Senedd Cymru / Welsh Parliament
Pwyllgor Diwylliant, y Gymraeg a Chyfathrebu / Culture, Welsh Language and Communications Committee
Ymchwiliad i'r achosion o COVID-19 ac effaith y feirws ar ddiwylliant, y diwydiannau creadigol, treftadaeth, cyfathrebu a chwaraeon / Inquiry into the COVID-19 outbreak and its impact on culture, creative industries, heritage, communications and sport
CWLC COV66
Ymateb gan Unigolyn / Response from an Individual

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28th June 2020

To Whom It May Concern,

My name is Rhian Clement (Ferguson) and I am writing to you today to express my concern about the future of live performance as a result of the Covid-19 pandemic. As a flautist, Flute Teacher, and educator (Primary and for children with Special Needs), this issue is extremely important to me because I cannot imagine life without access to live performance and the benefits that participation in the performing arts bring to my family, my community and our local economy.

Being self-employed can be a struggle at the best of times. However, in this climate, the survival of the Performing Arts seems to be a very low priority. Yet it is one of the most lucrative industries for the economy. In Wales we have a thriving TV, Film and music industry. The BBC production of His Dark Materials, as an example, has been a massive success globally, and all the CGI, music scoring and recording, props, costume, filming and production took place in Wales. What does the Senedd and UK government imagine happens to all these freelance, highly skilled people?

Once current government support for the self-employed ends, many performers, creatives and technicians within this sector will not have jobs to go back to, and if freelance, will be facing empty order books for the foreseeable future. My fear is that many will be forced, for financial reasons, to leave the industry, or the country, and their talent and commitment to improving and enhancing life in the UK will be lost forever.

From my personal perspective I am affected in many ways.

1. My freelance playing has now stopped, so no income.
2. My private teaching will continue (on Zoom and gradually face to face)
3. My school teaching has stopped. Worse, I have had no communication from the schools. Despite being a highly skilled, King's College London graduate and Kodaly trained teacher (up skilled when I started a family), that work, although highly valued by pupils,and parents seems to be devalued by every official utterance from The UK government and education spokespeople. I am used to cover staff PPA by teaching for

a relatively low hourly rate (£25) and they refuse to employ me. When the schools shut I had no income from this work. I also am paid for only 30 weeks a year in one school but required for every week of the term and all concert work is done for free. I work at least 10 weeks of the year for nothing. The Gig economy is alive and well in education.

4. Our children all play instruments. Our eldest is an exceptional French Horn player. Everything has stopped for him. The news we receive, as performers has no hope. Yet do any of the advisers read the scientific and medical research coming from Europe in particular ? All research is showing there is virtually no added danger to Wind and Brass players. Socialising is more of a problem, yet football, pubs etc are opening. It makes no sense.

Here are my suggestions.

First please read and watch the following :-

https://www.thestrad.com/news/study-shows-no-increased-risk-to-orchestral-musicians-from-concerts/10687.article

https://www.youtube.com/watch?v=AsLHFwtpABU

I have also attached the paper by Lars Brandt on the Measurement of Aerosol from Brass and Woodwind Instruments.

Specifically, there does not seem to be a genuine drive to get theatres and concert halls open again. It is happening in other countries, very successfully, but in the UK we seem to be lacking foresight. The scientific studies showing that performers are no greater risk to each other on stage are being ignored. There would even be ways of encouraging audiences back, if face masks are compulsory, along with other measures.

Other alternatives are open-air drive-in concerts and most importantly, live-streamed concerts and theatre productions, but the Senedd has already announced the closure of the Millennium Centre until 2021. This latter issue seems to be around the safety of performers, yet if they were tested twice a week, as is afforded to footballers, this would be safe. You could sell limited numbers of seats and then more tickets for exclusive on-line streaming. You could make it work

Performers, musicians, teachers are not asking for something for nothing. I have spent my whole working life working long hours and working voluntarily for children and settings who do not have enough to budget for music. I have taught children in STF units, who are communicatively "locked in", who utter their first sounds through singing. Children on the

ASD spectrum socialise through my classes. It is a real joy and I wouldn't choose to do anything else, yet at times like these it feels under-valued.

My work, therefore, is affected on many levels. As a gigging performer, and as a teacher in schools. With all the measures being mooted it will be difficult for me to return to my kinaesthetic way of working in the near future. I have strategies in place for safe teaching, but my experience tells me that, having had no contact from the schools in any capacity so far, I shall be a very low priority.

I therefore request that you put in place specific support for the workers in the live performance industry. Strive to open up live performance, surely possible if shops, pubs and tourism are being allowed.

Thank you for your attention in this.

