

Transcript: Webinar - COVID-19 challenges and solutions 4. The role of the environment in COVID-19 transmission | 24 June 2020

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During this webinar our audience submitted their COVID-19 IPC questions to our expert panel.

Panel members:

- Dr Lena Ciric - Associate Professor in Environmental Engineering, University College London
- Dr Stephanie Dancer - Consultant Microbiologist, NHS Lanarkshire and Professor of Microbiology, Edinburgh Napier University, Scotland
- Dr Manjula Meda - Consultant Clinical Microbiologist and Infection Control Doctor, Frimley Park Hospital
- Dr Jon Otter - Infection prevention and control Epidemiologist, Imperial College London

Chair: Dr Surabhi Taori, Consultant microbiologist and infection control doctor, Kings College Hospital NHS Foundation Trust

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Surabhi Taori 0:05

Good afternoon everyone. At the outset, I would like to welcome each and every one of you to this next edition of COVID-19 challenges and solutions, which is next in the series of audience-led webinars. Today's topic is the role of the environment in COVID-19 transmission. And as always, we have four very distinguished speakers. I am Surabhi Taori a consultant microbiologist and infection control doctor at King's College Hospital, and it is my privilege to now ask the speakers to introduce themselves. So, first on we have Lena.

Lena Ciric 0:54

I'm Lena, I'm an Associate Professor in Environmental Engineering at University College London. I'm an environmental microbiologist and an academic and I work in tracking where microbes lurk in the built environment.

Manjula Meda 1:18

Hi I am Manjula Meda, I'm a microbiologist at Frimley Park Hospital and also the infection control doctor here, run some research work along with the University of Surrey in my spare time, but mostly infection control.

Surabhi Taori 1:33

Thanks Manjula, and then Jon.

Jon Otter 1:37

Good afternoon everybody. My name is Jon Otter of the infection control team and imperial research partner which has to do with environmental services in transmission. I've had a long standing interest in this area. I feel very privileged to be invited to be part of this panel. I've really enjoyed the previous ones and I hope this one will be useful. Just a little tiny over excited!

Surabhi Taori 2:09

Thanks Jon. Before this webinar, we asked all the audience members to submit questions to be put to the panel. Now we've selected six of the most popular questions for the panel to discuss in the first 40 minutes of the webinar. And then in the last remaining minutes, we will answer live questions which you can submit via Slido throughout the event. You will also be able to use Slido to express your opinion by voting on live polls to participate in via the Slido app, or the website, and enter the code. #HIS. There's a QR code as well, which should be there on your screen now.

So we can begin with question one

Jon Otter 2:54

It looks like Stephanie's joined us.

Surabhi Taori 3:09

Hello Stephanie, would you like to introduce yourself.

Stephanie Dancer 3:11

Thank you very much. Yes, I would. And thank you for inviting me to take part in this. And my name is Stephanie Dancer, and I'm a consultant microbiologist and manager in Scotland, and a professor of microbiology over at Edinburgh Napier University, and I'm interested in all things cleaning, in hospitals

decontamination and pathogen antibiotic stewardship. Just the usual really, and thank you again for inviting me to take part.

Surabhi Taori 3:36

Thank you Stephanie, we can go to question one,

Question 1:

How long does the virus survive in different surfaces in the environment? Are there any factors which affect survival?



Jon, would you like to take a question.

Jon Otter 3:57

Yes, please. I'd love to.

So, I think there's a short and long answer to this question. The very short answer is probably something like a couple of days and it depends on the usual things that would influence microbial survival in a lab, so that's things like the substrate that you're working with, whether it's porous or non-porous are made of copper or some other surface with antimicrobial properties. This depends on the medium, the amount of goop or goo that you're putting down with the virus, and the concentration that you apply the virus at. All of those will have quite a big impact on survival, and then laboratory studies that are published one in New England Journal and one in The Lancet Microbe suggest, all of those things also apply to the SARS-2 coronavirus which causes COVID. So, for example, the range of survival times on various different surfaces was something like less than one day on porous surfaces like tissues and paper, and actually greater than seven days on surgical masks. And that study also showed that the virus with susceptible to a broad range of widely used disinfectants, which you'd expect to see with this envelope virus.

As to how all of this applies in a clinical setting - it's much more complicated. I would expect the usual drivers of contamination to apply. So things like how much the patient or the individual is shedding into the environment, the body fluids that is being emitted with. The physical environment like surfaces that are there and the air flows that are there. And of course the cleaning and disinfection. But quite a few studies now have gotten their swabs out and done some environmental sampling in practice. We had a go at this, a month or two ago in London, and we sampled eight clinical areas and we found fairly widespread contamination, with SARS-Cov-2 RNA, but we didn't culture any virus that we could grow in the lab. We found contamination more frequent in patient care areas than in areas

not used for direct patient care. And we did little laboratory evaluations to see how low we could go with the concentration of virus dried onto a surface before it became non culturable, and that indicated the concentrations we were finding in chemical environment, were not able to be cultured in the lab. What does all this mean? Perhaps the other panellists would like to discuss that? And it's, it's difficult to tell. What we concluded with was, we had identified the potential risk of contaminated surfaces in transmission, but we felt that, because we hadn't identified viable virus, culture, we didn't need to press the panic button, and do a whole scale change about management of the environment from a disinfection point of view.

Surabhi Taori 7:04

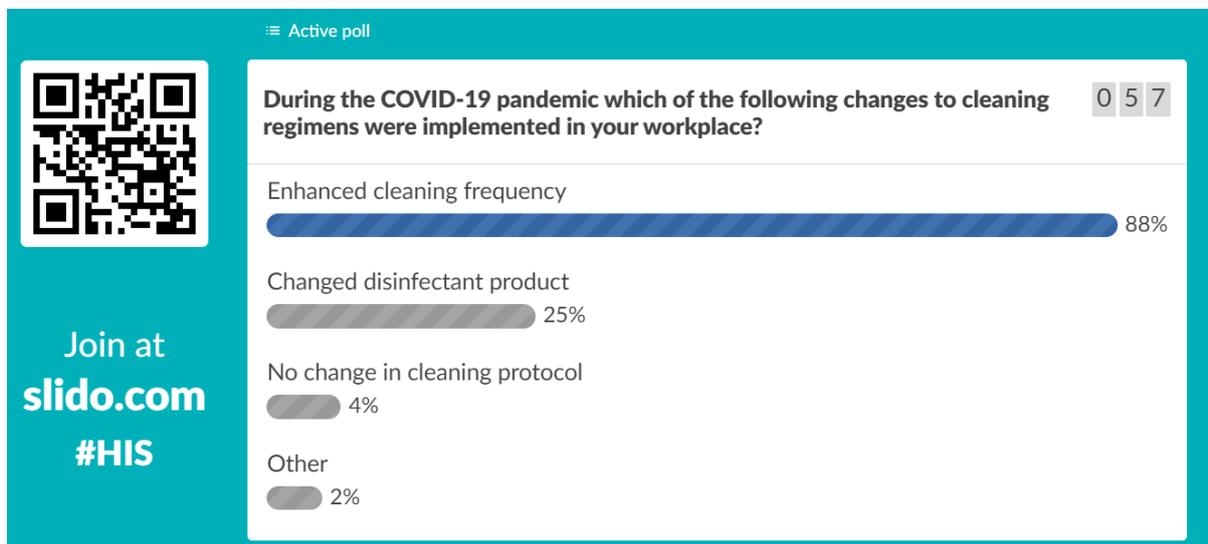
Thank you Jon. Would any other panellists, like to add anything?

