

## German Society for Music Physiology and Musicians' Association

# Make music during the SARS-CoV-2 pandemic Recommendations of the German Society for Music Physiology and Musicians Medicine (DGfMM) to protect against infection when playing music

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### Target groups:

- Instrumental / vocal pedagogues
- Music students
- Orchestra musicians
- Singers
- Instrumentalists and singers in the amateur / lay area

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Preliminary note:

- There is currently no evidence-based information on the transmission of SARS-CoV-2 while making music
- These recommendations are based on previous knowledge of SARS-CoV-2 and scientific research in the field of music (regular updates sought)

The recommendations described here summarize the scientific findings to date together and are not to be understood as binding instructions. They serve the Risk assessment of infection with SARS-CoV-2 while making music. They apply nationwide or in the federal states regulations that the musicians / institutions with ministries, Coordinate authorities and company doctors and implement them for their area.

Goal:

- Assessment of the risk of infection with SARS-CoV-2 when playing instruments and singing
- assessment of Risk potential different Instrument groups /  
Vocal formations in different musical Occupations and  
Teaching situations

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### 1. Information on SARS-CoV-2 and Covid-19

#### Epidemiology and type of infection

The coronavirus SARS-Cov-2, which was first detected in Wuhan in December 2019, is the causative agent Covid-19 disease (Corona Virus Disease 2019) led to a worldwide pandemic.

SARS-Cov-2 is mainly transmitted by droplet infection and partly by Contact infection <sup>1</sup>. However, the knowledge about the transmission paths is still incomplete. A Aerosol spreading is possible because in experimental situations SARS-Cov-2 is found in aerosols had it proven <sup>2</sup>. With SARS-Cov-2, there is a high risk of infection <sup>3</sup>, especially when coughing, sneezing and speaking. When transferring, it is important to use a droplet with a Size of > 5 µm, for example when coughing, sneezing and wet pronunciation, and those with a size of <5µm, which, for example, is exhaled as aerosol into the room air differentiate. The larger droplets are proven to be infectious, including infectivity of human aerosol has been scientifically proven in studies <sup>4</sup>. In studies, <sup>5,6</sup> can be shown that the virus was still detectable in the air after 3 or 16 hours. In front infection from larger droplets that fall to the ground after 1.5 to 2 m protects the Compliance with an appropriate distance rule, but not before a potential infection by Aerosols.

From infection to the first signs of infection (incubation period) pass in the Average five days, with a range between two and 14 days. Consecutive numbers The WHO and the are among others for proven infections, healed and deceased Robert Koch Institute (RKI) publishes <sup>7,8</sup>. Around 80% of the sufferers have a mild course to assume that 14% of the patients suffer from a severe course and 5% from a critical one Course with intensive medical care. Lethality (probability of SARS-Cov-2 to die after infection) is estimated to be 1-3%, with increasing age significantly There is an increased risk of dying from Covid-19 <sup>9</sup>. Furthermore, significant regional ones Observe differences in lethality <sup>1,8</sup>. Have an increased risk of serious illnesses People with diseases of the cardiovascular system, chronic pulmonary and Liver disease, diabetes mellitus, and people with certain cancers and a weakened immune system <sup>10</sup>. Smokers and very obese people also have a higher one Risk of a severe course <sup>11</sup>.

#### Clinical complaints

The symptoms of Covid-19 can be extremely diverse and the disease can be recognized

make difficult. It can be assumed that the majority of those infected are asymptomatic or only mild cold symptoms such as fatigue, cough, sore throat and

Has a headache. Most Covid 19 sufferers also have a fever (up to 80%), shortness of breath, muscle and joint pain, nausea and vomiting, and diarrhea added <sup>12</sup>. Also neurological symptoms such as temporary disorders of the sense of taste and smell

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are reported <sup>13</sup>. Some of them develop severe clinical complaints during the course pronounced shortness of breath and pneumonia <sup>14</sup>.

### Measures to reduce spread

The measures to reduce the spread of SARS-Cov-2 are on the website of the RKI described in detail <sup>15</sup>. The majority of the measures are based on the principle containment, whereby vulnerable groups of people are particularly protected and social Contacts are kept to a minimum <sup>16,17</sup>.

