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ITU/WHO JOINT WORKSHOP ON SAFE LISTENING IN E-SPORTS AND VIDEO GAMING: IDENTIFYING USE CASES AND REQUIREMENTS

GENEVA, 02 DECEMBER 2021, 1400-1635 HOURS CET

SHELLY: Thank you. And you can put yourself on mute for now. Good morning, good afternoon and good evening everyone. We are delighted to have you here today and thank you for participating in this joint WHO and IT workshop on safe listening in e-sports and gaming: Identifying use-cases and requirements. I would like to inform you this meeting is being

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ALARCOS: Good morning, good afternoon and good evening. My name is Alarcos Cieza, the unit head for sensory functions, disability and rehabilitation in Geneva and it's a great pleasure today to welcome you and also to moderate this meeting on the WHO-ITU standards on safe listening in e-sports and video gaming. Identifying use-cases and requirements. To get us started and to set the stage, I would like to immediately give the floor to our assist Director General at WHO for universal health coverage, communicable and non-communicable diseases, Dr Rennes Minghui. You have the floor.

REN: Thank you. Clear colleagues and participants, on behalf of the World Health Organization, I would like to welcome you to this ho ITU workshop on safe listening in e-sports and video gaming.

Since 2015, WHO's been working towards this goal of making listening safe for all people across the world. While the purpose is to protect one's hearing and to reduce the coherence of the

hearing loss, it's also got a deeper meaning which speaks to all of us. We all enjoy immensely efforts of sound. Sound helps us to experience and interact with other environments regardless of whether the environment is physical or virtual. In gaming, just as the physical world, sound provides information about the world around us, the possibilities of danger, of opportunity. Sounds allow us to communicate by listening and provide us with some feedback that is important, both for learning the games and for taking certain actions within.

We design this to be available to all throughout the course of their lives, was when individuals develop noise reduced hearing loss, it's invisible and they lose full access to the sound. 1.1 bel teenagers and young adults are at risk of developing hearing loss due to unsafe listening practice.

The world of making listening safe initiative has so far been directed with practices with personal audio device and systems, and has largely focused on music. Many of you have been here since we started this work in the 2015 and I thank you all for your continued support and for those who're here for the first time, we welcome your participation and look forward to working together. I would like to acknowledge our co-hosts today and those who will be working with closely the next steps following this workshop. Now, I would like to thank you for your attendance today and I will request alar kos to outline the purpose of the meeting and expected outcomes and take over as chairperson for the rest of the meeting. Over to you and thank you again for this opportunity.

ALARCOS: Thank you so much Dr Ren and thank you also for just setting the stage and telling us what is at stake and why we are doing this work. Before I start introducing the objectives, I would like to invite Dr Lee, the director at the telechampioncation union and Director of The Telecommunication standardisation bureau. As you know, partners ITU WHO join forces for this work and for the whole make listening safe initiative and it's extremely important as Dr Ren said to have you with us.

Please, you have the floor.

DR LEE: Thank you very much. Dear colleagues, WHO assist director Jeb and everyone, I wish all of you in good health in this difficult time. It's my great pleasure to address a few words ahead of this very significant event. Not long ago, I joined the WHO on a journey to develop a more effective standard to protect users of devices playing music from prevent hearing loss. We have produced technical standard that is endorsed by recommend daition 8.870. It puts things in practical ways to measure and control sound exposure and to guide, it will help vulnerable users such as children. The journey started with consultations with experts from the industry and from the medical field, including representation of the users. The journey took approximately two years, the result was a solution that is harmonized with European requirements and also accounted for practical issues identified by manufacturers and users to make the standard more useful and more applicable. The baseline focused on devices used for individual listening and

thus to provide a framework to account for other sound sources while for sounds over other types. WHO and ITU decided to organise this event to look at the specifications that could make safer listening available also for a wider range of cases.

In today's session, we start the dialogue towards identifying the used cases on how sounds are used as a part of the video gaming and e-sports experience. The information you start to share with us today, you are also helping us inform on what applicable requirements are and recommendations could be for making enjoyment of online gaming and e-sports safer for listening. Again, this is the start of the journey. So that we all are allowed to define our understanding of the used cases and also of the design aspects and other practical matters that could leave us towards a useful and implementable standard for safer listening in the video gaming and e-sports contest.

With that, I wish you the hear your inputs and hope that this can be enjoyable. Thank you very much.

Back to you.

ALARCOS: Thank you Dr Lee and thank you to both of you for the WHO and the ITU and to you Dr Lee for being with us and setting the stage of this meeting and actually showing also what the UN system when we collaborate is able to make reality. So thank you for that. And know indeed we go the objectives of this meeting.

We have a single objective to achieve at this meeting today and it's to determine the way forward for creating a technical standard on the application of safe listening principles in e-sports and video gaming. So, think and keep that in mind throughout the event - we want to determine this way forward.

Another to achieve - so we have also different processes to go through first. We will start the dialogue towards the common understanding and possible requirements that enable safe listening in e-sport and video games.

We will also increase our understanding of the different perspectives of stakeholders in this field.

And last, but not least, what we also want to do to achieve this objective is to identify e-sports and video gaming use cases where safe listening would be beneficial.

So, we need to find a way forward and we will proceed in this way. Dialogue and understanding different perspectives and identifying good use cases.

And now, I would like to proceed with - and then another - we have put together an agenda that of course we'll navigate through and this is how we'll achieve that and it will allow us to achieve the objective. We'll start today with an overview of the work that we are doing in collaboration between WHO and ITU in the making listening safe. We will also hear already from the experiences and perspectives of those who're our main targets audiences. Those who play games and e-sports. The perspective from the e-sports federation and then we'll have also an example of the perspective

from the industry. The most important part of this agenda will be discussion and we need to have your comments and questions and input there. In order to achieve the objective of this meeting, to determine a way forward, how to move this work, we will then finalise with final remarks from one of our colleagues from data communication.

I would like now to give the floor to my colleague Dr Shelly Chad what who will provide overview of the WHO and the work done in safe listening. Dr Chadra is the lead of the programme on prevention of hearing loss and eye care, and Shelly you have the floor, please.

SHELLY: Thank you, Alarcos. Let me talk to you about hearing loss and its prevention. So we are here to talk about how to we deuce hearing loss because of video gaming or e-sports. Let's talk about what hearing loss sound like in the voice of Olivia. Let's hear what it sounds like. (Music) Such hearing loss of different grades as you heard in the previous song, it's commoner than what you probably imagine it to be. Currently, one out of five people globally have some dedwree of hearing loss and this proportion is rising. We anticipate that by the year 2050 there could well be one out of four people with hearing loss, that is about 2.5 billion people globally with some level of hearing loss. And while a lot of this rise is driven by demographic factors, there are more people living in the world so more people with hearing loss and also more older people. But the fact that there are risk factors which are persisting and growing, is contributing to this rise. There are estimates that over one billion young people are at risk of hearing loss simply because of the way they listen to their music or enjoy their games or because of unsafe listening in recreational settings. To address this growing issue, WHO in the year 2015, initiated the make listening safe programme which is a collaborative initiative to reduce and prevent avoidable hearing loss, that has been caused by unsafe listening in recreational activities. As part of this initiative, WHO has been working with ITU and the core of this initiative is about changing the way people listen to sounds in recreational settings whether it's music or gaming sound or other sounds that they may wish to listen to. So that is the core of this initiative. And to make this change happen, WHO adopts what I need to or like to call a dual approach. So on one hand, it's to inform people because they need to be aware about the risks of listening to loud sounds, listening to loud sounds for a long period of time and, at the same time, they also need to have those tools available, those choices available which can help them practise safe listening. For example, it's good to tell people we'll turn the volume down, but what does it mean for somebody? How much is down for me may not be the same as for somebody else. If you tell people that when you are going to a concert or a club, make sure you give your ears a listening break, well where should that break happen? Do they have those options available? So, it's important to inform people, but then also to ensure that they have those choices, those options which can facilitate safe listening and prevent hearing loss.

So, to inform people WHO works a lot on raising awareness and undertaking advocacy about prioritisation of safe listening and prioritisation of hearing care. At the same time to ensure that people have the safe listening choices, we work to develop evidence-based standards. Let me give you a quick snapshot of the work which is being done in both of these approaches, in both of these models. So looking at the awareness and advocacy part, so awareness and advocacy, very importantly at the government level, we have an annual advocacy event which is World Hearing Day which will be observed on 3rd March with a theme related to safe listening, ultimately this is our opportunity to take our messages to the Governments, evidence-based messages, packaged in an appropriate way, to the governments. Also, raising awareness with media itself, because ultimately, people's opinions, the attitudes, behaviours and practices are often defined by what they read, what they see and hear in media. In order to ensure that people working in the media writing stories about hearing loss and so on have the correct information in one place we have a media brief on safe listening, similarly we target the youngsters who're most likely to practice unsafe listening. We have developed a library of messages which can be shared with young people through the t digital media and health initiatives in order to raise awareness about and promote safe listening attitudes and practices.

We also undertake media outreach through WHO's standard media and social media channels in order to inform governments, in order to form industry partners and also the general public about safe listening and unsafe listening.

