

ORAL ARGUMENT NOT YET SCHEDULED

No. 22-1081 and consolidated cases**IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT**

STATE OF OHIO, et al.,
Petitioners,

v.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, et al.,
Respondents.

**On Petition for Review of Final Action by the United States Environmental
Protection Agency**

**BRIEF OF *AMICI CURIAE* THE AMERICAN THORACIC SOCIETY,
AMERICAN MEDICAL ASSOCIATION, AMERICAN ASSOCIATION
FOR RESPIRATORY CARE, AMERICAN COLLEGE OF
OCCUPATIONAL AND ENVIRONMENTAL MEDICINE, AMERICAN
COLLEGE OF PHYSICIANS, AMERICAN COLLEGE OF CHEST
PHYSICIANS, NATIONAL LEAGUE FOR NURSING, AMERICAN
PUBLIC HEALTH ASSOCIATION, AMERICAN ACADEMY OF
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Dated: January 20, 2023

**CERTIFICATE AS TO PARTIES, RULINGS UNDER REVIEW, AND
RELATED CASES**

Pursuant to Circuit Rule 28(a)(1), *amici curiae* the American Thoracic Society, American Medical Association, American Association for Respiratory Care, American College of Occupational and Environmental Medicine, American College of Physicians, American College of Chest Physicians, National League for Nursing, American Public Health Association, American Academy of Pediatrics, and Academic Pediatric Association, through undersigned counsel, hereby certify as follows:

(A) **Parties and Amici.** All parties, intervenors, and amici appearing in this Court are listed in the State Petitioners' Brief.

(B) **Rulings Under Review.** The consolidated petitions before the Court challenge a final action of the Administrator of the U.S. Environmental Protection Agency, entitled "California State Motor Vehicle Pollution Control Standards; Advanced Clean Car Program; Reconsideration of a Previous Withdrawal of a Waiver of Preemption; Notice of Decision," published at 87 Fed. Reg. 14,332 (Mar. 14, 2022).

(C) **Related Cases.** *Amici curiae* are not aware of any related cases other than the consolidated cases before the Court.

Dated: January 20, 2023

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CORPORATE DISCLOSURE STATEMENT

Pursuant to Circuit Rule 26.1 and Federal Rule of Appellate Procedure 26.1, undersigned counsel certifies that the American Thoracic Society, American Medical Association, American Association for Respiratory Care, American College of Occupational and Environmental Medicine, American College of Physicians, American College of Chest Physicians, National League for Nursing, American Public Health Association, American Academy of Pediatrics, and Academic Pediatric Association, are not-for-profit public health and scientific organizations. *Amici curiae* do not have parent corporations and no publicly held corporation has ownership of 10 percent or greater in the American Thoracic Society, American Medical Association, American Association for Respiratory Care, American College of Occupational and Environmental Medicine, American College of Physicians, American College of Chest Physicians, National League for Nursing, American Public Health Association, American Academy of Pediatrics, or the Academic Pediatric Association. *Amici curiae* do not have any members who have issued shares or debt securities to the public.

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D.C. CIRCUIT RULE 29(d) STATEMENT

Counsel for *amici curiae* the American Thoracic Society, American Medical Association, American Association for Respiratory Care, American College of Occupational and Environmental Medicine, American College of Physicians, American College of Chest Physicians, National League for Nursing, American Public Health Association, American Academy of Pediatrics, and Academic Pediatric Association certifies, pursuant to Circuit Rule 29(d), that a separate brief is necessary to provide the Court with the perspective and expertise of public health professionals that *amici curiae* represent. The targeted focus of the *amici* on public health is uniquely relevant to the agency action at issue. Accordingly, *amici curiae*, through counsel, certify that filing a joint brief would not be practicable.

Dated: January 20, 2023

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GLOSSARY AND ABBREVIATIONS

EPA: Environmental Protection Agency

STATUTES AND REGULATIONS

All applicable statutes and regulations are set forth in the Initial Brief for Petitioners.

**STATEMENT OF IDENTITY, INTEREST IN CASE, AND SOURCE OF
AUTHORITY TO FILE OF *AMICI CURIAE*¹**

The American Thoracic Society is an international non-profit organization of more than 16,000 physicians, scientists, and healthcare professionals dedicated to the detection, prevention, treatment, and cure of respiratory disease and critical care illnesses. The American Medical Association, American Association for Respiratory Care, American College of Occupational and Environmental Medicine, American College of Physicians, American College of Chest Physicians, National League for Nursing, American Public Health Association, American Academy of Pediatrics, and Academic Pediatric Association are non-profit scientific and medical organizations dedicated to the protection of public health.

Together, *amici* are concerned about the severe health effects in California that result from greenhouse gas emissions, particulate matter, ozone, and other pollutants. These impacts include respiratory and cardiovascular illnesses, premature death, and escalating emergency room visits. This brief describes the public health necessity of regulating and reducing motor vehicle emissions in

¹ In compliance with Federal Rule of Appellate Procedure 29(a)(4)(E), counsel for *amici curiae* hereby state that no counsel for any party to this litigation authored this brief in whole or in part; no party or party's counsel contributed money that was intended to fund, or did fund, the preparation or submission of this brief; and no person, other than *amici curiae*, contributed money that was intended to fund, or did fund, the preparation or submission of this brief. All parties have consented to the filing of this *amicus* brief.

California through its Advanced Clean Car program. *Amici*'s collective medical, scientific, and clinical expertise leads them to support the position of the Respondents.

BACKGROUND²

The Clean Air Act seeks “to protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare.” 42 U.S.C.

§ 7401(b)(1). To this end, the Act requires the monitoring and reduction of air pollution from different sources, including mobile sources, such as automobiles.

Automobiles emit or contribute to the formation of several pollutants.³ Some are defined under the Act as “criteria pollutants”—air pollutants emitted from

“numerous [and] diverse sources” and which “endanger public health or welfare.”

42 U.S.C. § 7408(a)(1). Criteria pollutants include particulate matter (small particles like dust, soot, or smoke mixed into the air), carbon monoxide, nitrogen

² Counsel for *amici curiae* wish to note their thanks to law students Abigail Johnson and Brett David Gerardi for their assistance with this brief.

