

A layer of cool, healthy air

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Stratum ventilation systems have been touted as a much more energy efficient system for cooling buildings such as school rooms and offices in hotter climes based on the provisions of the recent ANSI/ASHRAE 55-2010. They may also reduce the risk of the spread of airborne diseases according to a study to be published early next year in the journal *World Review of Science, Technology and Sustainable Development*.

This approach to cooling small and medium-sized rooms in a building has come to the fore as a low-cost alternative to high-energy air-conditioning systems particularly in East Asia and is being recommended for school buildings and other establishments by several governments. In this system a horizontal [airflow](#) is produced. However, Lin and colleagues hoped to address the potential problem with any air distribution system in understanding how it might disperse airborne viruses, such as flu viruses, present on expectorated sputum [droplets](#).

Zhang Lin, Jinliang Wang, Ting Yao, T.T. Chow and K.F. Fong of the City University of Hong Kong have created a [computer model](#) to help them predict the movements of exhaled droplets in a room with different types of air distribution systems: mixing ventilation, displacement ventilation and stratum ventilation. The simulation is based on the so-called drift-flux model developed from an Eulerian-Eulerian approach is adopted to simulate the particle movement in a room.

"The results show that the [flow patterns](#) created by different ventilation methods have great influence on the particle fates," the team explains.

The [particle concentrations](#) for the breathing zone under stratum ventilation are significantly lower than that under mixing ventilation or with displacement ventilation. "This implies that the risk of pathogen inhalation under stratum ventilation is also lower," the team adds. The team's model demonstrates that of the various ventilation systems the occupants of stratum ventilated room would have the lowest risk of infection.

More information: "Numerical comparison of dispersion of human exhaled droplets under different ventilation methods" in World Review of Science, Technology and Sust. Development, 2013, 10, 142-161.

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