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The air Americans breathe contains more ozone from pollution than the Environmental Protection Agency estimates, Harvard scientists report. Ozone can cause pain, breathing difficulties, and coughing. It can damage the lungs, EPA warns on its Web site, and it can also make one susceptible to respiratory infections. Those active outdoors are particularly at risk for exposure, the agency says.

To calculate air quality standards for ozone, EPA distinguishes between the background or "natural" levels of ozone in the air and that caused by pollution in North America.

"Our results actually indicate that EPA is overestimating the background level, and as a result is underestimating the health risk associated with ozone pollution," atmospheric chemist Arlene Fiore says. This assumption skews the air quality standards that EPA sets, making them weaker than they could be, Fiore and co-authors report in the Journal of Geophysical Research - Atmospheres, published by the American Geophysical Union.

Using a three-dimensional model of atmospheric chemistry, the scientists simulated background ozone for the United States and found great variability in ozone, depending upon the season, elevation, and geographic area. "It is highest at high-altitude western U.S. sites in spring," Fiore says. "Results from our modeling study also indicate that frequent springtime high-ozone events, which were previously attributed by some researchers to a natural, stratospheric source, are driven largely by pollution."

The big question now for EPA and the scientific community is, according to the researchers, should risk levels of ozone be calculated on a type of sliding scale, depending upon the season and place? "Our answer to [this] question is a resounding yes," Fiore says. "Our modeling study shows that background ozone concentrations in surface air are highly variable, and this variability in background ozone—and its associated risk level—should be taken into account."

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