## 2. General recommendations

The recommendations listed below are mainly based on the recommendations of the Robert Koch Institute and try to transfer this to the situation of musicians or adapt <sup>18</sup>.

According to the current state of knowledge, the following two aspects result in the greatest Difficulties in implementing sustainable infection protection when making music:

- Infectivity of the infected even before the onset of symptoms or at asymptomatic course
- Unclear data on the occurrence and extent of infectious aerosols in Wind instrument playing and singing as well as with intensified breathing as a result physiological activation through any instrumental play

### Recommendations for musicians

General hygiene measures:

The general hygiene measures during the corona pandemic are also in place Make music and teach.

Since an absolute risk exclusion cannot be guaranteed at the moment, everyone involved should be able to decide independently and without obligation to justify (e.g. risk groups) whether and to what extent they are willing to expose themselves to possible exposure situations. A Exemption from employees who belong to a high-risk group can include: B. be made possible by the employer within the framework of occupational health care.

- Oral Nose Protection (MNS)

The mouth guard should be worn properly over the mouth and nose. The industrially manufactured mouth guard has a deformable metal plate, which on the bridge of the nose should be adjusted by pressing lightly. When removing the mask care must be taken not to touch the possibly contaminated front<sup>19</sup>. The

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self-made or industrial oral nose protection serves to reduce the Droplet transmission by the person carrying it and should be in the contact situation of everyone involved.

- cough label

Coughing or sneezing should be done in the crook of the arm or in a paper handkerchief that is in the connection must be disposed of in a closed container.

- Wash hands with soap

In addition to hand disinfection, thorough hand washing is a possibility of avoiding contact infection with SARS-Cov-2<sup>20</sup>. This should be under the fluent water and take at least 20 to 30 seconds. The use of liquid soap is recommended. Drying should be with a disposable towel or personal towel.

- Hand disinfection

SARS Cov-2 pathogens can be removed from the hands using alcoholic disinfectants. Reduce. In the event of repeated disinfections, it should be based on moisturizing disinfectants be taken to avoid consequential dermatological damage. SARS-Cov-2 is also on "limited virucidal" hand disinfectant containing sensitive<sup>21</sup>.

- Maintain a minimum distance of 1.5 to 2 meters in situations that are not with a

are associated with an increased probability of transmission (e.g. as a result of deep breathing and / or increased droplet formation and / or their further spreading)

The distance control is the most effective way to contain a transmission<sup>22,23</sup>.

- Avoid sharing utensils and instruments

If possible, do not share the same instrument. Wind instruments should never be shared. Using the same instrument especially from wind instruments, transmission of SARS-Cov-2 by droplets and contact infection cause<sup>24</sup>.

- Avoiding large groups

- Strict avoidance of contact in the presence of a cold

- Regular intensive ventilation (currently applicable regulations and recommendations for operation

of ventilation and air conditioning systems can be found under<sup>25</sup>)

- Room size as large as possible, based on the number of people and

Distance bids

### 3. Recommendations for special groups of instruments

#### Wind instruments

From instrumental considerations it is very likely that fine droplets, which are contained in the exhaled air blown into the instrument by the sounding Vibrations of the reeds or lips (flute, brass instruments) in aerosols (<5 µm) To be "swirled". Aerosol formation and spreading appears to exist in several Wind instruments are made differently, so possibly different

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Protective measures for infection protection must be taken. It is also believed that due to deeper inhalation when playing wind instruments, potentially infectious aerosols in can reach deeper lung sections.

Publications on systematic scientific studies on production and

So far there are no spreading of droplets and aerosols when playing wind instruments. To preliminary studies appear to be the speeds and ranges of air flows,

which leave the wind instrument to be significantly below those, for example when sneezing or cough are observed (see also: video contribution by Prof. Matthias Bertsch <sup>26</sup>,

Examination of air flows with the Bamberg Symphony Orchestra by Prof. Claudia Spahn and

Prof. Bernhard Richter <sup>27</sup>, air flow measurement by Prof. Christian Kähler and Dr. Rainer Hain <sup>28</sup>). The

Avoiding potential droplet infections from playing the wind instruments should

accordingly can be achieved by distances of 1.5 to 2 m. The investigations of

Spahn and Richter with the Bamberg Symphony Orchestra <sup>27</sup> were based on the spread of one

