Hazy Dreams: The Impact of Air Pollution on Sleep*

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Abstract

Surprisingly little is known about the causal impact of air pollution on human sleep. Using daily district-level data on sleep duration collected by half a million consumer wearables in Germany from 2020 to 2022, we find that even low levels of particulate matter air pollution adversely affect sleep. We document that a 10 unit increase in the average daily PM10 concentration reduces sleep duration on average by about one minute. To strengthen the causal interpretation of our findings, we employ an instrumental variables approach, using local wind direction as a predictor for local air pollution. Our findings offer a potential mechanism linking air pollution to a wide range of human outcomes. Although the estimated effects are modest in magnitude, the critical role of sleep in human well-being highlights the potential social burden of pollution-induced sleep loss.

Keywords: Air Pollution, Sleep

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