

Citation

, G.: Aerosols: the ignored problem, in „Monitor Versorgungsforschung“ (06/24), S. 32. http://doi.org/10.24945/MVF.06.24.1866-0533.2665

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Aerosols: the ignored problem

>> One central topic has been criminally neglected in the analysis of the corona pandemic: the role of aerosols in the transmission of viruses.

Aerosol medicine had already established before 1990 that even when breathing calmly, tiny aerosol particles are released from the bronchi or lungs. When infected with a respiratory virus, the quantity of exhaled aerosol particles increases by up to three powers of ten, but only in the so-called 'superemitters' (superspreaders). It is not known why only a small proportion of those infected become superemitters.

A good 15 years ago, researchers in the USA were able to prove that these exhaled particles (in the case of influenza) contain viruses capable of reproducing. These viral aerosols are not only produced when breathing, but also increasingly when singing, speaking, coughing, sneezing, etc. It is difficult to protect yourself from this 'viral aerosol'. The best protection is to spend time outdoors: The exhaled aerosol is immediately diluted by the ambient air. Carefully worn masks can also protect the wearer. Ventilation and good air filters can significantly improve indoor air quality. The time spent in a room with infected people plays an important role. The risk of infection increases almost quadratically with time: Double the time means almost four times the risk. Staying in small, unventilated rooms (including toilets and lifts) is particularly dangerous. The exhaled aerosol particles containing the virus can remain here long after a superspreader has left the room.

Even in the first weeks of the coronavirus pandemic, leading aerosol scientists worldwide informed us that the aerogenic transmission of SARS-CoV-2 viruses is very important. The problem: RKI, WHO and the well-known talk shows ignored aerosols at the beginning of the pandemic! Worse: Both WHO and RKI had published completely wrong definitions of the term 'aerosol': 'An aerosol is a droplet nucleus smaller than 5 µm.' This is nonsense. These droplet nuclei are merely a certain type of aerosol particle.

An aerosol is a mixture (suspension) of a gas (usually air) and small non-gaseous particles. These aerosol particles can be solid or liquid. They must be able to remain in the 'airborne' state for several seconds. There is no 5 µm limit. Even a 10 µm droplet in the airborne state is an aerosol particle and can be inhaled. Our ambient air is an aerosol, clouds are an aerosol, cigarette smoke is an aerosol. Smaller aerosol particles below 1 µm, such as those in cigarette smoke or inhaled aerosol particles containing viruses, can even float in the air for hours.

At the beginning of April 2020, the Leopoldina issued a statement on the mask requirement. On 14 April 2020, we contacted the Chairman to ask about the evidence for mandatory masks and virus transmission outdoors. At the time, there was already a preprint of a paper in which a Chinese researcher had analysed over 7,000 infections - a single one of which had occurred outside enclosed spaces! He rightly noted: 'The Covid-19 pandemic is an indoor problem'. The Leopoldina referred us to two inconclusive publications and Mr Drosten's podcast no. 28, so an aerosol researcher and aerosol physician should contact a virologist to find out more about the aerosol transmission pathway?

In autumn 2020, we published a position paper with the Gesellschaft für Aerosolforschung (GAeF) on 'Aerogenic transmission of viruses and how to minimise it'. It cannot be prevented . When Christmas markets were banned in winter 2020/21, ski lifts were closed, people jogging without masks were chased by the police, parks were closed and curfews were discussed, we spoke out again in an open letter to the Federal Chancellor. We criticised the excessive outdoor measures. And we made suggestions on how to make indoor spaces safer - without having to close daycare centres, schools, universities and offices.

Based on our own research, we had now established that FFP2 masks can retain 60-80% of viruses (the mask material itself filters approx. 99% of viruses from the air). However, with a wearing time of only a few hours per week and not tight-fitting, they cannot make a major contribution to preventing the aerogenic spread of viruses; to do so, they would have to be worn 24/7. In a phone call with Mr Spahn, I suggested that FFP2 masks should not be used for the general public, but should only be used by specialist staff: He could save billions that way. His answer: 'It's too late.'

We aerosol researchers had a well-founded suspicion that children transmit viruses significantly worse than adults. A study proposed to the Ministry of Health was rejected. A private fundraising campaign made it possible to carry out this study with the universities of Frankfurt and Bochum. The results were clear and have since been published: Children exhale far fewer aerosol particles than adults and therefore contribute less to the spread of an aerogenic virus than older people.

All these findings were hardly publicised. At a panel discussion in 2021/22, an older medical professor rebuked me: 'Dr Scheuch, stop this aerosol nonsense, viruses are transmitted by droplets! Full stop!' That was the end of all contributions to this discussion that dealt with aerogenic transmission.

This is not an isolated case: the wrong definition of an aerosol appears again and again in the scientific literature. This indicates that many medical researchers, hygienists and virologists are not concerned with the physical background. The consequences for public health combined with unnecessary costs are immense. An understanding of the aerogenic spread of viruses is a fundamental prerequisite for all non-pharmacological measures to prevent this. <<

Literature: sokrates-rationalisten-forum.de