

Podcast 1: Kevin Munro discusses 'Face mask misery: do face masks impair speech understanding?'

Hello and welcome to this first podcast hosted by ManCAD and the British Academy of Audiology. ManCAD or Manchester Centre for Audiology and Deafness is located at Manchester University in the UK. I'm Gaby Saunders, I'm a senior research fellow at ManCAD. I have, in fact, just moved back to the UK, which is where I'm originally from. So I'm back home and I'm also at the home of UK Audiology. The purpose of these podcasts is to support ongoing learning during this COVID 19 crisis.

We want do that by providing information about topics that are pertinent to the practice of audiology and to people with hearing loss under the current circumstances. But having said that, we're going to continue these podcasts on into the future, even when life has returned to normal, whatever that might be. So every month we're going to be discussing a topic which will be of interest to hearing care providers everywhere. The podcasts will be very informal, that will be about fifteen to twenty minutes.

If you want to provide us with ideas about future topics for our podcasts or ask follow up questions or give us feedback send me an email and you can find my email address as well as other information about the podcasts and also about online journal club at the url as follows it's the Manchester ManCAD website. So the year URL is: www.research.bmh.Manchester.ac.uk/mancad .

All right so on to today our inaugural speaker is Professor Kevin Munro. Kevin is Director of ManCAD. He is the deputy director of the NIHR Manchester Biomedical Research Centre and Theme Lead for Hearing Health and he's going to be answering a few questions that I'm going to post him on the topic of face misery and how face masks impact speech understanding. So I hope you find the upcoming content interesting and informative.

So, Kevin, I want to begin by asking you to set the scene by telling us why you think face masks and face mask misery are a timely topic for this inaugural ManCAD podcast.

Kevin: Well, first of all, thank you for the invite to do this Gaby and it gives me the opportunity to formally welcome you to Manchester. Like you I'm at home just now and I'm going to try to keep the background noise of the kids and the and the dog to a minimum. But back to your question. So as of today, the six foot me, we don't know if the government's advice to the public about wearing face coverings will change.

But you only have to go outside for your daily exercise to see that the number of people who are already wearing face coverings is on the increase. And my interest is that or our interest within the Manchester Centre for Audiology and Deafness is that being able to see someone's face and mouth when you're talking to them is important and it's important for at least three reasons.

One is, first of all, it helps you to know that they're actually talking to you. So it helps you to detect speech, but it can also be useful to help you to discriminate between different speech sounds. The second point is that seeing the speakers face probably reduces the effort required when you're listening to someone, particularly if you are in a noisy environment or you have a hearing loss or the conversation

is not particularly predictable then you know, a lot of cognitive effort could be required to listen and seeing someone's face probably reduces that. And the third final point I was going to make is that seeing someone's face it guides your attention so you know who's speaking and you know where to look.

So if there's widespread use of face coverings, there may be unintended consequences for people who have hearing difficulties.

Gaby: Yeah, so that makes that makes a lot of sense. So you've talked about some of the possible consequences. Are there any evidence that you want to talk about?

Kevin: Well, in terms of unintended consequences, I suppose there are two issues. One is general issues and then there are ones specific to hearing difficulties. In terms of the general points, which not really our area, we don't know yet for sure if face coverings reduce the risk of a wearer spreading infection to others. But we do know that face coverings might encourage people to be less careful with measures that are known to work. So keeping two metres away, washing your hands and that might encourage people to touch the face and transfer a virus to their eyes. But if we put these big issues to one side I am interested and you and our colleagues in the Manchester Centre for Audiology and Deafness of these specific concerns for people with hearing difficulty because if you can't see someone's mouth or face, it can interfere with their ability to communicate. And there are really two separate things that can happen if you start covering someone's face.

One could be that it reduces the visual cues you get so it's reducing what we commonly refer to as lip reading or speech reading. The other areas, depending on the type of mask or face covering you are using it may distort or reduce the level of speech that comes from the speaker, the person who's wearing the face covering.

You know, when I wrote an article recently on this topic, I'd just come home from the supermarket and the assistant was behind the perspex panel and was wearing a face mask, one with a filter on it. I know they spoke to me, but I didn't know what the what they were asking me. But I knew it was predictable. They either wanted my loyalty card to swipe or they wanted me to stick my bank card into the machine to pay. So I did that. But, you know, it really brought it home to me. If it becomes the norm that everyone or most people are wearing face coverings, then this has potentially a big big impact on people who have hearing difficulties.

Gaby: Yeah, yeah. I can totally see that. But face masks aren't entirely new. I mean, dentists have been wearing them during, you know, dental appointments for quite a while. Has there been any work on the impacts that they have.?