³ S.L. Winkler et al., *Vehicle Criteria Pollutant (PM, NO_x, CO, HCs) Emissions: How Low Should We Go?*, 1 NPJ – CLIMATE & ATMOSPHERIC SCI. 1, 1 (2018).

dioxide, and ozone.⁴ Automobiles also emit precursors to criteria pollutants, such as nitrogen oxides, as well as greenhouse gas pollutants such as carbon dioxide.⁵

The Act generally preempts states from “adopt[ing] . . . any standard relating to the control of emissions from new motor vehicles or new motor vehicle engines.” 42 U.S.C. § 7543(a).⁶ The Act nonetheless requires the Environmental Protection Agency (“EPA”) to waive this preemption for California when certain statutory criteria are satisfied, because California was the only state that addressed mobile source pollution through automobile standards prior to the Act. 42 U.S.C. § 7543(b)(1); *see Motor & Equip. Mfrs. Ass’n, Inc. v. EPA*, 627 F.2d 1095, 1109-10 (D.C. Cir. 1979).

Under Section 209(b) of the Act, EPA must grant a waiver for California to adopt its own automobile emission standards so long as they will be “at least as protective of the public health and welfare as applicable Federal standards,” and

⁴ *See Criteria Air Pollutants*, U.S. ENV’T PROT. AGENCY (Aug. 9, 2022), <https://www.epa.gov/criteria-air-pollutants>; *Particulate Matter (PM) Basics*, U.S. ENV’T PROT. AGENCY (July 18, 2022), <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM>. Ozone is formed when sunlight strikes nitrogen oxides, which are emitted into ambient air when fossil fuels are burned. *Basic Information about NO₂*, U.S. ENV’T PROT. AGENCY (Aug. 2, 2022), <https://www.epa.gov/no2-pollution/basic-information-about-no2>.

⁵ S.L. Winkler et al., *supra* note 3, at 1.

⁶ The Act regulates stationary sources of pollution, such as factories, under different sections.

they are needed to meet “compelling and extraordinary conditions.” 42 U.S.C.

§ 7543(b)(1). Once EPA has granted the waiver, other states may choose to adopt California’s standards. 42 U.S.C. § 7507.⁷

In 2022, EPA reinstated a waiver that it had granted to California nine years earlier for a package of regulations called the Advanced Clean Car program. *Notice of Decision*, 87 Fed. Reg. 14332 (U.S. Env’t Prot. Agency, Mar. 14, 2022). In 2019, EPA withdrew the waiver—the first time the agency had ever withdrawn a previously-granted waiver. *Id.* at 14333. California’s Advanced Clean Car program has three components: a low-emissions vehicle regulation for criteria pollutants, a low-emissions vehicle regulation for greenhouse gas emissions, and a technology-promoting zero-emission vehicle regulation.⁸ More than a dozen states have since

⁷ “[A]ny State which has plan provisions approved under this part may adopt and enforce for any model year standards relating to control of emissions from new motor vehicles . . . if— (1) such standards are identical to the California standards for which a waiver has been granted for such model year, and (2) California and such State adopt such standards at least two years before commencement of such model year (as determined by regulations of the Administrator).” 42 U.S.C. § 7507.

⁸ *Advanced Clean Cars Program - About*, CAL. AIR RES. BD., CAL. ENV’T PROT. AGENCY, <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/about> (last visited Dec. 20, 2022).

chosen to adopt California's standards under Section 177 of the Clean Air Act, 42 U.S.C. § 7507.⁹

SUMMARY OF THE ARGUMENT

California's public health is intimately tied to the state's authority to regulate motor vehicle emissions. This Court should uphold EPA's decision under Section 209(b) of the Clean Air Act to allow California to implement the Advanced Clean Car program.

California's greenhouse gas and zero-emission vehicle regulations are necessary elements of the state's plan to address air pollution and comply with federal air quality regulations. Zero-emission standards directly reduce criteria pollution. *See, e.g., Notice of Decision*, 87 Fed. Reg. at 14357. The greenhouse gas and zero-emission regulations also complement other standards in the Advanced Clean Car program to control criteria pollutants because greenhouse gas pollution exacerbates the formation of criteria pollutants. These components of the program thus work with California's other air pollution regulations to bring the state into compliance with the Clean Air Act. *See, e.g., id.* at 14350.

⁹ *States that Have Adopted California's Vehicle Standards under Section 177 of the Federal Clean Air Act*, CAL. AIR RES. BD., CAL. ENV'T PROT. AGENCY (May 13, 2022), <https://ww2.arb.ca.gov/resources/documents/states-have-adopted-californias-vehicle-standards-under-section-177-federal>.

The public health impacts of automobile emissions, including criteria pollution and greenhouse gas-induced climate change, are compelling and extraordinary in California. Motor vehicles emit a variety of criteria pollutants which are harmful to public health. Motor vehicles also emit greenhouse gases like carbon dioxide, which cause climate change¹⁰ and lead to severe public health harms.¹¹ Beyond exacerbating criteria pollution, greenhouse gas-induced climate change has also increased heat-related deaths and morbidity, wild and urban fires, droughts, and floods. Climate change increasingly harms Californians' respiratory health and disproportionately affects vulnerable populations including pregnant women and children, the elderly, communities of color, and lower wage earners. Because of California's topography, population density, weather patterns, and location, criteria pollution and climate change pose severe health and welfare impacts of a different degree from other states, as well as from the United States as a whole.

Amici curiae submit this brief to assist the court in understanding the serious public health implications of greenhouse gas emissions and air pollution in

¹⁰ *Overview of Greenhouse Gases*, U.S. ENV'T PROT. AGENCY (May 16, 2022), <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>.

¹¹ *See, e.g.,* Nick Watts et al., *Health and Climate Change: Policy Responses to Protect Public Health*, 368 LANCET 1861, 1861-1914 (2015).

California. Congress, courts, and agencies have recognized the need for California to regulate motor vehicle emissions under Section 209(b) for more than half a century. California's capacity to promulgate and implement these regulations is essential to protecting the state's public health, particularly in a warming world.

ARGUMENT

I. The Advanced Clean Car program reduces criteria pollutants and greenhouse gases to facilitate California's compliance with the Clean Air Act.