Yours sincerely,

Rhian Clement (B Mus Hons (Lond) )

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# Measurement of aerosol from brass and woodwind instruments

# playing 5 minutes in distances

# from 0.5 to 4 meter.

Lars Brandt MD PhD, Department Chairman, Ass. Professor

Center for Performing Arts Medicine

Department of Occupational and Environmental Health

Odense University Hospital

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**Background**

During spring 2020 the COVID 19 pandemic has swept across the world leading to the lockdown of many activities among those cultural activities like music performance. However, in many countries the COVID 19 is now under control and gradually reopening has started with hygienic precautions.

During the last decades studies have been performed to understand the mechanism of contact and airborne spread of infectious agents, such as viruses causing respiratory syndrome epidemics. It is well established that droplets and aerosols transported by expired air result in short range airborne transmission of virus. Sneezing and coughing produces high speed airflow with high concentration of droplets and aerosols expelled up to 1.8 meter. Furthermore it has been shown that virus to some extent is spread with very fine aerosols throughout a room depending on room ventilation.

Questions have been asked whether different cultural performances are safe with respect to spread of COVID 19 infection. There is for instance concern about the spread of aerosol while playing brass and woodwind instruments. The immediate thought is that blowing in the instrument may produce airflow containing aerosols, which could contain COVID 19 virus if the musician is infected. It has been suggested that safe distance playing brass and woodwind instruments has to be 3 to 4 meters. However, this is not based on solid knowledge about airflow from the bell of the instruments. Keeping a distance of 3-4 meters will entail great challenges concerning room size for rehearsals or concerts and for the artistic expression.

However, there has been no substantial documentation based on measurements for this recommendation. But during the last months several experiments to measure airflow and spread of aerosols playing brass and woodwind instruments have been performed.

Preliminary results from The Bamberg Symphony investigating airflow from bassoon, trombone, clarinet oboe and horn revealed hardly any measurable air movements while playing the instruments.

https://www.br.de/nachrichten/bayern/bamberger-symphoniker-wissenschaftler-messen-aerosolausstoss,Ry6T6OU?fbclid=IwAR0q9LfNqv3QFBZ6EiWDlKs2vvNEnBJKb96oYhDa-PeKx6ePGu9jQqy5RrQ

In another study occupational hygienist Thomas Eiche measured expelled droplets and aerosols while playing brass and woodwind instrument, measuring aerosols (<= 5µm) and droplets (> 5µm) concentrations at 1.2-1.6 nl/$m^3$ and 0.1-0.8 nl/$m^3$ respectively, highest for clarinet. https://www.thomaseiche.ch/

https://www.svtb-astt.ch/wp-content/uploads/2020/05/200522-Schutzkonzept_COVID-19_Theater_Konzert_Veranstaltung_V2_2.pdf

Another experiment, commissioned by the Vienna Philharmonic, examined the movement of musicians' breath while performing. The study involved members of the orchestra each being fitted with an aerosol device inside their noses, which spayed a fine mist into their lungs. They were then placed in front of a black canvas and very brightly lit from the front, then photographed while playing. This made it possible to view the mist and the extent to which it travelled in the air. The results showed that for string players the maximum distance the droplets travelled was around 0.5 m while playing and being at rest. For brass and woodwind instruments, no significant amount of mist could be detected around the area of the

instruments' openings. The only exception to this was the flute, where droplets were observed up to 0.8 m from the musician. Clouds of air were observed in the area of the mouth, regardless of the breathing technique. https://wien.orf.at/stories/3049099

The Institute of Aerodynamics of the University of the Bundeswehr in Munich conducted flow experiments with 8 brass and woodwind musicians using Particle Image Velocimetry to measure air velocity and the movements of droplets emerging form the instruments. They observed airflow at 0.5 m from the bell of brass instruments. The larger the brass instrument had the lower exit velocity and air movement. Woodwind caused airflow more than 1 m. As a conclusion they recommend safety distance to be 1.5 m.
https://www.unibw.de/lrt7/video-musizieren-waehrend-der-pandemie-was-raet-die-wissenschaft
https://www.youtube.com/watch?v=BYo3wlWUDDM

**Measurement aerosols from brass and woodwind instruments, Odense Symphony Orchestra**

The Musician Health Clinic, Department of Occupational and Environmental Health, Odense University Hospital together with Odense Symphony Orchestra performed an experimental study on 7$^{th}$, 14$^{th}$ and 15$^{th}$ May 2020 measuring airborne particles from brass and woodwind instrument, playing at distances of 0.5,1,2,3 and 4 meters. The measurements were performed in rehearsal room 1.