Kevin: Well, you know, anything that covers your face can definitely act as a barrier and remove effortless conversation. But it depends on the situation you're in. If you have good hearing, it is a quiet environment. You know the topic then that might not be especially challenging compared to someone who's in a very

noisy environment, who has a hearing loss and isn't able to predict the conversation. So it is well known that face coverings can have an impact.

I'm not sure it's been systematically investigated because up until now there hasn't been widespread spread use of facemask being used by the general public.

Gaby: Yeah, that that makes a lot of sense. Are there any solutions to the problems that these face masks will cause or is there anything in the works that you know?

Kevin: So if the government policy changes and face coverings are recommended as a precautionary measure in Manchester Centre for Audiology and Deafness we have been exploring a variety of options. And there are really two main categories. One is to wear the kind of traditional surgical/dental facemask. But you can get these with a transparent panel that allows you to still see the mouth. They're not very easy to acquire in the UK just now so that's a potential limitation there.

The other option is to use a transparent face shield or visor. These are the things that we're now used to seeing on television that people in hospitals are wearing, that you have a transparent visor that starts at your forehead goes down to your chin and bends around to your ear. And that really is the choices available right now.

Gaby: OK, and is there any data out there comparing the face mask with the transparent? I mean, with the transparent panel versus the traditional face mask?

Kevin: So there's some information out there, but there's not a lot. I mean I think we're about to see an increase. There was, for example, a study published in the Journal of the American Academy of Audiology in 2017 by Sam Acheson and colleagues. And that does exactly as you've just said. It compares each understanding when someone's wearing a conventional surgical mask with a surgical mask that has a transparent panel. So just to be clear, not the transparent visor that were talking about but a mask that either completely covers your mouth or has a transparent panel.

And the bottom line really was the more hearing loss, the more benefit you receive from the transparent panel - so you can see your speaker's mouth. And the listening task that was used in that study, the performance that we would classify as a moderate hearing loss, increased from 75 percent when it was a traditional mask and you couldn't see the mouth to around 90 percent when you could see the mouth. That's a significant jump, and for people with a more severe hearing loss their performance was, on average, 25 percent, and increased to about 50 percent when you could see the mouth. So that comparison as I was saying, was using the surgical mask, not the visor, which is one of the options that we think might not be available.

Gaby: It sounds a great idea to have a transparent panel over your mouth with a mask. Something that comes to my mind immediately would be with moisture build up so it all steams up and then you cannot see the person's lips anyway. Did they look at that in the study?

Kevin: I think so. There may well be a whole range of practical issues. Things that affect the acceptability of these options that I have just mentioned and these really need to be investigated; so for example people's glasses steam up if they come in from a warm room or go outside in the cold or vice versa, wearing a face visor for some people may feel a bit claustrophobic, you might not be able to get in to get your glasses on, there may be reflections on them. So in addition to simulating what the acoustic properties are like with these face coverings and doing experiments to measure people's performance. I think there is a big need to get a group of people to try these different options at home so we can really understand what are the pros; what are the cons and what are the things we might be able to do things about to help people.

Gaby: Totally off script. I heard something yesterday that actually the wearing of masks when wearing a hearing aid is also a problem because people have to have the mask looped over their ears and the hearing aid is there and there were issues when people remove the masks the hearing aid goes flying. So we are looking at this as a hearing aid user doesn't need a mask but there is that added complication as well.

Kevin: I have also had someone email me over that exact point. Because of their career they have had to use a mask as well as a hearing aid and they have discussed how difficult it can be for the reasons you have just explained.

Gaby: Now I am just going to flip back. You mentioned you had written an article and that was published by The Conversation. Can you explain what The Conversation is?

Kevin: The Conversation is really an online magazine. Started overseas in Australia I think, been in the UK 7-8 years now. Written by academics and researchers but written in plain English for the public. The strap line for The Conversation and the website is theconversation.com. The strapline is Academic rigour with journalistic flair, I think, but anyone can submit articles. If they are published they are available for anyone across the world to republish as long as they acknowledge the source, so it came from The Conversation and you are not meant to make any changes without permission. I was already aware of The Conversation maybe about 4 years ago I published an article about the low and the slow uptake of hearing aids and it just seemed like the right sort of outlet for reaching the public about an issue that is clearly important for people in the country right now and across the world.

Gaby: What have you heard from the public who have read your piece?

Kevin: Difficult to know where to start. Probably the one thing I have written that has attracted the most interest. I have lost count but the number of Emails is in the hundreds, comments on my Twitter account, on Facebook and also posted on the facebook account of the British Academy of Audiology with some comments there and the responses on The Conversation web site. Once you have viewed an article you can leave a comment underneath it and it alerts the author. What I do know is there are a lot of anxious people out there. Because of the article I have been contacted by for example the National Deaf Children

Society because parents are concerned, discussion with Action on Hearing Loss, people from overseas again Australia been in touch asking if they can reproduce it. I suppose the thing I have noticed the most are the individual concerns. The very first concern that came in, I cannot remember whether this was an email or on The Conversation page, an Academic, a Professor in Surrey, who contacted me to say she has a hearing problem and she can manage on zoom because she can be at home and alter the volume but is extremely anxious if she has to go into work and teach when people are wearing face masks.