Lena Ciric 7:10

I guess I'd like to just add briefly - that I mean as Jon said it's a very complex environment and stuff gets onto surfaces by, you know, by people expelling respiratory droplets in various ways, but also from touching and from respiratory droplets being blown around by ventilation systems too. So it's a really complicated intricate set of factors that contribute to. And each scenario will be different because, you know, the way that things are done are different, where patients are is different, the ventilation systems might be different. So, I think it's just a really complicated thing to look at. Patients will be..I guess the studies that we have so far have been done in the lab and that's different, as Jon said, but also the studies where people have looked for SARS-Cov-2 to within the hospital environment on surfaces, you know it's not, it's not gone over a time period since somebody coughed on the surface it so it's a sort of snapshot of what's going on.

Surabhi Taori 8:43

Okay, thank you. We have a poll now for the audience.



It looks like that everyone has almost everybody has enhanced cleaning frequency.

Some have changed their disinfecting product as well.

Brilliant. I think that leads us nicely to the next question.

Surabhi Taori 9:22

Question 2:

Is there any evidence that more frequent environmental cleaning reduces transmission of COVID-19?

What would be the most optimal cleaning regimen in the community and in hospitals?



Stephanie.

Stephanie Dancer 9:41

Yes. I'm delighted to see that everybody's increased the cleaning in their hospitals, but we don't have a shred of evidence, that's the right thing to do. It looks as if what we've all been doing is relying on common sense, which is essentially what we did about 20 years ago when faced with increasing amounts of MRSA. Everybody started to concentrate on the environment and cleaning became a real issue. And, as I say, there's no evidence. We actually don't even know what the infective dose is. We don't even know how much fingers will pick up from the surface to transmit to us or to others. So with these huge not knowns. How do we know that cleaning even has an impact on the transmission of the virus?

And I would say, what you do when you don't know all these different things. Is break it down into a series of statements which when put together, produce a pathway, which you can then take as a potential hypothesis. And we did this, 20 years ago when we were looking at the role of the environment to say:

Can you find the virus on surfaces? Yes.

Is it viable? We don't know that yet.

Jon didn't find any in his paper, and I don't think many other people have, if at all. But we know its there. Can people pick it up touching hand touch surfaces? Well we don't know that but we certainly know that that is the case for other pathogens. And so, so if you look for the evidence in these brief statements that take you from virus on surface and infection. Then I think my hypothesis has to be yes it's possible. And if you accept that, then clearly cleaning would be a very important mitigating action to do to stop transmission of virus, and particularly in healthcare environments where we've got a lot more of it being shed - as far as we know.

So you know, we don't even have robust evidence for cleaning frequency, anyway, whether it's *C. difficile* or MRSA or multidrug resistant Gram negatives. So, for me to answer the question, What difference does the frequency of cleaning make? Is almost impossible.

So once again I'm going to go back to basic statements, and these are mostly based around bacterial pathogens, but certainly we know that for ordinary wards in hospitals (so not specialist ward – not paediatrics or critical care etc) then cleaning the hand touch sites in the patient zone around the bed, if that's done properly - once a day is sufficient - to control pathogens on surfaces, within the patient zone. Now, is that enough for SARS-CoV-2? We don't know.

I would suggest that on designated COVID wards us, I think you should probably increase the frequency, and it looks as if many of you agree with me on that. I would go one step further. And I would say, given asymptomatic patients are potentially transmitting as well although what load they transmit we don't know. You should actually consider increasing the frequency throughout your hospital, and not just on specialist COVID wards. And then I can actually take the highest risk, which I think is in hospitals, and that it's ward, where you've got non-ventilatory respiratory support so CPAP, nasal canula etc etc. We've already got information that patients on these aerosol generating procedures, if you like, are going to be shedding more of the virus which means that wards which are not necessarily critical care with closed, respiratory support, are going to be higher risk from a point of view of the environments. And I'm not going to talk about the air – just surfaces. So, these are the wards I suspect, where we would need to up the frequency.

And I also think like as we get another step further. Look to your toilets and your bathrooms. I really like toilets and bathrooms - they are really interesting places. And if you start thinking about the environment, air, surfaces, people and so on. Then toilets, you can actually take all the risks of spreading the virus, and they're all there in a bathroom. We know there are high levels of SARS-CoV-2. -broken up- It's an enclosed area, there may not be natural sunlight. So I think, increasing the frequency of cleaning in your hospital bathrooms is an absolute must.

Once again, I don't think you should be restrictive in keeping that to the to the specialist SARS-CoV-2 wards. I think you should think about that for all of our wards at the moment.

Now, if you want me to carry on and talk about unity. I can do, but let me just quickly summarize the community. Unless people want me to go back and look at the community in more detail?

I would say that any risk from high touch sites in the community. Firstly, for sites which are based with natural light, and in particular, sunlight. The risk is negligible. So cash machine in the full glare of the sunlight most of the day, quit worrying.

