

Interview with Finnish pulmonologist Dr. Alexander van Assendelft on airborne transmission during the COVID-19 pandemic

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Early on in the COVID-19 pandemic, many leading scientists in aerosol physics and infectious diseases quickly understood that the primary mode of transmission of the SARS-CoV-2 virus, which causes the disease, was through airborne mechanisms. Despite these admonitions and decades of evidence supporting their concerns, the World Health Organization (WHO) and national health agencies disregarded these concerns. The failure to address the route of transmission and coordinate a global response has seen the pandemic extend into every corner of the planet infecting much of the global population. Although official COVID-19 deaths are approaching 7 million, global excess deaths are now at 25 million and the prospect of repeat infections with new variants of SARS-CoV-2 has created a pandemic within a pandemic, with Long COVID characterized appropriately as a mass disabling event.

Dr. Alexander van Assendelft, a retired pulmonologist from Finland, recently contacted the World Socialist Web Site to speak on his early efforts to bring attention to the world that SARS-CoV-2 was transmitted through aerosols, and it was necessary to take appropriate measures to address this mechanism to bring a swift end to the pandemic. He called for better source control, through the limitation of speech in indoor spaces, as part of a comprehensive response that included masking and ventilation.

However, despite his attempts to raise concerns with local, national and international officials, including the editors of high-impact medical journals like The Lancet, Dr. van Assendelft and his colleagues were repeatedly rebuffed. It took the WHO nearly two years to say that COVID-19 is airborne, by which time the Omicron variant had already emerged and the crisis posed by the pandemic had deepened. The following interview is part of the International Committee of the Fourth International's inquest into the COVID pandemic.

Benjamin Mateus (BM): *What do you remember or when did you first hear about the pandemic? What was your first understanding of what was happening when COVID-19 began to appear?*

Alexander van Assendelft (AA): I naturally heard about it already in January 2020 and got worried, even more worried because I was in Spain, and I heard about how it was developing in Finland and at that time also, especially in Italy, where it was awful.

I didn't understand more of it than anybody else at that time until the 28th of March 2020 when I received a link to an evening news piece from our son. There was Professor Ville Vuorinen [Professor of Energy Technology at Aalto University, Finland], who was speaking about the work he had been conducting for not more than about two weeks at that time.

He said he had preliminary results and concluded that people exhale aerosols when they speak. Being a pulmonary physician, I was struck by a bolt of lightning at that moment when I suddenly understood that the

transmission of the SARS-CoV-2 virus must be by aerosol, which explained its rapid transmission all over the world.

I was quite shocked also because I had never heard about such things relating to transmitting infections through talking and breathing. The only aerosol sources I knew were the ones we use to give medicines to asthmatics in aerosol devices.

BM: *If I may pause for a moment, you are a retired pulmonologist, correct?*

AA: Yes.

BM: *Can you speak more about your profession and what you did after you retired? Maybe just so that people can understand who you are.*

AA: I studied in Switzerland, in Basel, and became a physician in 1970. And then I went on to specialize and became a pulmonologist in 1976. Since then, I was working in two different hospitals until I was elected chief physician for the Central Hospital in North Karelia, Finland.

In 1986 I was elected medical director of the Central Hospital in Kotka in southern Finland. I was director there until 1992. From then on, I was assistant chief physician, until my retirement in 2015. After that I thought I would have a peaceful life.

But then the Corona came, and it didn't become at all peaceful because I happened to acquire a new specialty. I have tried to really catch up with the Corona in all the ways I have been able to.

BM: *As a pulmonologist, I'm assuming much of your work is done in the critical care setting. And does part of that also include respiratory infections?*

AA: In my case, very little in critical care, but all sorts of infections naturally.

