SAN FRANCISCO GAY MEN'S CHORUS

NATIONAL LGBTQ CENTER FOR THE ARTS

Choral Singing in the Time of COVID-19

By Dr. Timothy Seelig, Artistic Director, San Francisco Gay Men's Chorus

This is not a scholarly research paper. It is a user guide to allow us to ponder a new world of choir rehearsals ahead. It is specifically written for SFGMC leadership. Some of this may not apply to other choruses. That said, there is a considerable amount of research that contributed to this. Some of the sources are listed at the bottom of the article. In addition, I have had the assistance of three physicians (one of whom is a psychiatrist) who sing in the chorus (and will be adhering to the protocols they suggested!).

Let's start here. As LGBTQ+ choruses:
We are singers.
We are huggers.
We are kissers.
We are hand holders.
We are…..family.

We need to hold on to #'s 1 and 5 with all our might. And use our brains.

Now, on to the virus.

Our understanding of this virus and its transmission has morphed since its first introduction. The initial impression was that it was spread through contact, carried on fairly large droplets, thus the hand-washing, hand sanitizer, etc. Not long into the proliferation of the disease, scientists began to realize it was also an airborne pathogen carried in microscopic particles.

Let's start with the broad news!

According to Dr. Kevin Kavanaugh, in an article for MJH Life Sciences, "The combination of singing in close quarters and decreased ventilation is nothing short of a petri dish for viral growth."

But wait, there's more. Summarizing the scientific reports below:

- Speaking releases 2–10 times as many particles as coughing.
- Airborne droplet nuclei generated by singing is 6 times more than that emitted during normal talking.
- A 10-minute conversation, talking in a normal volume would yield an invisible 'cloud' of approximately 6,000 aerosol particles.
- Singing = coughing in number of particles emitted. Singing, however, is sustained.

Given that, imagine a 2-hour chorus rehearsal.
I will stop there. That should be enough to get your/our attention. Since this is basically a "Users Guide," I'll move on to the possible protocols. More of the research will follow. It is extremely dire.

The most important factor here is the safety of our singers. There is nothing that can be altered in the actual activity of singing to make it safer. All of the alterations to singing in a choir are external to the actual act of singing.

The research reveals various vocal mechanism activities in order of danger to others:

- Breathing through the nose
- Breathing through the mouth
- Whispering
- Sneezing
- Coughing
- Speaking
- Singing

PROTOCOLS

The following recommendations are meant to be fairly inclusive. Each organization and group will need to study these to decide which ones are feasible and best for use with their group. SFGMC will study these and see what is feasible for us. We are most fortunate to own our own building.

➢ Lifting of restrictions will be gradual. It may begin with groups of 10, 30, 50, etc. We may begin with test groups in July and be ready to apply many/most of the following when Season 43 begins in August.

➢ Shorter rehearsals. 90–120 minutes. No break. No snacks.

➢ Limited and monitored bathroom use.

➢ Physical distancing (6 feet between singers) will limit max capacity based on room size. *See calculator below.

- Guidelines on physical distancing while entering the building. Place marker lines 6 feet apart for waiting to get into the building.

- Provide a hand-washing station at the front of the lobby.

- Temperature check. (thermal cameras)

- Wear masks at all times, even during rehearsals, unless official restrictions are altered/eased. Otherwise, wear a mask to your seat/position. Remove the mask for singing. Replace for departing.

- No touching. No choreography (increases emission). No singing in circles. Face forward.

- No printed music provided. No sharing of music, or pencils, or iPads. Could project music on screens, but leaves them with nothing to rehearse at home.

- Attendance policy will have to be very generous. If you feel sick at all, you MUST stay home and there will be no consequences. Folks who come to rehearsal sick or get sick during rehearsal need to go home asap and we may want to have some sort of screening person at tap-in.

- Mitigation plans in place if someone who was at rehearsal comes down with covid-19. (hopefully, members will be generous with that information). potentially may include all of us quarantining ourselves for 14 days and cancelling rehearsal during that period. If someone is symptomatic at rehearsal (but not yet covid+), letting people know they need to monitor for symptoms until we get results back?

- Wipe down chairs with sanitizer, before and after rehearsal.

- Conductors face chorus from 10 to 20 ft. away from the first row of singers. Possibly wear goggles or install a plexiglass shield. Droplets float into the eye's mucous membranes, and you're in the direct line of fire! The same accommodation should be made for accompanists or instrumentalists.

- Have anyone over age 60 or with high-risk medical problems (diabetic a1c over 8, asthma or COPD on inhalers, cancer, immune compromise such as on chemo or uncontrolled HIV, BMI over 35, etc.), sit in the very back rows so they are exposed to less aerosol (highest exposure will be those in front rows)

- Break the chorus into small "cohorts" of balanced voices in groups of up to 50. One cohort can rehearse downstairs, one rehearse upstairs, with staggered start times that reflect droplet settle time (to avoid exposures coming in and going out). I strongly suggest the cohort idea, as it will contain any unexpected exposure/outbreak if someone develops symptoms shortly after a rehearsal, but allow the remainder of the chorus to

continue. It will likely reduce the number of potential infections, hospitalizations and deaths if such a thing did occur.

- ➢ Performances. Should we be so fortunate as to perform in the fall/winter, not only will audiences most likely be required to adhere to physical distancing, but the performers will as well.

PHYSICAL DISTANCING

This is obviously one of the most serious – and difficult considerations.
Here is an excellent space calculator.

https://www.banquettablespro.com/social-distancing-room-space-calculator

These numbers are based on our two rehearsal rooms at 170 Valencia Street in San Francisco.

