

## Effectiveness of a personalized ventilation system in reducing personal exposure against directly released simulated cough droplets - DTU Orbit (08/11/2017)

### Effectiveness of a personalized ventilation system in reducing personal exposure against directly released simulated cough droplets

The inhalation intake fraction was used as an indicator to compare effects of desktop personalized ventilation and mixing ventilation on personal exposure to directly released simulated cough droplets. A cough machine was used to simulate cough release from the front, back, and side of a thermal manikin at distances between 1 and 4m. Cough droplet concentration was measured with an aerosol spectrometer in the breathing zone of a thermal manikin. Particle image velocimetry was used to characterize the velocity field in the breathing zone. Desktop personalized ventilation substantially reduced the inhalation intake fraction compared to mixing ventilation for all investigated distances and orientations of the cough release. The results point out that the orientation between the cough source and the breathing zone of the exposed occupant is an important factor that substantially influences exposure. Exposure to cough droplets was reduced with increasing distance between cough source and exposed occupant.

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Authors: Pantelic, J. (Ekstern), Tham, K. W. (Ekstern), Licina, D. (Intern)

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