TSI Dust Trak $^{tm}$ aerosol monitor was used to measure airborne particle concentration by measuring total particle mass in mg per m$^3$, and for particle mass under 1, 2.5, and 10 µm.

The aerosol monitor was placed on a music rest, and the distances were marked on the floor with tape. The musicians played one to two minute standing 0.5, 1, 2, 3 and 4 meters from the aerosol monitor. Background particle concentration in the room without any activity was measured at the start. The musicians were asked to perform a music piece and play with the same effort as under a concert. The instruments were tuba, clarinet, trombone, fagot, oboe, trumpet, horn and flute.

**Results**

The background mass of particles were 0.004, 0.005 and 0.006 mg/m$^3$ for particles less than 1, 2.5 and 10 µm respectively, and the total mass of particles was 9 mg/m$^3$. As seen in table 1, measured particle mass was quite similar for tuba, clarinet and trombone compared to the background measure, and a little higher for fagot, trumpet, oboe, horn and flute. In contrast, coughing at a distance of 0.5 m produced 70,000 times higher levels of particles.

Table 1.

Average particle mass expelled from brass and woodwind instruments in mg/m$^3$, measured during play 5 – 10 minutes in distance from 0.5 to 4 meters.

| Particle size | <1 µm | <2.5 µm | <10.0 µm | total |
|---|---|---|---|---|
| Background | 0.004 | 0.005 | 0.006 | 0.009 |
| Tuba | 0.004 | 0.005 | 0.007 | 0.009 |
| Clarinet | 0.004 | 0.004 | 0.006 | 0.007 |
| Trombone | 0.003 | 0.004 | 0.006 | 0.012 |
| Fagot | 0.011 | 0.012 | 0.016 | 0.024 |
| Oboe | 0.012 | 0.013 | 0.018 | 0.036 |
| Trumpet | 0.011 | 0.011 | 0.012 | 0.014 |
| Horn | 0.007 | 0.008 | 0.011 | 0.013 |
| Flute | 0.010 | 0.010 | 0.015 | 0.017 |
| Coughing (0.5 m) | 7343 | 7343 | 7590 | 9593 |

The measurements showed based on visual examination that there was no significant variation in the aerosol concentration while playing 0.5 m from the monitor or standing at a distance of 1, 2, 3 or 4 m, as seen in figure 1-8. During the time period noted on the x-axis the musician stepped progressively backward away from the monitor. The y-axis shows the size range of particles/aerosols measured. The may differ for the each instrument. The x-axis shows the time period when measurements are taken. The small fluctuation in the aerosol concentration corresponded to the small fluctuation in the background measurements (Figure 9). There are some small peaks, which not can be explained by distance from the monitor or by variation in the playing the music. The most likely explanation is dust caused by person movement in the room.

Figure 1.