Theater fog in front of the respective wind instrument, those of Kähler and Hain <sup>28</sup> were based on

a visualization of the exhaled air and the saliva particles when playing the wind instrument

Laser light <sup>28</sup>. Visualizing the air movement revealed that the range of the air flows and

Particles when playing the investigated brass instruments was less than 0.5 m and when playing

Woodwind instruments (except for the flute) were around 1 m. Only when playing the flute could apparently

larger ranges are observed (data in m are missing here) <sup>28</sup>

Size studies

however, the authors of both studies did not report the aerosol particles. Of the

The size of the aerosol particles depends on how long they float in the air and, if necessary, through

Air flow to be spread. It also matters how long virus-containing

Aerosols remain infectious. Studies carried out under laboratory conditions could over 3

Detect hours <sup>29</sup> and even 16 hours of infectious SARS-CoV-2 viruses <sup>30</sup>. To what extent these studies

are transferable to everyday or music situations is currently unclear. Becomes scientific

both the importance of aerosol transmission and the resulting ones

Security measures discussed intensively. Setti et al. note in this connection that the

2 m distance rule may not be sufficient in the case of aerosol transmission <sup>5</sup>.

However, as long as it is not clear to what extent it is used for all wind instruments

Aerosol formation is coming and what ranges can be achieved here has to be done by

Wind instrument play from an increased risk of infection compared to the play of others

Instruments are run out. Additional protective measures must be used, such as

eg compliance with larger minimum distances (according to preliminary investigations at least 2

<sup>30</sup> meters, possibly more when playing the flute and piccolo), the covering of the horns

with textile covers and intensified ventilation concepts with shorter lessons and

longer ventilation phases in between. Here are detailed investigations urgently

necessary in order to be able to determine the measures in an instrument-specific manner.

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Instrument-specific features:

- Woodwind instruments:

The clarinet, oboe and bassoon were able to produce deep and long-lasting tones  
Flow movements in the range of 1 m can be measured. It may be because of the smaller ones  
Blow-out openings and the lower flow resistance due to the straight design  
larger flow movements are generated than with brass instruments [n.28.](#) With the flute  
is an important aspect that a significant part of the blowing air is not blown into the instrument  
(and leaves it at the end), but at the blowing edge straight into the room  
accelerated and redistributed. As a result, the risk of infection is likely to be significantly higher  
than other wood and brass instruments.

To limit flow movements and saliva emissions, tightly woven textile fabrics can be used  
or paper towels in front of the instrument opening (cup or funnel) or, for example, a  
Pop protection or similar in the direction of blowing before the flute. So the spread of  
Droplets are reduced [n.28.](#)

- Brass instruments:

Even with brass instruments, covering the cup / funnel with one can be tight  
woven thin textile may curb droplet flight <sup>31</sup>. A special feature of the  
Brass instruments cool the air blown into the instrument more strongly due to the design  
forms a condensate which, like the valve moisture, is to be regarded as potentially infectious.  
Air turbulence at the valves also causes further settling  
(Sedimentation) of aerosol particles. The air from a brass instrument is thereby  
Return to the room drier and more saturated than the original breathing air. Possibly is  
the condensate remaining in the instrument is significantly more infectious, which is why safe disposal and  
adequate hygiene in handling this is absolutely necessary (e.g. disposal in  
closed containers). It was found in flow experiments that the in  
The smaller the horn, the greater the movement of the air in front of the instruments  
of the instrument, the lower the tone and the more shocking the sequence of tones is [t.28.](#)

String instruments, keyboard instruments, percussion instruments, plucked instruments

The playing of string, keyboard, percussion or plucked instruments is usually not with one  
increased risk of infection associated with SARS-CoV-2. This applies if the instruments are



Of four-handed or multi-handed piano playing is due to the inadequate  
Keeping distance is discouraged. Playing the piano on multiple instruments can be done if one  
The distance of the musicians from 1.5 to 2 meters is considered harmless. A mouth guard  
is recommended.

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With striking mechanism, there should not be a shared use of instrument parts (mallets or similar) come.