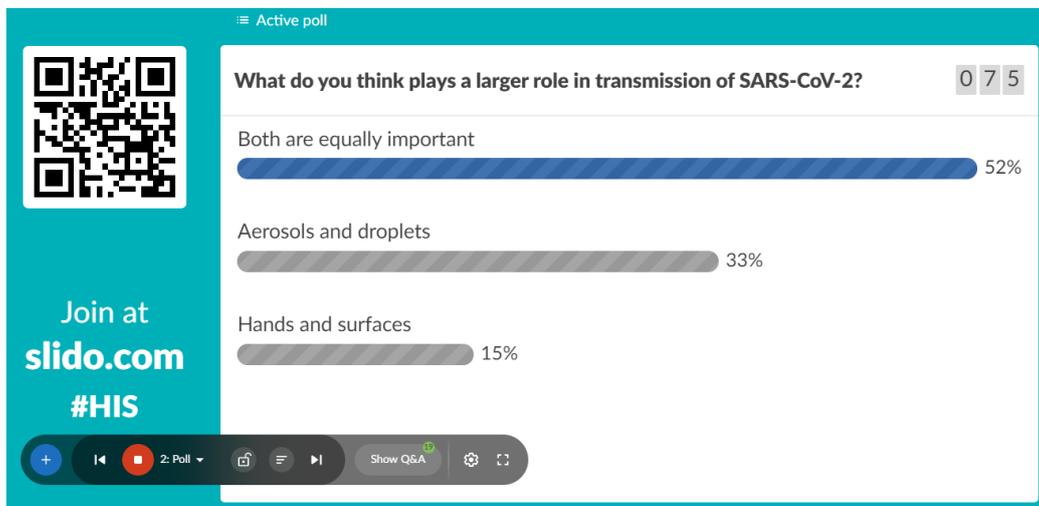
On the other hand, four hand touch sites, frequented by high levels of people traffic in internal environments such as shops. For example, particularly if they're enclosed with poor ventilation - I think the hand touch sites in there will still offer a risk. And what can you do about mitigating that? Well for us personally, it's about hands, and those of us that keep various wipes, and things in our car. I have a very compromised member of my family. That's what we do before going out shopping, and before I go home. The first thing I do when I get home is wash my hands. So, there's a personal view to this for mitigation, but also I think there's an onus on the community, folk running businesses, there are collections of people. I think the restaurateurs, pubs, cinemas and swimming pools and the schools, and so on.

I'm sure all of them, and I know all of producing our own guidance, for reducing the risk of hand touch site contamination.

There you go. In a nutshell, I haven't talked about the agents you would use to clean. And I'm not going to say very much about that because I think Gunter Kampf did a lovely study in the JHI, how he got in there so quickly I don't know. But usefully shows us that alcohol or 60% alcohol for sensitive clinical equipment and good old bleach, you know bleach, are the mainstays for cleaning. And for households look at the International Forum for Home Hygiene - there are really great recommendations there, particularly if you are shielding or looking after someone who is. And once again, focus on those bathrooms, and potentially kitchen surfaces

Surabhi Taori 17:47

Stephanie we will come back to you again. If you're in from the other questions. But at this point, I think we're ready for a poll.



Just a bit more than 50% think that both are equally important, but a substantial feel like aerosols in the droplets as well.

Shall we go to the next question then.

Question 3:

Which (other) measures are most effective in preventing environment to person transmission?



Manjula would you like to take this question?

Manjula Meda 19:06

Hello everyone. So Jon and Steph, thank you very good introduction. So, I think it's also good to see the audience poll. The majority of us, obviously agree that the surfaces do play some role although we don't have evidence for it right now. Like Jon's already said, you know, we know that the virus survives in the environment, well we've detected the virus by PCR on several surfaces. And what we also know is that at least the surrogates of the, of these viruses is dispersed widely within our hospital environment. So we know that it's there but I think what will be good for us to know is, I know Jon's studies shows that there is not know the cover of reliable virus from the environment is to see if that is applicable to all others hospital environments as well, taking into account, temperature, humidity, various other factors that could affect the virus viability. Like Steph said you don't know what infectious dose of this virus is. I mean being a pandemic we assume that the infectious dose is not very high. So, it would be good to establish what would the infectious dose is. And we really don't know again, whether this, you know, if we start to recover viable virus from an environment, whether there is sufficient quantity of the viable virus in the environment to cause disease.

We know now from previous studies because of respiratory viruses and animal models that it is possible for the state of viruses, to get from fomites to mucous membrane and then cause disease. It was interesting to read a paper from the 1980s where they use participants, healthy volunteers to take part in a Rhinovirus studies. I don't think it will be allowed now. And they found that when they inoculated handles and light switches, more or less 50% of them went on to develop a rhinovirus infection. So, so, so it's possible. And also, it would be good for us to establish if, if we do find viable virus in our environment. Is there any genotypic links between surface and patient viruses. So that'll give us a bit more data I suppose to establish, you know, quantify what the risk associated with surfaces. But at the moment there's a lot of unknowns here like Jon and Steph have said.

From our own experience at Frimley, you know actually what we have found is that not many but a few patients have had hospital acquired COVID infections, where they've been completely isolated in side rooms. So these are patients who have not come out of their side rooms and have been in all en suite rooms, and they have been taken care of by staff who've been wearing masks and obviously, there have been no visitors. For several weeks now. So, to me this suggests that there's probably some role for direct or indirect transmission from surfaces to patients.

So, that is the background on you know what can we do. Steph already said about cleaning surfaces and the frequency. Obviously that's very, very important. Like with any other infection I think and as as infection preventionists is we'll all agree the most important thing probably is hand hygiene irrespective of where we find it, and whether we know that it was viable virus in our environment or not, we can cut the loop if hand hygiene is good. And this is just not for COVID and I think we tend to forget sometimes that dealing with the COVID pandemic. And we get so much focused on COVID itself that now there are all the other pathogens around, as usual. So, so hand hygiene, obviously cut the loop for not just COVID for various other pathogens and going into the winter season now in the next few months. Obviously we need to be taking into account the influenza and RSV and various other things as well so hand hygiene again hand hygiene hand hygiene hand hygiene I would say most important factor here.

Another factor again which we have found especially in the beginning, is the inappropriate use of PPE. So obviously, I think, staff were more, they felt a sense of security while wearing gloves. So, and often forgot to wash hands. So it's important again to stress that appropriate wear of appropriate use of PPE, including gloves is important. We don't need to use gloves when you're not handling body fluids or specific indications.

Other PPE - masks and doffing of masks, or gowns, for example, again, you know, you need to be very careful that you don't contaminate our hands and import the stress that in our training with staff. Um, other factors which are likely to have effect on reducing transmission from surfaces especially would be, again, you know, early testing, isolation, nothing new. I think, because we have found already I mean, there are reports of viable virus being found in patients who are pre symptomatic so early testing isolation of any patient with new onset respiratory illness and contact tracing exercises within the hospital should reduce hospital acquired cases.

And what we have also found is reducing patient movement within the hospital reduced risks of hospital acquired COVID. And also, as much as possible reducing staff movement within hospitals, not having to have big teams going to go into wards at the same time will probably help as well as this minimizes the risk of staff with the, with the environment.

Again, I'm sure we will discuss this a bit later, but segregation of patients the COVID and non COVID patients, and having sort of ring fenced areas will perhaps protect the COVID protected patients. And lastly, obviously, the most important factors which we, which is essential part of infection control is education and audit.

So, we know we will now be opening our hospitals to visitors and one of the concerns now will be how do we educate our visitors in using appropriate infection control practices, with their patients. So we are now focusing our hospitals in trying to get ready for visitors being in our environment and how we tackle them being aware that they should help us protect the environment for patients and themselves.

Origin feedback, again we found this very useful, whether it's work cleaning scores, hand hygiene, or PPE compliance. People do learn, you know when they see visual indicators. So, so I think those I think would be probably the most important things. There are probably many many more that I've missed. But I'm sure if anybody else wants.

