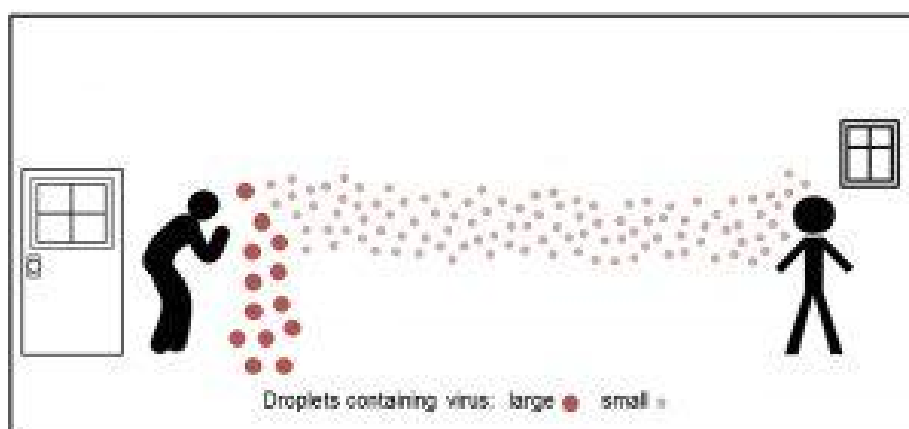
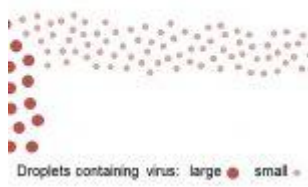


Should we consider aerosol vaccines for COVID-19



Source: Morawska & Cao

Despite, the advancement of the COVID-19 pandemic there is still contention on whether the virus is spread predominantly via contact and fomite or aerosol transmission. Initial transmission prevention strategies primarily focused on mitigating contact and fomite transmission by recommending regular hand washing (and sanitisation) and social distancing. This recommendation was later refined to include mask-wearing as a way to prevent inhalation of droplets containing SARS-CoV-2. However, formally aerosol transmission is not considered as the main mode of transmission. Historically droplets that $<5\mu\text{m}$ are defined as aerosols, however, many scientists are advocating for clarification of this definition suggesting that a $100\mu\text{m}$ size threshold should be used to distinguish between aerosols and droplets. Thus, resulting in classifying airborne transmission as the major mode of SARS-

CoV-2 transmission, similar to its predecessor SARS-CoV-1. This is also supported by evidence of individuals spreading SARS-CoV-2 via aerosols (Prather et al., 2020).

Since we know that SARS-CoV-2 is airborne, we would be better served by a vaccine that would be delivered intranasally in order to promote an IgA response that targets the virus at mucosal sites rather than an intramuscular administration that predominantly induces IgG neutralizing antibodies that have a limited contribution to the mucosal defence against the virus. Further, IgG has a greater risk of promoting antibody-dependent enhancement. And perhaps, more importantly, the intranasal administration of a vaccine is more cost effective and less risky with respect to accidental needle sticks, reuse of syringes and medical waste.” (Source: Craig Travis personal correspondence)

Summary by Cheleka Mpande

References:

- Morawska & Cao. 2020. [Airborne transmission of SARS-CoV-2: The world should face the reality](#). Environment International.
- Meyerowitz et al., 2020. [Transmission of SARS-CoV-2: A Review of Viral, Host, and Environmental Factors](#). Annals of Internal Medicine.
- Prather et al., 2020. [Airborne transmission of SARS-CoV-2](#). Science
- Travis. 2020. [As Plain as the Nose on Your Face: The Case for A Nasal \(Mucosal\) Route of Vaccine Administration for Covid-19 Disease Prevention](#). Frontiers in Immunology
- [Airborne Transmission of SARS-CoV-2: A Virtual Workshop](#)