Bulletin de veille émissions d'aérosols par l'appareil respiratoire humain N° 26 – Janvier 2026

Objectifs : veille scientifique sur les émissions d'aérosols (gaz et particules) par l'appareil respiratoire humain (nez/bouche).

La validation des informations fournies (exactitude, fiabilité, pertinence par rapport aux principes de prévention, etc.) est du ressort des auteurs des articles signalés dans la veille. Les informations ne sont pas le reflet de la position de l'INRS. Les éléments issus de cette veille sont fournis sans garantie d'exhaustivité.

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Kulmala I, Karvinen A, Hakala J, Kultanen M, Säämänen A.

Dynamics of Aerosol Dispersion Between Occupants in an Office Space.

Indoor Air. 2025;2025(1):2867690.

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This study experimentally investigated the transport dynamics of exhaled aerosols, which may carry infectious pathogens, in a mixing-ventilated test room using three heated dummies as human simulators. Two dummies were seated at desks separated by a partition wall, while the third stood nearby. Each dummy acted as an infector one at a time, releasing test aerosols through a low-momentum horizontal jet simulating continuous mouth exhalation. Aerosol concentrations were monitored using 28 sensors to provide high-resolution data on aerosol spread dynamics. The mixing ventilation air change rates were 1.8 and 3.2 1/h, and additional measurements were conducted with an air cleaner in operation. CFD simulations revealed that particles from the low-momentum exhalation jet were deflected upwards by the dummy?s thermal plume and quickly mixed with supply air from a circular ceiling diffuser. The results showed that the exhaled particles reached the exposed person?s breathing zone within 20?100?s. Particle concentrations were relatively uniform throughout the room, indicating that a well-mixed approximation is suitable for estimating airborne infection transmission risk from indirect exposure in small spaces. Relative transmission risks were analysed under various conditions. While the partition wall delayed initial exposure, it had minimal impact on long-term risk. Air cleaners increased air mixing and reduced the delay between aerosol release and exposure, potentially elevating short-term risk. However, the long-term benefits of enhanced ventilation outweighed the initial increase in risk, reducing overall airborne infection transmission over extended durations.