The Clean Air Act tasks EPA with establishing air quality standards with which all states must comply. 42 U.S.C. § 7409.¹² A location's geography, size, temperature, precipitation, and wind patterns all affect how air pollutants are formed and concentrated. Nowhere in this country is that relationship more evident than in California, with its unique combination of wind and ocean currents, topography, and densely populated, automobile-dependent cities. Despite adopting extensive regulation that is more protective than the regulations promulgated by EPA, California has often remained unable to meet EPA's standards.¹³ The

¹² The Clean Air Act requires EPA to establish National Ambient Air Quality Standards for six criteria pollutants, including ozone, particulate matter, lead, carbon monoxide, sulfur dioxide, and nitrogen dioxide. *Criteria Air Pollutants*, *supra* note 4. EPA requires states to regulate these criteria pollutants. *Id.*

¹³ *See, e.g.*, Fred Lurmann et al., *Emissions Reduction Policies And Recent Trends In Southern California's Ambient Air Quality*, 65 J. AIR & WASTE MGMT. ASSOC. 324, 334 (2015) ("Despite the substantial accomplishments in emissions reduction and air quality improvement to date, the Los Angeles region remains in violation

Advanced Clean Car program encourages innovative technologies for addressing local air pollution and its interaction with climate change. Without this program, California may be unable to come into compliance with EPA's air quality standards, continuing to endanger the health of its residents and visitors.¹⁴

The program is intended to improve public health in the face of substantial growth in the number of automobiles in the state. California's transportation sector causes nearly 80 percent of the state's nitrogen oxide pollution and 90 percent of its diesel particulate matter pollution.¹⁵ Accordingly, the greenhouse gas and zero-emission vehicle regulations in the Advanced Clean Car program work in concert with the program's criteria pollutant emission standards to diminish the harms of

of the [National Ambient Air Quality Standards for particulate matter and ozone]. Additional emissions reductions will be needed in order to achieve regulatory compliance. . . . In the interim, millions of people continue to breathe unhealthy air in an area where the word 'smog' has become a common household term.”)

¹⁴ *Notice of Decision*, 87 Fed. Reg. at 14350 (“[T]he underlying record from the [Advanced Clean Car] program waiver, and the record of [the Safer Affordable Fuel-Efficient Vehicles Rule Part One], have shown that [the California Air Resources Board's Zero Emission Vehicles] sales mandate and [greenhouse gas] emission standards are designed to address California's serious air quality problems, including both its [criteria] pollutants and a variety of climate impacts from [greenhouse gas] emissions.”)

¹⁵ *Transforming Transportation*, CAL. ENERGY COMM'N, <https://www.energy.ca.gov/about/core-responsibility-fact-sheets/transforming-transportation> (last visited Dec. 8, 2022).

air pollution, described in detail below.¹⁶ Taken together, these standards decrease emissions from automobiles, and they reduce emissions from the extraction, transportation, and refining of fuels used in automobiles (termed “upstream sources”).

The Advanced Clean Car program also recognizes that criteria air pollution and climate change are interrelated. Changing climatic conditions exacerbate local concentrations of criteria pollutants; as one study puts it, “[a]ir pollution and climate change are inextricably linked.”¹⁷ Climate-driven changes to the weather, including changes to temperature and atmospheric water vapor, impact the development and accumulation of pollution.¹⁸ For example, increased greenhouse gas emissions create conditions that favor the formation of ground level ozone.¹⁹ Precipitation, temperature, and air circulation patterns also affect the formation,

¹⁶ See, e.g., *Notice of Decision*, 87 Fed. Reg. at 14336; *Low-Emission Vehicle ([Low-Emission Vehicle] III) Program*, CAL. AIR RES. BD., <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/lev-program/low-emission-vehicle-lev-iii-program> (last visited Dec. 15, 2022) (“The [Low-Emission Vehicle] III regulations include increasingly stringent emission standards for both criteria pollutants and greenhouse gases for new passenger vehicles through the 2025 model year.”)

¹⁷ Shupeng Zhu et al., *Comprehensively Assessing the Drivers of Future Air Quality in California*, 125 ENV’T INT’L 386, 386 (2019).

¹⁸ *Id.*

¹⁹ See Nicholas Nassikas et al., *Ozone-Related Asthma Emergency Department Visits in the US in a Warming Climate*, 183 ENV’T RES. (2020).

transportation, and local concentration of particulate matter.²⁰ Fires, dust, and other natural sources of particulate matter and ozone are projected to increase, amplifying climate change as a result.²¹ Thus, lowering greenhouse gas emissions from sources such as automobiles is necessary to reduce climate change, which otherwise exacerbates criteria pollution and its associated harms.²²

II. The Advanced Clean Car program responds to the compelling and extraordinary conditions in California caused by air pollution and climate change.

California suffers significant and particularized public health harms from air pollution and climate change.²³ Among other impacts, climate change worsens the

²⁰ Shupeng Zhu et al., *Decarbonization Will Lead to More Equitable Air Quality in California*, 13 NATURE COMM'S 1, 1 (2022).

²¹ *Id.*

²² See Tammy M. Thompson et al., *Air Quality Co-Benefits Of Subnational Carbon Policies*, 66 J. AIR & WASTE MGMT. ASSOC. 988, 988 (2016) (“[N]umerous studies have found that policies designed to reduce [greenhouse gases] will also reduce [conventional air pollutants such as nitrogen oxides, sulfur dioxide, carbon monoxide, ammonia, and volatile organic compounds] . . . leading to air quality improvements.”); see also Christopher G. Nolte et al., *Impacts, Risks, and Adaptation in THE UNITED STATES: FOURTH NATIONAL CLIMATE ASSESSMENT, VOLUME II*, U.S. GLOB. CHANGE R. PROGRAM 512, 514 (2018), https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf.

²³ See, e.g., Shupeng Zhu et al., *Decarbonization will lead to more equitable air quality in California*, *supra* note 20, at 1 (“California is already experiencing significant economic and health damages from the effects of climate change, including an increase in intensity and incidents of wildfires and deteriorating air quality.”); Kim Knowlton et al., *Six Climate Change-Related Events in the United*

effects of air pollution, causing respiratory problems, cancers, stroke, and cardiac issues; raises heat-related deaths and morbidity; multiplies and intensifies forest and urban fires; and increases droughts and floods.

A. Automobiles emit criteria pollutants that harm public health in California.

With the largest population of any state,²⁴ California is home to six of the ten cities suffering the worst ozone pollution in the nation and seven of the cities with the worst particulate matter pollution.²⁵ The four cities with the most severe air pollution in the country—Los Angeles, Bakersfield, Visalia, and Fresno—are all in California.²⁶ These distinctive air pollution problems have wide-ranging public health effects.

States Accounted for About \$14 Billion In Lost Lives and Health Costs, 30 HEALTH AFF. 2167, 2168 (2011).

