Aerosol Study FAQ's Blog

By International Coalition on Aerosol Study on August 25, 2020

Disclaimer: All information provided through the study is to be used strictly for general consideration. This information will be updated when it becomes available, please share the link to the coalition page.

Over 125 organizations have pledged their support and donated time and resources to find ways to reduce the risk of returning to rehearsals and performances for music, speech, debate, theatre, academic, and aerobic activities. Researchers at the University of Colorado Boulder and the University of Maryland are over one month into a six-month study.

We understand the gravity of the situation and want to help everyone who has questions, comments, and concerns. The most commonly asked questions are compiled below. If you do not see your question answered, please submit it **via this link**.

Please know that we receive 100's of emails every day from coalition members, scientists, music administrators, speech, debate and theatre administrators, teachers, coaches, parents, students, and other interested parties. We will try to update the FAQ page as quickly as possible.

Post 8/25/2020

Is this study a part of the CSU study?

- Answer: No, The Colorado State University aerosol is an independent study being operated by that institution. The study found on this website is a coalition research initiative working with the labs at the University of Colorado - Boulder and the University of Maryland. Although some of the research will cross over and be complimentary in research method, we are unable to speak to their results or recommendations. The recommendations found on this FAQ and other resources on this webpage are based on the information coming from the two labs related to this study.

Post 8/19/2020

Does this study recommend certain bell covers?

- Answer: No, bell covers should be well fitting and lined with a MERV 13 filter material.

Post 8/13/2020

If singers are masked and socially distanced, is there any need or benefit to also have them wear face shields?

- Answer: Face shields can be worn for large droplets but have not been shown to be effective in aerosol mitigation.

Do you have an infographic that I can share with the 5 main recommendations?

- Answer: **Yes, please click this link to download**
- **Click here to purchase a poster for your school**

Is there a control group to compare to talking as if in a core class? Specifically, regarding student discussion and teacher lecture.

- Answer: This will be addressed as the study continues.

Do puppy pads need to be used for spit valves outside, or can students empty into the grass?

- Answer: Something should be used to mitigate the collection and dispersion of the spit valve discharge. The recommendation for a disposable absorbent material is primarily for indoor emptying. Outdoors, water keys should be emptied away from others.

What is the recommendation for percussion ensembles?

- Answer: Masking and distance recommendations apply to all. We are planning to conduct a test in the lab that involves an aerobic simulation to better capture the idea of particle generation rates being released in activities such as: Marching Band, Show Choir, Dance, Percussion, etc.

It was recommended that groups leave a space after rehearsing for 30 minutes and that at least one, but ideally three, exchanges of air take place in the room before returning. Must those exchanges use air from outdoors or if the air can be filtered through HEPA filters one to three times?

- Answer: Fresh outside air is always best, however HEPA filtration works for ACH rates as long as the HEPA purifiers are sized appropriately to the size of room.

What blend of polyester and spandex is needed for bell covers?

- Answer: As this study has progressed the recommendation now stands at any material as long as there is a MERV 13 filter material lining the bell cover.

Do the 30 minute time limits recommended for lessons and ensemble practice also apply to someone who is practicing individually in a room to be used later?

- Answer: Individual practice rooms are different as there won't be others to infect in that room. However, following a practice session in a practice room, all equipment should be disinfected and the 3 air changes or more should occur prior to the next use of the room.

In the first round of study, it was said that you should not use plexiglass barriers, as this slows the air exchange rate per hour. Is this specifically just a concern for performing, or should this be brought to the attention of my non-music teaching colleagues as well?

- Answer: Depending on the size of the barriers it can cause an issue in all HVAC scenarios. Our study is strictly focusing on performing arts applications: thus we cannot comment on general classrooms.

30 minutes is the suggested indoor rehearsal time, but does that 30 minutes include time setting up and packing up, or is it just 30 minutes of actual rehearsal?

- Answer: 30 minutes is 30 minutes. We assume rehearsal will start quickly, but your local health department and administration will need to determine class schedules and risk assessment.

It seems that most of the results that have come out so far are geared toward High School and College. I teach general music K-8, what are the recommendations for those grade levels?

- Answer: So far, the recommendations are for all performing arts classes and grade levels.

What rating of surgical mask do you recommend for choirs?

- Answer: ASTM Level 3.

If students have a surgical mask designated for choir only and we sing for 60-90 minutes (with breaks for ACH) per day, can they reuse the mask the next day? How many days (or minutes) can they reuse the mask before it becomes ineffective or dangerous?

- Answer: Yes, they can reuse, but need to follow the manufacturers recommendations for replacement.