### 4. Recommendations for teaching

In principle, the above recommendations for protection against infection apply. On the instrument-specific Recommendations were made in Chapter 3. Whenever possible, everyone should be one  
Wear mouth protection. The number of people in the room should be kept to a minimum  
be limited and the minimum distance of 1.5 to 2 meters should be observed. We  
further recommend:

- Wash hands before class (if necessary, additional hand disinfection, eg if from  
Teacher instruments must be tuned). To do this, provide a  
Washing facilities and a disinfectant.
- Avoiding face-to-face contact, for example by setting up at a 90 ° angle.
- Possibly. Use of plexiglass walls between teacher and learner to avoid  
a droplet infection.
- Limitation of contact times to a minimum.
- Cleaning the touched instrument surfaces / buttons after each lesson.
- Lessons on your own instrument and with your own accessories (also no audition of the  
Teacher on the instruments of the students). If this is not possible (e.g.  
Harp, double bass), so after cleaning (if possible), the transfer  
after 24h at the earliest (wind instruments 72h, see also chapter 7).
- Professional cleaning and disinfection of the classroom after everyone  
Lesson.
- Regular intensive ventilation after each lesson (currently applicable regulations  
and recommendations for the operation of ventilation and air conditioning systems can be found under 24 ).
- For risk individuals with pre-existing conditions or advanced age (see Chapter 1) is  
to advise a clarification of the procedure with the family doctor / company doctor.
- Covid-19 works in people aged 70 and over and those with severe  
Previous illnesses (see also Chapter 1 ) **are accompanied** by a significantly increased mortality rate.  
They should therefore refrain from teaching in the same room with other people  
or to take lessons.
- Strict avoidance of physical closeness is given for forms of teaching such as online  
Lessons or room-to-room teaching using appropriate technical  
Solutions.

## 5. Recommendations for orchestras and ensembles

The resumption of the operation of opera and concert orchestras while respecting the Protection against infection for the musicians is a great one for those responsible in the cultural field Challenge.

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General protective measures such as observing symptoms, taking into account the Belonging to a risk group, compliance with hygiene and distance rules, wearing an MNS outside the concert hall, cleaning the work and functional rooms as well as consistent Implementation of a ventilation concept must be observed to prevent infection. The current Approved group size must be coordinated with the authorities and health authorities.

The orchestral arrangement that is common in normal operation is not possible due to the risk of infection. In order to develop practicable solution models, one has to consider the different ones Risk potential of the instruments usually required in orchestral operations is necessary (see Explanations in Chapter 3). Various suggestions (which in relation to the distance rules of the Wood and brass instruments differ considerably in some cases) [f. 31, 32, 33](#) have already been developed .

A final risk assessment, especially of the wind instrument playing on the basis scientifically published data, however, is - despite the current Untersuchunge [n 27, 28](#)- to the current one Time not yet possible. Based on the current scientific knowledge on Aerosol problems are the increasingly recommended distance rule of 1.5 to 2 m for wind players consider, since only the larger droplets fall to the ground after 1.5 to 2 m and the aerosols in Room air remain.

It is therefore advisable to use additional protective measures to minimize risk. As before executed larger seat spacing, spatially offset Aufstellung could [n 28](#) Plexiglass bulkheads and textile coverings in front of the instrument openings provide additional protection.

Depending on the specific working conditions, the orchestras are also recommended a hygiene and protection concept, rules of conduct and a concept for the running of samples and Concerts based on the SARS-CoV-2 occupational safety status of the Federal Ministry of Labor and To create social issues <sup>34</sup> and in coordination with the company doctors and health authorities to implement.

In principle, these recommendations also apply to the lay and amateur sectors. It's closed consider whether there is a possible risk given the residual risk that cannot be excluded Infection transmission currently orchestral and ensemble samples may be better avoided should. In addition, the common practice time should be kept to a minimum. People from the age of 70 years and with severe previous illnesses are excluded from the ensemble play discouraged. Conducting orchestral and choir rehearsals without special hygiene concepts can are not currently recommended.

Last but not least, there are recommendations for specific ones for the resumption of cultural activities To develop protection concepts for the public (see DOV proposals)[21](#). Open air concerts can when following the clearance and installation rules and taking the wind direction into account largely considered safe.

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### 6. Singing

Analogous to speaking, the smallest droplets are released when singing, which may occur can lead to a droplet infection. Since aerosol release occurs when speaking, which with greater volume, with sibilants among other factors increasing, it can be assumed that this for the singing also applies <sup>35,36,37</sup>.

