

Can bad air alerts help the public?

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If a dollar is spent to warn people about how much pollution is in the air, is that a dollar well spent? Michael L. Anderson, Minwoo Hyun, and Jaecheol Lee seek to answer this question in their paper [“Bounds, benefits, and bad air: welfare impacts of pollution alerts”](#) (National Bureau of Economic Research, Working Paper 29637, January 2022). Using 2016–17 data from South Korea’s air-quality alert systems (AQAS), which cover 51 million people and warn them of high air pollution, the authors found that air-quality alerts saved over \$7 for each dollar spent.

Anderson, Hyun, and Lee use a regression discontinuity design to determine how air pollution and the avoidance of air pollution can change how much a society spends on healthcare. Because AQAS issue air-quality alerts at particular but arbitrary levels, the authors can calculate expected medical expenditures for similar levels of pollution that are just above and below the cutoff needed for the system to issue an air-quality alert. This design allows the authors to compare healthcare costs across similar levels of pollution with the main difference between the groups just above and below the cutoff being whether or not the system sent an air-quality alert.

The authors reason that air-quality alerts allow people to take safety precautions, such as wearing particulate-filtering masks or avoiding outdoor activities, when air quality is low. These precautions in turn lowers levels of cardiovascular-illness expenditures and respiratory-illness expenditures. The authors calculate that the lower bound for total savings from the alert system was \$41 million (when only considering health savings the day of an alert) or \$51 million (when accounting for what the authors call “dynamic” reductions in health costs) in medical costs over the 2016–17 period studied. Of those figures, 70 percent is public cost reduction and represents saved taxpayer dollars and 30 percent is private cost reduction and represents saved income.

Air-quality monitoring systems are not costless, however. Anderson, Hyun, and Lee estimate the cost of managing the AQAS in 2016–17 at \$4 million, which includes the cost of sending alerts via text messages, maintenance costs, electricity costs, management costs, and other smaller costs. This cost gives the program a public benefit-to-cost ratio lower bound of 7.1 to 1; or 9.2 to 1 when one counts the dynamic benefits.

The authors end by pointing out that their study only covered one country and that for a country in the Organization for Economic Cooperation and Development, it has particularly high air pollution. However, they believe that their findings may still be of interest in countries that have lower levels of pollution. They reason that other countries

may have higher costs of healthcare compared with South Korea (for example, health expenditures per person in the United States are 270 percent higher than in South Korea) and so could see greater reductions in total healthcare costs.