²⁴ *New Vintage 2021 Population Estimates Available for the Nation, States, and Puerto Rico*, U.S. CENSUS BUREAU (Dec. 21, 2021), <https://www.census.gov/newsroom/press-releases/2021/2021-population-estimates.html>.

²⁵ *Most Polluted Cities*, AM. LUNG ASS'N, <https://www.lung.org/research/sota/city-rankings/most-polluted-cities> (last visited Dec. 8, 2022).

²⁶ AM. LUNG ASS'N, STATE OF THE AIR 2022 5 (2022 ed.).

First, ozone threatens public health in California more acutely than any other state.²⁷ Ground level ozone forms through a photochemical reaction between nitrogen oxides, volatile organic compounds, heat, and sunlight.²⁸ It causes difficulty breathing, coughing, and shortness of breath, and contributes to respiratory-related death.²⁹ Studies consistently report significant correlations between long-term exposure to ozone and reduced lung function,³⁰ even for otherwise healthy young adults.³¹ Exposures to ozone also elevate the risk of

²⁷ Neal Fann et al., *The Geographic Distribution and Economic Value Of Climate Change-Related Ozone Health Impacts In The United States In 2030*, 65 J. AIR & WASTE MGMT. ASS'N 570, 570 (2015).

²⁸ Daniela Nuvolone et al., *The Effects of Ozone on Human Health*, 25 ENV'T SCI. & POLLUTION RES. 8074, 8074 (2017).

²⁹ Ander Wilson et al., *Climate Change Impacts On Projections Of Excess Mortality At 2030 Using Spatially Varying Ozone–Temperature Risk Surfaces*, 27 J. EXPOSURE SCI. & ENV'T EPIDEMIOLOGY 118, 118–124 (2017) (modeling ozone-related mortality due to projected changes in climate conditions); Jennifer D. Stowell et al., *The Impact Of Climate Change And Emissions Control On Future Ozone Levels: Implications For Human Health*, 108 ENV'T INT'L 41, 41 (2017) (“Research has consistently linked [ozone] exposure to a variety of adverse health outcomes including increased emergency room . . . visits and hospitalizations, asthma exacerbation, cardiovascular stress, impaired lung function, and premature death.”)

³⁰ See Rob McConnell et al., *Asthma In Exercising Children Exposed To Ozone: A Cohort Story*, 359 LANCET 386–91 (2002); see also Daniela Nuvolone et al., *supra* note 28, at 8078 (finding “well-established evidence” of the short-term effects of ozone exposure and “growing epidemiological evidence” of long-term effects).

³¹ Ira B. Tager et al., *Chronic Exposure to Ambient Ozone and Lung Function in Young Adults*, 16 EPIDEMIOLOGY 751, 758 (2005).

hospitalization for asthma patients.³² EPA classifies nineteen regions in California as ozone nonattainment areas (areas that fail to comply with the National Ambient Air Quality Standards for ozone)—more than any other state.³³ California is home to the only “extreme” ozone nonattainment areas—EPA’s most dire category of nonattainment, 42 U.S.C. § 7511³⁴—in the country.³⁵ In 2015, nearly 35 million Californians were exposed to ozone levels exceeding federal health standards.³⁶

Particulate matter pollution is also a grave health concern for Californians. Increased exposure to particulate matter from vehicles is associated with illness, decreased lifespan, and death. Long-term particulate matter exposure impacts cardiovascular risk, lung injuries, and subclinical atherosclerosis—the accruing of

³² See *id.* at 751; Benedicte Jacquemin et al., *Air Pollution And Asthma Control In The Epidemiological Study On The Genetics And Environment Of Asthma*, 66 J. EPIDEMIOLOGY CMTY. HEALTH 796, 796–802 (2012); Kelly Moore et al., *Ambient Ozone Concentrations Cause Increased Hospitalizations for Asthma in Children: An 18-Year Study in Southern California*, 116 ENV’T HEALTH PERSPECTIVES 1063, 1063–70 (2008); Erika Garcia et al., *Association of Changes in Air Quality with Incident Asthma in Children in California, 1993-2014*, 321 JAMA 1906, 1906–15 (2019).

³³ See *Summary Nonattainment Area Report*, U.S. ENV’T PROT. AGENCY (Dec. 31, 2022), <https://www3.epa.gov/airquality/greenbook/popexp.html>.

³⁴ See also *Ass’n of Irrigated Residents v. U.S. Env’t Prot. Agency*, 10 F.4th 937, 941 (9th Cir. 2021).

³⁵ See *Summary Nonattainment Area Report*, *supra* note 33.

³⁶ See *id.*

fats and other substances in the arteries; while short-term particulate matter exposure is associated with cardiovascular and stroke mortality and hospital admissions, and altered cardiac autonomic function.³⁷ Particulate matter also causes lung cancer.³⁸ Association is stronger when exposure is concentrated, such as a neighborhood in close proximity to a highway or other high-traffic area.³⁹ California is at the forefront of these impacts: the Los Angeles and Riverside metropolitan areas are the two most impacted cities in the entire country for air pollution including particulate matter, and nine other metropolitan areas in California are in the top twenty-five most impacted cities for health harms attributable to air pollution.⁴⁰

³⁷ C. Arden Pope III & Douglas W. Dockery, *Health Effects of Fine Particulate Air Pollution: Lines That Connect*, 56 J. AIR & WASTE MGMT. ASS'N 709, 731–32 (2006).

³⁸ See, e.g., K.R. Cromar et al., *Excess Morbidity and Mortality Associated with Air Pollution above American Thoracic Society Recommended Standards, 2017-2019*, 19 ANN. AM. THORAC. SOC. 603, 605 (2022). Exposure to air pollution in California has also been connected to the severity of COVID-19 cases and is associated with a spike in COVID-19-related mortality. Zhanghua Chen et al., *Near-Roadway Air Pollution Associated With COVID-19 Severity And Mortality - Multiethnic Cohort Study In Southern California*, 157 ENV'T INT. 1, 1–8 (2021); see also Zhanghua Chen et al., *Ambient Air Pollutant Exposures and COVID-19 Severity and Mortality in a Cohort of Patients with COVID-19 in Southern California*, 2006 AM. J. RESPIRATION CRITICAL CARE MED. 440, 440–48 (2022).

³⁹ Garcia et al., *supra* note 32.

⁴⁰ Cromar et al., *supra* note 38, at 606 (“At the state level . . . California far exceeds all others in air pollution-related health impacts.”).

