Environmental and Regional Equity website: <https://dornsife.usc.edu/pere/climategap/>
- ⁸ Ibid.
- ⁹ Ibid.
- ¹⁰ U.S. Environmental Protection Agency. (n.d.) Fact sheet: overview of the clean power plan. Available at: <https://www.epa.gov/cleanpowerplan/fact-sheet-overview-clean-power-plan>
- ¹¹ <http://www.arb.ca.gov/cc/pillars/pillars.htm#factsheets>



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