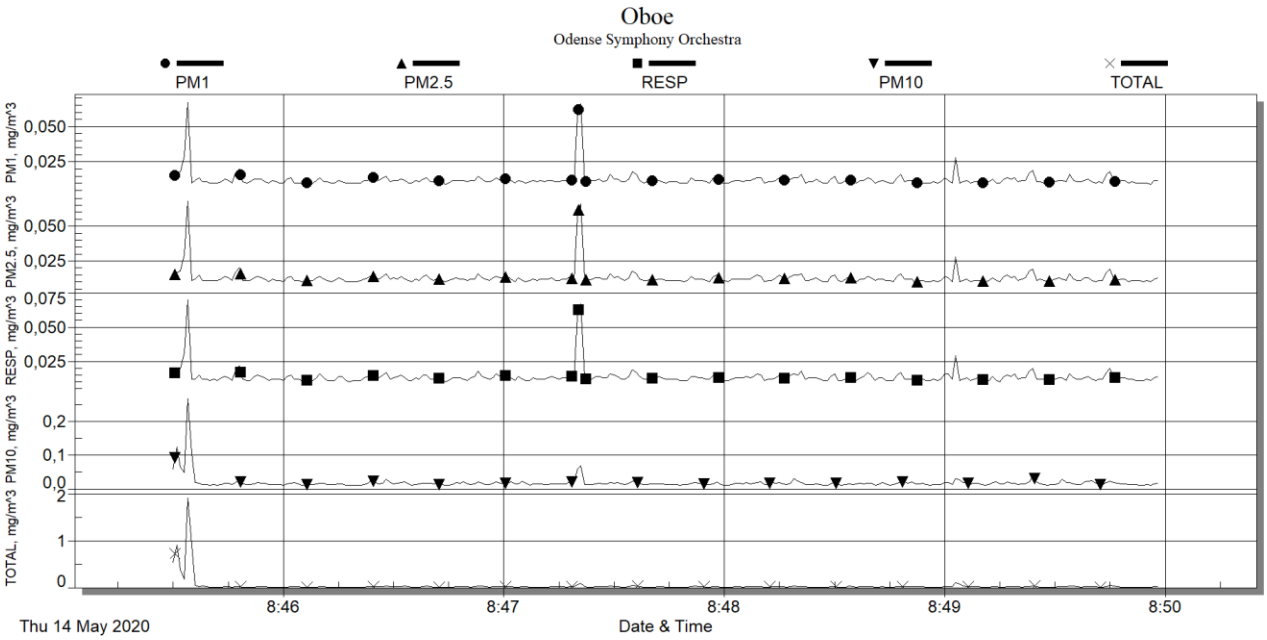



Figure 2.

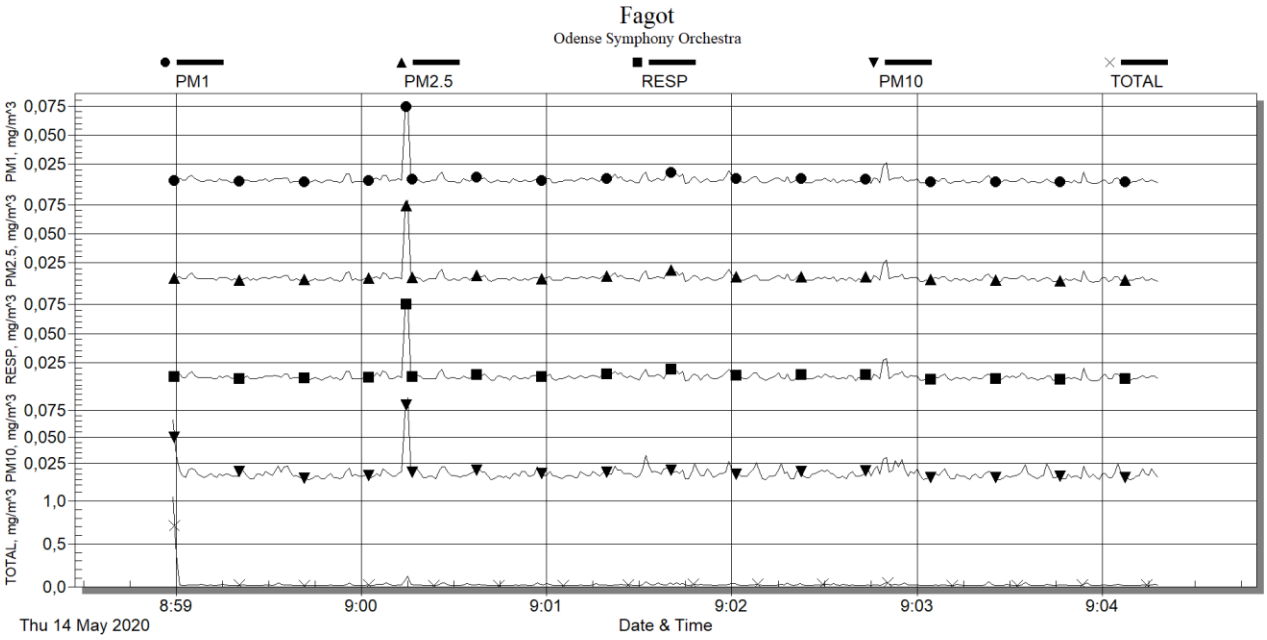


Figure 3.