So while this important to raise awareness and inform governments, inform people about safe listening, we have to make sure that they have those safe listening choices through developing evidence-based standards and norms and by facilitating their implementation. So, in this approach, WHO has been working over the past six years to develop a number of pieces of work, working in close collaboration with the international telecommunications union, WHO developed and launched in 2018 and 19 the WHO ITU global standard for safe listening devices and systems, which Dr Lee mentioned, which is also on WHO's website and it's available freely on both WHO and ITU websites. It excludes gaming consoles, and its key features whilst informing, are that a device that is being used, so like a smartphone or MP3 player with an ear phone or headphone should be able to monitor how much sound an swied is consuming and to also display this information to the user. So this is in line with our principle of informing people, give them the information they need to make good choices, and then give them the choices like volume limiting options and also send them those information as notifications, as messages, so that people are actively made aware of these in a reasonable manner.

This standard has been taken up by some of the companies and organisations and this is the kind of interface which you may have seen or if you haven't, maybe you would now like to explore it and see it. Again, with the principle that we want to inform and

enable people. In this work, WHO has also developed with ITU a
conformance testing and certification, so industry parter in who
is wish to claim come plains have a way to do so now. The other
piece of work which WHO is currently working on is to develop a
global standard for safe listening in entertainment venues and
events. So for example a club or a concert. And this, the standard
looks at six aspects. It looks at what should be the sound levels,
the average sound maximum sound levels when you should have, it
looks at how the monitoring can be done and looks at what are the
ways to optimise venue acoustics and sound systems, because it's
not just about giving people a safe listening experience, it's
about giving people a safe and enjoyable, pleasurable listening
experience.

Making hearing protection available in these events and venues,
making Cher that people have access to quiet places when they rest
their ears and also providing training and information so that the
messages can also be available to people attending these venues,
as well as those who're working within the venues.

this is a standard we'll be launching on 3 March of the next
coming year, and I hope that it's an event that you will all take
up. The parts that we have been focusing on with ITU for safe
listening by WHO are the personal audio systems and devises, as
well as the entertainment venues and events.

We are now starting to work in the field of video gaming and e-
sports, as well as automobile or car audio systems. But today's
discussion is about video gaming and e-sports. So safe listening
in video gaming and e-sports. And, as Dr Lee mentioned, we see
today, and this workshop really is the first step in this new
journey that we are embarking upon, and we welcome all of you who
have joined us today to be a part of this, of WHO and ITU's
journey, to join hands with us in order to make listening safe and
reduce hearing loss and to share in our vision which is the vision
that people of all ages should be able to enjoy listening to
whatever it is that they wish to listen to. They could listen to
music, gaming sound, audio books, it's their choice, but, in so
doing, they should not put their hearing at risk. And it's our job
today to try to facilitate that safe listening experience.

So I thank you all for your patient listening and also for joining
us and I hand back to Alarcos, thank you.

ALARCOS: Thank you Shelly for that overview, absolutely fantastic
and also giving meaning to the reason why we are all here and what
we want to achieve also with this initiative at the end of the day
and this work.

And now we are coming to one part of the event that really has to
be, because at the end of the day, it's the lived experience of
those who're frequently users or they frequently do e-sports and
also gaming who can also inform us around the process best. And
today we have a colleague from the ear hearing care programme from
WHO, Ayrton Hogan, to guide the discussion with two people that

are indeed users or those who have the lived experience of what we are talking about. I would like then to come into the discussion and into the camera Ben and Ashwin who I think Ayrton they will introduce themselves, probably. I leave it completely to you, how you want to run it. So, I give you the floor, thank you.

AYRTON: Sure, no problem, thank you so much Alarcos and hi everyone, my name is Ayrton, as was said by Alarcos, it's not an name but there it is. We have Ben , first of all, give us a wave and say hello.

BEN: Hello everybody, good to be with you all here today. My name is Ben.

AYRTON: Great. Thank you Ben. And Ashwin, say hi to the group.

ASHWIN: Hi everyone, thank you for having me.

AYRTON: Awesome. Thanks, guys. Looking forward to hearing a little bit about your gaming experiences and I'll chip in with mine a bit along the way. We'll start with you request Ben, if that is okay.

We'd like to ask what kind of games you like to play? BEN: I like shooty games, apex legend and Call of Duty war games and I also like to play sports games like Fifa which is a football game and I'm hoping to get the latest Fifa underneath the Christmas tree! AYRTON: Nice. I've got my fingers crossed for you. Can you explain to us apex legend, most people are probably familiar with shooting and sports games, but with what happens in apex legends? BEN: Apex legends is a battle round game where you can choose a character to be as and all the different characters have different abilities such as super speed, teleporting and like force fields and it's the last team standing wins.

AYRTON: Sound fun and very competitive.

BEN: Yes.

AYRTON: What is it that you like about the shooting games, the sporting games, the battle Royal? BEN: I like the competitiveness of the games and also like to play in teams with some school friends and it was something nice toy do during lockdown when obviously we couldn't hang out in person with them, so it was a nice way to stay connected with them.

AYRTON: Sure, yes. I can imagine that would have been good, it's been a hard year for all of us in that respect, but gaming is a way to come together. Great. Thanks, Ben. Ashwin, I'll ask you the same questions now, what sorts of games do you like to play? ASHWIN: So I really like shooting games as well. I played a lot of Fifa still, shooting games, but also a bit of Rocket League with cars, so it's pretty interesting because you have to understand that, it's a lot of fun, it's mainly the online games that I really enjoy, it's a bit competitive but can be a good way to just relax so it's a mix depending on how you play it.

AYRTON: Sure. For you it's an aspect of socialising, depending on the game and the mood that you are in.

ASHWIN: Yes, exactly. Sometimes if I play with friends, I guess, it's similar when you heard Ben say, I'm sure we both could say with a friend it's more competitive because you are playing against other people but also at the same time you want to be the better one out of all of your friend, so there's that extra added pressure than when I just play by myself, yes, it's just for money.

AYRTON: Nice. It's interesting we have got a good mix of different sorts of games we like to play.

I'm a bit more into the role playing games myself. I like cowboy games because I get to pretend that I'm a cow by which you I never got to live out in real life. That's obviously fun.

ASHWIN: Dead redemption? AYRTON: That is right, yes. (Laughter) so, Ben, tell us, in the games that you have talked about, what sort of sounds do you experience when playing those games? BEN: In the battle Royale games you would want to listen out for footsteps or gun shots so you can hear where the other enemy players are. So yes, those are the things that you want to listen out for.

AYRTON: Sure. What sorts of sound do you enjoy, so those are important feedback but are there sounds that you enjoy or like listening for? BEN: Yes, definitely, so if you are to win a game, there's almost a slight sound that indicates that you won, it's quite satisfying to hear that.

AYRTON: Yes. It's the little thing that dings in your brain that lets you know that you have won.

Cool. How about you Ashwin, what about the sounds in the video games that you are playing? ASHWIN: Likewise when playing shooting games, you need to hear out for footsteps because these are subtle hints that they are trying to get you to, you know, for you to locate where the enemy is. So those are very important, whether it's the switching off of a gun or whether it's someone walking past you. So you have to really listen out for those things. When it comes to games like Fifa or Rocket League, sounds are more often novelty, for example, the commentary in Fifa, it's supposed to make it more realistic so it indull nls you in that sense, you feel like you are playing a football match other than just your video game. So that is very interesting. Ben also mentioned, the sound for example when you win, there's this kind of more often upbeat sort of a sound which, you know, or if you are diffusing something there's a sort of a chipper sound which you look forward to and for some reason it satisfied you when you hear it because obviously you associate it with winning. So I think that's really interesting because there's almost the sort of satisfaction once you hear that coo iped of sound whereas if you lose, there's usually a different kind of sound effect. It keeps you going further, you know, keeps you engaged.

AYRTON: Yes.

AYRTON: So it's a lot of immersion, a lot of feedback about what's happening, sometimes it's fun, it's a reward system. I'm Curios as well with music, because I know in the games that I play, music is

a big element of what makes me feel immersed. I know for example Ashwin you have played Halo before and music is a big part of that game, it's very iconic. So Ashwin if you want to go first, can you talk about music and games as well, is that important to you? ASHWIN: It really is actually. They cured the games to go with music so it gets you in the mood, whether it's halo, whether you are shooting aliens or burning stuff -- they curate the games to go with the music. Scoring goals in Rocket League, for example. It's almost sort of like the thing they give you to keep you going and immersed and I think it's a very important part because if you are not able to hear the game, I don't think you get immersed into it the same way. So I know a lot of friends who actually when they play maybe if they are playing something casual like Fifa, they just put on music in the background because it's just their sort of way to get themselves pumped up. So music is just, whether it's prominent or just in the background, at some point or the other, music is there in the game and it just kind of, like in movies, it's either to help you to know whether you are an intense situation to calm down or to just enjoy the scenery, so it's also like subtle hints that they give you.

AYRTON: Sure. How about the games you play, Ben, is music a big part of it for you? BEN: Not really. The games that I play, there's normally a lobby that you would wait in before you go into a game, and there's normally like music that just plays in the background, but like Ashwin said, I normally just have some music playing in the background before I would go into a game just to stay involved in the game.