Because highly populated areas in California have become hotspots for ozone and particulate matter pollution, asthma symptoms have also increased.⁴¹ Adults who live within 200 meters of highways bear an increased risk of developing asthma.⁴² The harms of living in a high-traffic area are also disproportionately carried by communities of color,⁴³ as racial disparities contribute measurably and independently to the burden of death from particulate matter.⁴⁴ Exposure to air pollution is significantly associated with disparate risks for pregnant people⁴⁵ and people in poverty.⁴⁶ There are also heightened risks to

⁴¹ Michelle Wilhelm et al., *Environmental Public Health Tracking of Childhood Asthma Using California Health Interview Survey, Traffic, and Outdoor Air Pollution Data*, 116 ENV'T HEALTH PERSP. 1254, 1254–60 (2008).

⁴² Doug Brugge et al., *Near-highway pollutants in motor vehicle exhaust: A review of epidemiologic evidence of cardiac and pulmonary health risks*, 6 ENV'T HEALTH 1, 1 (2007).

⁴³ Yin-Yin Meng et al., *Living Near Heavy Traffic Increases Asthma Severity*, UCLA CTR. HEALTH POL'Y RSCH. 1, 1–6 (Aug. 2006), <http://healthpolicy.ucla.edu/publications/Documents/PDF/Living%20Near%20Heavy%20Traffic%20Increases%20Asthma%20Severity.pdf>.

⁴⁴ Benjamin Bowe et al., *Burden of Cause-Specific Mortality Associated with PM_{2.5} Air Pollution in the United States*, 2 JAMA NETWORK OPEN 1, 8 (2019).

⁴⁵ Petra Klepac et al., *Ambient Air Pollution and Pregnancy Outcomes: A Comprehensive Review and Identification of Environmental Public Health Challenges*, 167 ENV'T RSCH. 144, 144 (2018).

⁴⁶ Ihab Mikati et al., *Disparities in Distribution of Particulate Matter Emissions Sources by Race and Poverty Status*, 108 AM. J. PUB. HEALTH 480, 480 (2018).

children. Children with asthma living close to heavy traffic areas in Southern California experience increased asthma symptoms,⁴⁷ and children in California who play sports in high-ozone areas bear vastly inflated risks of developing asthma.⁴⁸ Exposure to ozone or particulate matter pollution is also associated with increased risk of preterm birth and low birth weight.⁴⁹ The health impacts of criteria pollution are serious and wide-reaching, and California's size, geography, and weather patterns amplify these impacts.

California's acute problems with air pollution, particularly in the southern part of the state, spurred California to pioneer vehicle emissions regulations in the United States.⁵⁰ Regulations like the ones at issue here have made strides toward

⁴⁷ Brugge et al., *supra* note 42, at 7.

⁴⁸ McConnell et al., *supra* note 30, at 386–91 (comparing a group of children playing three or more sports in Southern California to children who are not playing sports).

⁴⁹ Bruce Bekkar et al., *Association of Air Pollution and Heat Exposure With Preterm Birth, Low Birth Weight, and Stillbirth in the US: A Systematic Review*, JAMA NETWORK e208243 (June 2020).

⁵⁰ See, e.g., Ann E. Carlson, *Iterative Federalism and Climate Change*, 103 NW. U. L. REV. 1097, 1110 (2009) (“The region’s battle with dirty air began in the 1940s when the city of Los Angeles experienced its first major smog episodes. After heated battles over the extent to which the automobile engine contributed to the air pollution problem, California established its Motor Vehicle Pollution Control Board in 1960.”) See also *Motor Vehicle Mfrs. Ass’n of U.S., Inc. v. New York State Dep’t of Env’t Conservation*, 17 F.3d 521, 525 (2d Cir. 1994) (“[T]he Senate Committee on Public Works was persuaded by California’s then Senator Murphy

reducing emissions and improving health. In spite of California's inherent challenges, including explosive population growth over the last decade,⁵¹ California's emissions have decreased.⁵² Studies have shown improvements in children's lung growth and function as a result of reduced pollution.⁵³ There is also a strong correlation between lower asthma rates and decreased pollution in California, demonstrating a link between protective emissions standards like the ones at issue here and improvements to public health.⁵⁴

that his state's 'unique problems and pioneering efforts' warranted a waiver from preemption.")

⁵¹ *Compare Economics and Statistics Administration, Bureau of the Census, 1990 CH-1-6, 1990 Census of Housing – General Housing Characteristics, California, Table 13*, U.S. DEP'T OF COM. (Jun. 1992), <https://www2.census.gov/library/publications/decennial/1990/ch-1/ch-1-6.pdf> (listing California's total population at 29,760,021) *with Quick Facts – California*, U.S. CENSUS BUREAU, <https://www.census.gov/quickfacts/CA> (listing California's estimated July 1, 2019 population at 39,512,223) (last visited Dec. 8, 2022). California is projected to reach 45 million residents by 2050. *California's Population*, PUB. POL'Y INST. CAL. (Jan. 2022), <https://www.ppic.org/publication/californias-population/>.

⁵² *Indicators of Climate Change in California*, CAL. ENV'T PROT. AGENCY, OFF. ENV'T HEALTH HAZARD ASSESSMENT (May 2018), <https://oehha.ca.gov/media/downloads/climate-change/report/2018caindicatorsreportmay2018.pdf>.

⁵³ W. James Gauderman et al., *Association of Improved Air Quality with Lung Development in Children*, 372 N. ENGLAND J. MED. 905, 905–13 (2015).

⁵⁴ Garcia et al., *supra* note 32, at 1,909–14.

B. Automobiles emit greenhouse gases that fuel climate change and harm public health in California.

Greenhouse gas emissions cause rising global temperatures, which endanger public health in California by increasing air pollution, heat-related deaths, fires, droughts, and floods.⁵⁵ California's location, topography, and population density make its residents particularly prone to public health harms stemming from climate change, just as it does for localized air pollution. By continuing to regulate emissions from the transportation sector, California fosters improvements in public health, both on the local scale through reducing vehicle exhaust, and more broadly, by combatting climbing temperatures.⁵⁶

a. Automobiles emit greenhouse gases that cause climate change.

Greenhouse gas emissions contribute to climate change.⁵⁷ Greenhouse gas emissions, including carbon dioxide from fossil-fuel combustion, have changed weather patterns and other natural cycles across the world. These changes include

⁵⁵ See, e.g., Patrick L. Kinney, *Climate Change, Air Quality, and Human Health*, 35 AM. J. PREV. MED. 459, 459-62 (2008); Shakoor Hajat & Tom Kosatky, *Heat-Related Mortality: A Review and Exploration Of Heterogeneity*, 64 J. OF EPIDEMIOLOGY & COMMUNITY HEALTH 753, 754 (2010).

