

## State of Global Air 2019: Air Pollution a Significant Risk Factor Worldwide

**S**tate of Global Air 2019, the third edition of HEI's flagship report and website with global data on air quality and its health impact, was released on April 3.

The *State of Global Air* [website](#) provides both air quality and health-impact data by country and region, based on the most recent data available from the Institute for Health Metrics and Evaluation's Global Burden of Disease (GBD) project. The site offers exposure and health data for ambient particulate matter, ozone, and household air pollution, and also estimates the total health burden from all three forms of air pollution.

For the first time, *State of Global Air 2019* also provides worldwide estimates of lower life expectancy that can be attributed to air pollution. These estimates were based on a [global analysis](#) conducted by Joshua Apte of the University of Texas at Austin and his colleagues.

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## HEI at Symposium on Transport, Air Quality, and Health

**H**EI was pleased to participate in February in a symposium hosted by the Center for Advancing Research in Transportation Emissions, Energy, and Health (CARTEEH) in Austin, Texas. This was the first meeting hosted by CARTEEH, a new multi-university center funded by the U.S. Department of Transportation. "HEI's work to produce, evaluate, and communicate the latest science on air quality and health to inform environmental policy and transportation decisions seemed like a very good complement to the work of CARTEEH," said HEI President Dan Greenbaum.



From left: Joe Zietsman, Greg Winfree, and Katie Turnbull, all from the Texas A&M Transportation Institute; HEI President Dan Greenbaum; and Neil Pedersen of the Transportation Research Board. © TTI PHOTOS

In an opening keynote address, Greenbaum summarized the evidence on health impacts of transportation, broadening the scope to include noise, socioeconomic status, and green space. Looking toward the future, he identified ways to assess transportation-related health impacts in consideration of changing mobility patterns.

Also at the meeting, HEI Staff Scientist Allison Patton presented her research on strategies to design mobile monitoring campaigns for assessment of long-term exposure to near-highway air pollution. 

Presentation slides from the symposium are available at <https://events.tti.tamu.edu/conference/2019-carteeh-symposium/program>.

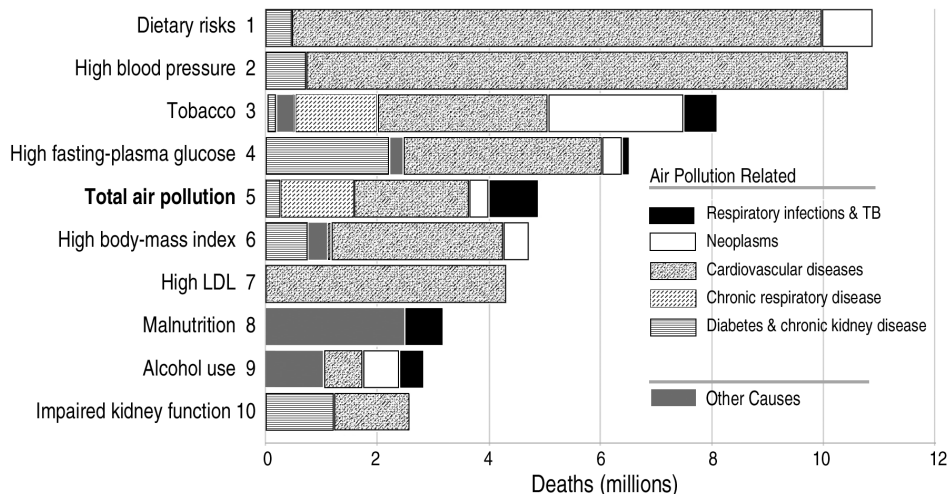
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Here are key findings in the 2019 report:

- Air pollution (PM<sub>2.5</sub>, ozone, and household air pollution) is the fifth leading risk factor for mortality worldwide. In 2017, air pollution is estimated to have contributed to close to 5 million deaths globally — nearly 1 in every 10 deaths.
- Air pollution contributes to more deaths than many better-known risk factors such as malnutrition, alcohol use, and physical inactivity.
- Air pollution reduced life expectancy in 2017 by 1 year and 8 months on average worldwide.
- In China, PM<sub>2.5</sub> pollution has dropped markedly in recent years, but concentrations still exceed the World Health Organization’s least-stringent target.
- Nearly half the world’s population — 3.6 billion people — were exposed to household air pollution in 2017. There has been progress: the proportion of people cooking with solid fuels declined from about 64% in 2005 to 47%.