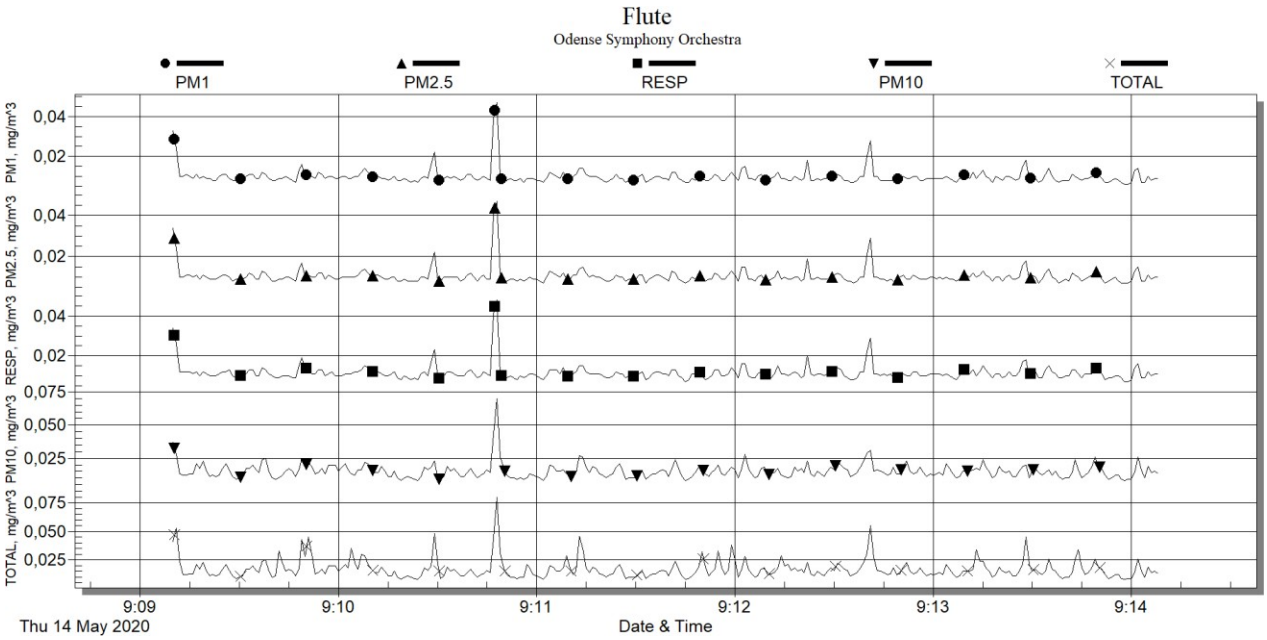



Figure 4.

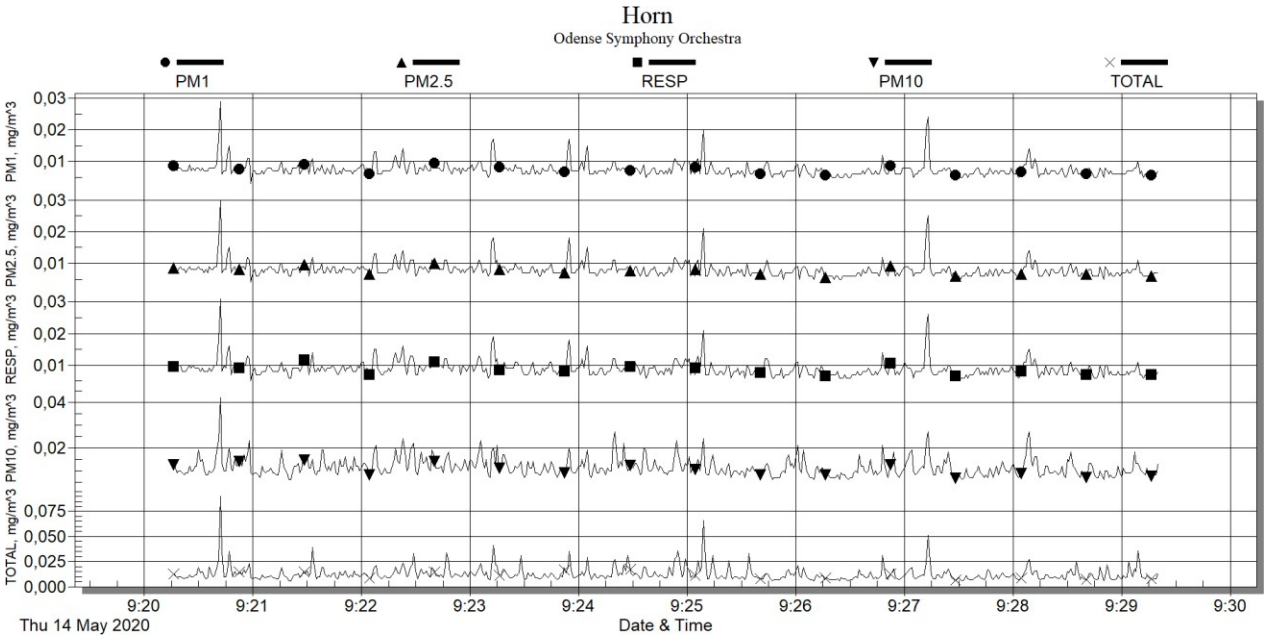


Figure 5.