AYRTON: Sure. The lobby music is interesting, it's a bit like being stuck in an elevate right listening to that annoying elevator music. Ben are you listening through headphones when playing video games? BEN: Yes. I use plug phones and plug that into the Xbox controller.

AYRTON: And are you using a microphone with that as well, one built-in? BEN: Yes, there is a microphone attached to it.

AYRTON: Just explain for people who might not be aware, what is the purpose of the microphone on the headphones? BEN: For the microphone, you need that if you are playing, especially in a team, you would need that to tell your team-mates or friend what's happening in the game so that they can, I don't know, have a competitive advantage, yes, I guess.

AYRTON: To communicate with the other people you are playing with.

AYRTON: Ashwin, same for you, headphones or speakers? ASHWIN: I move between the two depending what I'm doing. If I'm playing an intense shooter game like a battle royale I want to hear out for the footsteps, but if I'm playing once again something which is not as intense, something like Fifa or a sport game where sound isn't really that important to winning, I tend to have the speaker so I don't have to keep wearing my headphones, not just because they are bulky but it's loud and direct into my ears, as well as, yes, I can play music on it, so it's, you know, just, yes...

AYRTON: Yes. Thanks Ashwin. I know for me, if I'm playing a role playing game, some of the music is quite against and sound effects quite violent I would say.

ASHWIN: Yes.

AYRTON: So I often do that for people's sake, as much as my own as well, so my wife doesn't have to listen to that while she's trying to go to sleep.

ASHWIN: Yes, you are doing all the manic and killing beasts, it's pretty... there's a lot of noise.

AYRTON: It's not very relaxing, let's put it that way! Thanks, guys. Ben, Hoy often do you play video games? BEN: I play a lot of video games during the weekend or during the holidays. I could play like between 1-3 hours during the weekend, like if I'm not doing any school work and then during the holidays I can play anything from 5-6 hours in total.

AYRTON: Great. Is that back-to-back five to six hours without a break? BEN: I think the I would normally play most three hours at a time. I wouldn't usually play more than that and then I would play again sometimes maybe in the morning and then also later in the evening again.

AYRTON: Cool. Great, thanks Ben. How about you Ashwin, how often are you playing and for how long? ASHWIN: I tend to play a bit every day at least, especially once I'm back from work. That's the time I tend to to play and let go of some steam. But it ends up being that I would average about two hours a day I would say so yes, at least.

AYRTON: Sure, so across the week, sort of 14 hours, cool.

ASHWIN: Yes, at least.

AYRTON: Okay, great. And what about your friends, for both of you, Ben first, do you think they play a similar amount of games to you like in terms of time or more or less? BEN: Most of the friends that I have I usually play with five different friends in total that I play regularly with. But I definitely think that most of them play a lot more than I do. Some of them don't, but some of them are a lot better than me and that requires a lot more time to get better at the games.

AYRTON: Right. Just like any sort of skill I guess, the more you play, the better you get, yes.

Ashwin, is it similar for you with the crowds that you are in and the people that you know? ASHWIN: Yes, approximately the same I would say, I mean a know a couple of people who play a lot more, but I know some that play not as much or more. I'm probably at my six, seven friend, I might be in the top two people whoa play the most. But they would be averaging around the same as well but sometimes not as much.

AYRTON: Okay, great, thanks. What impact do you think that gaming might be having on your hearing, Ben how about we get you to go first again? BEN: I've never really considered the impact but

because of this meeting and the whole thing that we are doing here , I've sort of become a little bit more interested in it. And yes, I think out of my friends at school I'm pretty sure that none of them have ever considered it, if it's taken like a big World Health Organization meeting to realise that that is an issue, I'm sure they haven't known about it either.

AYRTON: Fair enough. Good point. What impact do you think gaming might have on your hearing, Ashwin? ASHWIN: It took me a long while to realise it as well, I guess. That is why recently, I invested in a good set of speakers just so that I don't have to have my headphones on me all the time. I know it's not the solution, but it's a solution which is better than having headphones on me at all times. But yes, like I said, it's hard to game without sound because it's not the same and you can't enjoy it the way you do. The best thing I do sometimes is, I switch over to my speakers and try to reduce the volume. But it's a part of it, yes, sound is a big part of gaming and I know it's important part of the game so I need to make sure I can still hear.

AYRTON: We want you to keep gaming and enjoying it with your ears. Ben how do you think gaming could be made safer for people's hearing? BEN: I definitely had a couple of ideas, like in a game there could be a volume indicator in the game that lets you know if the volume is like raised beyond a certain point then you could have some hearing loss and then you could also say that it's irreversible to try to make it a little bit more, try to enforce ate bit more in the game.

AYRTON: Yes, try and make it a bit more impactful for people, yes.

BEN: Yes, and also, like, there could be like a message on the game itself, like say if you buy a disc or something which you don't really do much of anymore, but if you were to buy like a disc, there could be a message on the box that tells you that there's like some quite loud sound effects that need to be looked out for.

AYRTON: Sure. So you are talking about something like the age rating, for example? BEN: Yes, like that.

AYRTON: Is that something that you would be interested in or want in the games that you play, to have that indicator on there, for example? BEN: It would be interesting to have it there, but I don't think because based off of the games that you play you listen to things at a certain sound level and if you found a volume that's good for you, you wouldn't really want to change it if it gives you that competitive advantage over somebody else who is maybe listening to it softer and couldn't hear you coming.

AYRTON: Sure. Understood, good input. Thanks, Ben. How about you Ashwin, how do you think any other ideas that gaming could be made safer for gaming? ASHWIN: The thing that fortnight does very interesting. So what they do is, basically when you are playing the game of Fortnite, there are footsteps or gun shots, there is there is an indicator, a visual indicator which points relatively in direction of where it's coming from, it's not perfect but it's

pretty good. I know a couple of my friend use it because they can't miss it when it's on the screen but they can listen to it when listening. I haven't played too much of it so I don't know much, but that is a good way because you can actually that way see rather than listen, you can see where the footsteps are coming from. That is essentially doing the same thing which headphones are supposed to do to you, because you are supposed to tell where they are coming from, rather than listening to it. Higher volume or really focusing on it, you can see it. I actually really like the idea that Ben said about the volume indicator because I've noticed my iPhone tells me, it gives me a heads up if I'm listening to music at a good volume or not. So I think it's an interesting feature that you can activate. Even Fifa recently introduced a feature where if you are playing too much, it gives you a warning. It tells you that you have been playing for four hours straight, you know, maybe you should take a break. The same way maybe if you reach the danger zone, you know, it could be something as small as just an LED bar at the bottom of the game. But as long as there's a thing that doesn't interfere with the gaming but it's there for someone to notice, that'd be a helpful thing because while it might give people the competitive advantage to listen to it at a loud warning, I think unless you really are professional e-sports gamer who is really into it, I think to some extent you will also, it's going to plant this thing into your head that maybe it's there for a reason, maybe you should listen to it and reduce the volume a little more carefully or just take a break. Rather than just listening to it at such a loud volume. I think that's very interesting. As well as - I'm not sure if many of the consoles are having the feature where you can put the volume cap on where you can max up - where you can not increase your volume beyond this level, it could be like a parent thing or something you can do for yourself but it would be a helpful feature to have, I feel, because you don't give yourself the option to actually then go above that limit. So I think that would be very interesting.

ASHWIN: Awesome. This has been great. You guys have lael really given us some great information here. One more question because we are running ahead of time. You mentioned e-sports just before Ashwin, what involvement or interest do you guys have in e-sports, Ben I might start with you? BEN: I quite enjoy e-sports, some of my friends play games which have a competitive side to it and there's the Valour Championship which started recently and I've started to watch that a bit on YouTube, it's streamed live on there and I also a couple of years ago watched the Fortnite World Cup with my dad which was streamed on TV.

AYRTON: Cool. When you are watching these kinds of things is it comparable to watching a sporting event on TV, does it run in a similar sort of way? BEN: I feel like in a sporting vent it's definitely a sporting event looks a lot more intense because on a gaming thing it's just, you just see the people's perspective of what is happening and you see them sitting at a desk and it's not as intense as like rugby where they are tackling each other.

AYRTON: Right okay but you still have commentators and things?
BEN: Yes, there's definitely some commentators.

AYRTON: Okay, great, thanks. Ashwin, how about you with e-sports?
ASHWIN: I wasn't really into it at the beginning but now I
increasingly am starting to watch a couple of streams on twitch
sometimes or would watch Ninja videos or Fortnite. But like Ben
said, I don't think there's that sort of, you know, intensity in
e-sports just because obviously when you are watching an actual
football game, there are like 50,000 people this the crowd and
then there's like 22 other people. And then there's a long list of
histories that go behind each club or whatever which obviously
because e-sports is a new thing so that sort of thing isn't really
there yet. But obviously, I have seen a lot of Fifa tournaments
and the way that they have actually started organising it is a lot
more organised than you would imagine because they have special
commentators coming and actual football players who actually come
and maybe take part in it or initiate the tournaments. It's
something that's taken over the world I think by surprise, and in
a very good way because it's really brought e-sports, like you
know people don't just look at gaming as a waste of time or as
just a hobby, they actually use it as a way to - I mean people
actually see it as something more than just sitting there and
killing things, zombies, you know...