Surabhi Taori 26:36

That's a very long list. I'm sure we'll all try to do as much as we can. Is anything anybody else would like to add?

Jon Otter 26:35

Yeah just, just quickly. I think we've got a lot that we can learn from, from what's been established with other pathogens, particularly with other respiratory viruses. There's a whole body of literature around influenza SARS-1. Remember that? And MERS, which gives us some insight on which circumstances under which circumstances contaminated surfaces may play an important role, and may even play a more important role than respiratory roots under some circumstances, although I think my view is that most of the time for respiratory roots are likely to be more important than surface and contact roots for this particular virus but the evidence is emerging. So we can look at things that we've already mentioned, laboratory studies epidemiological analyses, animal models, and mathematical modelling, to try and help us understand what might test in a simulated environment which interventions are likely to be most effective and impactful.

Surabhi Taori 27:49

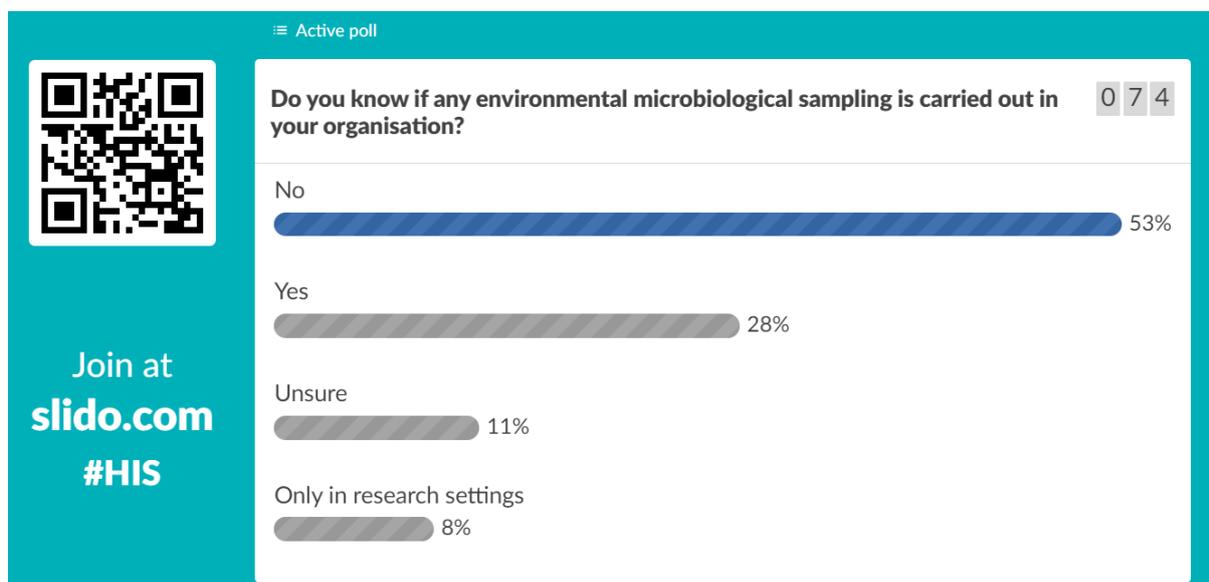
Anybody else would like to add?

Stephanie Dancer 28:00

I'd like to say something. And it's really about glove wearing, and there was a study. I don't know whether this has to be mentioned I think so but there was a study back during, then the SARS one outbreak in the Hong Kong Hospital, where the incidence of MRSA went through the roof. Because staff were not managing gloves properly, and I think I've seen some information in the literature that there have been flurries of multi drug resistant organisms in critical care units where there are patients with COVID, and, of course, people will wear gloves, primarily to protect themselves, and the high hand hygiene opportunities when your wearing gloves sometimes slip through the net and I think that's a risk that's worth mentioning.

Surabhi Taori 28:49

Thank you. Thank you Stephanie, that brings us to the next poll.



Okay, so the vast majority seem to think no and everyone else is divided. And the next question



Question 4:

What, if any, is the role of environmental sampling in managing the risk of transmission?



Surabhi Taori 29:37

Jon, would you like to take the question?

Lena Ciric 29:42

I think this one I was going to hit. I've got a few. I have a couple of things that I'd like the others to contribute to as well. So I think the main contribution that carrying out microbiological surface sampling would have to understanding to lowering the risk of transmission is having an understanding of what is where, and how much of it is there.

So, we know now from the some of this wealth - there's, there's been some studies carried out sampling surfaces, for SARS-CoV-2 to I mean, there's also many studies looking at other pathogens, as well. So, we know that the viruses in lots of different places at different concentrations. Generally, other than the study that Jon's published as far as I've seen. Everyone's been testing using our RTPCR so looking for the RNA from SARS-CoV-2 rather than trying to culture the virus to see whether it's viable and therefore poses an infection risk.

So I think that's, that's the main point - to understand better what the reservoirs might be where they are and how, how we can try to address these. And then I think once we know where these pathogens might be lurking then we can start thinking about how to get rid of these. We carried out a study, just before lockdown, actually, it was part of a research project that we're working on at Great Ormond Street. And we were interested to find out if, you know, we didn't use a viable virus we only used a DNA marker that's completely safe, and we applied it to a red rail in an isolation room within an outpatient ward. And then we just waited to see where it was going to spread so, you know, if we'd had our way we would have been in there sampling, you know, hundreds of surfaces, every hour but clearly that's not physically possible unless you have a massive team of people so anyway. To cut a long story short, we found that the DNA marker had spread to about 40% of the surfaces that we tested and we tested about 50 of them within 10 hours. And, and we continued to find it on surfaces, for the next five days so I mean this indicated that there were issues, both with hand hygiene, and with cleaning efficacy and I don't think this is anything that's, you know, specific to Great Ormond Street, these are issues that that we'll have everywhere. So I think that what we find out from

environmental sampling is how these things could spread and what this spread could mean for us, and then more importantly than anything else we can use these results in training.

So I think, you know, actually having some environmental data for specific wards, where cleaners, specifically are cleaning or specific staff are working in brings it home a lot more rather than having some Hospital in blah, you know, they found some virus here and they found some virus there. When, when it's so much closer to home, it makes people think, Oh Christ it's here and it's there and it's everywhere I really shouldn't be more careful with my hand hygiene and I really should be, you know, more careful with the way that I clean things. So, I'm going to hand over to Jon in a minute if any of you are thinking about coming up with a surface sampling strategy. What are your top tips Jon for places to look at?

Jon Otter 33:47

Thanks Lena so just very briefly I know we're running a bit short on time. I see the key role of environment consulting is twofold in this COVID thing.

