Contact transmission

41. Contact transmission is the most common route of infection transmission and consists of two types: direct and indirect contact:

    a. Direct contact transmission may happen when infectious agents are transferred directly from one person to another. Examples include body fluids from an infected person entering another person's body through mucous membranes, cuts, or abrasions. This also includes shaking the hand of an infected person allowing pathogens to be transferred directly from one person to another when there is physical contact.

    b. Indirect contact transmission may occur when infectious agents are passed from an infected person to another individual via a contaminated person or an object (also referred to as a 'fomite'). Examples in healthcare settings include shared patient care equipment not being correctly cleaned between uses, contaminated items such as toys, and inadequately sterilised surgical instruments.

Droplet transmission

42. Droplet transmission involves droplets (5µm to about 200µm in diameter)[6] from an infected person's respiratory tract reaching the eyes, nose, or mouth of another person.

43. Large droplets (>20µm) typically fall to the ground or surfaces within a 1 metre (c.3 foot) range from the source, which is considered the highest risk area for potential transmission. However, how long droplets remain suspended in the air depends on factors such as particle size, settling velocity, temperature, humidity, and airflow. Large droplets fall to the ground within seconds, while smaller droplets (5µm to 20µm) can stay airborne for several minutes before settling.

44. Droplets are produced by talking, coughing, or sneezing, and can also be generated during healthcare procedures that cause splashing or spraying of body fluids, such as open suctioning, endotracheal intubation, and cough induction by chest physiotherapy.

45. Infectious agents transmitted via droplets include *Bordetella pertussis* (whooping cough), influenza virus, adenovirus, rhinovirus (most frequent cause of the common

[6] µm is a micrometre or 'micron', it is one millionth of a metre (0.000001m) or one thousandth of a millimetre (0.001mm).

cold), *Mycoplasma pneumoniae*, coronavirus (those which cause the common cold and those associated with more severe disease such as Severe Acute Respiratory Syndrome (SARS)), and *Neisseria meningitidis* (which can cause meningitis).

Airborne transmission

46. Airborne transmission involves infectious particles or droplet nuclei (aerosols) in the respirable size range that can remain suspended in the air for long periods and be dispersed by air currents over distances greater than 1 metre.

47. Short-range aerosol transmission involves tiny respiratory droplets (less than 10μm in diameter) that can spread over short distances (less than 2 metres). This is more likely in poorly ventilated indoor spaces where these aerosols can accumulate e.g., in a crowded room or during specific activities that produce more aerosols such as singing or shouting.

48. Long-range aerosol transmission refers to the spread of pathogens through very small particles that remain suspended in the air for long periods and can travel longer distances, potentially spreading between different rooms or even through building ventilation systems. This is typically associated with highly infectious diseases that can stay viable in the air for extended periods, like measles or tuberculosis.

49. It is my view that the distinction between a respiratory aerosol and droplet in terms of size (micrometres) is an academic consideration that cannot be usefully applied in national guidance or by healthcare workers in 'real' clinical environments. This is because:

    a. Patients are often diagnosed based on medical criteria, not confirmed pathology (laboratory testing).

    b. Devices to measure particle size are not widely available in clinical environments, and would require specialised training, which could delay patient care.

    c. Measuring particle size does not confirm the presence of a viable virus - particle size is only one of several considerations related to communicable disease transmission.

50. While there is a difference in transmission related to particle size and viral load, from an IPC perspective, both aerosols and droplets represent a risk. Therefore, mitigation