AYRTON: Yes, I hear that. I'm a big fan of Formula One, I'm named
after a Formula One dwriefr so it was inevitable! But it's become
a huge thing, even before the pandemic, but particularly during
the pandemic when head to take the F1 car off, the touring had to
stop, they started putting e-sports out there to replace it. It
was already something which was becoming popular but now people
are associated with teams and have sponsorship so it's becoming a
huge thing and the games are a lot of fun so it's, yes, it's
legitimized it as you said in a different way to how games have
been seen previously.

ASHWIN:...

ALARCOS: Sorry, Arwyn you could come back but I wanted to point
out that there is a question from Mark Laureyns in the chat,
perhaps you can also address that? If you cannot see it I can read
it loud.

ALARCOS: It's to both of you and then please come back with what
you were about to say, but the question reads: Do you only want to
hear the soft sound, like footsteps louder and could the loud
sound be left at the normal or even lower level? AYRTON: That is a
good question. I'll have a short answer to that myself then open
it up to Ben and Ashwin. With game like this cowboy game for
example that I like to play, that I be us a lot of work into
making the gun shots sound realistic, immersive and very good.
That's part of the whole intensity of the experience, is having
that dynamic range between what is sort and what is loud.

There's also limitations in terms of compression and different
effects that you would put on that would ruin the naturalness and

the genuine experience that you would get. So whilst the something that could be considered in squashing the sound in that way, it would be something which I think would dinl Nish the experience somewhat. Ben or Ashwin, either of you have a perspective on that? ASHWIN: Yes. I absolutely agree with you on that, because at the end, now games are being made to look a lot more realistic, feel a lot more realistic and immersive. So by doing that, it takes away from the game to a certain extent, like you said it just wouldn't feel the same.

AYRTON: How about you Ben, do you agree or have a different opinion? BEN: I also quite agree with it because the games are getting a lot more realistic and if you are standing right next to somebody and they are shooting a gun and it sounds like a pop of some bubblewrap, it's not going to be very realistic, it's going to ruin the experience.

AYRTON: Sure. Great example! ALARCOS: And sorry, Shelly is asking, could you rephrase the question, what do you mean Shelly? SHELLY: That is a request from Patricia in the chat. Not sure what the question is.

ALARCOS: Perfect. Sorry, I didn't see the link. Good. And I see, because we have some more minutes, can we get why not Stephen in for a brief question? Stephen? NEW SPEAKER: Good afternoon everybody, Ben and Ashwin, thank you very much for a very insightful contribution. I would like to just talk about the changing the sound scape as an issue. I've been in discussion with an e-sports association and they tell me that it's actually outlawed in e-sports, so if you are playing competitively, you are not allowed to change the sound scape to aassist you, it's considered cheating. Do you have a comment on that? I have only heard it from one person but that was a comment I have heard? ALARCOS: Okay. Great. That is the comment more than a question. Thank you for that. And there is another question from Patricia and we will want to hear more of those comments later on, please. So that is already bringing insight into that and achieving our objective. So how many of your friend expend 24 hours playing the video games competitions? BEN: Most of my friends don't really play the games that competitively. I feel like you can definitely play competitive modes but I don't know any of my friend who play or train like it's a sport, like you just get on on the weekend and play competitively with like some of your friend but I don't know anybody that plays for that long. Yes.

ALARCOS: Ayrton, can I ask you too now? AYRTON: I'm not aware of anyone in my circle. Definitely in my younger days I went to parties where you would get computers in the same room and stay up all night playing games, but that was more a socialising event. Ashwin, how about you? ASHWIN: Just - I know one friend who would be playing competitively and he plays a lot - so, yes, just about one. Like I said, most of my friends, we don't do it like, we don't compete in tournaments all that much, we just do it like in weekly competitive modes, but not tournaments that much.

ALARCOS: Back to you, sorry, so now we need to close slowly. Final questions.

AYRTON: No problem. I guess for Ashwin and Ben, before we close out, is there anything else that you think that we should know about gaming or sounds or the environment which we haven't covered so far? BEN: No, I think that you have covered most of the things, yes. Yes.

AYRTON: Getting some nods from Ashwin.

ASHWIN: Yes.

AYRTON: Cool. All right, guys, you have been awesome thank you very much for your input and being generous with your time and your opinions and it's been great. It's been fun. So cheers.

ALARCOS: Great. Thank you also from our side, from WHO again. It's been absolutely fascinating to listen to all three of you, so thank you for sharing the experiences. It's been extremely insightful, as Ayrton said, so thank you for that.

So you have a round of applause from the floor. So thank you also for setting the stage in this way.

And it was very relevant really to hear your perspective, the perspective of those who compete, of those who play games, and we move forward with hearing additional perspectives and so we are going now to the perspective from the global or from the global e-sports federation. We have with us, Dr Melita Moore who, in addition to being a physician and having served as a physician in the NBA-2K League and also WNBA and NBAG-league, she's a member and chair of the health and wellness commission Vice-President of the Tencent global federation and it's a great pleasure Melita to he have you with us and hear the perspectives of the federation and you have the floor, thank you.

MELITA: Thank you so much. This has been very exciting, whenever I have an opportunity to hear from gamers, I get energised and empowered, so Ben and Ashwin have really given some great information perspective on what it is to be a gamer and how they interact and engage and how sound has a big play in what they do as far as when they are competing. Thank you very much again for the warm introduction. I am from the global e-sports federation, we can move to the next slide, and, as you mentioned, I am a professional team physician and I have been so for over a decade in the United Stateses and I started taking professional e-sports in 2019. So I have a bit of an interesting perspective from the health and wellness phase. And just to give a little context, the difference between e-sports and gaming, so when we talk about e-sports, it's really organised competitive video gaming, so we are talking about professional level e-sports athletes and gaming is really casual gaming, and so it sound like Ben and Ashwin are more of the casual gamer and thankfully and gratefully I get to take care of e-sports athletes and the casual gamer. We know that around worldwide there's almost 3 billion people who identify as gamers. The average of a gamer is 18-34, but we know it's starting to trend much younger. So the fact that we are having this

conversation today about safe listening and we know that there will soon be almost a billion youth, that are going to have issues with hearing loss and that youth word is around 12-35. So it fits into that demographic of your gamer. So this is a very important topic so I'm very grateful to be here to represent the global e-sports federation and just a little bit about GEF or the global e-sports federation, we are excited to celebrate our second anniversary this month and so we were founded December 16, 2019, and our goal was really to create the point of reference and be the voice in the community for the world's e-sports ecosystem. Our goal, and we have hopefully achieved this, is that we are bringing credibility and press teem to sports by leveraging the history and foundation of sport. That's very important. Next slide.

With our heads down over the past two years during a global pandemic, we are very proud to say that we actually have 104 member federations or countries that have joined the global e-sports federation. And so we use or motto and hashtag we are all connected and we really do mean that, when we have the ear and we are listening and learning from 104 different countries plus, this really has allowed us to mature as an organisation just being two years young, and really taking a listen to the e-sports ecosystem and community because it's very important. Next slide.

We talk about the GEF, we all show the slide. This is very important to us. When we look at our values, the values are the soul of who we are as an organisation, we are certainly values-based and we talk about equality, fair play, diversity, inclusion and innovation.

If you look at the bottom and our vision, we hope that we are providing and I believe we are doing a pretty good job of this, a safe, inclusive ooive and healthy e-sports ecosystem that celebrates and inspires the youth. We'd certainly not be able to accomplish the goals and vision without the support of some of our key stakeholders so I know we are going to hear from TENCENT after this, our global founding partner. We also have our global partner ITU, and work with some of the other leading organisations around our global, social impact initiatives like WHO and UNESCO and others.

So from a global e-sports federation, we have really taken on the role of creating and being the voice for health and wellness also in the e-sports space. Next slide, please.

So, as a quadruple board certified physician, sports medicine and brain injury medicine is my area of focus and what we are looking at and it makes me warm and fuzzy, this is the picture of a brain in a very specialised type of MRI. And as a brain injury specialist when I look at this I see the power, I see the beauty of the brain. And at GEF when we talk about health and wellness, we really centre on cognitive wellness or brain wellness, and that's why we have this picture of the brain.

It's very interesting that when we are talking about safe listening, we think our ears are doing a lot of the work which

they are, but truly the brain is the workhorse when it comes to hearing, and so I really think it's very important that we certainly focus on brain health, cognitive health and at the GEF if we talk about the brain-eye body connection and it all centres back to cognitive wellness. And when you are talking about safe listening and hearing loss, certainly the ear comes into play, so just as a reference when we actually hear a sound it comes through the ear, it travels through a nerve to the brain, and the brain is really what is processing that sound and creating the sound for us. When we talk about hearing loss and loud noises, it's really the inner ear that gets damaged, that is creating the hearing loss.