⁵⁶ ROBERTO MOLAR CANDANOSA, NASA, REDUCING EMISSIONS TO LESSEN CLIMATE CHANGE WOULD YIELD DRAMATIC HEALTH BENEFITS BY 2030 (Nov. 30, 2021), <https://climate.nasa.gov/news/3134/reducing-emissions-to-lessen-climate-change-would-yield-dramatic-health-benefits-by-2030/>.

⁵⁷ Christopher G. Nolte et al., *supra* note 22, at 512–538.

more frequent heat waves, higher average temperatures, more forest and urban fires, increased air pollution, longer and intensified allergy seasons, and more potent and frequent storms and flooding.⁵⁸ If left unchecked by regulations like California's, this trend will continue, with worsening and compounding public health consequences.

California's proportion of greenhouse gas emissions from transportation considerably outstrips the nation as a whole. In California, transportation accounts for 38 percent of greenhouse gas emissions in the state,⁵⁹ compared with 27 percent of total greenhouse gas emissions for the United States.⁶⁰ California's massive and concentrated population means a density of motor vehicles,

⁵⁸ See, e.g., Kim Knowlton et al., *supra* note 23, at 2168 (describing the health costs of climate change).

⁵⁹ *Current California GHG Emission Inventory Data*, CAL. AIR RES. BD., CAL. ENV'T PROT. AGENCY, <https://ww2.arb.ca.gov/ghg-inventory-data> (last visited Jan. 13, 2021).

⁶⁰ See *Carbon Pollution from Transportation*, U.S. ENV'T PROT. AGENCY (May 9, 2022), <https://www.epa.gov/transportation-air-pollution-and-climate-change/carbon-pollution-transportation>; *Fast Facts on Transportation Greenhouse Gas Emissions*, U.S. ENV'T PROT. AGENCY (July 14, 2022), <https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions>. See also Benjamin Leard, *Federal Climate Policy 104: The Transportation Sector*, RESOURCES FOR THE FUTURE (Mar. 24, 2021), <https://www.rff.org/publications/explainers/federal-climate-policy-104-the-transportation-sector/> (finding that 58 percent of greenhouse gas emissions coming from transportation are from light-duty vehicles, which includes cars, small pickup trucks, and most other small to medium-sized passenger vehicles).

particularly in Southern California.⁶¹ Recognizing the dangers of climate change to its residents and visitors, California’s Advanced Clean Car program would reduce greenhouse gas emissions.

b. Climate change harms public health in California.

Climate change causes a variety of public health harms that are particularly acute in California. These harms are wide-ranging, but some examples include temperature inversions, stagnation events, ozone intensification, heat waves, fires, drought, and flooding.

1. Temperature inversions. California’s unique topographic profile—a “bathtub shape” with sides of uneven height because of the way the mountain ranges enclose the Central Valley—creates ideal conditions for temperature inversions.⁶² In an inversion, the temperature rises, rather than falls, with altitude, inhibiting air movement and preventing pollutants at ground level from dispersing into the atmosphere.⁶³ Temperature inversions concentrate local air pollutants, exposing people in the affected region to elevated levels of pollution. Temperature

⁶¹ Jack Ross, *Why Los Angeles Hasn’t Solved Its Transit Crisis*, CAPITAL & MAIN (May 10, 2021), <https://capitalandmain.com/the-gridlock-behind-the-gridlock-0510>.

⁶² Greg de Nevers et al., *The California Naturalist Handbook 5* (U.C. Press 2013).

⁶³ Sam Iacobellis et al., *Impact of Climate Change on the Frequency and Intensity of Low-Level Temperature Inversions in California 25*, Final Rep. to Cal. Air Res. Bd., Project 06-319 (2010), <https://ww2.arb.ca.gov/sites/default/files/classic/research/apr/past/06-319.pdf>.

inversions thus cause health problems by limiting the diffusion of pollutants, trapping them where people live and breathe.⁶⁴ Rising temperatures increase sea-breeze circulation, which is linked to the magnitude and frequency of inversions.⁶⁵ Inversions are already present nearly every summer day and sixty-five percent of winter days in California,⁶⁶ and they will increase as the climate changes.⁶⁷

2. Stagnation events. In California, there is also a heightened danger of stagnation events, defined as air remaining in one place, trapping and accumulating pollutants within it.⁶⁸ Stagnation occurs when there is a lack of wind or rain to move the air, worsening drought conditions.⁶⁹ Like inversions, stagnant air masses keep pollutants closer to where people breathe, magnifying their harm to public

⁶⁴ See, e.g., Leonard Greenburg et al., *Report of an Air Pollution Incident in New York City, November 1953*, 77 PUB. HEALTH REP. 7, 7 (1962).

⁶⁵ Iacobellis et al., *supra* note 63, at 20-21.

⁶⁶ *Id.* at 20.

⁶⁷ *Id.* at 20-21.

⁶⁸ Daniel E. Horton et al., *Occurrence and Persistence of Future Atmospheric Stagnation Events*, 4 NATURE CLIMATE CHANGE 698, 698 (2014).

⁶⁹ *Id.*; John H. Tibbetts, *Air Quality and Climate Change: A Delicate Balance*, 123 ENV'T HEALTH PERSP. A148, A151 (2015) (“In 2003 a summer stagnation event in Western Europe resulted in intense heat, elevated [ozone] levels, and drought-related forest fires that would ultimately cause an estimated 15,000 excess deaths in France alone.”)

health.⁷⁰ Stagnation is expected to increase as the weather becomes warmer, and it will be intensified by California's mountains, valleys, heat, and sunlight exposure.⁷¹

3. Ozone intensification. California receives extraordinary doses of heat and sunlight, especially in its valleys.⁷² Because ozone is formed when sunlight strikes nitrogen oxides, warmer temperatures that come with higher atmospheric concentrations of greenhouse gases increase ground level ozone.⁷³ As a result, climate change will magnify California's ozone problem, which is already the worst in the nation.⁷⁴ Studies project that California will experience some of the highest ground level ozone escalation over current levels in the United States, increasing the pollutant's extensive public health impacts.⁷⁵

⁷⁰ Horton et al., *supra* note 68, at 698-700.