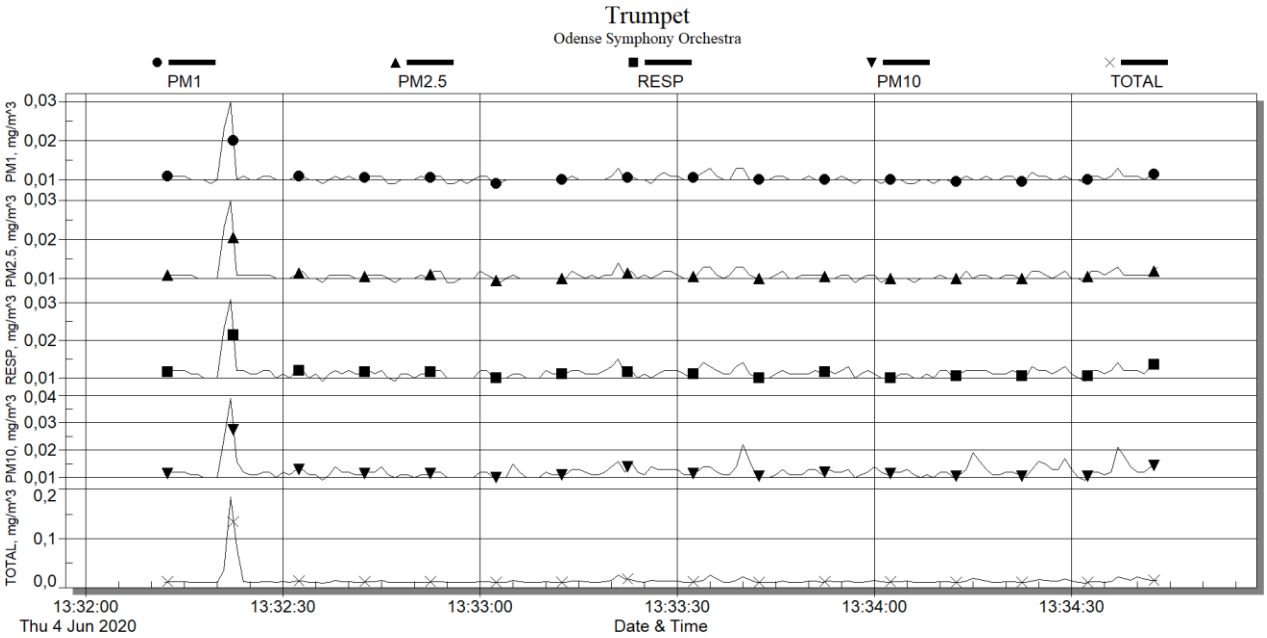



Figure 6.

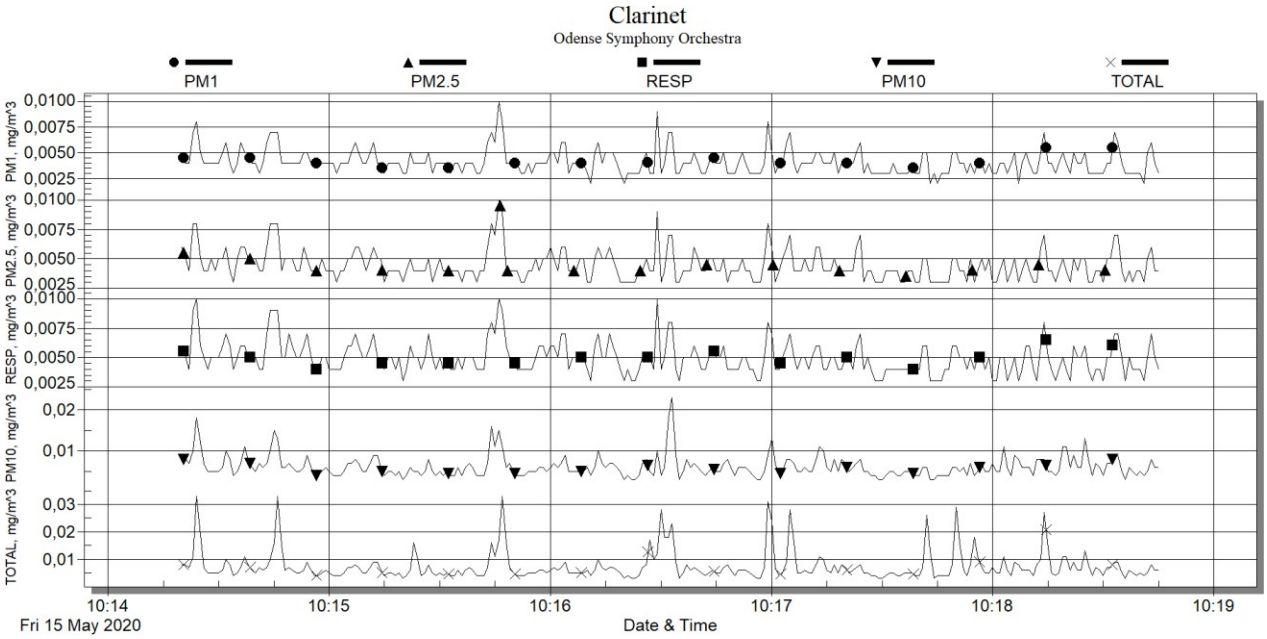


Figure 7.