When we talk about this e-sports and gaming, I know Ben and Ashwin spoke about this, you know, we look at e-sports pre-pandemic, arenas are sold out, it's a large crowd just like you would see in a traditional sporting event and yes, the e-sports players are centred on the stage. But I know some of the work that has been done with WHO since 2015 in creating this campaign was around traditional sport, sporting venues, music venues and you have all of that when you talk about e-sports, so I want to make sure that we make that point when we are looking at e-sports and gaming that we are considering those things as well.

Next slide.

When we talk about health concerns for the gaming community or e-sports athletes, these are some of the things that we think are important and that we focus on at the GEF and our health and wellness panel is really made up of a collective of health care providers, scientists, wellness specialists and medical providers to really create a robust programme to make sure that we are touching every single thing in that health and wellness space. For us, we certainly talk about mental health, the positive and the negative sides of mental health, we know that with gaming, certainly it can increase socialisation communication which Ben and Ashwin were talking about, speaking on their headphones to their friends or team-mates. We also know the negative sides of mental health with isolation and depression, certainly more so during this pandemic, but we really want to make sure that we are focusing on the team-building, trying to get in the zone and that's keeping in mind the negative aspects of mental health as well. But all sectors around cognitive health or brain health.

Vision health has been key and a lot of people don't really think about vision health when we talk about health and wellness, but you heard Ashwin and Ben said they maybe play three or four hours a day. When you are talking about a competitive e-sports app as a professional, they can game up to 16-18 hours a day and this's practising, playing, and so you can imagine being on a headset or microphone, a screen, sitting for 16-18 hours a day, all the blue light coming from the screen affects your vision health and starts to affect other things like your sleep. But also listening.Nd I think another key thing to point out as we are talking about gaming, and e-sports, we have seen a boom in mobile gaming and I

certainly think this is following along with the trend and, although we want to make sure that we are taking to the makers of the headsets. Mobile gaming is moving in a fast space certainly in some part of the world for sure in a pandemic, so it's not just being on the console, the Xbox or PlayStation, or a computer or a PC, it's also keeping in mind mobile gaming and being on the phone.

We also talk about musculoskeletal issues. It affects your sleep hormone and makes it harder for you to sleep. Competitive e-sports athlete again may be streaming or playing 16-18 hours a day, that really impacts their sleep. Pre-pandemic, they're on a tough travel schedule which I don't think a lot of people recognise, just like in traditional sport, professional e-sports players play all over the world to play. When you are sitting for a long period of time and your job is to game and be on the come pewter and play well, the nutrition can take a hit because you are focused on the game. So we talk about the healthy benefits that snacks, that things that you can do to try to increase better nutrition and of course exercise, exercise is good for everybody. Certainly when we talk about e-sports and gaming, with their research and studies that have shown that when you do exercise even 30 minutes a day, it improves your performance and when you are a come competitive gamer, your goal is about performance, you want to be the best, play the best. What I'm very appreciative of today is that we are having this conversation and now we can start to talk about ear and hearing care when we are looking at health concerns under e-sports and gaming. 2019 when I started, there was not a lot of information about e-sports in professional gaming when it comes to performance. We have seen a lot more research and we know that science leads with everything that we do, and to be able to bring in more of the ear and hearing care, from an e-sports perspective, we are very honoured to be able to do that. We are creating innovation and research centres around the world and being able to bring in very particular and specific things for hearing care and talking about safe listening is our goal. That is a little bit about what we are doing at the global e-sports federation, who we are, and certainly looking forward to the discussion about health and wellness and the global e-sports federation about being that voice, that centre voice for the e-sports ecosystem. Thank you.

ALARCOS: Thank you so much Melita and really thank you for educating us also about this, especially me, so really what is the appropriate language that we need to use in terms of casual gamers, also those who really practice e-sports and also yes, you said about your mission and your vision, it's been also fascinating to hear than, I have to say. So thank you for that and we hope to hear more of you also during the discussion. Lacking forward also to hear and to see how others react to everything what you have said. Joining from the US and actually what we didn't say before was that our panel was coming from different places from around the world, because we have Ayrton joining from Australia, we have Ben joining from South Africa, and we have Ashwin joining from India. So we have also participants in all

over the world so thank you for taking the time to join us from many, many different places and at different times in different time zones. This is great. I would like to proceed now with our next perspective and it's the perspective from the industry and we have Simeon Shang and Simeon, actually what I also want to say, is that everyone has The opportunity to look at the documents. Simeon, we know that - let me check - what do you want to actually tell us first, what do you want to emphasise from your CV that everyone, what is what everyone should know from your CV before we hear you talk? SIMEON: Sure, thank you. You can just call me Simon, I am Simon from TENCENT China. So I work in awe Cowes ticks. Before I joined my company I worked for Dolbw in Australia for a number of years and joined TENCENT about three years ago, now working in the media lab as the leader of the acoustic and audio team.

ALARCOS: Great, you are the right person to represent the industry. Looking forward to hearing from you.

SIMEON: Thank you. Could you present the deck for me. Cool, next slide, please. So so we realise the importance for protection for quite a long some time, and so at the beginning of this year, we know that March 3rd is World Hearing Day so we launched a programme basically to make the hearing level of ordinary people. It's a mini programme we launched. We used this programme, this mini programme to help the ordinary people to do a very quick screen test of their hearing levels. The purpose here is to see how many, because everyone knows TENCENT is a big gaming company, so a lot of the approach is to get access to our users so we lodge this programme to see how normal users and their hearing level are. So we launched this programme on March 3rd and the next two weeks, we have more than half a million users using this programme. Most of them are the game players. Some are pretty young from the statistics you can see that trend. So we look at the first set of data and how that reflects the hearing level of all different groups of different ages.

Next page. Something wrong with the presentation. Yes. That one. Go back. That is weird. Ah...

something wrong with the slides. Okay. If we could use the PDF.

SHELLY: Yes, probably if you would like to share your own screen, please go ahead and do that.

SIMEON: Okay. No, I can't do that. All right, okay, I'll explain, because I'm in a hotel and the connection is pretty weak. So I can't use my laptop to do the presentation. But basically I will explain what it says in the this graph. So, fro our results, so here I want to show the distribution of the hearing scores across different ages. So what we have learnt from the result is that the hearing level for different ages is severely polarised. What I mean is that the young people, the people of the age between 20 and 30, when they have the hearing loss, the hearing loss severity is much worse than people older than them. That's our common sense right, everyone knows that when we are ageing, our hearing level

will drop. But we found that from our test results, the people with the hearing loss at the age of 20-30 has a much serious hearing loss than the people over the age of 30-40 or 40-50. So that is what I mean by the hearing loss. So then we do - can you go to the next page - we do the survey of how it happened and we get the information that the young people are either exposed to a lot of the sound for too long or they're exposed to the sound exceeding the normal ratio. Then we did further investigation. We go to the WHO and the ITU deck just to check the regulation of the hearing loss and we do find that the definition of the maximum loudness and the hearing is around 120 and if the sound goes beyond this level, it's going to damage our ears. We have also found the calculated definition from the ITU. We found that - if we could go to the next page that would be good - we found that in China some of the device manufacturers, like smartphone manufacturers, they have already reached the maximum loudness of their phones. The volume of your mobile phone, your PC or pad, it won't go beyond the 120 DP. If you want to go beyond that, the warning will pop up lake on the left hand side. Some applications, they could also restrict the level of the gaming, of the music, background music. We could do that, that hopes a lot, even the maximum loudn't doesn't match what is in the standards, but there's something in there to protect the hearing of normal users. We are glad to see that happening. But further our study, we see it's just not enough. Next page.

The reason we find that it's not enough is that we, take the iPhone as an example, and conducted the pressure level at a different loudness setting and we found that if people - so the normal hearing we learn from the ITU is that you better make sure that it doesn't exceed 80 DP and if it does exceed, it's better to keep it below 40 hours every week. If we go beyond that amount, it's going to damage your hearing long-term.

So we did this experiment and a level consistent across all devices. This is good but for some other devices, the sound level from their phone is not consistent. In our survey we found from our users, they don't just play one game. For example, with a commute on the bus or on the Metro, the music level sound was high, it could be minus 10 DP and because of the loudness of the environment, it's a loud sound on the commute. They get the loud sound ant laptop in the office then when they get home there are sounds. This could exceed the recommendations from the standards, like 40 hours per week.

That's like the maximum acceptance for the normal users. We actually learn that for the use for the young people, they're actually needing to be reduced than compared to adults. Next page. Here we have a Call to Action - so we want to advocate this across different games, across different devices to protect the hearing. All games, all applications should report their sound usage every day or at least every week, they should report when a user plays the game for a certain amount of the time, they should report the usage, like a percentage of they're usage. You should take into account that a lo of the variation of content, the purpose here is

to - the reason we bring this up is to be a different content - music games and they could have different levels of loudness. It's dependent on the characteristics of the content, right, we all know that. Some of the calculations should be a mechanical way to compute the amount of time or amount of, yes, the amount of time the user spent in that game, they should take into account the loudness variation of the different content. The calculation should take into account the acoustic levels of different devices. We have seen the acoustic variations across different smartphones and laptops. So that needs to be a fairest mace of the usage. Then the last one is that the sound dose calculation is to be sourced in the industry, so the music players, like the Zoom, the conferences, the conference users, they can get a consistent definition or result of the sound dose usage that they have for their application or games respectively.