It is also important to sing between droplets with a size of  $> 5 \mu\text{m}$ , for example when coughing, Sneezing and wet pronunciation arise, and those with a size of  $< 5 \mu\text{m}$ , for example in the Differentiate between exhalation and aerosol. it is supposed that different types of tuning as well as different voice intensities at different The size and density of the droplets lead and the amount of aerosol increases with the volume <sup>t.37</sup>.

The larger droplets have been shown to be infectious, including the infectivity of the aerosol Studies in humans have been scientifically proven <sup>38</sup>. In addition, in studies<sup>29,6</sup> shown that the virus was still detectable in the air after 3 or 16 hours. So could Aerosols may pose a risk of infection in closed rooms with poor ventilation represent <sup>n.37</sup>. Further investigations are urgently needed.

It protects against infection from larger droplets that fall to the ground after 1.5 to 2 m Compliance with an appropriate distance rule, but not before a potential infection by Aerosols. An investigation showed that professional singers too no air movement in loud singing at a distance of about 0.5 meters detectable were <sup>n.28</sup>. Accordingly, compliance with the general rule of distance is sufficient for protection even when singing from a droplet infection, for safe protection against a potential virus transmission in Aerosols are also recommended as additional protective measures. The following recommendations for Individual singing lessons and choral singing are discussed:

#### Individual lessons:

Individual singing lessons are regular with observance of the distance and hygiene rules thorough ventilation of the premises, which should have a large surface area as possible, denkba <sup>r.30,37</sup>. The use of plexiglass walls between the teacher and the student to avoid Droplet infection can also be useful.

#### Choir / ensemble:

Singing in a choir / ensemble will differ in the opinions available so far

rated. Both the difficult to keep distance requirement, the room size and the ventilation as well as the total duration of a choir rehearsal and the rapid moistening of an MNS Risk factors for infection with SARS-CoV-2 during choral singing are becoming critical rated<sup>37</sup>.

Other authors consider a choir rehearsal possible, provided that there is at least a distance of 1.5 m adhered to, the choir members stand in a staggered manner with the corresponding room size

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great ceiling height is ensured and proper ventilation in the rehearsal rooms is ensured (Suction of the room air upwards through the ceiling)<sup>28</sup>. Also in another opinion under specific conditions (distance of 2 m, sufficient room size, Ventilation situation, number of people according to current regulations) a choir rehearsal for possible hold [p.30](#).

However, infection through the aerosol that is distributed in the room air cannot be ruled out can be and protective measures such as spacing may be ineffective and as the likelihood of infection increases with increasing group size, the Common (choir) singing in closed rooms is currently rather discouraged.

### 7. Disinfection measures on the instrument

The United States Environmental gives recommendations on suitable disinfection measures Protection Agency <sup>39</sup>, World Piano News <sup>40</sup> and the NFHS, NAFME, NAMM Foundation <sup>41</sup>. Come here especially alcoholic disinfectants used, with a tolerance of the Disinfectant on the instrument surface should be tested in advance. The Cleaning the keyboards of keyboard instruments with alcohol-based disinfectants discussed controversially. The long-term effects of alcohol on the key surfaces as well the glue that fixes the surface of the white keys has not yet been examined. Therefore It is sometimes recommended to use tensides (commercially available detergents) to clean the keyboards use <sup>42</sup>. When sharing pianos it must be taken into account that the Lateral key surfaces made of unpainted wood cannot be reliably cleaned can. In these cases, special care must therefore be taken to ensure that the player ends it during the Avoid practicing or teaching phase by facing your face with your own hands grasp.

The sharing of wind instruments is also with careful cleaning Cleaning solutions containing alcohol or soap are not advisable according to the current state of knowledge. Unless otherwise possible, the cleaning should be done by the specialist teacher at a time Repeat the distance again and the instrument only after a time delay of passed on to the next student for at least 72 hours. If not excluded that moisture has remained in the instrument, it should not be passed on.

### 8. Final opinion

The information status on SARS-Cov-2 and Covid-19 is constantly changing. The currently known  
The data situation is sometimes interpreted and discussed differently. The ones mentioned here  
Recommendations are based on the current state of scientific knowledge and may apply to new ones  
Insights lose their validity. We strive for timely updates.