BM: *At the time, one of the issues that a lot of the physicists raised is that there's a very strong divide between medicine, meaning you receive people who are already infected and you treat them, and the aerosol physicist, who is more interested in the mode of transmission. Medical schools and training don't really address the physics behind how infections are acquired.*

AA: Yes, that's true. And that's probably also why I didn't know much about the ways they are transmitted. Naturally. I knew, for instance, that tuberculosis was very easily transmitted through the air, and measles too. But we were only concerned about the people who got ill, and the mechanism behind it was not such an important factor. We just tried to give medicines and make them better through the right treatment.

BM: *And do you think there's a need to somewhat amalgamate the public health in relation to infectious diseases and physics? Also, in the facilities where people are treated, meaning that we can't be so specialized that we don't understand one person's role versus another person's role.*

It's important for the specialties to exist, but we must be talking to the

aerosol physicist. We must be speaking to the public health people who establish policy. We must be speaking to the hospital system and explaining the engineering behind filtration and the technology. These different areas seem to be very separated, and there's no communication between them.

AA: Yes, I agree, absolutely. That is probably the greatest problem and has been the reason why at the beginning and not even now, it's realized how important the physics are, which the aerosol engineers already had been working on by the end of the 1990s and beginning of the 2000s because of the SARS-CoV-1.

That's one point also for me which has been very important. I have a great admiration for the engineers, who really from the beginning understood what it was about. They have been as frustrated as I, that the message just doesn't go through to those who should take care of what to do about it.

BM: Because of what you had told me about Professor Vuorinen, I looked up and found his article on modeling aerosol transport and SARS-CoV-2 virus exposure by indoor inhalation, which was finally published in October 2020. Did you happen to communicate or speak with him on these issues when you saw his report on the news?

AA: Well, I have become almost friends with Ville since then. At the beginning I was very annoyed with him because I tried to get him to be more active in Finland to inform the authorities from his point of view, as he is the foremost aerosol expert in Finland.

I think the engineer's way of thinking about their duty is to inform us physicians and the authorities about what is happening and why it's happening, but it's not really their duty to inform the public in the way we would like to. The first time I called him we had almost a dispute, which I was quite unhappy about.

Since then, we have been in contact, and a very nice thing was that he recently received a prize from the Finnish Academy for applying computational flow dynamics to the study of the spread of COVID through aerosols. It is one of the most important prizes for researchers in Finland. He invited me to the celebration of this prize for his work with COVID-19.

He's an aerosol researcher, for meteorology and other kinds of aerosols, but not for COVID or viral transmission. However, he changed his whole scientific approach when he realized that he understood more than anybody else in Finland about it.

BM: I want to also interject, that at the time in Sweden, Catalina Neeson had published in November 2020 their experiences with identifying SARS-CoV-2 genetic material in hospital ventilation systems a long distance from where the COVID patients were being kept.

They say in their conclusion that airborne transmission of SARS-CoV-2 must be taken into consideration for preventive measures. Their report is based on data from April and May of 2020. I think you also referenced in your letter from October 2022, "Overcoming failures of imagination, rethinking of the US Covid-19 pandemic response." You wrote that there was a reference to an ABC News article in Chinese, from February of 2020, where it said that the Chinese authorities had recognized that transmission of COVID was happening through aerosol or airborne pathways.

They actually go a long way to say things like, if you're in a closed space, try not to talk, try not to be in close contact, open your windows and take basic airborne precautions ... and this is in February 2020...

Placing these in context, on March 28, 2020, you get this link to a news piece where Vuorinen says the virus is transmitting through aerosol, which has significant implications. What did you try to do? This is a huge paradigm shift in recognizing that the pandemic is airborne. What were the implications of this in your mind, and what were you trying to do to let people know about it?

Censorship of the science on aerosol transmission

AA: I really acted, I would say very fast because already on March the 29th, I wrote a letter to be published in the big newspaper in the capital city, the Helsinki *Helsingin Sanomat*.

