

COVID 19 Information and Best Practices

(As of 8-6-2020)

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This document IS NOT medical/legal advice. Rather, this is a reference document based on current scientific evidence.

- COVID-19 presents with common symptoms, mostly “fever, fatigue, muscle aches, headache, cough, difficulty in breathing, and sore throat” (Kumar et al., 2020, p. 4).
- COVID 19 spreads primarily in two ways
 - Through the air via inhalation
 - Droplets (heavy, larger particles)
 - Aerosols (smaller, lighter particles)
 - Physical contact and direct inoculation onto mucous membranes
 - Poor hand hygiene
- People are most infectious approximately 5 days before and after the onset of symptoms
- Causal relationships are difficult to establish and there is much scientists do not understand about what causes severe COVID-19 symptoms
 - Age and comorbidities seem to be the most consistent predictors of complications from COVID-19
 - Diabetes, cardiovascular disease (such as hypertension), kidney disease, obesity, and smoking are examples of comorbidities
- Ventilation is a significant factor in COVID 19 transmission
 - Factors such as vent placement, airflow, and air change rates are all related to the spread of viruses in HVAC environments
 - “HVAC system control strategies can usually be modified to increase ventilation to a certain extent in the occupied zones, with relatively little additional cost, to reduce the risks of airborne transmission between occupants. However, this is not via a simple ‘flick of a switch’, as HVAC systems are complex and usually designed for individual buildings within standard specific operating parameters. Many requirements need to be considered apart from the ventilation rate, including control of temperature, relative humidity, air flow distribution and direction” (Morawska et al., 2020)
 - American Society of Heating, Refrigerating, and Air-conditioning Engineers statement: <https://www.ashrae.org/File%20Library/About/Position%20Documents/Airborne-Infectious-Diseases.pdf>
 - Incorrectly ventilated closed spaces increase chances of spreading COVID 19 by a factor of 18.7 when compared with the outdoors
 - A short video regarding ventilation and COVID by one of the referenced researchers (<https://www.youtube.com/watch?v=-D7fz3gkwKY&feature=youtu.be>)

Video detailing procedures for minimizing airborne transmission:

<https://www.youtube.com/watch?v=jK6Cef5A8FQ&feature=youtu.be>

Best Practices

- Ventilation is one of the more effective preventative measures
 - Exchanging bad air for clear air from outside
 - Modify HVAC systems to improve ventilation
 - Increase outside air exchange
 - Raise humidity to 40-60-% of relative humidity
 - Germicidal ultraviolet (GUV, or UVGI – ultraviolet germicidal irradiation) has been shown to be effective at purifying air
 - Air filters may be helpful if the correct type (HEPA filters on HVAC equipment)
 - Avoid using recirculating portable filters while a room is in use unless using HEPA/UV filters
 - If using portable HEPA/UV filters, pay attention to Clear Air Delivery Rate (CADR) and be sure that the CADR is equal to 2/3 of the overall room area in square feet. (See <https://ahamverifide.org/wp-content/uploads/2019/07/Scope-of-Air-Cleaner-Certification.pdf> for more detailed information)
 - Large rooms may require more than one portable filter to be effective
 - Allow sunlight when possible
 - Improve ventilation in bathrooms
 - Use bathroom fans if available (improve outside air exchange)
 - Introduce filtering systems to bathrooms (HEPA preferred through HVAC, recirculating with closed restrooms if not)
 - Open air tents allow for more airflow outside, **avoid closed tents at all costs**. Closed tents are even *worse* than HVAC.
- Face masks prevent transmission
 - Effectiveness depends on material and fit
 - When possible, everyone should wear face coverings
 - Greater prevention in limited droplet spread
 - Surgical masks even prevent inhalation of viruses to small degree
- Screens (face shields or fixed screens) prevent transmission of the vast majority of droplets (96-97%) but are less effective at preventing aerosol transmission (~23% for face shields).
 - This is in part due to eye protection preventing transmission of COVID 19
- Some universal interventions will decrease the spread of the disease
 - Wear masks whenever possible!
 - Utilize outside space for increased airflow when possible
 - Wash hands regularly
 - Avoid extended periods of time in an enclosed, HVAC space
 - Allow rooms time to exchange air (>1 hour when possible or at least 3 air changes)
 - Increase HVAC air exchanges rates
 - Install HEPA filters to HVAC systems
 - Clean bathroom surfaces regularly
 - Have students use hand sanitizers when entering the classroom
 - Maintain social distancing, both in the classroom and when transitioning classes/in the hallways
 - Eliminate hang-out space

- Limit performance time when possible (≤ 30 minutes for indoor activities)
- Disinfect door handles regularly
- Use disposable hand sanitizer bottles and change regularly or disinfect the bottles themselves
- Do not share instruments
- Assign cohorts of students to practice rooms
- Brass instruments can decrease aerosol spread through interventions
 - Brass instruments produce more droplets, but less aerosols, than breathing regularly
 - Cover bells
 - Bell covers decreased Aerosol reduction by 78.5% and Droplet by 63.8% (Parker & Crookston, 2020)
 - Need double layers of bell covers or thicker materials
 - Wear masks while playing
 - Eliminate water onto absorbent material (puppy pee pads, disposable underpads, etc.) and throw away in closed trash.
 - Avoid removing water with force/air
 - Wash/sanitize hands after using
 - Avoid mouthpiece buzzing
- Woodwind instruments can decrease aerosol spread through interventions
 - Reed instruments wear masks while playing
 - Cover bells/ends of instruments
 - Need double layers or thicker material
 - Wash/sanitize hands after using
 - DO NOT share reeds
 - Do not handle reeds from another player
- Singers can decrease aerosol spread through interventions
 - **Wear a mask at all times**
 - Direct singing away from others or in the same direction
 - Use HEPA filters
- String performers can decrease aerosol spread through interventions
 - Wear a mask at all times
- Instructors or conductors may consider wearing a face shield and mask for greater protection

Summary: From an institutional perspective, improving ventilation would be the most impactful at curtailing the spread of COVID-19. Beyond that, requiring face coverings, limiting air movement/recirculation through physical means, improved hand hygiene, and maintaining social distancing are the evidence-based, meaningful interventions at this time. Colorado State University research data will provide more empirical data regarding aerosol and droplet spread during music performance.

Here is a rough model for estimating airborne transmission risk: <https://cires.colorado.edu/news/covid-19-airborne-transmission-tool-available>

Here is a model for predicting compounding risk over the course of the semester (see classroom tab):
https://therealandrewmaynard.com/wp-content/uploads/2020/07/2020_06_COVID_Airborne_Transmission_Estimator-7-3-20-Maynard-modification.xlsx

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