Okay. I think that is the last page, yes, that's all from me.

ALARCOS: Great, thank you, great to hear from you and also I think it came very well through what at least some of the insights from the perspective of the industries and thank you also for joining us when you are travelling, it's great. So thank you. And this perspective also will inform the discussion later on. So we are now finished with sharing different perspectives, the perspectives of those who are casual players, but also those of a little bit also from what would be for those they do e-sports. We have heard the perspectives from the e-sports federation and from the industry.

Let's have a brief break. I would say five minutes. We will start at 37 after the hour or 7 after the hour depending on where you are in the world. So five minutes break, close your camera and your mic and we will start this five minutes again. Stretch a little bit and get energy because now we come to the discussion and that will be a really the key thing of this meeting for our objectives.

Thank you. Welcome back to everyone. A little bit nrmised. Now comes the core part of the event.

After having heard the perspectives, we would like to have a discussion from two main questions - and we are aware that many opinions and comments have been put in the chat. However, I would like now to ask everyone whom wants to speak if possible to come and take the floor and communicate thereby what the question and comment and especially the opinion, share your views during this session that we will have for about 40 minutes. In case that you are not able to speak, please send me a personal message in the chat so that if you want me to read your can comment loud or question loud, then I would like also to ask the WHO colleagues if they realise that I am missing a question or comment of anyone who for whatever reasons to write it in the chat and then I also bring it up.

Please turn on your camera and mic so that everyone can if possible hear or otherwise we will indeed move forward as I said.

So paying attention also to the chat and sending me a personal message. The two aspects, or the two questions that we would like to hear from you about is, what are the main points to consider for designing gaming software or hardware that can mitigate the risk of hearing loss. So we would like to hear your informed opinions and evidence-based opinions about that, and secondly, we would like to hear what factors you think need to be considered with the developing the standard that we intend to standardise for safe listening in e-sports and video games. Okay I see Shelly wants to make a comment. Shelly, please? SHELLY: Thanks a lot. I was hesitant to take the floor, but I thought I'll claim it again, only to highlight some of the discussion which is on in the chat and extremely interesting which is about the kind of warnings or prompts which could potentially be given in gaming or software perhaps in the hardware side of it as well, regarding how the settings could be safer for listening. So US I just want to share that. And also that of course while these prompts would be useful and in themselves informative it's important to understand that people to make best use of them have to have that basic awareness or information about safe listening. So I wanted to just highlight this.

But I see that there are already a number of hands raised so I'm happy to give that back to you.

ALARCOS: Perhaps we can do it in the following way, since it's a discussion - if someone from the team could put the two questions in the chat so that everyone has seen them, then do you want to have them and then what we'll do is to have really the screen without highlighting anyone, but we'll have gallery so that we can see everyone in the screen and everyone can listen to that. Please feel free to put on your camera of course if you wish, but everyone's happy to see lots of faces in these times when we are so far from the screen. So you have the floor.

SARA: Hello everyone and thank you very much for this meeting. I just want to pose a point because I come from the field of health communication.

ALARCOS: Can I very briefly ask everyone, you are the first one Sara, to please say your name and where you are joining from and where you are from SARA: Sara from the university and one of the collaborating centres for specifically my team for this project. And I would like to point out that health communication's becoming more and more clear. From a technological software perspective, we have a lot of possibilities, so I see the challenge of building such things is a gaming things, app or whatever, that we have all the technology to do this. Still the challenge remains which is concerning behaviour. Behaviour, the cognitive part, the factor that determines the behaviour. And so anything that has to do with the standard I think cannot be removed from the behaviour or challenge that needs to always be addressed if we want people to use something. This is a major issue for awarness but even more so for behaviour change which is the important thing that we need to move into society with because they need to change habits and that

goes back to health promotion and how difficulties. So just to emphasise the importance of this aspect which is as important as the technological part and should be worked together through that.

ALARCOS: Thank you Sara for making that point. At the end of the day, up with of the main objectives we want to achieve is behavioural change and we need to take that into consideration, thank you for that. So, Mark, please? MARK: Thank you for this great meeting, so happy to have so many people on board. When we discussed what we could...

ALARCOS: Say where you are joining us from? MARK: Mark Lawrence an audiologist and the co-chair for the make listening safe group. We have been working on the ITU standard on safe listening and we, I think we are quite happy to see that we should be careful that we keep the sound experience of gaming as good quality full as possible. And we should maintain good dynamic. So when I suggested it in the chat could we only raise the level for the footsteps so it's easier to win, I must admit that discussion we have had before because we had the car on compression on sound levels and streaming and music streaming and if you increase the soft levels too much you end up having no dynamic range and you end up having an overall dose which is much too loud constantly. So I don't think it's a great idea. And then the similar bel question is, couldn't we come up with a quality label for a good sound in gaming, respecting on the one hand good dynamics in the sound, right, but on the other hand, maybe just implementing most of the steps that have already been defined in the current ITU standard 8.870 because what I've heard so far is most of the things you were looking to whand was in the presentation of Simon was in fact exactly that. Because most of the things we do is calculate quickly, inform people about good listening practices, inform them about where they are, and it looks like it's a very good idea to do that. The only thing I don't know and that is why I hope the experts are here, can this be done on those gaming consoles , can that be done on the other systems, it can definitely be done on the smartphones when you talk about gaming or whatever, because they are already implementing it today. That is an open question. I hope we go for quality, sound experience, great, and maybe adopting what is already there, I don't think we have to reinvent the wheel again, it's already there. Thank you.

ALARCOS: Thank you. Can it be done, keeping the sound experience as well as the quality. Can it be done for e-sports and gaming. Good. Please, come in and respond to that challenge. Cory, you tell us where you are joining from? CORY: I'm Cory, an audiologist and hearing scientist at the University of Colorado in Denver Colorado in the United States. I come to this from the perspective of public health and risk and one thing that has not been made clear is what the actual public health problem here is. Certainly we understand sound level exposure for people playing video games but it's not clear that that's actually a widespread problem. To my knowledge, there's not a substantial literature base evaluating the risk of gaming to hearing. There are minimal case studies on this. There are scattered reports across the Internet and popular

media about hearing loss from video games, but to my knowledge it hasn't been studied. I would propose that this group take on research as to whether it's a widespread problem, or if this is really tilting at windmills.

ALARCOS: I could imagine because some hands came up I think when you were speaking, potentially addressing what you have said, otherwise I will go back to Shelly in order to respond after that.

But let's go to James and then to Melita, first, so James Young? JAMES: Hello, my name'ses James Young, I'm calling in from Canada, I'm a teacher and coach the e-sports team, I'm a member of the governing body for high school or secondary school level e-sports in our province, e-sports association. I think Sara said it much morel constituently than I can which is that all of the development of these standards need to take into account the importance of be behavioural side of it as well. That is something that we struggled with a whole lot, not just in terms of sound or safe listening, but also the idea that implementing any sort of standard or safe practices is that at the end of the day, the behavioural like, it's the choice of the player, you know, in the chat lots of people have said you can override that, you can override any limitations through hardware and make the changes in hardware so I definitely agree with what Sara was saying in terms of the fact that behaviour is a big part of it. I guess my question is, is the mandate of the WHO just development of the, or I guess of this committee or whatever, is it just development of the standards or is it also development of educating coaches like myself or governing bodies like the unwith I'm a part of, of those standards as well? ALARCOS: Thank you, James. We will do something again, let's - because you reemphasise the message from Sara in terms of behavioural change, that is what we want to achieve, but you have also a question for WHO similar to the point put before with another question. So we'll go back after Melita. Melita, please? MELITA: I have a comment to Mark and I certainly agree about not reinventing the wheel and focusing on quality. When talking about safe listening in gaming, safe listening in e-sports, I think it's a very different, it's not a different conversation but certainly has its own nuance. When we are talking about public consumption and health awareness, I think this is absolutely great but when talking about a competitive athlete like in a traditional sport we'd never tell Serena Williams or Cristiano Ronaldo make your ball smaller or your racket bigger to help decrease potential outcome, so I think that that is very important that we focus on that. To Cory's point, I absolutely agree, there's a lack of research in this area and I take the point of, as a concussion specialist, I would rather get ahead of something and be proactive versus reactive in the concussion space, you know, how we treated concussion ten years ago and educated the public in awareness for parents and players is very different and if we would have had that education and awareness ten or 15 years ago we wouldn't be where we are with regard to how we are treating a specific concussion and the injuries that we see. So I think we have an opportunity to be proactive here during

the research, starting to educate the public, educate and create the awareness before we have a true potential issue within the e-sports and gaming space and have to be reactive.

ALARCOS: Thank you. I would like now to give the floor to Shelly in terms of for the evidence, the public health evidence that we have. But in terms of the mandate of the WHO, perhaps a word from the colleagues of the ITU, potentially Simeon will want to comment because it's not only about the mandate of the WHO, it's a collaboration between two UN organisations and of course two different mandates that indeed come together. First to you, Shelly.

