



Contribution ID: 67

Type: **Poster**

## **Airborne SARS-CoV-2 in healthcare settings –when, where and how to prevent it?**

### **Background**

In order to improve infection control guidelines for healthcare workers, we investigated SARS-CoV-2 in aerosols and risk factors for airborne transmission in healthcare settings during the covid-19 pandemic.

### **Methods**

Briefly, a liquid cyclone was used for air sample collection close to patients at several wards, and an 8-stage NGI impactor (ranging from 0.1 to  $>8.1\mu\text{m}$ ) was used for a longer measurement campaign in corridors of infectious disease wards. RT-qPCR was used for SARS-CoV-2 detection in collected air samples.

### **Results**

During 2020 and 2021, we collected more than 1100 air samples from several hospital environments, including infection clinics, intensive care units, medical emergency, geriatrics, maternity ward, respiratory ward, anterooms and corridors. In patient rooms, across all collected samples, 10.6% were positive for SARS-CoV-2 by RT-qPCR. Shorter distance to the patient, higher patient viral load, and fewer days since symptom onset increased the risk of obtaining a positive air sample, while increased ventilation lowered the risk. So called aerosol-generating procedures (AGPs), which were of initial concern, were less significant. In corridors, the positivity rate was only 2.7%. The large number of samples from corridors is attributed to the size-fractionated collection method, where 8 size fractions were collected every week. Positive samples were found in particle sizes ranging from 0.1- $8.1\mu\text{m}$ , with the majority of positive samples in size fractions below  $1.7\mu\text{m}$ .

### **Conclusion**

Airborne SARS-CoV-2 RNA was mainly found close to patients in healthcare settings. Patient characteristics, type of treatment and ventilation rates significantly influenced the risk of a positive air sample, indicating that infection control measures should be aimed at controlling these factors.

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