When it comes to a monologue show, is it acceptable for an actor to perform without a mask if the only other individual in the theater is a camera operator and the room is cleared after the performance for proper air ventilation/change to prep for the next monologue performer?

- Answer: You need to ensure proper and high level ACH with distance.

Does volume have an impact on aerosol generation?

- Answer: Yes it does, several studies (including this one) have shown louder speaking dynamics produce more aerosol and the aerosol transmits further.

General Statements Post 8/12/2020

- The mitigation strategies recommended are designed to reduce the risk of returning to performing arts activities

- Hopefully a result of our testing and studies in the lab will be more information regarding time, distance, value and finding out what the curves are in terms of different fitting masks to fit a wide range of student behavioral norms.

- These are preliminary results and recommendations may change. We understand most items are stretchy and that is why we are recommending the additional MERV 13 filter material to be added to bell covers.

- We are currently creating a variety of scenarios for you to apply to your individual situation. We are getting a large volume of questions that deal with very specific situations and are working to provide more general guidance that will assist in applying these recommendations to specific situations.

Post 7/31/2020

I have been seeing research about face shields, do you recommend them?

- Answer: Face shields do not protect against smaller particles and are only protective at close range against larger particles that are similar to spray drops. These larger particles (greater than 50 microns) impact on the shield surface. Smaller particles, those less than 5-10 micron easily follow the fluid streamlines and do not impact. They remain airborne for extended periods of time. This is based on physics of particles, and we do not plan on testing shields in this study as they are not a mitigation measure against particles that remain airborne in an indoor space.

Post 7/29/2020

What air cleaner should I use?

- Answer: Our researchers provided us with this blog post they wrote: **https://shellym80304.com/2020/06/15/a-hopefully-helpful-short-report-on-air-cleaners/**. In the report is a table of some air cleaners to consider. This website is also helpful: **https://ahamverifide.org**
- Answer: Dr. Miller tweeted this on 7/29 - Are you searching for an air cleaner? 1st, I recommend HEPA only for COVID risk mitigation indoors. Want to treat a 600 sq ft room? FYI an air cleaner with a CADR of around 400 cfm will give you 5 air changes of particulate-free air (assuming an 8 ft ceiling). CADR (in cu ft/min) = room volume in cu ft x 5 air changes per hour / 60 min/h. See page 5 **https://shellym80304.files.wordpress.com/2020/06/air-cleaner-report.pdf**

Can I send in different products for the lab to test?

- Answer: No, this is not a product testing lab and all mitigation strategies that are being tested need to be approved by the aerosol study committee prior to being sent to the lab.

The study suggests that singers should be in straight lines, not curves. Is it safe for them to be in rows of straight lines as long as there is at least 6' between rows? Should each row be offset so students are in windows between the row in front of them or directly behind the singer in front of them?

- Answer: Spacing is important and a minimum of 6 feet should be between all singers. If you have the additional space to provide windows the more space the better.

Will you be testing any of the "Singers Masks" that are available in later rounds? I'm wondering if they are as effective as surgical masks.

- Answer: Masks should be worn at all times. We will be testing singing masks as we progress in the study.

Which is more effective for 7-12 grade chorus, cloth masks that have/will be worn all day or single use disposable masks that would be put on at the beginning of chorus class and disposed of at the end of the period?

- Answer: Currently we are studying mask efficacy to see what materials should be used. At this point we are recommending masks in general and if cloth masks are used they should be laundered daily.

Can students (ex: tuba and bari sax) share their wind instruments safely with players who rehearse in other class periods by a) using their own mouthpiece and b) wiping down the keys with an alcohol pad, or does the virus linger in the moisture inside the instrument such that it could infect another user? Can string players share (wiping down in between users)?

- Answer: Further guidance will be coming out on this topic with the updated instrument cleaning guidelines.

The study notes that instruments like trumpet and clarinet have more aerosol transmission due to their direct nature, but will the measuring device test next to each tone hole?

- Answer: We are currently in week 4 of a 6 month study and will continue to study all of the variables as it pertains to aerosol emissions from all parts of the instruments. As we gain more information the results will be shared and may continually evolve until the completion of the study.

Can you explain the recommendation of singers wearing masks more? I haven't come up with a mask yet that allows me to inhale to prepare for a phrase, and exhale comfortably into a mask. I realize after the group singing study is completed you might have different recommendations.

- Answer: We agree that there is not a fully comfortable mask to be worn while singing. However, it will be important that some changes be made to account for mask wearing until the COVID-19 crisis is over.

If it is possible to use HEPA filters to exchange air three additional times would it be possible to rehearse for 60 minutes instead of 30?