SHELLY: Thank you. We have had of course this kind of discussion even within the ITU Group before we started and have come to this point about what is the evidence behind gaming causing actually any harm to hearing, so thanks for raising that point. As Melita and Cory pointed out, we have a lack of evidence in this respect and we have ourselves, the hearing health care professionals to blame for that because it's not an aspect that has been researched significantly however having said that, and there is a publication which I'm happy to share on the sound levels from gaming, in different kinds of games in racing games, in shooting games and so on, what are the sound exposures like. There is really if you look at average sound exposure, there is no reason to believe that the ear would react differently or extinguish between a gaming sound versus another type of sound music or occupational exposure. We know there are cases that lead to the rationale that it would impact the ear and hearing of people. And certainly, as Melita said, we could wait for ten years to gather all of that evidence or we could be proactive and gather that evidence in level or develop those systems to measure hearing loss attributed to various things, whether it's listening over a personal audio device or while gaming or while listening to an audio book or it could be while listening to music in your car stereo system. So we could gather that in parallel. But to wait for what we already know is coming with three billion users at least if you saw some of the panellists who were there three to four hours a day, we are looking really at potential issue which needs to be addressed as a politic health issue you now. So I would not think that waiting is a good choice or option for us in this space. So that is about the evidence or the lack of it. The second question you had was about...

ALARCOS: Yes, how far we will go, so to speak.

SHELLY: Yes. I think as of now, James, we don't have a clear path. We don't have, I would say, any kind of well-defined work items. As we develop the standard and it comes to light that, the training of certain groups or sensitisation of certain groups is an important aspect of that, we, as a public health agency certainly have the capacity to look at that, to propose to develop also the modules, what we are not is, we don't really implement those things, we then work with partners to implement those trainings in their own settings whether it's for example in the

case of music, in schools of music, or it could be for audio engineers or others who're working in this industry. So, I would say that that is something, as we move along and define the needs for this, of this work and the scope of this works, we are have been happy to consider and how to realise that as well.

ALARCOS: Thank you Shelly. From the WHO perspective, actually it's the health risk what we are looking at. For those who are new to the partnerships that we have, can you again emphasise the angle from which ITU is coming from in terms of the importance of this initiative? SIMAO: Yes. I hope my audio is coming through well. Just introducing myself, I work for ITU, I'm responsible for the management of the process for multimedia standards in ITU. And I look at e-health, digital health and of course we developed the safe listening standard with WHO, first edition published in 2019. In that process we did several things in terms of the mandate. Partnering with the health specialised agency, the WHO, we have come up with the technical guidance on How to measure and communicate with moments upon which the communication user would be made to us Yahoo! It to make it more impactful. We are sharing the efforts with a large team of audiologists as well as other experts and communication in terms of I think finding the full messagings and how to change behaviour. In relation to the technical standard, talking about the devices, playing music, and communication, was to how we could communicate the concepts to different kinds of partners, so we developed it with the development sector, a kit for helping spread the word about the standard and the implementation. Implementation has to be driven by the industry in this particular case and I would think that I would have to be spread also in the case of games and e-sports by the manufacturers of software and hardware games and people implementing those events that the could happen. So there a then a spread of communication or the awareness-building aspect, such a kit could be useful there. So we have done that for the safe listening for devices and I imagine that we are going to keep our options open to that. The WHO in addition as Shelly mentioned, had this wider mandate for the health itself. So, there is a strong programme been here that goes just beyond safe listening for music, but it's a very wide programme so there are many initiatives and workshops and every year regular events to raise awareness, so it's, let's say, the multiapproach to address this.

While I have the floor, I want I to make one verification that is sometimes important distinction between a standards and regulations. So the standards, some become part of regulation because of the country or a regular organisation like the European Commission decides that a standard should be part of regulations, that is when they become implemented and used in that jurisdiction. But the standard itself is not a regulation. So I want to make sure that some people might be afraid of, oh, ITU and WHO are creating regulations for that to impact how we do things, that's not the spirit of the thing, the spirit is finding the best technical means how to make safer listening, make listening safe and the WHO makes the compliment that this makes sense, it's

useful for the user. So that is the two sides, and now if some states decide to use that as part of the national regulation, some guidance and so on, this is something that is beyond our mandate in terms of saying what they should do, the best thing we can do is to say you should do it this way, we believe it is fostering a safer environment for listening, and we start that with the devices, we are looking to this area of games and e-sports. There is a lot of areas we might want to look into, for example entertainment, environments like a car, connected cars that have multimedia environment within it so. This is another area that could be looked into. WHO is already looking into safer listening venues. It's not clear whether this is a standard that should be developed in that context or not.

So we are keeping the options open. E-sports could be a combination of both, device listening and venue listening, so that is something that we should keep an eye on as we proceed. And just one final comment, also prompted by a comment by Ashwin I think he left already this event, but I think he said that he likes to hear in his headphone music while playing a game so that brings to me the issue that put music and our work on the lawnmower to, you know,ings so the combination of that, so that makes more important the issue of one building awareness of what is the concept of those and how that is impacting hearing, and second, we need to think about ways of computing sound exposure coming from different devices. We didn't really address that. We know that it's an issue but it's something that we might want to all take a look at separately, maybe it is going to prompt us to start to look into that as well. Thank you.

ALARCOS: Thank you for that comprehensive answer addressing the many different issues, also emphasising the difference between the standard regulation and it's also important to clarify from the outset and opening also for other areas that we need to concentrate on like dosing. But let's go to Brian who has been waiting for some time. Good to see you, please tell us where you are joining from and your comment or question, please? BRIAN: Thank you. Brian Fligor in Boston associated with the university in private practice audiology now, but it was at Harvard Medical School 14 years prior where I was. I completely support the notes saying that we need to make sure that we are clear ourselves with the risks associated with this and Dr Moore's point, we don't want to be reactionary, late to the game, Cory, Colleen, a few others were one of the early folks to say hey headphones more music listening may actually raise raifk for hearing loss, so we don't want to downplay the significance. I want to suggest, as we explore this, what I'm hearing so far today is that there's a strong interest in us focusing on the engineering and administrative controls associated with hearing loss prevention, as well as education and motivation of the final users. Those are two of the most important components of a framework for a hearing loss prevention programme and hearing loss prevention programmes within occupational, recreational settings, there's a very, very good framework within the industrial hygiene world on the other

hand is that we first do sound exposure survey, then we do engineering and administrative controls then engage in audio metric monitoring, education and motivation then hearing protection devices if the other four components don't match and result in reduction of risk.

So I think within that framework, I want us to be sure that we ourselves are looking at our own question critically and prior to engaging in the engineering administrative controls for education and motivation that we do look at the other components of the framework to ensure that we are answering the question completely, thoroughly and that we are critical of the question first before people outside start asking the question that we want to be ready to answer. He ALARCOS: Thank you, Brian. Point to consider. This is from the framework not only concentrated on part of them. Perhaps you can put also the four components in the chat so that it's remaining in the minds of everyone. I would like to bring back the questions we are concentrated on and it is, what are the main topics to consider for designing software or hardware that can mitigate the risk in the case of e-sport and gaming. Or is the discussion in the direction we already know dose? Shelly? SHELLY: Yes, thanks Alarcos. I think there can be two thoughts about the engineering controls or a standard would be a part of a solution, it's not that by implementing a standard we'd be able to prevent hearing loss completely but it's an important part and the part that we are discussing today. I want to see that as Brian said agreeing with him could not be functions in ice lace, it has to be part of the puzzle and it's a peace of that. To further the discussion, in the chat or when Mark spoke, it was said that we have have a standard that is appliable essentially to audio content heard over a mobile device, mainly applicable to music and other streaming content as well. Of I would like to challenge the group as Mark did to ask, is that the kind of standard which could be applied not to say that we just transfer things but is that the direction we can start thinking on, that we have measurement of sound levels and information about it, make sure that settings are appropriately but if there are settings options, those can be suitably highlighted for people and so on. So is that the kind of basis which would be reasonable to start working and I ask this of people who have the expertise in gaming sounds and also software development for gaming because that is ultimately what we'd like to do, to work with in the context of this standard.

ALARCOS: Thank you Shelly, it's going back to the question of Mark, can it be done in terms of keeping the sound experience and keeping the quality? Is that also the question that you are emphasising? SHELLY: Yes, of course. That is a given. We have to make sure that we preserve the integrity of the listening experience but what I'm talking about is how far the 8.870 and I outlined the features briefly that could be applied actually to gaming. What would be the challenges of that, and is that something that could be done? CHUCK: Hi, can I chime in? So, I'm an electrical engineer as part of the CDC in the US and I agree with Mark, the framework is already there. However, what Cory

brings up, the point and Brian as well, we really need to understand e-sports a bit differently. Unlike music, there are, you heard Ben and Ashwin talk about shooting and there are some different types of sounds characteristics to gun shots, to different types of things on gamings. And what Melita said about the e-sports gamers being in an arena, we need to understand how the noise levels generated by the audience can affect the exposures. So I think there is a need to study and understand those exposures well and then see what parts of the H870 can be applied for. We have done it and had several studies in this area but I don't think we are at the point where we can make generalised statements on these things. So I do want to emphasise that a little bit more studying and understanding of these exposures need to be done. We understand that it's an issue, but I think we still need to figure out what the actual sound allowance and sound dose is actually, you know, from someone playing recreationally to someone playing as an occupation which, you know, we might want to be involved in. That's what I wanted to share with you.