⁷¹ *Id.*

⁷² AM. LUNG ASS'N, *supra* note 26, at 5.

⁷³ Fann et al., *supra* note 27, at 570 (“Climate change can affect air pollutant concentrations in a myriad of ways. Meteorological factors, such as temperatures, cloudiness, precipitation frequency and intensity . . . all . . . influence air quality by determining photochemical reaction rates”); I.S.A. Isaksen et al., *Atmospheric Composition Change: Climate-Chemistry Interactions*, 43 *ATMOSPHERIC ENV'T* 5138, 5169 (2009).

⁷⁴ *See supra* Section II(A).

⁷⁵ Fann et al., *supra* note 27, at 574.

4. Heat waves. As temperatures continue to rise, the likelihood of major heat waves has doubled.⁷⁶ Exposure to extreme temperatures even for brief periods can pose grave dangers, such as a spike in heart attack rates,⁷⁷ and fetal effects, such as increased preterm delivery, stillbirths, and low birth weight,⁷⁸ and can be particularly harmful to those with pre-existing conditions.⁷⁹ Children are especially susceptible to climate-related temperature increases and heat waves, as they do not have the same capacity as adults to regulate their body temperature.⁸⁰

⁷⁶ A. Haines et al., *Climate Change and Human Health: Impacts, Vulnerability, and Mitigation*, 367 LANCET 2101, 2102 (2006). A heat wave is “generally understood to be a period of extreme and unusual warmth,” although quantitative definitions differ across disciplines. Tiffany T. Smith et al., *Heat Waves in the United States: Definitions, Patterns, and Trends*, 118 CLIMATIC CHANGE 811, 812–14 (2013).

⁷⁷ Sebastian T. Rowland et al., *Can Ultra Short-Term Changes In Ambient Temperature Trigger Myocardial Infarction?*, 143 ENV'T INT'L 1, 6 (2020).

⁷⁸ Matthew F. Chersich et al., *Associations Between High Temperatures in Pregnancy And Risk Of Preterm Birth, Low Birth Weight, And Stillbirths: Systematic Review And Meta-Analysis*, BMJ 2020;371:m3811 (Nov. 4, 2020).

⁷⁹ Mare Lõhmus, *Possible Biological Mechanisms Linking Mental Health and Heat- A Contemplative Review*, 15 INT'L J. OF ENV'T RSCH. & PUBLIC HEALTH 1, 2–3 (2018) (discussing how individuals with pre-existing mental health disorders were more likely to die during the 1996 California heat wave).

⁸⁰ Kim Knowlton et al., *The 2006 California Heat Wave: Impacts on Hospitalizations and Emergency Department Visits*, 117 ENV'T HEALTH PERSPECTIVES 61, 61 (2009) (observing greater risk of heat-related emergency department visits for children ages 0-4); Aaron S. Bernstein & Samuel S. Myers, *Climate Change And Children's Health*, 23 CURRENT OP. IN PEDIATRICS 221, 222 (2011).

Heat waves in California have more than doubled in recent decades,⁸¹ and they are expected to worsen and multiply as climate change progresses.⁸² California's coastal regions in particular, which have the state's highest population densities, are anticipated to face disproportionate increases in heat wave activity.⁸³ Under a high-emissions scenario—atmospheric concentrations of carbon dioxide reaching 970 parts per million by 2100⁸⁴—heat-related deaths across all age groups in Los Angeles are predicted to increase seven-fold by the end of the century.⁸⁵

5. Fires. California's high temperatures and long dry season exacerbate wildfires as well.⁸⁶ Increased wildfires generate particulate matter pollution, which, in turn, increases the risk of respiratory disease and mortality.⁸⁷ Particulate matter,

⁸¹ OFF. ENV'T HEALTH HAZARD ASSESSMENT, CAL. ENV'T PROT. AGENCY, INDICATORS OF CLIMATE CHANGE IN CALIFORNIA i-7 (4th ed. 2022), <https://oehha.ca.gov/media/downloads/climate-change/document/2022caindicatorsreport.pdf>.

⁸² Kristen Guirguis & Alexander Gershunov, *California Heat Waves in the Present and Future*, 39 GEOPHYSICAL RSCH. LETTERS L18710, 1 (2012).

⁸³ *Id.* at 6.

⁸⁴ Katharine Hayhoe et al., *Emissions Pathways, Climate Change, and Impacts on California*, 101 PNAS 12422, 12422 (2004).

⁸⁵ LOUISE BEDSWORTH, PUB. POL'Y INST. CAL., CLIMATE CHANGE AND CALIFORNIA'S PUBLIC HEALTH INSTITUTIONS 4 (Nov. 2008), https://www.ppic.org/content/pubs/report/R_1108LB3R.pdf.

⁸⁶ Nolte et al., *supra* note 22, at 521.

⁸⁷ *Id.*

such as dust and soot, from California wildfires has been shown to be more harmful than other particulate matter of the same size, especially for young children.⁸⁸ Respiratory and cardiovascular-related hospitalizations rise during the fire season; fires' fumes are especially damaging to people with pre-existing asthma.⁸⁹ However, the risk of death spikes for all individuals, regardless of whether they have a pre-existing condition.⁹⁰ As a result, California has issued wildfire guides for residents, including mask-wearing recommendations and times

⁸⁸ Rosana Aguilera et al., *Wildfire Smoke Impacts Respiratory Health More Than Fine Particles from Other Sources: Observational Evidence from Southern California*, 12 NATURE COMM'N 1493, 1494 (2021), <https://www.nature.com/articles/s41467-021-21708-0>; Rosana Aguilera et al., *Fine Particles in Wildfire Smoke and Pediatric Respiratory Health in California*, 147 PEDIATRICS 1, 4 (2021), <https://publications.aap.org/pediatrics/article/147/4/e2020027128/180791/Fine-Particles-in-Wildfire-Smoke-and-Pediatric/> (finding that particulate matter from wildfires resulted in a 30% increase in hospital admissions as opposed to a 3.7% increase caused by non-smoke sources).

⁸⁹ Jennifer D. Stowell et al., *Associations of Wildfire Smoke Exposure with Cardiorespiratory Events in Colorado 2011-2014*, 133 ENV'T INT'L 105151, 5-7 (2019) (demonstrating that increased exposure to wildfire-derived particulate matter was associated with increased respiratory hospitalizations, when separating out background particulate matter); Daniel A. Jaffe & Nicole L. Wigder, *Ozone Production from Wildfires: A Critical Review*, 51 ATMOSPHERIC ENV'T 1, 2, 7 (2012).