HEI spread the word on the release of *State of Global Air 2019* through enhanced communications tools, including social media (see [www.stateofglobalair.org/engage](http://www.stateofglobalair.org/engage)) and factsheets on particular countries. A



Global ranking of risk factors by total number of deaths from all causes for all ages and both sexes in 2017. (Adapted from State of Global Air 2019, Figure 1. For a detailed version, see the report at [www.stateofglobalair.org](http://www.stateofglobalair.org).)

webinar, held on April 10, drew nearly 100 participants from around the world. It was also streamed live on Facebook.

The *State of Global Air* is a collaborative effort between HEI (which helps lead the air pollution analysis) and the Institute for Health Metrics and Evaluation (IHME) at the University of Washington, with expert input

from the University of British Columbia and University of Texas at Austin. On the interactive *State of Global Air* website, visitors can explore and compare trends in air quality and health from 1990 to 2017 tracked by the IHME GBD project. [HEI](#)

For more information contact Katy Walker, [kwalker@healtheffects.org](mailto:kwalker@healtheffects.org). Join *State of Global Air* on Facebook and Twitter (@HEISoGA).

## HEI in the News

### Diesel Technology Forum/Policy Insider

#### “Tunnel Studies Offer New Vision for Real-World Emissions from Heavy-Duty Diesel Vehicles” (April 2, 2019)

This [article](#) highlighted separate studies by HEI and the California Air Resources Board (CARB) that, in the Forum’s words, “validate how the newest-generation diesel technologies deliver cleaner air.”

The HEI work, by Xiaoliang Wang and colleagues from the Desert Research Institute, is presented in [Research Report 199](#), *Real-World Vehicle Emissions Characterization for the Shing Mun Tunnel in Hong Kong and Fort McHenry Tunnel in the United States*. The investigators characterized mobile-source emissions of more than 300 pollutants in the two tunnels, and found that average emissions from gasoline and diesel vehicles for most pollutants declined in both tunnels compared with findings in previous studies. The [CARB study](#) found emissions reductions over time in the Caldecott Tunnel, near the San Francisco Bay area.

“These two independent studies highlight the effectiveness of new emissions control technologies and cleaner fuels in diesel engines,” the Forum noted, “and support analyses that suggest that the newest-generation diesel trucks are achieving low emissions in real-world working conditions.”

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HEI recently released *State of Global Air 2019* (see related article, page 1), drawing worldwide media attention. This included prominent coverage in more than 100 news outlets, including:

- The Guardian
- The Hindustan Times
- China Science and Technology Daily
- Bloomberg News
- La Vanguardia (Spain)
- CTV News (Canada)
- DW News (Germany)
- Reuters

Links to many of the articles on *State of Global Air* — and related video coverage — are available at [www.stateofglobalair.org/engage](http://www.stateofglobalair.org/engage). [HEI](#)

## HEI Welcomes New Digital Communications Manager



Sofia Chang-DePuy

This spring, recognizing the rapidly changing nature of science and other communication, HEI created a new position for a Digital Communications Manager. Our aim is

to more effectively share research results from HEI-funded studies as well as inform the air pollution science community and public of HEI’s many other activities.

We are pleased to welcome Sofia Chang-DePuy to this position. Chang-DePuy holds an MPH in Health Communication from Tufts University School of Public Health in Boston, Massachusetts. Previously, she was

the manager of marketing communications at PatientsLikeMe, a graduate researcher at the Dana-Faber Cancer Institute in Boston, and special projects coordinator at the Massachusetts Department of Public Health.

HEI looks forward to expanding our digital outreach with Chang-DePuy’s help and expertise. [HEI](#)

## Traffic Literature Review Well Underway

In line with HEI's current Strategic Plan, an expert panel appointed by the Institute's Board of Directors is actively conducting a systematic literature review on the health effects of long-term exposure to traffic-related air pollution. The review is currently well underway, with preliminary results expected in late 2019. The systematic review will undergo peer review in 2020, and HEI aims to publish it as a Special Report in the summer of 2021.

The health effects of traffic-related air pollution continue to be of important public health interest, with highest exposures in urban settings and at residences close to busy roadways.


Panelists are taking a systematic approach to search the literature, assess study quality,

summarize results, and reach conclusions about the body of evidence. To this end they have developed a review protocol, which they will publish this summer. They will search the literature in PubMed with publication dates between January 1980 and June 2019.

Criteria for selection of health outcomes in the review included relevance for policy and public health, and previous strength of evidence. As a result, the selected health outcomes focus on all-cause and cause-specific mortality, respiratory effects, cardiovascular effects, diabetes, and birth outcomes.

The panel developed an exposure framework to guide the selection and evaluation of epidemiological studies on traffic-related

air pollution, building on the 2010 critical review. Studies will be considered if they were conducted both within and outside the near-road environment and if they had an exposure assignment of less than 5 km. The panel so far has identified about 700 studies relevant for further screening.