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### 9. Further links

#### **Orchestra / stages:**

Practical suggestions from the DOV for resuming play during the Corona  
pandemic (Working group health and Prophylaxis)  
[https://www.dov.org/oeffstaendig\\_mteilungen/praxisnahe-vorschlaege-der-dov-zur-resumption-of-the-play-operation-position-on-the-play-operation-of-the-orchestras-during-the-Covid-19-pandemic](https://www.dov.org/oeffstaendig_mteilungen/praxisnahe-vorschlaege-der-dov-zur-resumption-of-the-play-operation-position-on-the-play-operation-of-the-orchestras-during-the-Covid-19-pandemic)

Opinion on the operation of the orchestras during the Covid-19 pandemic (Willich, SN et al,  
Charité - University Medicine Berlin)  
[https://epidemiologie.charite.de/fileadmin/user\\_upload/microsites/m\\_cc01/epidemiologie/downloads/Statement\\_Spielbetrieb\\_Orchester.pdf](https://epidemiologie.charite.de/fileadmin/user_upload/microsites/m_cc01/epidemiologie/downloads/Statement_Spielbetrieb_Orchester.pdf)

Industry-specific guidelines for action SARS-CoV-2 occupational safety standard recommendations for the  
Stages and studios branch, for the rehearsal area of the association of  
VBG professional associations  
[https://www.vbg.de/DE/3\\_Praevention\\_und\\_Arbeitshilfen/3\\_Aktuelles\\_und\\_Seminare/6\\_Aktuelles/Coronavirus/Industry\\_info\\_Lab\\_protection\\_standard/BuufenuStudios\\_Probenbetrieb.pdf?\\_\\_blob=publicationFile&v=6](https://www.vbg.de/DE/3_Praevention_und_Arbeitshilfen/3_Aktuelles_und_Seminare/6_Aktuelles/Coronavirus/Industry_info_Lab_protection_standard/BuufenuStudios_Probenbetrieb.pdf?__blob=publicationFile&v=6)

SARS-CoV-2 occupational safety standard of the Federal Ministry of Labor and Social Affairs  
<https://www.bmas.de/SharedDocs/Downloads/DE/PDF-Schwerpunkte/sars-cov-2-occupational-safety-standard.html>

#### **Voice / singing:**

Assessment of the risk of infection with SARS-CoV-2 viruses while singing (Mürbe et al., Charité -  
University Medicine Berlin)  
[https://audiology-phoniatry.charite.de/fileadmin/user\\_upload/microsites/m\\_cc16/audiologie/Allgemein/Singen\\_und\\_SARS-CoV-2\\_Prof\\_M\\_C3%BCrbe\\_et\\_al\\_04052020.pdf](https://audiology-phoniatry.charite.de/fileadmin/user_upload/microsites/m_cc16/audiologie/Allgemein/Singen_und_SARS-CoV-2_Prof_M_C3%BCrbe_et_al_04052020.pdf)

Choir singing and singing lessons in Corona times. (Hess M, German Vocal Clinic Hamburg)  
[https://stimmklinik.de/wp-content/uploads/2020/04/Chor-Singen-und-Gesangsunterricht-in-Zeiten-by-Corona\\_21.4.2020.pdf](https://stimmklinik.de/wp-content/uploads/2020/04/Chor-Singen-und-Gesangsunterricht-in-Zeiten-by-Corona_21.4.2020.pdf)

**Conservatoires:**

Risk assessment of a coronavirus infection in the field of music. (Spahn et al, 2020. FIM, University Hospital and University of Music Freiburg)  
<https://www.mh-freiburg.de/hochschule/covid-19-corona/riskeinschaetze/>

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**Music schools:**

Guide to resuming face-to-face teaching at the music schools in Carinthia  
<https://musikschule.ktn.gv.at/>

**Miscellaneous:**

Making music during the pandemic - what does science advise? (Kähler et al, Institute for Fluid mechanics and aerodynamics, University of the Federal Armed Forces Munich)  
<https://www.unibw.de/lrt7/musiken-waehrend-der-pandemie>

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Dr. med. Maria Schuppert.

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### 10. Literature

<sup>1</sup> [https://www.rki.de/DE/Content/InfAZ/N/Neuartiges\\_Coronavirus/Steckbrief.html#doc13776792bodyText1](https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Steckbrief.html#doc13776792bodyText1) (last access 13.05.2020)

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