Firstly, as discovery, which is what we've been talking about to understand routes of transmission of potential interventions and impact, and the other is during outbreak, if there is an outbreak of cases, environment sampling could help you to identify whether you've got some deficiencies in the cleaning process and disinfection process, or whether you've got a point source that might be contributing to transmission. So we took a very pragmatic, building on what's been done by others and others have looked to try and collect a viable SARS-CoV-2, and have also failed to do so, where we wanted to try and take a cross section of different parts of the hospital. So we went out with swabs, we sampled conventionally a small surface area. Did the RT PCR and the culture from the same swab with some contemporaneously collected air samples as well. And we tried to sample a range of areas we looked at patient care and non-patient care scenarios doing a AGPS in theatres, to try and get an overview but it's really it's very descriptive and really a first step I think we need to do some more detailed environmental work with some longitudinal sampling and correlating that with clinical situations, in order to understand a little bit more about transmission dynamics.

Manjula Meda 35:26

Jon can I just ask a quick question there, did you time that to when you had cleaned the wards for instance, because given that it's a very fragile virus, where you giving it enough time, because there is enhanced cleaning everywhere now isn't it so.

Jon Otter 35:44

That's a really good question, so it was very much a point prevalence of the environment we didn't, we didn't link it in time to cleaning and that should definitely be one of the next things to explore how could this be used as a tool to evaluate the effectiveness of cleaning alongside the other tools we have already mentioned.

Surabhi Taori 36:01

Thank you Jon, Thank you Lena. I think we should rush on to the next question we are having a very animated discussion, but we have to stick to time So, next question:

Question 5:

There are increasing reports of outbreaks of COVID associated with abattoirs and meat processing plants. Do you think that surface contamination is relevant here as cleaning will be minimal, or is transmission more likely to be airborne/aerosol mediated? Or is it impossible to say?



Surabhi Taori 36:00

Stephanie?

Stephanie Dancer 36:25

Yes, thank you. I thought I would get this question. There's been increasing numbers of clusters of outbreaks involving dozens if not hundreds of workers in meat processing plants, abattoirs, and the such, and it's generated quite a lot of discussion.

And if you start looking at the conditions in the processing farms, you can pick out one or two high risk factors which might explain why we're seeing this. And the first thing to say is that there's a high proportion of migrant workers generally in these processing plants and they have actually been centralized as well so there's not very good on the resilience when things do cause problems and migrant workers may not have the English or the local languages first, which means there may be misunderstandings and ignorance as to safe practices.

And it's also the case that they will be low paid, which means that if they are symptomatic they may not want to declare that. They may well not want to declare that. In their working practices, it might be impossible to distance more than 1.5 to 2 meters apart and if you've seen any pictures of what goes on in these processing plants you'll see what I'm talking about despite the personal protective equipment, they have to work side by side for sometimes up to 10, even more hours a day. There's no natural sunlight. And, which means that the cool conditions within these plants are going to favour propagation if not survival, of the virus. Now there's no evidence whatsoever that the virus is found on meat flesh, in any way, it's quite possible that in actual fact has been brought in by workers and spread because of the conditions.

But you know, everything I've said could potentially mirror conditions in many factories that processes food or do other things in one way or another, and there must be something different about these processing plants which is leading to the high number of people contracting virus.

And I sort of found interesting comment on the HIS discussion list a few days ago. It was about the processing of the meat, the carcasses in the processing plants. For a start, there are very strict regulations on the cleanliness of carcasses and should there be bone saw through particularly through the central nervous system associated bone, then they have to be hosed down with jet streams of water and pressure hoses and all the rest of it.

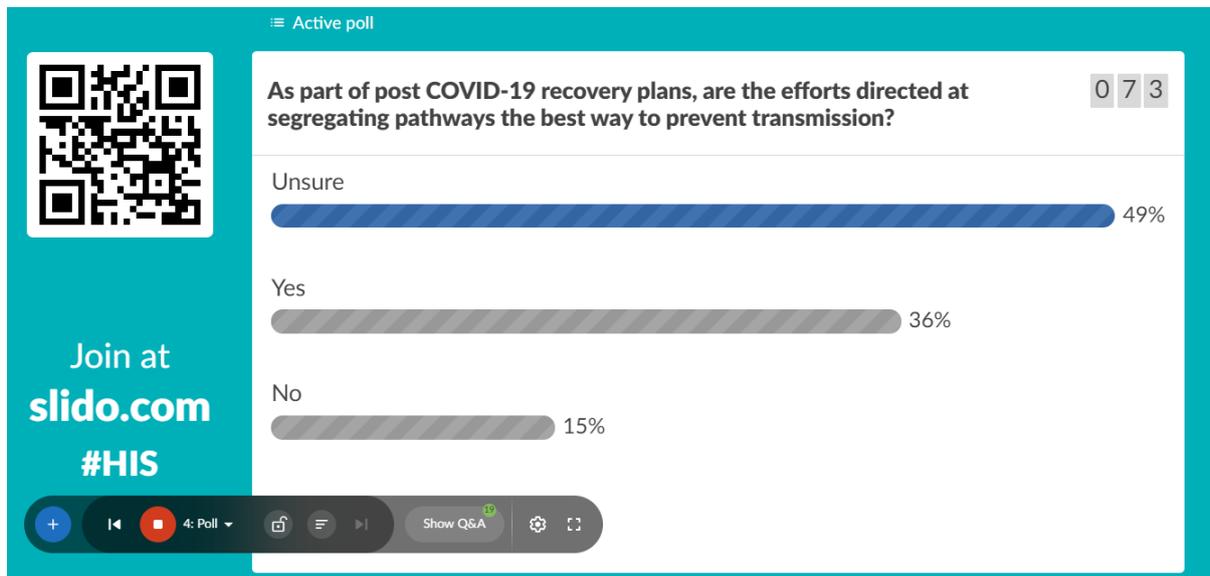
So it's an aerosol generating procedure. And of course when they're cleaning, they using high pressure hoses, which may or may not contain disinfectants. I think bleach to both detergent and bleach are used in the plants. But there's something else as well and that's re-aerosolization which is something that we haven't touched on and hasn't been talked about very much. And that is in the cool conditions, lower than 12 degrees C, usually around about 80 degrees centigrade. In these plants that virus which may be dried and protected on surfaces with bodily fluids could then be re-aerosolized with the cleaning procedures, at the end of a particular shift or the end of that particular process.

So, massive aerosol generating procedures going on in these places with lack of knowledge and understanding, and perhaps overcrowded conditions.

One other thing though, which so far has not yet been evidence-based and that is that the majority of workers, are not seriously ill. We don't even know if they are zero converted we know they are positive but many of them are asymptomatic, and there hasn't been what you would expect the requisite number of deaths that you might see. Perhaps it's because it's a younger population. I don't know, you would expect there to be some risk factors among individual workers. But so far, not. And I would say that this lends us a unique opportunity to look at transmission because of what's going on in these plants, and certainly some antibody tests and maybe even the sampling procedures we've been talking about, in particular meat processing plants, might give us more information, which would be valuable in other environments. Thank you.

