Choirs and Aerosols
Information Sheet: Professor Martin Ashley

What are aerosols?

In this context an aerosol is a tiny particle of moisture expelled during respiration. An aerosol is 5 microns or less in diameter. As it is so small it floats around in the air (suspension). It does not fall to the ground under gravity as do particles bigger than 5 microns. The 2m social distancing rule is mainly based on the behaviour of the bigger particles that fall to the ground within two meters and remain on surfaces.

Why do they constitute an additional risk to choral singing, over and above the risks common to all social activities?

During vigorous exercise of the voice thousands of aerosol particles break from the mucosal layers (protective fluid) of the vocal tract through a process known as "fluid-film burst". Loud use of the voice can release 50 times as many aerosols as normal speech.

Since most choral singing takes place indoors, aerosol particles do not disperse in the way they would do outdoors. They can be contained and build up in concentration in the atmosphere of a church or concert hall.

Scientists are still researching the way aerosols travel indoors. We do not know all there is to know.

A significant proportion of scientists think that an aerosol particle can carry a viable virus load, but there is not complete agreement on this.

There is uncertainty concerning the effects of atmospheric conditions. Aerosols may evaporate in low humidity conditions but not high humidity. This is a neglected area requiring further research.

There is uncertainty concerning the training of the singers. Amateur singers may generate higher aerosol concentrations that trained professional singers with efficient breath management.

What additional control measures can be used for aerosols?

The larger the space the better. A small intimate concert setting would be riskier than a cavernous cathedral. So, one control measure would be to book a large hall and reduce the number of singers.

Always use the largest available space. So, this might mean all rehearsing in the hall or church, not a small practice room.

Another would be to ensure there is plenty of air circulation. Doors and windows open, but do not use fans. Floor to ceiling air movement might be good if the building has that facility (according to *one* study).

Also, a generous interpretation of social distancing. Stick with at least 2 metres. Probably unwise to reduce this.

Shorter than usual rehearsals with more frequent breaks.

How effective will these control measures be?

We cannot be certain until it is possible to measure what actually happens when choirs sing under controlled conditions.

But if all other risks have been reduced to a minimum (e.g. the country or region already has the virus well under control, as in an R number comfortably and consistently less than 1) the control measures might be effective to some degree at least.

Worth the risk? You must decide. I cannot tell you. The UK government says "follow the science". This is the science.

Source: Ashley, M. (2020) Where have all the singers gone, and when will they return? Prospects for Choral Singing after the SARS-CoV-2 Pandemic. *ABCD Choral Directions Research*. Vol 1 supplement, May 2020