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By Timothy Huzar on November 17, 2020 — Fact checked by Catherine Carver, MPHA new opinion article argues that reducing air and noise pollution is crucial in minimizing cardiovascular-related deaths. Share on PinterestImage credit: Shabdro Photo/Getty ImagesIn the piece, an international team of experts argues that there is clear evidence linking air and noise pollution to an increased risk of cardiovascular disease. The article, published in the European Heart Journal, identifies a number of strategies that may help reduce the effects that air and noise pollution can have on cardiovascular health. According to the World Health Organization (WHO), 17.9 million people die of cardiovascular disease globally each year. This makes it the leading worldwide cause of mortality. The WHO define cardiovascular disease as an umbrella term for a collection of disorders that affect a person's heart and blood vessels. Four out of every five deaths due to cardiovascular disease occur because of a heart attack or stroke. Research has shown that genetics can make a person more susceptible to cardiovascular disease. However, environmental factors — which a person may be able to act on — also play an important role. According to the WHO, key environmental drivers of cardiovascular disease include an unhealthy diet, low levels of physical activity, smoking, and an excessive consumption of alcohol. More recently, however, scientists have conducted research that seems to indicate a link between environmental pollutants and cardiovascular disease. These include both air and noise pollutants. In the present article, the authors argue that attending to these forms of pollution is important for reducing cardiovascular disease mortality. The authors acknowledge that while the evidence of links between air and noise pollution and cardiovascular disease mounts, understanding the specific effects of each factor is more difficult. This is in part because air and noise pollution are often caused by the same issues. For example, a busy road leads to a significant amount of noise from the contact of the vehicles' wheels and the road's surface. Meanwhile, the vehicles' combustion engines and the wear of braking can produce a significant amount of particulate air pollution. Untangling the two factors to better understand how much each contributes to damaging cardiovascular health is challenging. Nonetheless, the authors highlight a report for the European Commission that estimates that air and noise pollution could cost Europe around 1 trillion euros — significantly more than alcohol and smoking. In another piece of research highlighted in the article, global premature deaths due to air pollution were estimated at almost 9 million. And a review conducted for the WHO found that noise from road traffic increases a person's risk of ischemic heart disease by 8% for every 10 decibels of noise. The authors of the article suggest that noise pollution can affect a person's cardiovascular health whether they are awake or asleep. During waking hours, noise pollution can make a person feel annoyed or angry, causing stress. This can result in increased oxidative stress and inflammation, which can damage cardiovascular health. On the other hand, noise pollution can disrupt sleep cycles, which are important for cardiovascular health. The authors highlight that air pollution can also cause cardiovascular damage in a variety of ways. These include, in the short term, the stiffening of arteries and increased blood coagulability, and in the longer term, the buildup of plaques in blood vessels. The lead author of the article — Dr. Thomas Münzel, chief of the cardiology department at the medical center of the Johannes Gutenberg University of Mainz, in Germany — believes that reducing air pollution to WHO-recommended levels, mostly by phasing out fossil fuels, "could prevent around 400,000-500,000 excess deaths of Europeans." Given the harmful effects of these environmental pollutants, more emphasis must be placed on finding effective ways to mitigate them, the authors argue. The most effective way to reduce noise pollution depends, of course, on its cause. The authors note that the options open to individuals and local governments have a minimal effect on their own. As a consequence, they suggest that multiple interventions are necessary in areas more heavily affected by noise pollution. These might include installing noise-reducing windows, using quieter road surfaces and low-noise tires, reducing speed limits, and installing noise-reducing barriers. The authors also report that the most important way to mitigate air pollution is through government intervention. However, "The political momentum required to accomplish this globally is currently limited," they observe. Consequently, they highlight actions that individuals can take, in addition to electing governments that take environmental pollution more seriously. These actions include wearing masks, such as N95 respirators, that are designed to remove damaging particulates from the air, avoiding routes through heavily polluted areas, and exercising. Currently, however, the Centers for Disease Control and Prevention (CDC) do not recommend N95 respirators for public use, as these are critical supplies for healthcare workers and other medical first responders during the ongoing COVID-19 pandemic. The authors of the article highlight that exercise is important, even if it takes a person through a polluted area because the benefits of the exercise very likely outweigh the damage of the air pollution. Nonetheless, if a person has a choice, exercising away from polluted areas is the best option. The authors also suggest that both air and noise pollution can be mitigated through better urban design. This includes creating housing and urban areas that encourage walking, cycling, and the use of public transport and ensuring that urban developments have plenty of greenery but maintain proximity and compactness. Finally, the authors note that increasing the detail of investigations into the link between environmental pollution and cardiovascular disease is important. By having the most compelling and precise evidence possible, clinicians, charities, interest groups, and individuals are in the best position to encourage governments and international organizations to enact systemic change. Heart Disease Cardiovascular / Cardiology Environment / Water / Pollution Climate change is projected to harm human health by increasing ground-level ozone and/or particulate matter air pollution in some locations. Ground-level ozone (a key component of smog) is associated with many health problems, such as diminished lung function, increased hospital admissions and emergency room visits for asthma, and increases in premature deaths. Factors that affect ozone formation include heat, concentrations of precursor chemicals, and methane emissions. Particulate matter concentrations are affected by wildfire emissions and air stagnation episodes, among other factors. By increasing these different factors, climate change is projected to lead to increased concentrations of ozone and particulate matter in some regions. Increases in global temperatures could cause associated increases in premature deaths related to worsened ozone and particle pollution. Estimates that assume no change in regulatory controls or population characteristics have ranged from 1,000 to 4,300 additional premature deaths nationally per year by 2050 from combined ozone and particle health effects. Less certainty exists about the responses of airborne particles to climate change than the response of ozone. Health-related costs of the current effects of ozone air pollution exceeding national standards have been estimated at \$6.5 billion (in 2008 U.S. dollars) nationwide, based on a U.S. assessment of health impacts from ozone levels during 2000-2002. Watch a short video about air quality changes, and learn what communities can do to prepare. CDC Air Pollution Resources:

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