Surabhi Taori 41:00

Thank you Stephanie I think we can sneak in a poll before the next question.



Okay, so as expected, most people are unsure. And that brings us to the next question:

Question 6:

The latest recovery guidance recommends creating red and green zones for patient pathways. What are the advantages and pitfalls of such segregation?



Surabhi Taori 42:15

Manjula?

Manjula Meda 42:18

So quick background on what we did here. So very early on in the pandemic obviously it was very easy we had plenty of side rooms to cohort or to isolate suspected and confirmed cases, which is what we did. As the, as very quickly obviously we were exceeding our side room capacity. And we knew that the sensitivity of the test was only 80% so we had to combine a clinical assessment tool for clinicians, along with the test results, and not just completely this, our placement of patients on a test result. So we established this technical assessment tool, which the clinicians would completed at the time of admission and the ward round to establish what the likelihood of infection was. So once the test was available the patient could then go in either into the cohort area for COVID, or they could stay in the side rooms or if the likelihood was very low and the test was negative, then they could go into sort of non COVID areas.

Currently, the situation has probably come back to the peak of sort of the beginning of the pandemic really where we have a prevalence at least in our region is less than 1%. So unless we have we assume that the specificity of this test is hundred percent, we can expect a few false positives. So what we are telling clinicians now is that you need to be almost source isolating any positive patient with SARS-COV-2, because we don't know whether this is a false positive or if this person has true infection.

Whether it's pre symptomatic or, or asymptomatic. So we still use the tool. The clinical assessment tool. When we get a result to establish where these patients go.

So, and we don't have any more COVID cohort area because the number of cases are so low, we managed to isolate them all in side rooms. Going on to the recovery plan. Obviously we have to open up the hospitals for elective surgery, and I think it is what we have done is we have set up an on-site and off site area where we have our elective surgical and oncology patients, these are patients who had 14 days of self-isolation, and who've had a negative test, within the 48 hours of admission and staff in these areas, wear masks at all times, and obviously other standard infection control precautions are equally important, like we've discussed.

So, so hopefully this is somewhat sort of a ring-fenced area for patients who are COVID, protected really. And I think this is essential as we move forward, and perhaps going to a second wave in the winter months. And if we are to still continue to have some amount of elective surgery and see some amount of elective patients in hospitals.

The advantages obviously are the, you know this this would be ring fenced area we know these patients will be protected. As long as you know staff adhere to strict infection control precautions, we can protect these patients from acquiring COVID within hospitals, and as any other hospitals we know that's the last thing we want because you know COVID once you have it in any ward it just sweep up sweeps across very very rapidly.

And again, even in these areas, we get a clinicians to use the clinical assessment tools whenever whether it is in this area or in any other part of the hospital, along with the test results, not to take the test result at face value, essentially, because you do have the risk of false. At the moment of false positives but as we, as prevalence increases, you will have the risk of false negatives as well.

So we can't risk putting patients who are who are essentially COVID positive if your false negative - so you don't want patients to go into a non COVID areas, if they have COVID.

What the disadvantages of what of these green areas, essentially, in the recovery plan what we have found is that that's going to mix up quite a lot of specialties now in these in these ring fenced areas. There's orthopaedic there's muscular and every other speciality next door to each other and the staff are really unfamiliar with the set up, so we know that unfamiliarity itself leads to poor compliance with infection prevention and control. So we're trying to encourage staff to remember to their basic infection control precautions.

In a perfect world, they can familiarise themselves with the ward areas. So they know where for example, the disinfectants are wet wipes are and so on and so forth. So, um, another other disadvantage we have found is that, because, again, you know, there's all these specialties mixed up in these areas. So many teams were going in, you know, for their ward rounds at the same time. So we had to have a mechanism somehow arranged to suggest you know that clinicians time themselves and not everybody lines up at 10 o'clock in the morning, because it was impossible to socially distance in these wards given the number of staff that were in there.

One other disadvantage, which I've already discussed is you know the focus seems to have shifted again. You know, to purely being focused on COVID, when we know we just assume because this is a COVID protected area that COVID is only pathogen that exists, so you know you forget that there's various other pathogens that you know orthopaedic surgeons sometimes, you know, we already had a MRSA setting fenced areas now you know that you accept that you're going to have a COVID ring fenced area. So, so again, you know, you just need to remember that there are other pathogens that still, you know, and you need to remember that we have to still cohort and isolate patients based on those pathogens, not just COVID. So a lot of challenges, which we need to weave through to establish all of this, especially if you have a second wave. So when I have to continue with all the elective work really.

Surabhi Taori 48:47

Thank you Manjula, that is, that sounds quite complicated but you've made it very approachable to at least start doing. So we are running out of time and we have a number of questions from the audience. And we will try and address as many of them as possible and some of the panellists have kindly agreed to stay on even beyond six o'clock.

The role of the environment in C x +

wall.slido.com/event/hjkgf4d?section=b642c7be-1204-4a94-874c-662cde7175a7

Highlighted question

Surabhi Taori

Join at
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#HIS

Is detergent sufficient for routine cleaning or should routine cleaning include a disinfectant - in the healthcare setting AND in the non healthcare setting e.g.schools thank you.

Anonymous

49:20

Surabhi Taori 49:31

Who in the panel is going to take that one?

Stephanie Dancer 49:36

I'm going to take that one is that ok?

Surabhi Taori 49:38

Stephanie of course.

Stephanie Dancer 49:39

Yes that's a great question. Thank you very much to anonymous for a lovely question, have you got three hours? Believe it or not detergent is ok for envelope viruses because of the lipid envelope and the both the ionic and the catalytic components of most detergents are enough in a few minutes to destabilize the virus on surfaces. And there's a big debate going on about whether we can actually just rely on detergent, particularly if it's frequently applied to hand touch sites. Do we actually need bleach or any other powerful disinfectants which cause so much trouble, not just cost but toxicity and manipulation of the environmental microbiome for a start. And I think a lot of us are accepting that provided the correct mantra for disinfectant, whether it's wipes, or disposable wipes and bucket etc etc. One wipe, one site, one surface.

If you get that right, then you probably don't need bleach. I'm prepared to be shut down for this. What about in the community? Absolutely. And I think that there is plenty of opportunity for detergent based cleaning with wipes, or whatever, all the for the high risk hand touch sights, the frequency depends on the people traffic and the vulnerability of the population within the setting. So it's all risk assessed its just a shame we don't have basic parameters to be able to build up exactly what frequency should be, but certainly in a school, I think, with careful attention to the most frequently touch hand touched sights - and you can audit that without any problem - then detergent is sufficient. But it has

to be done correctly, you don't go back over a surface with a detergent wipe, it's the S shape for long for big smooth surfaces or as I say, one wipe one site, one direction, and then you don't need bleach.