ALARCOS: Yes. Great, thank you, Chuck. The point is very well taken. I think the question was also before. Of course we'll collect the evidence, but should we not start really move being in that direction and defining already dose criteria and what can be done and should be done? Mark? MARK: Yes. Thank you. So this is Mark again and by the way I'm sitting in Belgium somewhere right now. You see a European star behind me, that's hopefully giving away something! When we are discussing questionnaires and raising questions, some people think this is just about evaluating what's there, but asking the question is already an intervention. Telling you that what you are doing today is already making a difference. I was surprised when you were looking for a candidate to join this panel, I was looking into multiple websites and LinkedIn sites and whatever and I came across the awareness on the importance of health, right and securing health during gaming and during e-sports which is great. On the other hand, I was surprised that the ear was always forgotten.

Melita showed that as well and I was really surprised it wasn't there. At least now half of this panel are people that can make a difference. So please don't forget the ears, that's already a first step in the good direction, looking into it, it's important to take care of this. On the other hand, we were surprised in the beginning and we had many discussions that explicitly caming was left out of the H.870 and the reason it was left out is that we thought it was probably too specific in difference and we needed really the get much more knowledge about how it works if we are implementing that because it's a lot easier to copy and paste it into e-sports and game over that's done and you can implement it as is. We are aware that it might be different because sometimes you are working on the different console, on the different equipment, of what is happening at that moment. How do you then combine the sound of the audience or the people playing and the crowd in combination with the amplified sound in your headset. A

lot of things are happening so. That is one point. The other point is, I think it's easier when you talk about mobile gaming because most of that is working on smartphones and a lot of smartphones today already have the capacity of measuring weekly dose and you can already adopt it as is. I think that would be low-hanging fruit. So I'm happy that there is some good thinking going on, please help us what to do and how to combine it and yes, honestly our ears don't really care what the sound is in terms of damage, the most favourite music can be as damageful as the most worst music either so we need to be careful into not trapping into that. Thank you.

ALARCOS: Great, thank you, Mark, again for your comment. And I see Andy with a comment, I would like to ask about the comment there. Shelly do you want to read one of the comments? SHELLY: I want to make one of my own as well. I'll read Raj's first. With all of the possible devices including smart devices and e-game player, how do we notify the accuracy for the exploez sure, multiple sources present an issue if they cannot communicate with each other, which is a very pertinent point. Somebody can get a full day or week's dose from listening to music plus additional dose from gaming and then more by going out and still stay on the device and stay within limits. So certainly that is a challenge which we lack to people with expertise in these fields to address. But I want to make a comment, and in this case, after Chuck's comment, which is to reassure. So, the reason why gaming sounds were left out of Hn't 870 was because of the recognition that we do not have the understanding, the know-how and also the expertise around the table to actually work in this, what kind of sounds does it involve, what kind of levels are we looking at, what kind of practices exist around it? So, certainly we recognised it at that time and at the moment, we are only I would say slightly better informed through a study of literature but not more than that. And what we hope to do, starting on this work, so that is why we can convened this discussion at the outset before we actually start the work, because we want to get that expertise the, we want to find those people who can contribute to this work who have that know-how, that knowledge-base that skill, to guide this work to also educate us along the way as many have don't about other aspects of software and devices and so on. So, it's really to find that information that this meeting is convened. It's not to present or say that okay this is something which needs to be done and we cut paste and so on, that is not the purpose of this discussion.

ALARCOS: Yes. Thank you. Thank you Shelly for specifying that. The question is, we could already go to really, based on what we have heard today, what will be the next steps from the WHO and ITU perspective and I think we hear quite a lot of insights that even if it's a little bit spontaneous and we'll take the freedom to modify that currently, integrating everything, Shelly, what will be then the next steps? SHELLY: So, as I see it, we would like to follow a process somewhat similar to what we did for H.870, so once this is accepted and we move forward within ITU and the

standardisation process, we'll start with an initial situation analysis to look at what exists in this space, what are the kind of sounds we are talking about and so on. And in that we would also like to talk to people with expertise because what is their public health literature is fairly limited. And then on the second hand, also start with user survey to understand better what are the practices that we are looking at.

ALARCOS: Great. Thank you for that. Of course that will happen and potentially this group or potentially even a larger group that will come with information in the next couple of weeks. Good.

Any additional comments? So we are now six minutes still on time and I don't see anything. Tell me if you do? SHELLY: I see some comments from Andy Payne and also from Raju, so perhaps you want to read those? ALARCOS: Yes. Andy, let me know if I have you here - I see several of them. So, two areas of focus, the first one software games sound design with games, all sports are games but not all games are sports.

ANDY: Shall I just help? ALARCOS: Yes.

ANDY: Excuse me for butting in. As far as I can see it, there's two areas to think about. It's the actual sound within the software as designed, so quite rightly several speakers from talked about the sound within a game, there's obviously music within a game but there's also a huge amount of sound, it can be directional stereo phonic et cetera. The second aspect is the hardware that players and fans will use to enjoy their experience. So that's going to be dependent on headphones, speakers, sound cards, and all of that stuff. So, there's like, the sound design is with the games' developers, and then the output is with all the various manufacturers. So I think if we understand that, then that is pretty cool. We could go out and get an expert panel put together of sound designer, two or three people globally recognised within the games industry who actually do this for a living, and I'm sure that with the right push to get them to come and speak or join or whatever you want them to do to advise, it's in the interests of the game industry to work with the WHO and so that would be understood. Then just to say that all e-sports are video games but not all video games are sports so. Playing communities, which is the fans, they choose what games effectively become e-sports and it's within the communities that you find all the players and fans and they will be useful if you are going to do outreach. So if you want to talk about user surveys and so on, then there's probably 30, 40, 50 different games that could be contacted by the games developers and communities and again happy to help you with all of that stuff.

ALARCOS: Thank you. Good comment, thank you, Andy. So Mark, I give also you the floor before we go to the closing, please? MARK: Thank you, Alarcos. I wanted to mention that we don't have to wait until we have a fully developed standard to start acting. There's a lot of stuff we already know on the other hand is why please involve us, let us have a floor or inform your members and all your organisations about the importance of safe listening. I have

a feeling that when e-sports and gaming is considered, that the aspect of hearing and safe listening is probably an aspect that has not been very well highlighted or not very audible talking about hearing communication. So that would already be a very good step to look into this, and be aware that we don't want to spoil the fun. On the other hand, I think it may be wise to start with gaming because the moment we go too much into e-sports and professional use, then we are moving towards maybe more complex mine field. That could be a start. I want to leave it open for discussion. Melita pointed toward that, but it's a difficult way of working to be fair and we may want to look at it in a different step, sta starting with the easy, logical step that we look at in spare time. Thank you for the great meeting, I will leave it with you. Thanks a lot.

ALARCOS: Thanks a lot Mark, all the comments we'll take on board. The additional comments now came in the chat and again we'll go back to the chat to see also all the additional comments that we didn't perhaps we missed. So, thank you for that. But I would like now to go to Simao for any, Shelly before to you if you want to add something in case before at this point before I pass over? Great. Then Simao to you for a closing.

SIMAO: Thank you. Very glad to be able to listen to all the inputs. This has been what I expected to have today, having people that have been participating to safe listening, and bringing in new experts, people with different perspectives that give us the additional level of information and leads into these problems. So I think it would be great to go ahead. I think it was a very, very, very productive meeting and very glad that we had this event. We are going to be discussing, I believe, in the next week or so, a few further steps in the direction of further structure in the work. We are going to take what we have learnt today and reach out to all of you to continue to be on board with us to continue to do this process. Hopefully we are going to be able to bring more people on board from the user side, from the manufacturers side, to amplify the understandings and make sure that we can develop a meaningful guideline for safe listening within the space of gaming and e-sports.

So just to close this event, I would like first to thank Alarcos for guiding us through the process today, it was great to have this, and all of the intervenors, just wanted to mention Dr Lee and Dr Minghui for the support for going ahead with the technical work and the advocacy work that we are going to be engaging in. All the different views from the intervenors in the panel and then in discussions. I learned a lot today so I'm very, very happy to have had this inputs and I'm sure that this will lead to a very interesting path ahead of us as Dr Lee mentioned, this is the starting of a new adventure in this direction and we hope to develop something that's meaningful guidance that can be useful when protecting hearing of all players, young and older for, you know, improved quality of life and enjoyable. Thank you.

ALARCOS: Great. Thank you, thank you Simao and thank you then to everyone, all the participants for joining and also especially to our panel that also shared with us their own experience. We will increase the number of people we will be able to tell about their experiences as was said also in the chat that the next time involving e-sports, people who are engaged in competition of the e-sports and we will of course consider that and other comments. So, great, thank you and you will hear from us regarding the next steps and we count on you, please, yes for the future for this adventure. So goodbye to everyone, also good end of the year potentially for some of you also who noise know yes, thank you so much and bye-bye.

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