As I realized that it wouldn't be published, I wrote to the THL (the Finnish Institute for Health and Welfare). At the same time, I wrote to our government and all the ministries in charge and warned them also and asked them to inform the public and to contact Professor Vuorinen to get some more information. There were still no reactions.

Then I tried to get this knowledge out internationally. On the 7th of April, I wrote a short article in the European Respiratory Society's new COVID-19 forum, where I recommended that we should speak as little as possible indoors, that the ventilation and air filtration all over in the buildings should be looked after, and that the people, at least in the shops, should have masks on.

And further, if we would like to talk with each other, we should go outside and keep a distance. Still, even that that didn't give any reaction.

Then I saw an article about COVID-19 in the Swiss *Neue Zürcher Zeitung*, and because I had studied in Switzerland, I wrote a comment to that article which also wasn't published. Because we should have had a meeting with our fellow students in Basel that year, I wrote to two of them wondering about what I should do. The nice thing was that both colleagues reacted to it in the same way, saying that my view about the transmission of SARS-CoV-2 was just the same as theirs. That was the start of our collaboration.

Then there was Professor Per-Henrik Groop, who is an internist professor at the Helsinki University Hospital. He's a good friend, and I also told him about my problem to get anything out nationally and internationally about the aerosol transmission. He said, "I think you should write an article about it."

I asked him if he would also be prepared to contribute to the article? He replied, "Yes, I think the thing is so clear that I would do it." I was a bit astonished because I had already at that time understood that it was something that you couldn't speak about without getting negative comments.

Anyhow, we wrote the article together, and it was published on the 15th of May 2020, in the *Finnish Medical Journal* with the headline, "Aerosol Mediated SARS-CoV-2 Infection: An Underestimated Danger." Still nothing happened, even if I had already sent the manuscript for the article to the Institute of Health and Welfare in the hope that, as it was written by four physicians, it would generate interest.

The same day I wrote an article, which I sent to all the Finnish newspapers for which I could find an email address, 190 in all, but none of them published the letter. So, I decided to take the matter to an even higher level.

I made a complaint to the Parliamentary Ombudsman against the Institute of Health and Welfare. All they said in their answer was that "They couldn't do anything about it. There's nothing criminal which has happened, and the THL institute has the right to interpret the science as they want." I had hoped that they would understand that there is a serious discrepancy between the official line, which came from the WHO to the Institute of Health and Welfare in Finland, and our very clear understanding of the aerosol mode of transmission, backed up already then by Professor Jose Luis Jimenez and Lidia Morawska, with whom I have become friends through email.

I had hoped that they would put together an independent commission to decide what is really the truth and what is not. Then I wrote to the Chancellor of Finland, who is the one who has to control that the government does its job. My complaint was that the government in Finland didn't do its duty to save the population's health and save their

lives. According to the Constitution, we have a right to live, and that should be one of the main things that the government should ensure for the population.

That didn't lead to anything either. It took half a year to get an answer, which was no answer. Then I made my last attempt in this respect by sending a complaint to the European Court of Human Rights. They said the same thing: Nothing to do about it. Nobody realized that it would have been possible for the governments in the whole world to do something else other than what they were doing. It would have been possible to erase the whole pandemic.

I still went on trying. I sent this little article I had in the European Respiratory Society to all health authorities across the world for whom I found an email address, including the WHO and the European Union's own heads. The only response I received was from Austria and Norway, which said thank you, but no one took any actions on the implications noted in the article regarding COVID.

BM: *I think you also told me that you sent it to Dr. Fauci and a personal note to Angela Merkel in December. No response?*

AA: Absolutely no response from anyone.

BM: *What did you make of this complete disregard of your concerns?*

AA: I concluded that we were being censored. It was public censorship in Finland and all over the world.

I suppose that the newspapers use self-censoring routinely, so I wasn't surprised when I didn't hear from them. For instance, I tried with the *New York Times*, with English newspapers, with German newspapers, with Swiss newspapers without any result. The only courageous exception was a small newspaper in Lovisa, Finland. It even published the facts about the censoring.