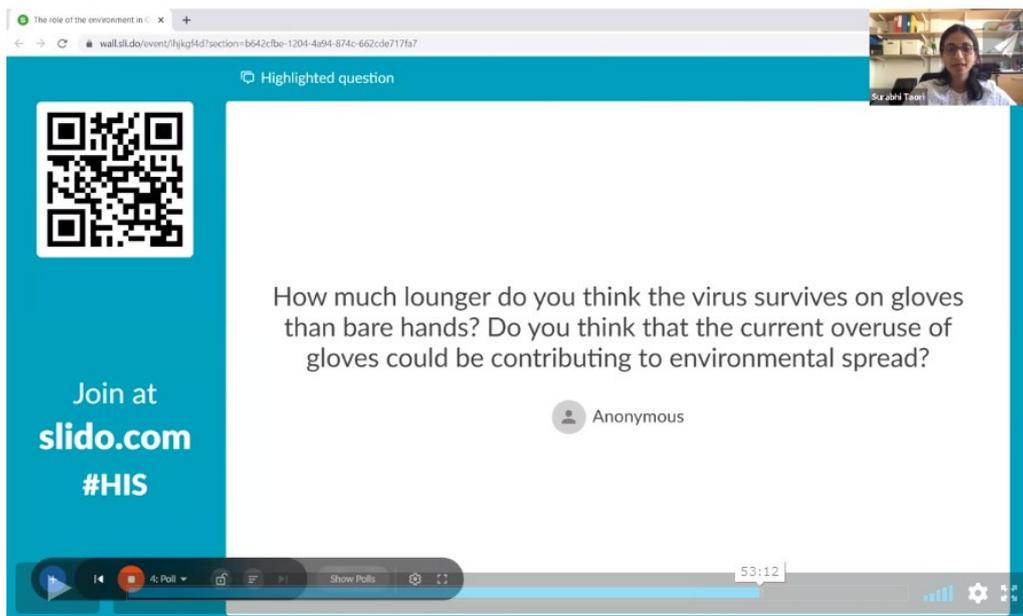
In a more risky situation, though, where you have got vulnerables and I think we include we're including care homes in that as well as hospitals, then I think potentially for the moment, we're going to have to rely on hypochlorite in the appropriate concentration. Thank you for the question.

Jon Otter 52:10

If I can just add a view to that. If we look across the international guidelines and from PHE and CDC, WHO as well. They all come down on the side of assessing the evidence, saying, yeah, we're not sure about the importance of surface contamination. But we think we need more than just a standard clean here with detergent, and they go down the route of recommending a disinfectant in addition, mainly a chlorine based disinfectant or an alternative agent that has an efficacy, a suitable level of efficacy against an envelope virus like SARS-COV-2, and that's certainly the case in healthcare settings. I think outside of healthcare settings like in schools. I think the use of a disinfectant may be appropriate sometimes but it would have to be a rationalized use on a risk assessed basis.

Surabhi Taori 53:00

Okay, thank you both. Should we go to another question.



The screenshot shows a Slido poll question displayed on a screen. The poll question is: "How much longer do you think the virus survives on gloves than bare hands? Do you think that the current overuse of gloves could be contributing to environmental spread?". The poll is anonymous. The screen also shows a QR code, the Slido logo, and the hashtag #HIS. The poll is titled "Highlighted question". The poll is currently at 53:12.

Jon Otter 53:28

Maybe I could take the first part of that. Certainly, I don't think there is evidence that this particular virus survives longer on gloves, done on bare hands, that would certainly be an interesting question to answer. I think it would absolutely survive long enough on both bare hands and on gloves to be involved in transmission. So, the appropriate use of gloves, which is not very much, and much less than people think is definitely the way to go here and yeah, I also think and I've seen some emerging evidence that glove use may have been involved in increasing in hand transmitted infections.

Surabhi Taori 54:10

Thank you Jon anybody would like to take the second half?

Stephanie Dancer 54:16

Yes, I've got a good point here about viral survival on gloves, well it's actually virus survival on human skin. Human skin itself, contains various microbicidal products. And, for example, what we do know about flu A another envelope virus is that it only last for five minutes on bare skin. So, there is a possibility maybe virus does support a bit longer on gloved or bare hands. But, as Jon says, and it's micromaterial to a certain extent because I think we all accept that whether it's his hands or whether it's gloves there's enough virus that can potentially be picked up to be transmitted elsewhere, and that's the crucial factor. Thank you.

Surabhi Taori 55:00

Thank you Stephanie, Manjula Would you like to add?

Manjula Meda 55:04

I agree with what Jon has said basically our own experiences suggested that there was overuse of gloves in the, in the hospital environment, and perhaps could have easily contributed knowing that you know the widest dose has been detected on gloves and bare hands and contributes to ineffective hand hygiene. So, it must have played a role in transmission.

Surabhi Taori 55:30

Okay, thank you all three. Shall we go to the next question.

The image shows a screenshot of a Slido poll question. The question is: "Is it known what the minimal viral load from fomites is that leads to infection?". The poll is anonymous. On the left side, there is a QR code and the text "Join at slido.com #HIS". The video player interface at the bottom shows a play button, a progress bar, and a timestamp of 55:36. A small video thumbnail of Surabhi Taori is visible in the top right corner of the Slido interface.

Oh wow. Lena?

Lena Ciric 55:50

I think the answer is we don't. Well the answer is we don't know, and I think everyone else on the panel will agree.

Stephanie Dancer 56:02

Yes, I can, I can add to that, I agree with you, we don't know. However there is a there's a working level, and its 10 to the 3 to 10 to the 4 infectious viral particles. And I really don't want to be asked how to define thank you very much.

Surabhi Taori 56:21

Thanks Stephanie. Is there time for other few questions?

The screenshot shows a Slido poll interface. On the left, there is a QR code and the text 'Join at slido.com #HIS'. The main area displays a poll question: 'Will wastewater sampling be done regularly in every WWTP to follow sarscov2 loading in the population?'. Below the question, it says 'Anonymous'. At the bottom, there is a video player control bar with a play button, a progress bar, and a timestamp of 56:29. A small video thumbnail of Surabhi Taori is visible in the top right corner of the Slido interface.

Jon Otter 56:40

I'm guessing that's wastewater treatment plant?

Surabhi Taori 56:45

Yes thank you Jon.

Lena Ciric 56:48

I'll throw in my tuppence worth so we know that SARS-CoV-2 is excreted faecally in some in some patients so I think testing wastewater treatment plants. I mean that there have been some studies and they have shown SARS-CoV-2 within the water that comes to the wastewater treatment plants. However, it would give us an idea of the sort of general level of infection within a space, or even, or even asymptomatic infectious guess? Or is that even an infection. But it wouldn't be able to pinpoint exactly where, where the infected people are so, so it really depends the wastewater treatment plants vary in size and vary in sort of catchment. So I think it would be a sort of a surrogate for the levels in a particular area but it wouldn't be really give us much more it's more. I guess it would give us maybe an idea of presence and absence but not really anything more than that.