Also an email from I think an Occupational Therapist who has a hearing loss and had to be redeployed and was wearing a mask. Quite a few from members of the public expressing concern and notably from parents who are anxious because their child has a hearing impairment and what's going to happen to their development, how are they going to cope if they are not able our mouths or their teachers mouths? A big interest from the public right now. Clearly an important issue.

Gaby: Clearly that really underlines it. From a Research perspective and ManCAD - what's next?

Kevin: So we have been discussing this within the Manchester Centre for Audiology and Deafness. We have a number of plans I can share with you. First one is Michael Stone who's background is in acoustics and engineering; he has recorded some audio simulations of a speaker wearing a face covering, he's recorded a passage from Lewis Carroll's Alice in Wonderland with a surgical mask, a filter mask and a visor. One thing to note he's recorded someone who's a very clear speaker with only one other talker in the background, if there was multi-talker babble or someone had an accent or didn't speak so clearly it would be a lot more difficult. We have these recordings and what Michael's going to do is to make them available, going to appear I think tomorrow on the website of ENT News. I will also just to update people provide an update via twitter. If not already following my twitter handle kevin.j.munro. I will give an update on where that information is going to be.

It's worth noting that Michael's recordings are done under what were pretty good recording conditions with a clear speaker.

One final point to note about that is the real impact on the quality of the speech is when you have the face visor some solid surface in front of you that really is starting to attenuate the high frequencies.

Second thing we are hoping to do is to have an audio visual test online so people can complete this test right now from home and that will allow us to compare a surgical mask with and without the transparent panel and the face visor.

The surgical mask it covers the mouth but does not greatly interfere with the speech signal, it would depend on the quality of the mask and how tight it is to your mouth. On the other hand the face visor enables you to clearly visualise the face but it will distort the speech signal by removing some of these high frequencies.

What's going to be the biggest problem for people with a hearing problem. Is it going to be covering the mouth so you cannot see it or is it going to be the visors that distort speech.

Third thing. Survey with the public on their views about face coverings.

Fourth thing. Trial to look specifically at these practical aspects of what you alluded to earlier. Are they comfortable, do they steam up? Lots to keep us busy but clearly of real practical importance and the public really want the answers to these questions.

Gaby: That's what it seems like. I think it's going to be interesting to design experiments that reflect real world interaction as well as the more standardised lab tests. In a way that's where we really I think will gain insight into this.

Kevin: I think so too. It might be that our lab based measurements we do online don't truly capture some of the nuances that happen when you have conversations in the real world. That might even be the best case scenario but it could be a lot more difficult in real life when you are trying to read expressions and these sort of things.

Gaby: That's what it sounds like to me. Just one more question. What's the key message here to Audiologists. What should Audiologists be telling their patients as we know things right now.

Kevin: A general comment before I answer your question; My own view is that the WHO and UK Government currently have it correct. That face masks are not really required by the general public unless you have symptoms or caring for someone with symptoms. That's quite different of course from saying there should be face coverings for essential workers working on the front line.

If Government view changes or if someone decides just as a precaution they want to wear them as many people are starting to do. I think I would say, just consider the possible unintended consequences especially for people with a hearing loss, as I think there could be huge consequences for communication, raising anxiety and creating social isolation. You need to weigh up the pros and cons of different types of face coverings, might even be a case of trying different face coverings to decide what suits you and your family.

Finally, it occurs to me if people are going to be wearing things like face visors and that is going to be interfering with communication. It would be great if someone designed a little sticker you could just put on the corner of your visor, but not so it obstructs your visual field, to say please speak clearly and slowly. That would be the advice I would give right now but watch this space. I think there's a lot of important work to be done by people like us in Manchester Centre for Audiology and Deafness. Yes we will be playing a full part.

Gaby: So the message to patients is they should be proactive and advocate for themselves and ask people wearing a face covering to speak slowly and clearly.

Kevin: I agree.

Gaby: Kevin thanks for your time. Been a wonderful discussion. To those listening. As I mentioned earlier. If you want to ask follow up questions, give any feedback or share ideas for future topics for future podcasts, please get in touch with me. Email is on the ManCAD website at the URL I gave you earlier or gabrielle.saunders@manchester.ac.uk

I hope you enjoyed this discussion and you will come back to hear our next podcast. Until then, farewell and stay well.

Thank you.