

New COVID-19 study could help performers back on the stage

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The performing arts have been hit hard by the restrictions enforced during the coronavirus pandemic. In particular, singing has been identified as a potentially "dangerous" activity following the occurrence

of clusters of COVID-19 cases, in several choirs around the world. Despite there being no clear evidence that these cases are linked to the activities themselves, singing and playing of woodwind and brass instruments has effectively been banned in many countries. A new collaborative study will explore whether singing and the playing of woodwind and brass instruments produces more respiratory particles than speaking and whether the size and temperature of a venue makes a difference to the generation and accumulation aerosol droplets and particles.

The research project, known as PERFORM (Particulate Respiratory Matter to InForm Guidance for the Safe Distancing of Performers in a COVID-19 Pandemic), is supported by Public Health England, and will be carried out by a collaborative team from Imperial College London, University of Bristol, Wexham Park Hospital, Lewisham and Greenwich NHS Trust, Royal Brompton Hospital and ARUP.

The researchers will carry out a number of scientific experiments to investigate airborne [droplets](#) produced during breathing, speaking, singing, and the playing of brass and woodwind instruments. The experiments will include the same individuals singing and speaking between the decibel (dB) ranges of 50–60, 70-80 and 90-100 dB. The effects of these activities in an indoor environment, with defined air change rates, versus an unventilated empty space will also be explored.

It is widely agreed in the infectious diseases community, that virus transmission between humans happens by direct person-to-person contact, and indirect (contact with contaminated surfaces); in addition, airborne (aerosols and droplet) mechanisms have been implicated in the transmission of the SARS-2-CoV virus.

The research will be crucial in the disease response efforts and could provide guidance for the reopening of arts venues and the safe distancing

of performers, during the COVID-19 pandemic.

The project aims to understand and find out:

- The amount of respiratory [aerosol](#) particles and droplets created by breathing, speaking, singing, coughing, and the playing of woodwind and [brass instruments](#).
- The effect of distance on the amount of respiratory particles transmitted by breathing, speaking, singing, coughing, and the playing of woodwind and brass instruments.
- To explore how the length of the performance, volume, pitch and number of performers relates to the amount of respiratory aerosol particles and droplets produced in a venue.
- To understand the impact of performance length, venue size and ventilation regimen on the concentration of respiratory aerosol particles and droplets accumulating in a venue.

Pallav Shah, Professor of Respiratory Medicine at Imperial College London, Consultant Respiratory Physician at the Royal Brompton and Harefield NHS Trust/Chelsea and Westminster Hospital, who is leading the project, said: "The current pandemic has paralyzed the music and theater industry, with concerns about the aerosol spread of COVID-19. This elegant study is being co-ordinated by Natalie Watson & Declan Costello, to address whether singing or the playing of brass and wind instruments spread aerosol particles beyond normal speech."

Jonathan Reid, Professor of Physical Chemistry in the School of Chemistry at the University of Bristol, a co-investigator on the project, added: "Using technology developed at Bristol we want to understand the aerodynamic behavior of droplets and airborne particles by singers and musicians and how the size and temperature of a venue impacts respiratory aerosol droplets and particles. We hope our research will provide a rigorous scientific basis for a plan of action to enable arts

venues to operate safely for both the performers and audience."

More information: For more information about the University of Bristol's coronavirus (COVID-19) research priorities visit:

[www.bristol.ac.uk/research/imp ... research-priorities/](http://www.bristol.ac.uk/research/imp...research-priorities/)

Provided by University of Bristol

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