

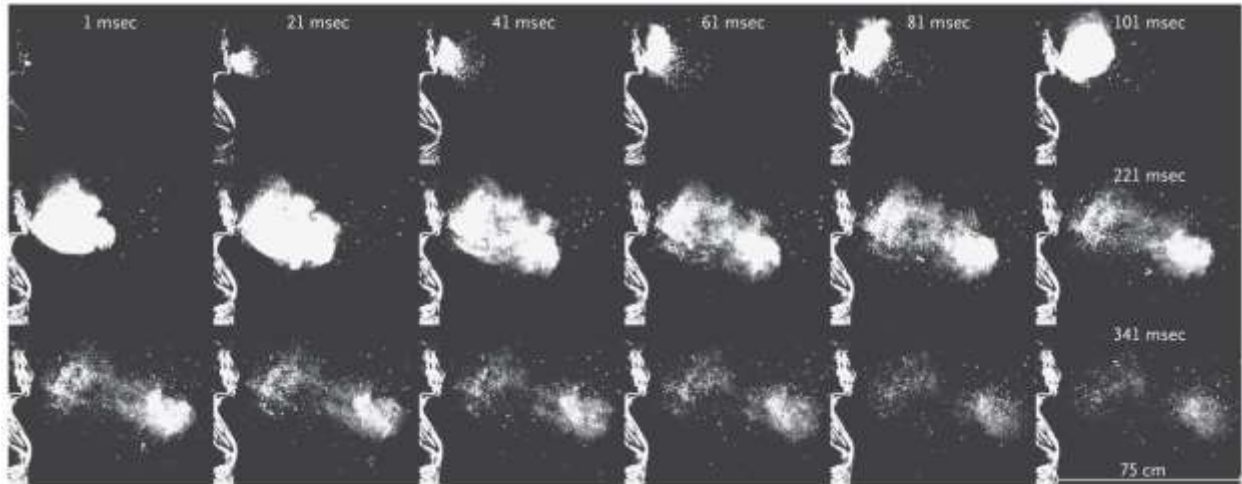
# THE LANCET

## Respiratory Medicine

### **Supplementary appendix**

This appendix formed part of the original submission and has been peer reviewed.  
We post it as supplied by the authors.

Supplement to: Fennelly KP. Particle sizes of infectious aerosols: implications for infection control. *Lancet Respir Med* 2020; published online July 24.  
[http://dx.doi.org/10.1016/S2213-2600\(20\)30323-4](http://dx.doi.org/10.1016/S2213-2600(20)30323-4).



**Figure. Specialized photographs of aerosol plumes. Sneeze (top panel)** From New England Journal of Medicine. Bourouiba L. A Sneeze. Vol. 375:e15. Copyright © 2016 Massachusetts Medical Society. Reprinted with permission from the Massachusetts Medical Society. **Cough (bottom panel).** Reprinted with permission from New England Journal of Medicine. Tang JW and Settles GS. Coughing and Aerosols. Vol. 359:e19 © 2008 Massachusetts Medical Society. Reprinted with permission from Massachusetts Medical Society.

## Panel: **Definitions**

Infectious aerosol: a suspension of pathogens in particles in the air.

Surgical or medical masks: Face coverings of the mouth and nose initially designed to protect sterile fields from wearers. They are usually loose-fitting and come in a wide variety of designs. They are not regulated or certified for protection against inhalation hazards.

Respirators: Face coverings of the mouth and nose designed to protect the wearer from airborne inhalation hazards. They are certified by the National Institute of Occupational Safety and Health (NIOSH) in the U.S.

Negative pressure respirators: Tight-fitting respirators in which the wearer generates negative pressure with inhalation, which pulls the outside air through filter material.

Filtering Facepiece Respirators (FFP): Negative pressure respirators in which the body of the respirator is the material that filters the air.

N95 respirator (U.S.) A FFP with filter material that is certified by NIOSH to be 95% efficient in removing test particles but is not resistant to oils. (Note that this is not the efficiency for the respirator as a whole unit.) Similar respirators in other countries are FFP2 (Europe), KN95 (China), P2 (Australia/New Zealand), DS2 (Japan) and Korea 1<sup>st</sup> class.

Face-mask leakage: The passage of air through spaces between the face and the respirator or mask. This is the weakest point of negative pressure respirators, presenting the need for fit testing.

Fit testing: A procedure in which the amount of protection offered by a respirator is determined. Qualitative fit-testing exposes the test subject wearing the respirator to aerosols of either saccharin or Bitrex (a bitter tasting substance). A failure occurs if the subject can taste the substance. Quantitative fit-testing involves measuring particles in the air outside and inside the respirator to determine a fit factor.

Fit factor (FF, U.S. nomenclature): The ratio of the number of particles outside over inside the respirator during quantitative fit testing. In the U.K., this is referred to as the 'reduction factor (RF).' These factors are the inverse of leakage. For example, a FF of 10 is equivalent to a leakage of 10%.

Assigned protection factor (APF): A NIOSH designation for the estimated protection offered by a class of respirators, using the same ration as the FF above. APFs for respirators commonly used in health care settings are 10 for FFPs and elastomeric half-face respirators and 25 for PAPRs.

Elastomeric half-face respirator: A negative pressure respirator made of a flexible material such as silicone or rubber that covers only the mouth and nose, with a filter inside a cartridge that attaches to the mask.

Powered-air purifying respirator (PAPR): Positive-pressure respirators with a covering over the entire face and/or head (offering eye protection) and a battery-operated pump that pulls air

through a filter and pushes it into the facepiece over the face of the wearer. These are the only respirators appropriate for persons with beards.

Airborne infection isolation room (AIIR): a room equipped with (1) enhanced dilution ventilation to reduce the concentration of airborne pathogens and (2) negative-pressure to prevent contaminated air from leaving the room.

Ultraviolet germicidal irradiation (UVGI): Light in the wavelength of UV-C that can be used to disinfect room air if directed to the upper room air and facilitated by mixing of room air. UVGI can also be applied to surfaces or items, such as masks or respirators, currently on a research basis. There is a hazard of keratoconjunctivitis if exposed to persons' eyes.