We also submitted our article on the concerns over aerosolization of the virus to the *Finnish Medical Journal* and to international publications like *The Lancet*. But none of them accepted it. So far, we have managed to publish three responses to other articles in such medical journals. Two were in the *British Medical Journal (BMJ)* and one in the *Journal of the American Medical Association (JAMA)*.

The most astonishing thing was that the editor-in-chief of *The Lancet*, Richard Horton, wrote three days after rejecting our article that "all governments and public health authorities will need to remain open to new ideas for controlling the pandemic." We had just given him a new idea to control the pandemic, and the article wasn't published despite that.

I also thought of getting out the information out on social media platforms, like Facebook. I contacted a journalist who really knew how that works. He said that it would be awfully expensive and would anyhow be impossible because Facebook had decided that any information about prevention and treatment of COVID-19 wouldn't be published. That is a clear form of censorship, and it would be very interesting to know who gave the order to censor such things.

I can understand the censoring of therapies and treatments because there were a lot of very strange concoctions various people were endorsing. But about something which could have prevented the whole pandemic ... really, I can't get my head around how it's possible to censor such discussion to the point that new ideas aren't allowed to be raised.

BM: *In September of 2020, the BMJ had written a comment on this issue regarding the transmission of COVID where they noted that the CDC published information on aerosol transmission where they clearly identified that the risk of aerosol transmission of COVID is real. But soon after that they quickly removed the statement, which is in keeping with a lot of what the CDC has done, which is to censor data and minimize, evade or delay important public information. The WHO is implicated in such censorship as well.*

Scientific truth and dogma

Taking the history of this science—the issue of germ theory and miasma, the controversy between Chapin's droplet theory and Wells' conception of airborne contagion, the CDC's studies on the airborne nature of influenza, Milton's important work on the aerosol of infectious agents in the last two decades, the SARS-1 global epidemic and numerous studies published since on the airborne nature of these transmissions, the critical work by aerosol physicists—there was an understanding that this route of transmission was a valid concern. So, I don't think so much that the censorship was related to scientific dogma, as Jimenez conceives it. I think it was politically motivated.

Because what would be the harm in recognizing that aerosol transmission as a valid mechanism? Not accepting it or considering it poses a serious risk to the population and infection control. The response to a pandemic should a priori concede to the precautionary principle to accept the aerosol transmission and then act accordingly, until proven that such a route lacks objective evidence. Otherwise, how do we hope to eliminate the virus if indeed it is aerosolized?

There should have been a major shift in addressing this question, not only in its scientific, physical understanding but in creating a political response to it, which includes policy on travel, on indoor spaces, on infrastructure funding, on international collaboration, on forms of airborne defenses in indoor spaces, treatments in health systems, etc.

AA: I absolutely agree. And that's also one part of this story, which I have tried to somehow understand. Why we in the 2020s were stuck in the dogma of the 1910s?

The expertise in the WHO couldn't have been real expertise. I would say they were completely incompetent in these respects. But I think that maybe one thing was that already in March and April 2020, COVID-19 had been going on so long and the WHO had denied any possibilities about the transmission by aerosol that they just didn't have the courage to take a step back and say, "Sorry, we were wrong. It is really transmitted by aerosol."

Another critical misstep was that although the engineers understood what it's all about, the physicians didn't. They were stuck in the dogma and maybe also they didn't like that in this respect, the engineers knew so much more about SARS-CoV-2 than they did.

There was also the issue that the scientists always want to have proof about everything. That's in most cases naturally something that we physicians also want to have. But in this particular case, we should have accepted that premise. ... To have absolute proof meant deliberately exposing people to a potentially lethal virus, and that is unconscionable.

