

Decades After Exposure, Air Pollution Linked to Sick Leave

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PARIS — Twenty years after exposure to air pollution — even at levels far below allowable limits — the sick leave that workers take because of respiratory issues is related to that exposure, a Scandinavian study indicates.

Because that region of the world is known for having lower levels of air pollution than many other areas, the findings are particularly startling, said Ane Johannessen, PhD, from the University of Bergen in Norway.

"What this points to is that even parts of world we've considered the safest experience the damaging effects of air pollution," she said here at the European Respiratory Society International Congress 2018.

"If you live in an area with high exposure," you might see "acute effects" after a couple of years, she explained. "In low-exposure areas, there might be a long period before it does damage. But it does do damage."

Numerous long-term studies have looked at the health effects of air pollution, but a follow-up period longer than 15 years is rare, said Johannessen.

She and her colleagues evaluated data on close to 7500 adults from centers in Norway and Sweden who participated in the [Respiratory Health in Northern Europe \(RHINE\)](#) study. Average age was 52 years.

All participants completed a questionnaire about respiratory and all-cause sick leave in the previous 12 months. However, participants were not asked about the specific symptoms that prompted respiratory sick leave, which can range from wheezing to shortness of breath to coughing.

"I suspect that COPD symptoms are part of this, too, particularly because it's typically a disease triggered by long-term, sneaking-in effects," Johansson pointed out.

Damaging Effects

Of the respondents, 34% reported having taken sick leave in the previous 12 months for any cause, and 4% reported having taken it for respiratory causes.

Regression analysis was adjusted for sex, smoking, education, and previous health-related changes in workplace. The home addresses of respondents were geocoded and linked to three measures of annual average pollution: particulate matter levels below 2.5 μm , particulate matter levels below 10 μm , and nitrous dioxide levels.

For all three measures, exposure was much lower than the recommended allowable limits in the European Union.

The data analysis revealed a dose-related increase in respiratory-related sick leave with every quartile increase in air pollution exposure, even when exposure levels fell below recommended international limits, Johannessen reported.

Surprisingly, there was no correlation between nitrous dioxide levels and sick leave, but "I think there's some confounding there we need to disentangle," she added.

In addition, it is "striking" that the relation between sick leave and exposure 10 years ago was not significant, "whereas exposure 20 years ago is absolutely related to respiratory sick leave," Johannessen told *Medscape Medical News*. The relation between sick leave and current exposure was also not significant.

It is compelling that even "low air pollution exposure has such visible effects over the long term," she said. "Perhaps the recommended limits are actually way too high."

"It's kind of depressing, because you can't do anything about 20-year-old exposure," she added. But the data might be helpful, from a public health perspective, "for the future, for city planning, for politicians."

"Thinking ahead is of the essence to reduce exposure, but also to increase green areas in cities," said Johannessen.

These data should be viewed in a broader context, said David Mannino, MD, a respiratory medical expert in COPD at GlaxoSmithKline in Research Triangle Park, North Carolina, who attended the presentation.

"Not seeing an effect with recent exposure, while curious, doesn't negate longer-term effects because people clearly have both exposures," Mannino told *Medscape Medical News*.

"Even though these levels were below action levels for Europe and would be below action levels for the United States," the range is very wide. "It doesn't tell you what's happening over shorter times in certain areas."

The findings need to be confirmed in other populations using different metrics, he said.

Johannessen has disclosed no relevant financial relationships. Mannino is employed by GlaxoSmithKline but has reported no relevant financial relationships.

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