- Answer: We are currently studying this to see if longer rehearsals could be possible.

If singing occurs outside (or open air tent) with proper 6×6 distancing, are masks still recommended?

- Answer: Masks are currently always recommended during all singing activities. We are continuing to study this and will have further recommendations on outside rehearsals forthcoming.

I see that bell covers are recommended in the Preliminary Recommendations. What should we use to block air that comes out of woodwind keyholes?

- Answer: We are still studying aerosol amount and effective mitigation for keyholes and hope to have those preliminary results soon.

Is the Wind Defender a useful mitigation strategy for flute players?

- Answer: Further study of the flute is still needed to determine exactly what is happening with this instrument and aerosol production. Since the initial results look different from the other instruments we need more information before making a recommendation on the flute.

Some are suggesting bags or covers for open-holed wind instruments like the clarinet, but those would make it nearly impossible to teach a young student. Are there any suggestions for further mitigation for younger clarinet players?

- Answer: The bags around instruments is also not a current mitigation suggestion as more study is needed. The current bag models that were shown in the study was used for collecting aerosols. However, there are a lot of practical issues with this type of mitigation strategies and more study is still needed to determine its efficacy.

Post 7/23/2020

When is the next round of preliminary results coming out?

- Answer: The next round of preliminary results will be received by the NFHS within the next week or so and guidance will be released to the public in early August.

Are we going to get information for elementary music teachers?

- Answer: Elementary aged students grades 3-5 will be tested in an upcoming phase of the study on: humming, singing and recorder.

Post 7/21/2020

What is this study actually testing?

- Answer: This study focuses strictly on the distribution of aerosol that is generated while playing wind instruments, singing, acting, speaking, dancing, and in a simulated aerobic activity, which may potentially contain virus. This study did not use a live virus and therefore cannot be used to determine specific infection rates. However, the study is based on previous research that shows the virus which causes COVID-19 can travel in respiratory aerosol.

What is aerosol?

- Answer: Aerosol is defined as solid or liquid particles suspended in a gas; in this case produced by breathing, speaking, coughing, sneezing, playing a wind instrument, singing, or engaged in strenuous activity.

How does this study relate to performing arts activities?

- Answer: This study then was designed to identify performing arts activities that generate respiratory aerosol including volume, direction, density, and mitigation strategies.

Why is preliminary information being released before the study is completed?

- Answer: We are providing these preliminary results to assist in the safer return to performing arts activities.

Are the results that have been released so far final?

- Answer: These results are preliminary and will be further defined as the study continues. We are entering week 3 of a 6-month study; results may change over time.

What techniques are being used in the lab?

- Answer: Lab techniques continue to be refined as subjects are in the lab, aiming for better accuracy. Currently we are measuring particle stream as it exits the mouth or instrument as well as build-up of aerosol over time for each activity.

What are the researchers doing in the lab?

- Answer: Wind instruments produce aerosol, which vary by instrument as well as intensity. Trends that the team has measured include:
- Woodwinds have aerosol coming from keyholes and bells.
- Brass have aerosol coming from bell.
- Singers and speakers have aerosol coming from the mouth and possibly nose.

How can aerosol emission be reduced when playing an instrument?

- Answer: At this time, it appears that if players wear surgical style masks with a slit for mouthpiece AND bell covers, aerosol emission is significantly reduced. Flute players can put the headjoint between their mouth and mask (see **https://www.youtube.com/watch?v=A3T6h1muUic**) and use a “flute sock” attached to the foot (see **https://youtu.be/7if6TMZy5OM**).

If bell covers work to reduce the spread of aerosol, what level of thickness should I buy?

- Answer: Bell covers tested so far were made from pantyhose made of 80 denier in 2 layers.

Does singing produce aerosol and if yes, how much?

- Answer: Singers produce aerosol, which vary with consonants, vowels, and intensity.

What should singers do to reduce aerosol?

- Answer: At this time, it appears that if singers wear surgical style masks (others will be tested soon), aerosol emission is significantly reduced.

Why are masks so important?

- Answer: Masks are needed to protect both for close and long distances, because aerosol is generated in both cases. Large drops will be higher in concentration at close distances, but still travel quite a ways across spaces. Face shields protect against drops only. That is why we advocate for safety glasses because then it is clear you are still not protected from aerosol and need a mask.

What about plexiglass partitions or barriers?

- Answer: Plexiglass partitions or barriers between musicians are not recommended because the room HVAC system cannot properly change the air as designed. "Dead zones" or areas where aerosol can build-up are a concern.
- Aerosol particles can still float around and move with the air, particles are so small that they do not fully respect gravity.