Auditorium: 3,900 square feet. This allows for 105 singers, 6 feet apart or 59 singers 8 feet apart.

Valencia Room (Cooper): 2,000 square feet. This allows for 55 people at 6 feet apart or 31 at 8 feet apart.

Hopefully that gives us all much fodder for making plans.
We must also factor in space for the conductor and accompanists as outlined above.

John Quillin, Artistic Director of the Gay Men's Chorus of Charlotte, created an alternate calculation that allowed for more people within specific square footage. The suggestion is to use the above as a template and adjust as needed/allowable.

Now for some good news!

We will get through this. We will figure out a way to move our family from Brady Bunch tile screens to actually making music and fulfilling our mission. We are going on a trip and we need to pack our patience, flexibility, courage, and commitment to do our part for ourselves and each other.

HUGE Thank you's to Dr. Blechinger, Dr. DeSandre and Dr. Ducut as well as my colleagues in GALA Choruses who added their suggestions.

For those of you interested in reading more about the actual transmission as we understand it, here are the resources used.

Dr. Kavanaugh, from the first quote above, continues explaining that approximately 50% of individuals catch this virus from asymptomatic carriers. They are not coughing and sneezing. The answer is probably aerosolization, where the virus can float in the air and be picked up later

by an unsuspecting passerby. The virus has been observed to survive in an aerosol form for up to 3 hours. Thus, singing in choirs may be the worst practice one can participate in.

According to Vincent Racaniello, Professor of Microbiology and Immunology at Columbia, speaking, singing, and normal breathing produces aerosols, which in an infected person, are laden with virus particles. While the largest of these droplets don't travel very far, the smaller droplets are a different story. "Those droplets 1-4 microns in diameter are called 'droplet nuclei'; these remain suspended in the air for very long periods and may not only travel long distances but can reach the lower respiratory tract. Inhalation of droplets and droplet nuclei places the virus in the upper respiratory tract, where it may initiate infection." [1]

The debate began when researchers reported earlier this year in *The New England Journal of Medicine* that SARS-CoV-2 can float in aerosol droplets—less than 5 microns across—for up to 3 hours, and remain infectious. In their review, Fineberg and his NAS colleagues pointed to other studies, including a recent one by Joshua Santarpia and colleagues at the University of Nebraska Medical Center that found widespread evidence of viral RNA in isolation rooms of patients being treated for COVID-19. Viral RNA turned up on hard to reach surfaces, as well as in air samplers more than 2 meters from the patients. The presence of the RNA indicates the virus can spread via aerosols, Santarpia and his colleagues concluded, although they did not find infectious viral particles.

The Journal of Aerosol Science reports the following: "Distinct physiological processes were responsible for specific size distribution modes. The aerosolization of secretions lubricating the vocal cords is a major source of droplets in terms of number. Speech can release dramatically larger numbers of particles compared to coughing. Speaking (as exemplified by counting aloud) releases about 2–10 times as many total particles as a single cough. Similarly, the percentage of airborne droplet nuclei generated by singing is 6 times more than that emitted during normal talking and approximately equivalent to that released by coughing." [2]

In a 2019 study in the journal Nature Scientific Reports, Dr. Ristenpart and his colleagues investigated how many of these tiny particles people let off in a normal conversation; they found that people expel between one and 50 aerosol particles per second as they speak, depending on their volume, or how loud they speak. A follow-up study published in January in the journal PLOS ONE revealed that certain units of sound generate more aerosols than others; for example, the "E" sound in "need" produces more particles than the "A" in "saw." But still, the sheer volume of a person's voice acts as the main determinant of whether someone emits many particles or few. "The take-home message there is that the louder you speak, the more aerosol particles are generated," Ristenpart said. "Certain individuals are so-called speech superemitters and give off about 10 times the number of particles as others, on average, although the reason remains unknown."

In the context of COVID-19, superemitters could potentially act as superspreaders, releasing thousands of infectious particles into the surrounding air in a matter of minutes. "A 10-minute conversation with an infected, asymptomatic superemitter talking in a normal volume thus would yield an invisible 'cloud' of approximately 6,000 aerosol particles," Ristenpart wrote in a report published April 3 in the journal Aerosol Science and Technology.

Dr. William Ristenpart, professor of chemical engineering at University of California, Davis, writes in Live Science, "The basic idea that speech releases aerosol particles has been known for decades. However, even within the medical community, speech often isn't acknowledged as a potential conveyer of infectious pathogens. Many particles emitted through speech measure only a micron across, rendering them invisible to the naked eye. When you sneeze, you see a spray, which may bias people towards thinking that respiratory droplets contribute heavily to spread. Though less obvious than a wet sneeze, aerosols are still large enough to carry pathogens.

"Mucus-like fluid that clings to thin blood vessels in the lungs can break off in droplets as people inhale and exhale," according to a study in the Journal of Aerosol Science. The same can happen as the vocal cords vibrate, snapping open and closed to generate different sounds. Both breath and speech generate aerosols in these ways, but speech can generate about 10 times more aerosols than breathing alone."

[1] Vincent Racaniello April 29, 2009
https://www.virology.ws/2009/04/29/influenza-virus-transmission/

[2] Journal of Aerosol since March, 2009
https://www.researchgate.net/publication/222567351_Size_distribution_and_sites_of_origin_of_droplets_expelled_from_the_human_respiratory_tract_during_expiratory_activities

[3] Live Science April 7, 2020
https://www.livescience.com/covid19-coronavirus-transmission-through-speech.html