Now the sad thing is that there has been published in June 2023 a study done in the UK at such a prominent institution as the Imperial College London by 13 colleagues. It was published in *The Lancet Microbe*. Their aim was to better understand viral transmission and disease. They studied 36 healthy volunteers in which SARS-CoV-2 was inoculated by nasal drops. Not only did they find viral genetic material in air samples, but viable virus samples were also collected in areas where the virus could only get to by being airborne. Two individuals released 86 percent of the airborne virus, which they said supported the idea of how superspreading events occur. Most of the virus that was released was detected over a three-day period.

All this we had already known and understood. In my opinion, the whole bunch at the Imperial College should be taken to trial for that study because it was unethical.

The initial stages of the pandemic

BM: *I found your story interesting in that you were essentially stuck in Spain and trying desperately to get this very important message out to the rest of the world that the virus was airborne. In a real sense, the frustrations you were facing found concrete expression in the predicament you faced. Maybe you can speak to that briefly?*

AA: Yes, it was quite an adventure because we were in Spain during the seven-week lockdown. The only time we were allowed to go out was to buy food. Otherwise, we had to stay at home. I recall at the time I was trying to write my letter to *The Lancet*, but I didn't have Wi-Fi nor my laptop.

Just opposite our flat there was a bar that had open access Wi-Fi. So, I took our rental car and drove around the block and parked right in front of that bar and began formulating my letter on my smartphone. As I was sitting there a police car stopped next to me. They got out and asked me why I wasn't at my home. They were clearly very angry with me.

I explained that I agreed with them that I should be at home but that I didn't have Wi-Fi where I lived and urgently had to get a letter out to the *Lancet* about the COVID pandemic. They asked how long I would need for that, and I said at least 20 minutes. They said, "Ok. In that case you can stay here but after 20 minutes you just have to go home!" So, that was quite a humorous, but still not so humorous situation.

What I thought about ... I will shortly come back to what we were discussing about the dogma ... about the WHO's lack of response at that time. They might have been afraid that the population would panic if they learned about the virus being airborne. In my experience as a physician, and especially when I have been treating patients with very severe diseases, for instance, lung cancer, I had always the principle of remaining objective. I did a thorough clinical investigation and determined if the patient could benefit from surgery or needed oncologic treatment.

First after that I told the patients the diagnosis and explained their proposed treatment. All my patients left with a positive attitude and didn't fall into panic or depression. They very much appreciated being told the truth of their condition. I don't think this is any different with the pandemic. People want to know the facts and what needs to be done to protect themselves.

This reminds me of another point of what I had been explaining to others at that time. Because we knew that the virus was aerosolized, we had discussed one important factor to reduce the risk of transmission: to minimize the amount of talking indoors. Some people, however, misunderstood what we were saying. They blurted out, "It's impossible to be without talking!" What we were saying is that we should minimize speaking as much as possible.

If we minimized how much talking we did—say less than 75 percent of normal and relied more on using texting and non-verbal communications indoors with smartphones, like many especially younger people anyhow do daily with their friends—the risk of facing a person who might have COVID and contracting the infection will be greatly reduced. Based on modeling data about the quantity of virus we emit breathing versus speaking, we could have driven the reproduction number to less than one and ended the pandemic in a matter of a few weeks without limiting our movements drastically.

People who I told this idea to, ordinary people, for instance, here on the island where I now am sitting in our summer house, there live about 300 people year-round. In the summer the figure grows to about 2,500. It was very interesting the first time I came out here in June 2020. There's a little shop nearby, and I stopped there and saw a circle of six women talking with each other, standing outside with about one meter between them. I asked them what they were doing. And they replied, "We are just doing as we have understood we should do because of the pandemic. We are not having any indoor meetings or discussions. We're meeting outside every time we want to get together."

Those women were wives of the local fishermen or normal working

people for whom I have a lot of admiration because they have much common sense and a special philosophical attitude to life. They also understand such things. When I told them about talking less, they said, "Okay, yes. We understand that very well. No problem. That we can manage." But the people who are more educated, they don't seem to understand it or don't want to understand it.