What are recommendations for rehearsal spaces?

- Answer: Rehearsal space recommendations in order of preference:

1. Outdoor rehearsals, using individual mitigation techniques described above.
2. Outdoor gazebo style tents with open sides and a high-pitched ceiling with mitigations.
3. Indoors with elevated outdoor air exchange rate from HVAC.
4. Indoors with typical outdoor air exchange rate from HVAC plus recirculation air through MERV 13 filters or addition of appropriately sized HEPA air purifiers.
5. Indoors with outdoor air exchange rate from open windows supplemented with appropriately sized HEPA air purifiers when airflow is reduced under certain outdoor wind conditions.

What about length of rehearsal times?

- Answer: Current recommendations based on preliminary results limit rehearsal times to a maximum of 30 minutes. It is important to clear the room and all the HVAC to complete at least 1 air change prior to the next rehearsal.

Do you have guidance on ventilation?

- Answer: Please refer to the Association for Heating, Ventilating and Air-Conditioning Engineers (ASHRAE) guidance on ventilation during COVID-19: **https://www.ashrae.org/technical-resources/resources**

What are some general best practices and procedures?

- Answers:

1. Masks must be worn at all times.
2. CDC guidelines for social distancing of 6x6 feet, with 9x6 for trombone players.
3. Indoor rehearsals should last for 30 minutes followed by clearing the room for 20-minutes for the HVAC system to change the air indoors with outside air.

I saw information about the study on another article/social media post/etc, can I trust it?

- Answer: Be careful with any information that does not come directly from this webpage: (**https://www.nfhs.org/articles/unprecedented-international-coalition-led-by-performing-arts-organizations-to-commission-covid-19-study/**) or from an email from Dr. Weaver, Dr. Spede or our research team.

I am wondering if you might be able to share data on the distributions of particle sizes that you encountered in your preliminary data for wind players?

- Answer: We have measured particles in our generated aerosol below about 10 microns. And because CoV-2 is in particles > 100nm, we do measure particles in the size range 100 nm-10 microns.

How should brass players empty their spit valves?

- Answer: Please use a puppy pad or some other similar device that can be placed next to the player. Do not empty spit valves onto the band room floor.

Do you have guidance for Marching Bands?

- Answer: Yes, please find the NFHS “Guidance for a Return to High School Marching Band” here: **https://www.nfhs.org/articles/nfhs-releases-guidelines-for-return-to-high-school-marching-band-activities/**

Does the NFHS have any other resources available?

- Answer: Yes, please visit the Performing Arts COVID-19 Resources page here: **https://www.nfhs.org/articles/performing-arts-covid-19-resources/**

Do particles come out of the keyholes of woodwind instruments?

- Answer: Yes, particles come out of the keyholes.

What is the risk assessment tool?

- Answer: The University of Colorado Boulder has developed a risk assessment tool: **https://docs.google.com/spreadsheets/d/16K1OQkLD4BjgBdO8ePj6ytf-RpPMlJ6aXFg3PrIQBbQ/edit#gid=519189277**. The NFHS is planning to develop a web-based tool in August.
- This can be applied to a practice/rehearsal room or any other space.
- Data needed for this tool:

1. Room volume (length x width x height)

2. HVAC outside air turnover rate, expressed by air "changes per hour" or "liters per second."

3. Add additional HEPA air purifier units to reach higher "changes per hour" or "liters per second."

I thought my organization donated money and/or joined the coalition, but we are not listed?

- Answer: Please submit a question on this link (**https://app.smartsheet.com/b/form/359a37c655744b5781691aae58d660ea**) and we will take care of your concern.

I am an individual and have donated money, why has my check not gone through?

- Answer: We want to thank you for your generosity and support for the COVID-19 Aerosol Study. Due to certain federal tax restrictions and the manner of project management provided by the NFHS we are unable to receive non-organizational contributions. Although it is a disappointment that we have these restrictions placed upon us by outside forces. We recommend you contribute to an organization that can make a contribution on your behalf.

Are you going to test adult singers?

- Answer: Yes, we are planning to test adult singers in the next couple of months. For the time being, we are focused on testing high school and college aged singers.

Are you going to test whistles?

- Answer: As we continue to move deeper into the study we will attempt to test aerosol generation in whistles as they are commonly used in both performing arts activities and athletics.

Can you explain the flute results in more detail?

- Answer: Right now the flute doesn’t appear to be producing as much aerosol as we thought, but more study needs to occur in order to prove this is the case.

Still don't see you question answered? **Please submit here**.