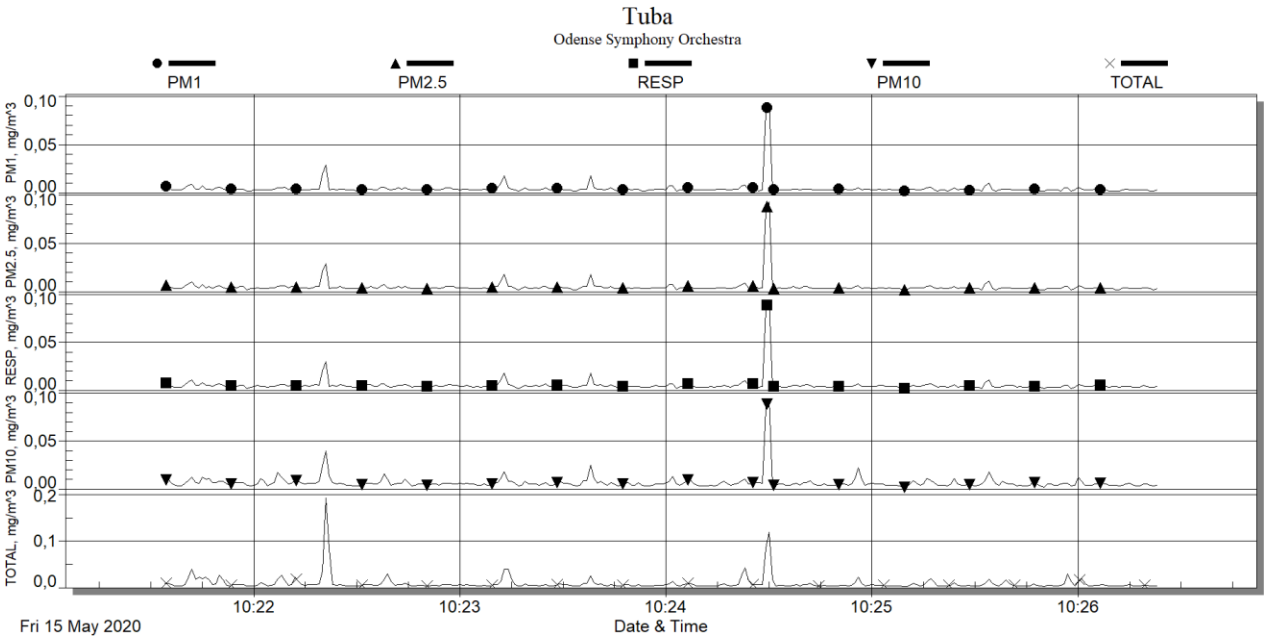



Figure 8.

