

INDOOR VS OUTDOOR BIOAEROSOLS

The main origin of bioaerosols is an outdoor environment. However, the indoor environment is a rich source of bioaerosols as well. Indoor air is particularly significant as we spend most of our time indoors. Several building materials such as water tanks, wallboard, wallpaper, ceiling tiles, carpets, plastic, wood, cement and bricks can all favour microbial colonization (i.e., mould) and therefore contribute to the release of the bioaerosols.

Ventilation of the indoor environment plays a key role in the amount of exposure to bioaerosols. We live and work in increasingly well insulated (energy saving) homes, which means they are often well sealed, causing levels of bioaerosols to accumulate. This can lead to serious health issues; for example, damp moulds that produce fungal bioaerosols.

Simple steps such as opening windows allows air to circulate. This does introduce bioaerosols from outdoors, but this is not necessarily a bad thing, as exposure to bioaerosols allows us to build immunity to bacteria.

HEALTH IMPACT OF BIOAEROSOLS

Natural or anthropogenic exposure to bioaerosols, in both indoor and outdoor environments, may cause

significant negative effects on human health, including infectious and respiratory diseases, allergies, and cancer. Airborne microbes may cause pneumonia, influenza, measles, asthma, allergies, and gastrointestinal illness.

DISPERSAL OF BIOAEROSOLS

Bioaerosols travel on global scales (between continents) and play a critical role in the dispersal and reproduction of plants and fungi (e.g., spores and pollen). Size plays a big role in bioaerosol dispersal. Smaller particles stay airborne much longer than larger ones. Therefore, smaller bioaerosols can travel farther from the source.

For pathogenic (disease-causing) bioaerosols, this is vitally important. For example, when you have a cold, you exhale small viral particles that may remain in the air even after you have left the room (especially if the room is not well ventilated). Some animal diseases, such as foot and mouth disease, can be transported through dozens of kilometres and infect animals downwind from a farm with infected animals.

The settling rate of bioaerosols depends on size. Smaller particles can disperse further as they are in the air for longer and can be carried farther by wind.