BM: *It's an interesting point you raised about the idea of explaining to people. Very early on there was evidence of the airborne transmission of this disease. We knew that in February 2020 in Washington state at a choir rehearsal, a superspreader event took place where many were infected, and a few died. That incident was caused through aerosolization of the virus during singing. A tremendous number of viral particles are released during such activity compared to just normal breathing.*

If we understood that the virus was aerosolized and that talking can emit more particles, we should take every effort, every precaution, to minimize the amount of talking we do indoors to avoid causing potential infections. I would add, the need for universal use of respirators and the use of HEPA filters and improvement to ventilation in indoor spaces and then only allowing the most essential workers to engage in such work in proximity while offering them daily on-site testing and medical attention as indicated. I think these are very basic public health demands.

What is insidious about COVID is the ability for infected people without symptoms or pre-symptoms to infect others. So, I don't think your warnings on this or recommendations to minimize speaking indoors are unfounded.

Now, on your question could the WHO have been worried that if they acknowledged the virus was airborne, it would have caused widespread panic is important to take up. The only time and only ones that always seem to panic when the truth is admitted are the politicians or policy makers. Then the real question becomes, "Who will panic knowing that COVID is airborne: the public or Wall Street executives?"

AA: I'd imagine that maybe the executives would panic about what they should do in that case.

I wanted to return to the discussion on limiting speaking in indoor spaces. These are based on objective data. When people speak, they emit in the order of 5 to 200 times more viral particles than when they are breathing, with an average of about 10-fold higher. That means by minimizing discussion or not speaking, then the amount of virus transmitted is 10 times lower, which has profound implications.

Tragically, the WHO's guidance in the beginning of the pandemic to wash your hands to diminish transmission, which they borrowed from their recommendations for the flu, did little to diminish transmissions.

Social distancing has the result to mute the aerosols and allows the big droplets to drop down. It does help for the droplets, but it doesn't help at all for the aerosols which are flowing around. The first time I heard Vuorinen speak, he compared the viral aerosols to smoke from cigarettes flowing in the air. When one person smokes in the room, everybody can smell it, but when one person has COVID, nobody can smell it, and that person can infect everyone there.

Who gets COVID-19 depends on individual immunology, current vaccination status and various factors which we have referenced. But SARS-CoV-2 has no odor, and no one knows if anyone in the room is infected unless they are displaying symptoms of COVID.

BM: *Recently I read that 90 percent of all human activity happens indoors. Had we accepted the possibility of aerosol transmission of the virus and acted accordingly to address this route of spread, we would have saved countless numbers of lives. Officially almost 7 million have died. Global excess deaths are over 25 million.*

This means that the pandemic is a social disease although the official public health line is to treat it as an issue of personal choice to decide one's own risks. This goes against any basic public health principle where the pathogen threatens all communities and must be addressed

socially. That's why I raised the issue of panic on Wall Street because accepting the objective scientific conditions required to end the pandemic means a critical shift in our understanding that indoor air that is safe to breathe is a democratic and social right.

This entails investment in HVACs, CO₂ monitors, virus detectors and an assortment of technologies that protect populations from infection while indoors. At the same time, we must design better and more comfortable masks and develop sterilizing nasal/mucosal vaccines. In short, every effort must be made to eliminate the virus and prevent the outbreak of the next pandemic.

The frustration that you have expressed in not finding anyone to listen to your concerns is not based on the lack of information or comprehension of these mechanisms on their part. The stated dogma of the droplet theory of germs, which we knew was wrong from the outset, was used intentionally to place doubt in the public's mind, so they didn't have to address the pandemic which had a significant impact on the global economy.

