

Doubt cast over face mask benefit

May 4 2018



Credit: Heriot-Watt University

Face masks are a common sight in some of the world's most polluted cities but a recent study has cast fresh doubt over their effectiveness.

An international team of researchers led by Professor John Cherrie from Heriot-Watt and the Institute of Occupational Medicine, found significant variations in the quality of the [masks](#) depending on where they are purchased.

Although masks sold for workplace use generally must meet rigorous standards, the study, published in the journal *Occupational and Environmental Medicine*, discovered there are few controls on masks marketed to consumers and little information on which product will offer the best protection.

Professor Cherrie explains: "If it's important for you to protect yourself or your family with masks, choose the best one you can and look for one marketed to workplaces.

"Don't opt for the cheapest option, choose the one that's most likely to do the best job."

The study assessed a selection of masks in Beijing as part of a larger project funded by the Research Councils UK. It also looked at [air pollution](#) in the Chinese capital and its impact on health.

A total of nine different masks were bought from shops in Beijing that claimed to protect against fine particle pollution known as PM2.5, which includes soot, droplets and other [particles](#) smaller than 2.5 microns in diameter.

These tiny particles are components of vehicle exhaust and industrial emissions and can penetrate deep into the lungs and bloodstream.

Researchers first tested the filtration efficiency of each mask by drawing airborne diesel exhaust through a section of the material for 30 minutes and measuring the particulate matter and black carbon concentrations on both sides. They also tested four masks on 10 volunteers who were exposed to diesel exhaust in a lab while performing tasks such as talking, sitting, bending over and walking in place.

Professor Cherrie continues: "The findings of the filtration test were

extremely interesting.

"They showed the average particle and carbon penetration ranged from 0.26 percent to 29 percent, depending on the material used for the mask.

"But when it came to the volunteers, the average leakage ranged from as low and three percent to 68 percent while during sedentary tasks this ranged from seven percent to 66 percent in active movements.

"Only one mask had an average leakage below 10 percent on both active and sedentary tests."

The researchers are now exploring whether people tend to wear [face masks](#) only on high pollution days. They also want to know if the proportion of particles removed by the mask is enough to provide health benefits, and how long people must wear a mask to see those benefits.

Air pollution causes an estimated 1.6 million premature deaths in China each year.

More information: John W Cherrie et al. Effectiveness of face masks used to protect Beijing residents against particulate air pollution, *Occupational and Environmental Medicine* (2018). [DOI: 10.1136/oemed-2017-104765](#)

Provided by Heriot-Watt University

Citation: Doubt cast over face mask benefit (2018, May 4) retrieved 3 May 2024 from <https://medicalxpress.com/news/2018-05-mask-benefit.html>

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