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## **Mask is the possible key for self-isolation in COVID-19 pandemic**

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Ma's research shows N95 masks, medical masks, even homemade masks could block at least 90% of the virus in aerosols<sup>1</sup>. This study puts the debate on whether the public wear masks back on the table. Recently Science interviewed Dr. Gao, director-general of Chinese Center for Disease Control and Prevention (CDC). Dr. Gao believed that wearing a mask is an important method to prevent the rebroadcast of COVID-19 from droplets<sup>2</sup>. In fact, the key to effectively control of the outbreak in Asian countries, especially China and South Korea, is full isolation. For individuals, the key method of adequate isolation is to wear a mask which is advised by the Chinese national healthy authority.

Asian countries have relatively large population densities and relatively concentrated populations, so wearing masks in daily life is a common phenomenon, especially in the winter when colds prevail. However, in the traditional concept of European countries and United States, no mask is needed for no illness. However, this is based on a clear understanding of whether one or the other is sick in non-fatal disease. At present, European countries and United

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States mainly adopt the method of social distance between people to reach 6 feet to prevent infection, but for the COVID-19 pandemic, it may not be effective as we supposed.

First of all, the disease is highly contagious, and whether a virus with a reproduction number of more than 2 can achieve true isolation through the so-called social distance by feet is a matter of probability rather than mathematics. A recent MIT study published in JAMA found that social distance requires 27 feet to be guaranteed not to be infected, which is not operational in real life<sup>3</sup>. In addition, there are a large number of asymptomatic infections in this outbreak. They look as asymptomatic as ordinary people, but these groups are as infectious as symptomatic patients<sup>4</sup>. As “normal people”, the surrounding population will lose their vigilance. In fact, in high-risk areas with a large number of patients, without sufficient testing to confirm clean, everyone can only be seen as potential infected, including themselves. Under such circumstances, wearing a mask is the default solution. Finally, the issue of propagation in confined spaces is a very important issue which was often ignored. Tests have shown that COVID-19 can exist for several hours in the state of the smallest of these droplets, sometimes called aerosols<sup>5</sup>. In fact, there have been cases of concentrated infection by a large number of people in confined spaces<sup>6</sup>. When we perform so-called "necessary activities" in a closed environment in supermarkets, banks, or public

transportation, such as subways, if there are asymptomatic patients or in incubation period, the risk of infection is still high. Although there are no large-scale randomized clinical trials to explain the above problems, at a critical point in life and death, it is better to consider an option harmless to general population than to ignore it and cause more people to be infected.

If it is caused by insufficient mask, the first priority is to increase the production of masks and purchase from other countries, rather than recommending that people do not wear masks, thereby increasing the chance of mutual infection. Of course, general public may only need to wear ordinary masks and do not need to change them every day, and hospital professionals need to wear professional masks, including surgical masks and N95 masks, which needs periodic replacement and disinfection.

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