## Assessment of transmission of COVID-19 in singing and music events

Question for NERVTAG:

2. Does NERVTAG consider that there is sufficient evidence for singing events to be a risk factor for transmission from a laboratory confirmed index case of COVID-19 to others to justify specific public health recommendations for controls on this activity during the pandemic?

Across the UK, 2 million people regularly sing and there are 70,000 choirs. This is an important question affecting the lives and livelihoods of many people. Singing groups come in all shapes and sizes, participants young and old and singing takes place in many settings, e.g. churches, schools, not just choirs. Participants range from professional singers where the activity is their livelihood through to amateur groups.

Beyond singing, concerns have also been raised about projected speech in theatres and playing of woodwind and brass instruments. Restriction of these activities again affects a very large number of people including almost all professional theatre and orchestral groups.

### Routes of transmission:

Virus laden respiratory secretions expelled by infectious individuals are responsible for the person to person transmission of COVID. These secretions can transmit infection in a variety of ways, largely dependent on the size of the droplets that make up these secretions.

Large droplets can impact directly on mucus membranes or they can settle on surfaces and then can be picked up by hands and transported to mucus membranes.

Smaller droplets (aerosols) can be inhaled and deposit somewhere in the respiratory tract; the smaller the particle the further it can advance. It's also possible that smaller droplets can deposit on surfaces too.

It remains uncertain what the relative contributions from large droplet contact, aerosol inhalation and surface contamination are in the transmission of COVID. It's likely that all play a role with the circumstances acting at any given moment defining what may happen. Despite all we know about influenza, it has proven very difficult to tease out what the most common mechanism(s) is and the same currently holds true for COVID. Nevertheless, most authorities currently state that large droplet and surface contamination are dominant routes for COVID.

In support of a role for aerosols, evidence is accumulating that virus laden aerosols can be detected around patients with COVID (1-3) and a case report describes the likely involvement of aerosols in an outbreak scenario (4).

### Respiratory secretion production during singing:

A comprehensive evidence review has been undertaken by Alberta Health Services in Canada https://www.albertahealthservices.ca/assets/info/ppih/if-ppih-covid-19-sag-singing-risk-transmission-rapid-review.pdf. A summary can be found in the supplementary information section at the end of this paper.