

# Less protection: Covid-19 research shows downsides of face shields and valve masks

Thursday 3 September 2020, by [YAN Alice](#) (Date first published: 3 September 2020).

- **US study finds the more comfortable alternatives give less protection than cloth and surgical coverings**
- **Chinese doctor agrees, and describes exhalation valves as 'selfish' because they only protect the wearer**

Face shields and masks with exhalation valves have become a popular alternative for people looking for protection against Covid-19, the disease caused by the new coronavirus, but American research has cast doubt on their effectiveness.

Researchers from Florida Atlantic University examined the performance of face shields and exhalation valves in impeding the spread of aerosol-sized droplets – one of the main forms of Covid-19 transmission – with disturbing results.

While clear plastic face shields blocked the initial forward motion of the jet of droplets, once expelled they were able to move around the visor relatively easily and spread out over a large area, according to the study published on September 1 in peer-reviewed scientific journal *Physics of Fluids*.

Visualisations for a mask equipped with an exhalation port indicated a large number of droplets passed through the valve unfiltered.

Scientists said they did the research to help the public understand the effectiveness of face shields and masks equipped with exhalation valves, increasingly popular substitutes for regular cloth or surgical masks because people find them more comfortable.

Face shields reduce humidity and fogging when worn with glasses and are easier to breathe in. They also protect the eyes from splashes and sprays of infected droplets, are easily cleaned and disinfected, and allow visual communication for the hearing-impaired.

Unfortunately, smaller aerosolised droplets can penetrate under the bottom of the shield and from the sides of the visor. The researchers found that, over an exposure lasting between one minute and half an hour, the shield was only 23 per cent effective in reducing the inhalation of droplets.

One-way exhalation valves, on the other hand, do not filter the breath of the wearer, potentially exposing other people to infected droplets.

“Overall, the visuals presented here indicate that face shields and masks with exhale valves may not be as effective as regular face masks in restricting the spread of aerosolised droplets,” the study concluded, adding that US Centres for Disease Control (CDC) guidelines discourage the use of face

shields as a sole means of virus prevention.

The CDC also advises that masks equipped with exhalation valves should not be used when a sterile environment is required.

Gao Xiaodong, a hospital infection specialist from Shanghai Zhongshan Hospital, said he agreed with the American researchers that both face shields and masks with exhalation valves had limitations in stopping the spread of the virus.

“It is safe to wear surgical masks inside the face shield,” Gao told the South China Morning Post. “Face shields were invented, not to deal with patients with respiratory diseases, but to protect the wearer’s face from splashes and sprays of body fluids.”

Gao said face shields came in different sizes and many people did not follow instructions on how to wear them correctly.

As for exhalation valve masks, initially invented for use during smog, Gao called them “selfish”, as they provided no protection to anyone except the wearer. “Hospital staff do not wear this kind of mask and no patients are allowed to wear them either,” he said.

**Alice Yan** in Shanghai

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- South China Morning Post. Published: 1:03pm, 3 Sep, 2020. Updated: 10:22pm, 3 Sep, 2020: <https://www.scmp.com/news/china/science/article/3100051/covid-19-research-shows-downsides-face-shields-and-valve-masks>
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- This article appeared in the South China Morning Post print edition as: Face shields and masks with filters ‘ineffective’