A poster was presented at the HEI Annual Conference this year, and results of the review will be presented at the 2020 annual meeting. 

Members of the HEI Panel on the Health Effects of Long-Term Exposure to Traffic-Related Air Pollution are listed at [www.healtheffects.org/air-pollution/systematic-literature-review-traffic-related-air-pollution](http://www.healtheffects.org/air-pollution/systematic-literature-review-traffic-related-air-pollution).


## Communicating the Science

### Applying the HEI Model to Other Important Science Questions

In May, HEI President Dan Greenbaum was invited to address the Gilbert W. Beebe Symposium of the National Academies of Science, Engineering, and Medicine on "The Future of Low-Dose Radiation Research in the United States."

The symposium this year brought together a range of scientists from government and academia to address the continuing needs for better research to understand the effects of exposure to low doses of radiation — and to explore ways in which future research in this at-times controversial arena might be funded and conducted.

The symposium organizers invited Greenbaum to present the HEI model, whereby research is funded jointly by government


and industry and undertaken with high rigor and careful attention to impartiality, ensuring that the results can be viewed as "trusted science" and used to inform important decisions. Greenbaum also described the earlier congressionally chartered effort by the Academies — in which he participated — to develop and monitor progress on a multidisciplinary research program on airborne particulate matter. 

For a copy of the presentation, please contact Dan Greenbaum at [dgreenbaum@healtheffects.org](mailto:dgreenbaum@healtheffects.org); the entire symposium is available as a webcast at <https://livestream.com/nasem/2019beebesymposium>.

## Selecting New Research to Improve Long-Term Exposure Assessment

As spring turns to summer, HEI will be busy selecting high-quality studies for funding.

In March, HEI issued a request for applications (RFA 19-1) on "Applying Novel Approaches to Improve Long-Term Exposure Assessment of Outdoor Air Pollution for Health Studies." The goal of the research program is to advance exposure assessment for long-term air pollution and health studies using sensors, mobile monitoring, tracking technologies, and other approaches. Preliminary applications were due on June 3.

HEI is also in the process of reviewing full applications for RFA 18-1, "Assessing Improved Air Quality and Health from National, Regional, and Local Air Quality Actions," to study the effectiveness of air quality regulations, and preliminary applications for RFA 18-2, "Walter A. Rosenblith New Investigator Award," to support creative early-career investigators with outstanding promise who are interested in the health effects of air pollution. Selected studies will be announced later this year. For more information, visit [www.healtheffects.org/research/funding](http://www.healtheffects.org/research/funding). 

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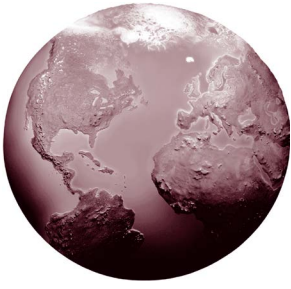
HEI is a nonprofit organization funded jointly by government and industry to research and evaluate the health effects of air pollution. An overview of HEI, information on its current research program, and all published HEI reports are available for downloading, free of charge, from the website.

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### SIGN UP: HEI NEWSLETTER ONLINE

To sign up for e-mail delivery of *Update*, go to "Newsletter Sign-up" at the bottom of our home page, [www.healtheffects.org](http://www.healtheffects.org).



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## A Word with Our Sponsors



HEI Vice President Robert O’Keefe (standing), with (from left) Barbara Hoffmann, Amy Herring, and Allen Robinson of the HEI Research Committee and Tim Wallington of Ford Motor Company. Above right: Wallington with Carol Henry of Cummins.

PHOTO BY MELISSA OSTROW

**H**EI sponsors and the Research Committee gathered in Boston in March. This yearly meeting provides an opportunity for the sponsors to hear an update on HEI’s activities, and this year especially for the Committee to hear directly from the sponsors about priority topics HEI should be addressing in its new Strategic Plan for 2020–2025. 

### MARK YOUR CALENDAR:

HEI Annual Conference  
April 5–7, 2020  
Renaissance Boston  
Waterfront Hotel  
Boston, MA

## Your Input Welcome on HEI’s Next Strategic Plan

**A**t its Annual Conference, held in Seattle in early May, HEI presented its draft Strategic Plan for 2020–2025, [www.healtheffects.org/sites/default/files/First-Draft-HEI-Strategic-Plan2020-2025.pdf](http://www.healtheffects.org/sites/default/files/First-Draft-HEI-Strategic-Plan2020-2025.pdf). This first draft is available for public comment. HEI will finalize the plan this summer and welcomes your comments at this early stage. Please send your thoughts on the draft Plan to [HEIPlan@healtheffects.org](mailto:HEIPlan@healtheffects.org). 