Limit Outdoor Activity on High Air Pollution Days for Heart and Lung Health Transcript

(Transcripts are generated by AI and may contain errors)

Air Pollutionu2019s Global Health Toll

"Limit Outdoor Activity on High Air Pollution Days for Heart and Lung Health" Globally, air pollution is the second leading killer, responsible for over eight million people dying each year from heart disease, COPD, and lower respiratory infections.

It's also a leading risk factor for poor health that disproportionately impacts the youngest and oldest among us. Ninety-nine percent of people live in areas that violate the World Health Organization's air pollution guidelines for fine particulate matter.

It's estimated that improving air quality to WHO standards would increase the average lifespan around the world by almost two years. So, every year, polluted air appears to shave off billions of years of life expectancy.

And the disparities are stark; people in the most polluted areas of the world breathe air that is six times more polluted than those in the least polluted areas.

Air pollution encompasses a complex mixture of solid and liquid particles and gases. Particulate matter is one of the primary components of outdoor air pollution conclusively linked to a range of health effects, earning itself the top designation by the International Agency for Research on Cancer as causally linked to cancer.

PM2.5 and Why It Harms the Heart and Lungs

Fine particulate matter was also highlighted by the American Heart Association for the unequivocal evidence as a cause of heart disease. Fine particulate matter, also known as PM2.5, is less than 2.5 millionths of a meter and invisible to the naked eye but can float deep into the lungs.

It's more than just a trigger of acute cardiovascular events. Longer-term exposure over months to years amplifies these risks. What can we do about it?

In 2014, China declared a war against pollution and pollutant particle levels have since dropped by 41 percent, potentially adding about two years onto its population's average life expectancy.

And almost double that in some regions of the country where air pollution was cut in half. While there is still plenty of room to improve relative to the WHO guideline, China is an example of successfully implementing strict public policies- restricting car traffic in major cities, reducing emissions from coal-fired energy plants, and replacing coal-fired boilers in people's homes with newer models.

Policy Successes and Personal Risk Reduction

Elsewhere, however, such strict policy actions "might not be politically acceptable" as they might inconvenience the population. Until we have better vehicle inspections, public transport, bicycle lanes, and other policies to help clean up the air, what can we do to reduce our personal health risks from air pollution?

The first step is knowing when and where exposures are likely to be more intense. There are websites and apps to help. For the U. S., check out AirNow.

For other regions of the world, the World Air Quality Index project or IQAir's Air Quality app are a couple options. But note that these are in no way an exhaustive list, and there might be a better one for your region.

The Air Quality Index serves as a guide that can indicate when air pollution levels are on the rise and the most susceptible groups should start to take precautions.

The WHO has a similar guideline for key pollutants such as PM2.5 and ozone. For those with heart disease, even short-term exposure to elevated levels over a matter of days can increase hospitalization and risk of death.

Personal strategies to minimize effects of air pollution include limiting physical exertion outdoors on high pollution days and near heavy traffic areas.

A randomized, crossover trial of older men and women found that walking along busy streets "curtails or even reverses" the exercise benefits to the heart and lungs.

Fortunately, traffic pollution concentrations fall rapidly the further you are from a road.

Checking Air Quality and Limiting Outdoor Exertion

For healthy individuals, the U. S. Environmental Protection Agency recommends limiting outdoor activity once fine particulate matter levels reach 55.5 micrograms per cubic meter.

Okay, but what does "limit" mean exactly? In a study of the cleanest versus the dirtiest cities (defined as an average PM2.5 of 100 micrograms per cubic meter or higher) no further health benefits were noted after 15 minutes of exercise.

But susceptible subgroups, like those with pre-existing heart and lung conditions, may need to be more cautious. The World Health Organization recommends that average daily PM2.5 exposures not exceed 15 micrograms per cubic meter, so even if you don't have a pre-existing condition, you may want to think twice about exercising in levels that high.

Note that there is no lower concentration cut-off considered safe. And it's not just particle air pollution you need to worry about. Ozone exposure can be minimized by exercising in the morning, thereby preserving the benefits of physical activity.

The degree, duration, and location of exercise are variables that might have opposing outcomes, given these factors may decrease or increase exposure with the magnitude of exercise.

Given the absence of definitive data on risks versus benefits, it might be prudent to avoid high-intensity exercise altogether on heavy pollution days.

Masks, Respirators, and Exercise Cautions

Close-fitting particulate respirators, such as N95 facemasks, should be considered when pollution is high. They effectively reduce the short-term impacts of air pollution on lung function declines and oxidative stress, with greater beneficial effects on the most polluted days.

But remember, for respirators to effectively work, they need to maintain a tight fit. While N95 masks have shown beneficial cardiovascular effects in randomized trials, on less polluted days, wearing true respirators can negatively impact heart health and act counterproductively, resulting in lower heart rate variability.

A quick word of warning for those with preexisting heart or lung conditions- wearing a respirator increases the work your heart and lungs have to do and could precipitate adverse cardiopulmonary events, especially with heavy exertion.

Is there anything diet can do? I'll cover that next.