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The determination of the effectiveness of mouth covering method while coughing using Background-oriented schlieren technique

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Many airborne infections can easily be transmitted from a patient through coughing, sneezing, or even talking. This encourages awareness of wearing a mask as a protection. This research demonstrates the dispersion characteristics of exhaled airflow through the different ways of protection using background-oriented schlieren (BOS) technique to visualize the air flow around facial area of a demonstrator. Circumstances such talking and coughing under the different modes of protection were video recorded and processed with a MATLAB PIVlab toolbox to visualize the characteristics of the airflow around facial area. It was found that there is always air leakage out from protected masks while coughing in which surgical mask performed poorly when compared with N95 masks. Nonetheless, wearing mask can significantly reduce the speed of airflow.

Nonetheless, there is a small amount of dispersion of the airflow from the protected circumstances. The characteristics of each dispersion relate to the shape of the mask. The high potential of the protection can be respectively classified as N95 mask without valve, N95 mask with valve, and surgical mask. On the other hand, all protection has a potential in reducing airflow dispersion comparing to unprotected circumstance.

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