Surabhi Taori 58:08

Thank you, Lena.

Jon Otter 58:12

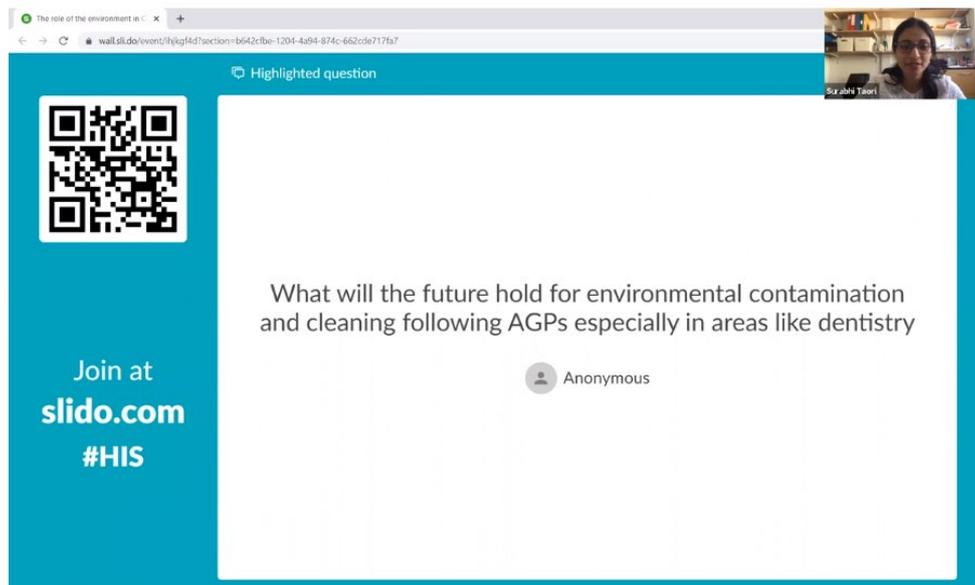
I would hope that the measures in place to manage microbial risks from wastewater would be more than sufficient to deal with SARS-CoV-2, because of course they'll have to deal with things like C. diff spores, and norovirus.

Stephanie Dancer 58:30

Jon, I can offer you some positive comments on that. And there's absolutely no doubt that sewage workers and wastewater treatment plant workers are well protected and have been right from the word go even before this pandemic came. And I have to say yes, we are looking at wastewater sampling. I think it's more a little bit worried about sewage untreated, and partially treated sewage contaminating water courses and particularly those where there are water sports. Of course seawater bathing as well is another issue. And I can assure you that there's lots of work on going right now to make sure that the risk is negligible - at the moment it is very low.

Surabhi Taori 59:15

Thank you Stephanie. One more question. I think after that we will stop.



Manjula?

Manjula Meda 59:37

Again, it's nothing too different. I think from what you're already doing for example in critical care environments, or in other ward areas following a AGPs. The risk of contamination of surfaces may be slightly higher than then otherwise and this has been reported in several other studies as well where they've shown that at least detection by PCR of the virus in areas that AGPs are conducted is much more frequent than in general ward type areas. So as long as we are following good disinfection practices. Frequently disinfecting surfaces - like Stephanie and Jon have said – the majority of disinfectants would be fine. Including detergent if there is enough time, but if there's an AGP being performed you would want to ensure that a disinfectant is acting rapidly - using such as chlorine base disinfectant following those probably would suffice. It is fragile - it's not this is not a virus that's going to persist, despite cleaning, with disinfectants or unlike C. diff spores for instance, or some bacterial

pathogens. This is much easier to eradicate from our environment than many other things that we find.

Surabhi Taori 1:01:04

That's reassuring. Anything any other panel member would like to add?

Lena Ciric 1:01:11

I have a just a tiny contribution. In pretty much every procedure that you would have done at the dentist - including your hygiene appointment and the scaling - is an AGP, so I think dentists are definitely going to have to rethink their strategies, probably looking at ventilation but possibly devices that are removing some of those aerosols, and better cleaning practice. Also thinking about time between patients and how to protect themselves as well so I think this is. I mean, it's a big issue for all AGPs but certainly in dentistry, as well. And I guess for the general population that's the most of the AGPs that we're exposed to. Most frequently. Sorry.

Surabhi Taori 1:02:05

I'm being asked to continue for another question so maybe we can have another question.

The screenshot shows a Slido poll question displayed in a browser window. The question is: "Do you think it is necessary for full FFP3 etc for community patients who wear CPAP overnight with no symptoms ?". The poll is anonymous and has one vote recorded. The Slido interface includes a QR code, the text "Join at slido.com #HIS", and a video player at the bottom showing a participant's video feed.

Stephanie?

Stephanie Dancer 1:02:36

That's a very good question because we can't answer that. And the reason why we can't answer that is that there is not yet universal agreement on droplet size, whether it's aerosol droplet, droplet nuclei. And, and the necessity for full FFP3 or any notifiable surgical mask, etc etc.

I can't back away from this - I would say that community nurses and district nurses who are charged with delivering care to patients with this type of respiratory problem should be fully protected.

And that means enough FFP3 and indeed all the other **elements** of protective wear for community and district nurses who are looking after these patients and got a bit of a personal issue here because I've got a member of the family is extremely immunosuppressed and is receiving care from a wonderful

team of District Nurses right now. Because he's not respiratory compromised, and he is negative for coronavirus then surgical masks and the usual PPE gloves and aprons etc are okay. But if he was compromised from a respiratory point of view, and having respiratory support, then I'd fully expect the team to be able to be issued with full FFP3. I think that there is short range aerosol generated by patients with COVID-19. And I think that regulations, in both community and hospital should take account of that. Thank you.

Surabhi Taori 1:04:23

Thank you Stephanie anything, which the panellists might want to add?

Jon Otter 1:04:29

Yeah, I mean we've taken the view that the national guidance is trying to make the best of the evidence that we have. So our tendency is to follow that unless we see a very very good reason not to.

Surabhi Taori 1:04:30

Thank you Jon. And so before we close I would like to thank Adel, Richard and Helen who do the work behind the scenes. And thank you to the audience for being brilliant and for all the questions you sent in.

And we have a date for the next webinar which will be 15th of July again 5pm to 6pm. This topic is yet to be confirmed.

Certificates of attendance will be sent out after the event, and the recording will also be available later on. Also because we are unable to answer every question we receive, we will be tweeting some of the ones we've run out of time to answer, over the next days on our Twitter channel, which is @HIS_infection. We'd love the audience to get involved and vote on the poll and share their thoughts. Thank you so much for attending.