AA: It's possible. Yes. And it's true that it would really have meant that the whole way of living for maybe two months would have been changed radically. My thinking was that with the help of digitalization and maybe also new inventions, or in the schools even by going back to the blackboard, people would have been able to manage at work almost without talking with each other and communicating in other ways. Going out would have been the right thing to do if it was necessary to talk face to face.

I am sure it wouldn't have been impossible to achieve. The time limitation of what we have estimated was so short that the investments made during that time wouldn't have been in any proportion to what was done during the lockdowns.

That really got the whole economy and the whole world on its knees. That was a much greater problem than informing people what situation we were facing everywhere and getting them to accept the temporary limitations in communications while attending work, school and cultural or other events.

Yesterday, the *British Medical Journal* had an article which was awful to read, about the estimation of how many were killed after China lifted their Zero-COVID policy. Their estimation is that since January this year, about 1.5 million Chinese have died. And more than 90 percent were infected in that short time.

The WHO has such an impact on the national health authorities that nobody dares to even think about doing anything other than what the WHO does. Clearly, no one heeded our warnings in May 2020, and even the physicians I spoke to then told me that they have to follow the recommendations of the Institute of Health and Welfare. The result was no response.

BM: Well, to a great extent, the WHO functions as an auxiliary to the state apparatus. It is a health authority but takes its marching orders from the US and European Union. I think your points are well taken and very critical. But the fundamental question here is the elimination strategy, which is not just a public health construct but one that assumes a political dimension on a global scale.

It requires more than trying to decrease transmission—and I agree that perpetual lockdowns are problematic in implementing. It requires eliminating the virus from every community across the planet. That means we have to rebuild our public health infrastructure from an international perspective. We have to have meaningful collaborations with scientists in every part of the world in conducting surveillance of dangerous pathogens that have pandemic potential. The technology exists to track every package, every truck, every ship and aircraft and every person on the planet. Why not utilize these to assist in conducting detailed tracking of viruses on a global scale?

This raises questions like how do we conduct flights into airports and assure the passengers and population they will be free from becoming

infected? It acquires political dimensions because this investment in an international public health process requires dialogue with every social aspect in every part of the world. You can't just eliminate COVID in Australia or in China and expect that for three years you will keep it contained. A national strategy is not viable.

So, this shift to an international perspective and eliminating the virus also means shifting from a profit-driven capitalist society to a socialistic perspective where the well-being and welfare of all communities are a priority. And from this grows the issue of healthcare, infrastructure building and the various social sciences that can address social needs. What is preventing addressing these urgent tasks is not lack of scientific comprehension or the means to achieve these needs. It is capitalism that has made the pandemic possible in the first place and has allowed it to permeate every aspect of our lives today. If we want to stop this and the next pandemic, then it assumes a political and social character.

AA: I absolutely agree with you. And that is probably one of the reasons why nothing was done, because that's really a huge task. And that may be impossible in our world to get all the governments to agree with this strategy.

BM: I'd like to end asking you if there is something you'd like to say to people who will be reading this interview. Maybe you'd like to make a concluding statement?

AA: I would like to say that even if it's not possible anymore to get rid of this pandemic because of the extremely transmissible Omicron mutations, it would still make a great difference if people realized that the most dangerous part in encountering others is when they are talking. By minimizing discussions indoors, maintaining distance and wearing good masks, then it is possible to decrease your risks considerably from getting COVID. Everybody can do something to protect themselves and others.

BM: I agree with your remarks but would challenge you that COVID **can** be eliminated if we placed our efforts into doing just that, even now under the current conditions. We've been able to do it with smallpox. We have gotten very close with measles. What is lacking is political will, which is why people say it is impossible.

AA: I think you're right, but it would now need much more time. I'm no mathematician. But I can imagine that when we formerly thought that it would take four to eight weeks, we have maybe to multiply it with the transmissibility of the Omicron in mind. I think that it theoretically would be possible, but practically I don't really believe it.

BM: Alexander, it's been a pleasure to speak with you.

AA: Thank you, with you too.



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