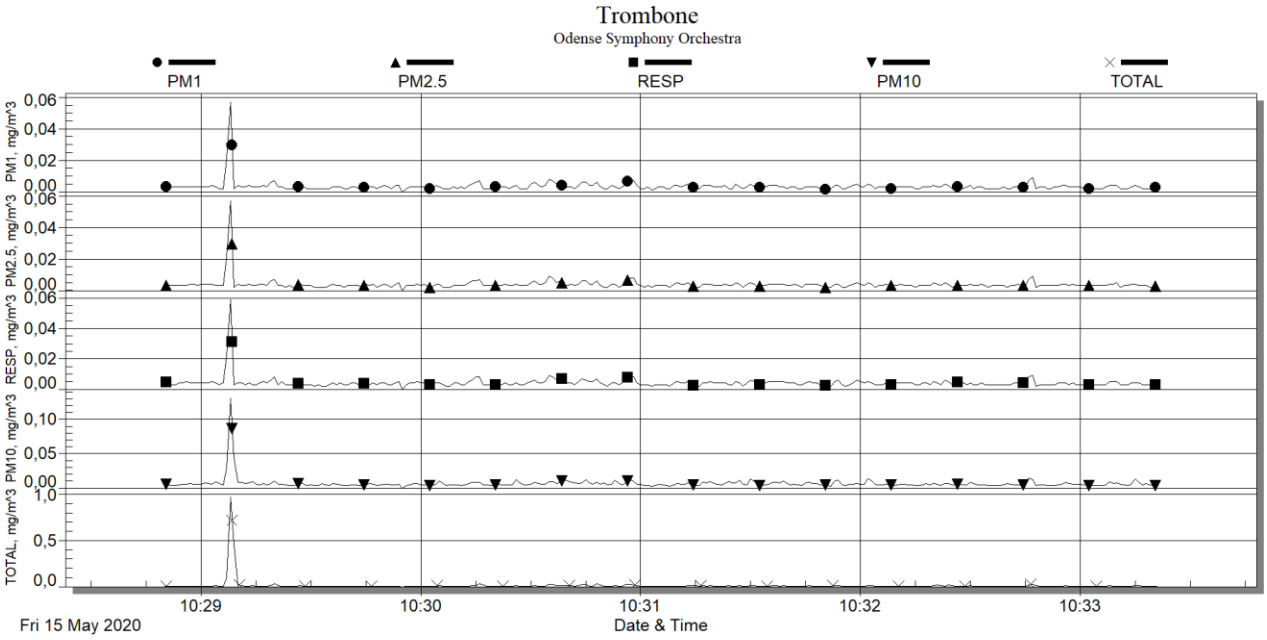
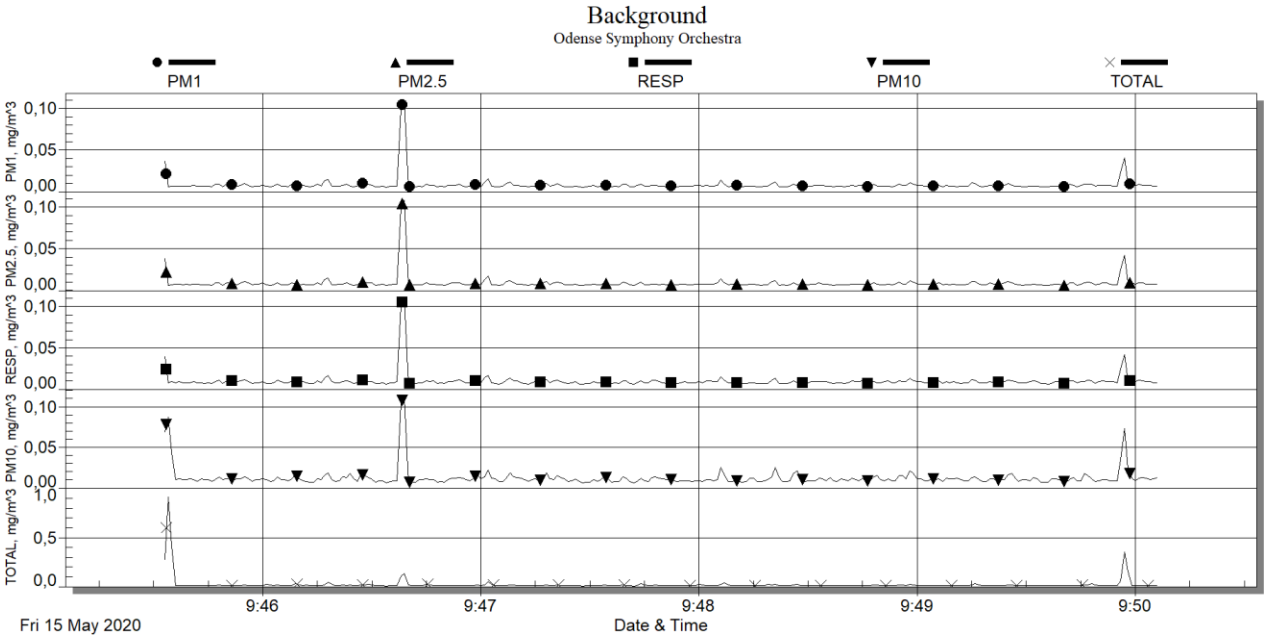


Figure 9.




## Conclusion

The emission of aerosol measured from brass and wood wind instruments was very low, and almost at the same level as background concentrations. Other experiments have shown very little airflow and verysmall aerosol concentrations at short distances from brass and woodwind instruments. Based on the actual measurements and the other studies mentioned 1 meter distance playing brass and woodwind instruments seems to be safe with respect to the risk of spreading aerosol from the instruments. This assumes that musician blow towards the back of fellow musicians.

## Acknowledgement

A special thanks to the Odense Symphony Orchestra and the musicians Rune Most (flute), Henrik Skotte (oboe), René Højlund Rasmussen (clarinet) Morten Østergaard (fagot), Tone Sundgård Anker (horn), Per Morten Bye (trumpet), Lukas Winther Andersen (trombone) and Carl Boye Hansen (tuba) for participating in the study.