⁹⁰ Ana G. Rappold et al., *Cardio-Respiratory Outcomes Associated with Exposure to Wildfire Smoke are Modified by Measures of Community Health*, 11 ENV'T HEALTH 71, 71 (2012); Johanna Lepeule et al., *Chronic Exposure to Fine Particles and Mortality: An Extended Follow-up of the Harvard Six Cities Study from 1974 to 2009*, 120 ENV'T HEALTH PERSP. 965, 968 (2012).

that they should avoid going outdoors entirely during fire season.⁹¹ Under high greenhouse gas emissions scenarios, California is predicted to experience a thirty-six to seventy-four percent increase in burn area by 2085.⁹²

6. Drought. California is simultaneously suffering from a grimly prolonged drought. The past twenty-two years, from 2000 until 2021, have been the driest twenty-two years in the state for the last thousand years.⁹³ Scientists call this an emerging “megadrought era.”⁹⁴ Droughts present major public health issues, including in food production and maintaining safe drinking water.⁹⁵ In California,

⁹¹ See, e.g., *Protecting Yourself from Wildfire Smoke*, CAL. AIR RES. BD., CAL. ENV’T PROT. AGENCY, <https://ww2.arb.ca.gov/protecting-yourself-wildfire-smoke> (last visited Dec. 8, 2022).

⁹² PETER HOWARD, COST OF CARBON PROJECT, FLAMMABLE PLANET: WILDFIRES AND THE SOCIAL COST OF CARBON 7–8 (2014) (citing A. L. Westerling et al., *Climate Change and Growth Scenarios for California Wildfire*, 109 CLIMATIC CHANGE 445, 445-63 (2011)), https://costofcarbon.org/files/Flammable_Planet__Wildfires_and_Social_Cost_of_Carbon.pdf.

⁹³ OFF. OF ENV’T HEALTH HAZARD ASSESSMENT, CAL. ENV’T PROT. AGENCY, *supra* note 81, at i-7.

⁹⁴ *Id.*

⁹⁵ See, e.g., Massimo Franchini, *Impact on Human Health of Climate Changes*, 26 EUR. J. INTERNAL MED. 1, 2 (2015).

drought has also worsened chronic disease and acute stress, and the trend promises to continue.⁹⁶

7. Floods. Even during a megadrought era, California has also become more prone to flooding. Rising sea levels and storm surge due to climate change expose areas that were previously safe from flooding to new floods, and increase the frequency and severity of flooding in the places that are already flood-prone.⁹⁷ Flood flows in the Sacramento basin are expected to rise with even minor temperature increases.⁹⁸ Those who live along California's coast are, as one study put it, "already familiar with disaster," living with the risk of flooding from coastal storms, and this will worsen as climate change progresses.⁹⁹

The health effects and costs of flooding are likewise significant. The immediate effects of floods include fatalities and destroyed communities and infrastructure, such as damage to roads, hospitals, and power grids.¹⁰⁰ Extreme

⁹⁶ Tracy Barreau et al., *Physical, Mental, and Financial Impacts from Drought in Two California Counties, 2015*, 107 *AJPH RESEARCH* 783, 783–84 (2017).

⁹⁷ *Id.*

⁹⁸ Ann D. Willis et al., *Climate Change and Flood Operations in the Sacramento Basin, California*, *S.F. ESTUARY & WATERSHED SCI.* 1, 15 (2011).

⁹⁹ Matthew Heberger et al., *Potential Impacts of Increased Coastal Flooding in California due to Sea-Level Rise*, 109 *CLIMATIC CHANGE* S229, S230 (2011).

¹⁰⁰ U.S. ENV'T PROT. AGENCY, *REPORT TO CONGRESS: COMBINED SEWER OVERFLOWS INTO THE GREAT LAKES BASIN* (2016).

flooding also diminishes water quality, another public health concern. Discharges from domestic, commercial, and industrial sources of waste can flow through floodwaters directly into surface waters, including rivers, streams, and estuaries.¹⁰¹ These discharges in turn impair water quality, expose people to untreated sewage, and cause gastrointestinal illness and other waterborne diseases.¹⁰²

* * *

In sum, California's topography, population density, and location expose the state to grave, substantial, and particular public health harms from climate change. The Advanced Clean Car program aims to mitigate these harms.

CONCLUSION

The petitions for review should be denied.

Dated: January 20, 2023

Respectfully Submitted,

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¹⁰¹ *Id.* at 1–2.

¹⁰² *See, e.g.,* Jonathan A. Patz et al., *Climate Change and Waterborne Disease Risk in the Great Lakes Region of the U.S.*, 35 AM. J. PREVENTIVE MED. 451, 453, 455–56 (2008).

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CERTIFICATE OF COMPLIANCE

I certify that pursuant to Federal Rule of Appellate Procedure 32(a)(7), the attached Brief of *Amici Curiae* the American Thoracic Society, American Medical Association, American Association for Respiratory Care, American College of Occupational and Environmental Medicine, American College of Physicians, American College of Chest Physicians, National League for Nursing, American Public Health Association, American Academy of Pediatrics, and Academic Pediatric Association contains 6,347 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(f).

I further certify that this brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type-style requirements of Fed. R. App. P. 32(a)(6) because it was prepared using Microsoft Office Word 2020 and uses a proportionally spaced typeface, Times New Roman, in 14-point type.

I further certify that all privacy redactions have been made.

I further certify that all paper copies submitted to this Court are exact copies of this version, which is being submitted electronically via the Court's CM/ECF system. I further certify that the electronic submission was scanned for viruses with the most recent version of a commercial virus scanning program and is free of viruses.

/s/ Sara A. Colangelo

Date: January 20, 2023

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CERTIFICATE OF SERVICE

I hereby certify that on January 20, 2023, I electronically filed the foregoing Brief of *Amici Curiae*, the American Thoracic Society, American Medical Association, American Association for Respiratory Care, American College of Occupational and Environmental Medicine, American College of Physicians, American College of Chest Physicians, National League for Nursing, American Public Health Association, American Academy of Pediatrics, and Academic Pediatric Association with the Clerk of the Court for the United States Court of Appeals for the District of Columbia Circuit by using the Court's CM/ECF system. I further certify that all parties are represented by counsel registered with the CM/ECF system, so that service will be accomplished by the CM/ECF system.

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Date: January 20, 2023