

Singing and brass/woodwind instruments COVID-19 transmission risk, evidence overview

Playing brass and woodwind instruments, singing, talking loudly and shouting are considered higher risk activities due to their potential for further propelling infectious airborne particles.

The below is taken from a comparison of breathed air spread through playing a number of brass and woodwind instruments and singing¹, giving some indication of projection distances of aerosols. This was not compared with normal speech or breathing.

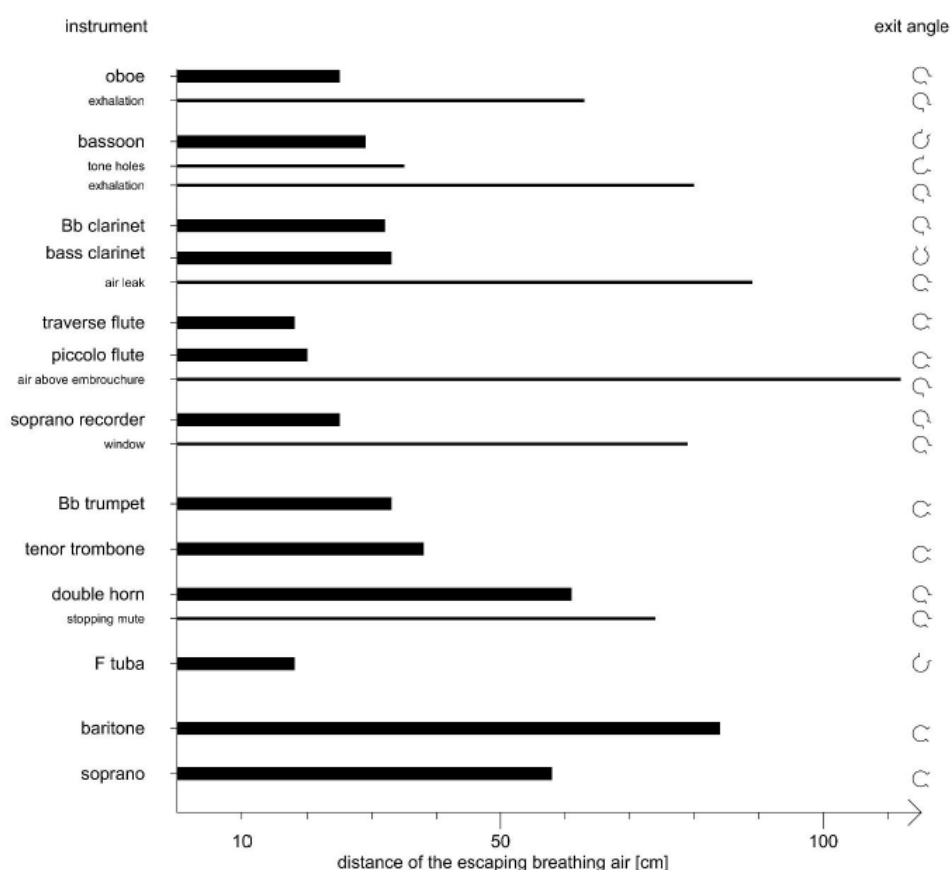


Table 1 Maximal spreading distance of the breathing air from wind instruments and singers

The evidence for transmission through singing or playing brass and woodwind instruments is either from this kind of study, that demonstrates the potential for aerosol spread, or from observational studies, where group singing preceded diagnosis in COVID-19 clusters. In the latter reports, multiple routes of transmission (e.g. prolonged close contact, touching common objects, or sharing food) have not been ruled out as contributing to spread.

Instances of ‘superspreading’ have been reported throughout the pandemic, including in exercise classes, bars, restaurants, funerals and churches. A BMJ review of factors that create superspreading events² outlines five types of factors that promote superspreading:

1. High rates or intensity of contact between people or with surfaces
2. Large aggregations of people
3. Poorly ventilated physical environments, especially indoors
4. Highly infectious individuals
5. Highly susceptible recipient population

The authors highlight that settings where superspreading has occurred combine multiple risk factors, and that choir practices, for example, are an example which can combine the risk factors of high densities of people, a high-risk activity (singing), and potentially poorly ventilated indoor spaces.

Some individuals are also thought to be more efficient at spreading infectious aerosols than others, and superspreading events may be more likely if superspreading individuals are present.

Consistent with this, one study comparing aerosol release across different instruments showed that variation between different instruments was less significant than the difference between individual players, and no discernible pattern related to either instrument size or design could be established³.

Risk comparisons

Example 1: talking, talking loudly and normal breathing

- Breathing and singing showed consistent numbers of aerosol type particles produced⁴, with mean values of:
 - 6.59x10⁷ aerosol type particles/m³ from breathing
 - 5.28x10⁷ aerosol type particles/m³ from singing
- Talking loudly has been categorised alongside singing in the level of transmission risk it poses⁵
- Aerosol emission has been shown to increase in correlation to loudness of voice⁶.

Example 2: working in an office

A meta-analysis of transmission risk across common activities⁷ indicates

- Work meetings lasting 1 hour associated with a transmission rate of 72.7% (43.6-98.0)
- Employees working together on the same open plan floor (where there is sufficient movement of people) is associated with a transmission rate of 78.7 (CI. 70.3-85.3%).
- Practicing singing in a group for around 2 hours, along with a high level of mixed social interactions is associated with a transmission rate of 86.9% (CI.76.2-93.2%)

Conclusion

The above highlights the limited key peer reviewed findings assessing the risk of singing, brass and woodwind instruments. While there have been COVID-19 outbreaks in contexts where singing has taken place, and biological plausibility of risk, the extent to which singing and playing of brass/wind, in itself, increases risk, remains unclear.

¹ Becher, Lia, Amayu Wakoya Gena, and C. Völker. "Risk assessment of the spread of breathing air from wind instruments and singers during the COVID-19 pandemic." (2020).

² Kain, Morgan P., et al. "Chopping the tail: how preventing superspreading can help to maintain COVID-19 control." medRxiv (2020).

³ Parker, Alexander Stuart, and Kenneth Crookston. "Investigation into the Release of Respiratory Aerosols by Brass Instruments and Mitigation Measures with Respect to Covid-19." medRxiv (2020).

⁴ Parker, Alexander Stuart, and Kenneth Crookston. "Investigation into the Release of Respiratory Aerosols by Brass Instruments and Mitigation Measures with Respect to Covid-19." medRxiv (2020).

⁵ Buonanno, Giorgio, Lidia Morawska, and Luca Stabile. "Quantitative assessment of the risk of airborne transmission of SARS-CoV-2 infection: prospective and retrospective applications." medRxiv (2020).

⁶ Asadi, Sima, et al. "Aerosol emission and superemission during human speech increase with voice loudness." Scientific reports 9.1 (2019): 1-10.

⁷ Prakash, Meher K. "Eat, Pray, Work: A meta-analysis of COVID-19 Transmission Risk in Common Activities of Work and Leisure." medRxiv (2020)