

Science Spotlight

April 2014

Air Pollution Accounts for 1 in 8 Deaths Worldwide, According to New WHO Estimates

By: Paula Whitacre

Air pollution accounts for 1 in 8 deaths worldwide - approximately 7 million deaths in 2012, according to new data from the World Health Organization (WHO). The findings, released in late March, doubled previous estimates from just a few years ago in 2008. WHO now characterizes air pollution as “the world’s largest single environmental health risk.”

“The risks from air pollution are now far greater than previously thought or understood, particularly for heart disease and strokes,” said Dr. Maria Neira, director of WHO’s Department for Public Health, Environmental and Social Determinants of Health. “Few risks have a greater impact on global health today than air pollution; the evidence signals the need for concerted action to clean up the air we all breathe.”



Household air pollution from burning biomass used in cookstoves and for heating contributes to 4.3 million deaths per year.

(Photo courtesy of Global Alliance for Clean Cookstoves)

A Look at the Numbers

According to the [WHO estimates](#), ambient air pollution (AAP), also known as outdoor air pollution accounted for 3.7 million deaths in 2012, most of them (88 percent) in low- and middle-income countries. Household air pollution (HAP) from such things as cooking and heating accounted for 4.3 million deaths, again mostly in low- and middle-income countries. The total number of estimated deaths is 7 million, rather than 8 million, to account for overlap among those who may have been affected by both AAP and

HAP. South East Asia and the Western Pacific bear the largest burden from both sources of pollution.



Ambient air pollution contributes to 3.7 million deaths per year.

(Photo courtesy of epa.gov)

The large increase in the estimates, WHO explains, is due to three main reasons:

- Air pollution can now be linked to a larger number of conditions, including cardiovascular diseases and cancer, in addition to acute respiratory infections and chronic obstructive pulmonary diseases (COPD) (See box).
- Researchers can make more refined assessments of pollutants due to improved measurement and tools
- Non-communicable diseases that may be exacerbated by pollutants are on the rise.

Of the 7 million deaths, 46 percent were men over age 25, 41 percent were women over age 25, and 13 percent were children under age 5. WHO does not have similar data on children and young adults between ages 5 and 25.

Household air pollution results from cooking and heating homes with solid fuels, the effect of which is worsened with inadequate ventilation. Globally, 2.9 billion people, or 41 percent of households worldwide, are exposed to HAP from cooking—78 percent of those in Africa and 63 percent in Southeast Asia. Because of the division of labor in most households that relegates cooking to women, women and younger children who spend more time indoors are disproportionately affected by HAP.

NIEHS and Air Pollution Research

Although not involved in developing the WHO estimates, NIEHS has funded some of the [key research](#) identifying the human health impacts of both ambient and indoor air pollution. “NIEHS research provided the impetus for exploring if HAP was related to overall global health measures,” noted Kimberly Gray, Ph.D., a health science administrator at NIEHS.

In addition to research support, NIEHS scientists also co-chair a working group on cookstove activities across NIH and a White House federal agency taskforce on cookstoves. These efforts bring together initiatives from throughout the U.S. government. “Coordination is essential and fruitful so we share lessons learned and scientific discoveries,” Gray said.

NIEHS has also supported research to study the effects of AAP created by vehicles, power plants, and other sources. In early April, several NIEHS grantees shared their findings with regulators, public health advocates, and others at a conference on “Health Effects of Fine Particles from Vehicular Emissions,” cosponsored by NIEHS and the Energy Future Coalition, and hosted by the Institute of Medicine.

During the opening session of the conference, NIEHS Director Linda Birnbaum, Ph.D. said, “The NIEHS investment in the past two decades has aided in understanding biological plausibility for the health effects observed in epidemiological studies.” Birnbaum underscored that NIEHS-supported research has shown not only respiratory effects, but has also added to our current knowledge on cardiovascular impacts, as well as impacts on the nervous system and birth defects.

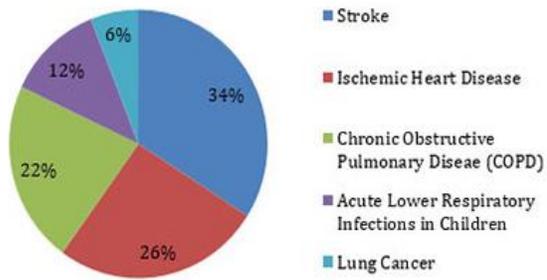
Next Steps

WHO plans to release Indoor Air Quality Guidelines in late 2014. These guidelines on the impacts of different fuels and technologies on air pollution and health will help member countries set their own standards and policies. WHO will also set up what it calls a Global Platform on Air Quality and Health as a way to stimulate coordination and information exchange. They will also continue to track and monitor air quality and health impacts, as well as to cooperate with international initiatives on air quality, energy, and health.

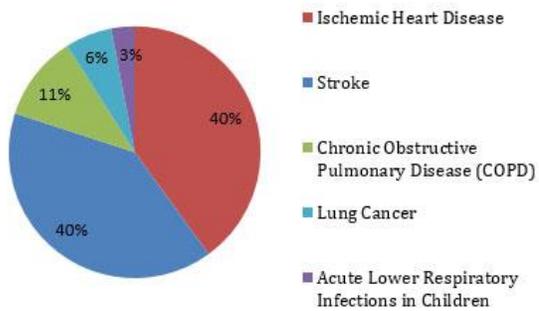
As a WHO Collaborating Center, NIEHS will continue to work with U.S. and global partners to further understand air pollution’s health impacts and to improve public health as a result. “I think by keeping the NIEHS agenda in air pollution and health on the map and in the public eye,” said Gray, “it will enhance our visibility, help us recruit innovative research, achieve our strategic goals in enhanced exposure biology response measures, improve exposure measure technologies, and identify early health effects.”

Indoor Air Pollution Caused Deaths by Disease

Indoor Air Pollution Caused Deaths - Breakdown by Disease



Ambient Air Pollution Caused Deaths - Breakdown by Disease



Charts created using [WHO data](#)