Transcript: Webinar - Monkeypox: a new clinical and IPC challenge | 15 June 2022

Watch the webinar

During this webinar our audience submitted questions to an expert panel on how we should manage the clinical, infection prevention and control challenges associated with the current Monkeypox outbreak:

- Dr Luke Moore, Consultant Infectious Diseases, Microbiology, & Virology, Chelsea & Westminster NHS Foundation Trust
- Dr Tom Fletcher, Consultant Infectious Diseases, Liverpool School of Tropical Medicine
- Dr Joe Heskin, SpR, Chelsea & Westminster NHS Foundation Trust
- Dr Catherine Houlihan, Consultant in Infection, Rare and Imported Pathogens Laboratory, Porton Down and Consultant in Virology, UCLH

Chair: Dr Samuel Moses, Consultant in Virology & Microbiology (Infection), East Kent Hospitals University NHS Foundation Trust

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This webinar is supported by an educational grant from GAMA Healthcare.

Sam Moses 00:02
Good evening. Thank you all for joining this joint HIS and BIA audience webinar on monkeypox, a new clinical and IPC challenge.

I'm Sam Moses, I'm a consultant virologist here at East Kent. Today we are joined by a fantastic panel and I'll ask them to introduce themselves.

Tom Fletcher 00:27
Thanks very much Sam. I'm Tom Fletcher, I'm an infectious disease academic in the Liverpool School of Tropical Medicine, I mainly research infections of high consequence pathogens and I'm the chair of the WHO guidance for monkeypox. Thank you.

Luke Moore 00:44
Hi, my name is Luke Moore. I'm a consultant in infectious diseases microbiology and virology at the Chelsea and Westminster Trust in London.

Catherine Houlihan 00:54
Hi there. I'm Cat Houlihan. I'm a consultant in infection at the Rare Imported Pathogens Lab Porton Down UK Health Security Agency, and the other half of my time is as a consultant virologist at UCLH.

Joe Heskin 01:05
Hi, I'm Joe Heskin. I'm a specialist registrar in genito-urinary and HIV medicine, also at Chelsea and Westminster Hospital.

Sam Moses 01:15
Thank you very much. That's introductions done. And before this webinar, we asked you all to submit questions to put to the panel. So you're going to see now the Slido. So, we have selected the eight most popular questions for the panel to discuss during the first 40 minutes of the webinar. And during the last 15 to 20 minutes there's a live question and answer session which you can submit by a Slido. Throughout the event you will also be able to use Slido to express your opinion by polls and to participate in the polls and questions, please do open the Slido app and enter the code #HIS.

So now I'm going to ask Joe to set the scene the brief introduction on what this is about, and, you know, where we are at the moment.

Joe Heskin 02:02
Thank you very much. So, I'm going to give you a very rapid recap over our first experience where we're working with monkeypox at Chelsea and Westminster. And next slide please.

So just a quick warning, there will be some medical images including genitalia. And please if you can avoid taking some screenshots, although many of the images are now available to UK HSA also. Next slide please. So, this is a very brief introduction to our two cases over a 24-hour period, over which we became significantly busier in our lives. We had two male patients admitted to our hospital, they had a history of peculiar skin lesions on sites of sexual contact. These lesions were their herald symptoms, followed by more systemic features of fever, fatigue, myalgia and lymphadenopathy. The average length of inpatient stay at this point was four days for our patients and the average number of healthcare settings they had attended at admission and diagnosis was two.

Over their time period in hospital, we had multiple differential diagnoses, and these included severe HSV, a VSV infection and atypical disseminated gonococcal infection. And then finally, on the dates on this slide here, we sent samples off to the Rare Imported Pathogens Lab and on the 15th of May we received the results. Next slide please. So, these are some of the features we saw on our patients. On the left-hand side you can see some lesions at the genital sites and on the right-hand side more ulcerative lesions around the perianal region. Next slide please. And again, so far… though now, now that we're more aware of the diagnosis and more classic pox like lesions that affect the perioral and beard areas and again, the nasal area also. Next slide, please.

So, as I said, on the 15th of May, one month ago today, we confirmed monkey pox infection of both of our patients, and they were transferred to the High-Consequence Infectious Disease Units in England. And this did raise greater awareness of an MSM cluster of monkeypox viral infections that has resulted in over 160 cases locally within our trust, 450 nationally and over 1,200 internationally. And I'm going to talk you a little bit through the impact of this on our service. And within our hospital itself.

You can see over 150 staff contacts are identified following diagnosis of these two patients. And this resulted in a total restructuring of our sexual health services. Next slide, please. So just to talk to you a little bit about what we did since then, for people who haven't either worked in monkeypox within the UK setting yet and what you may need to do and what we've done. Communication was absolutely key. So, we distributed widely educational materials to all staff involved in sexual health services defining what cases were, what new presentations may appear like monkeypox infection, and what our new pathways were for referral and testing for this, and crucially, similarly to this evening, we hosted virtual educational events. And for the question-and-answer sessions, as our staff concerns were the greatest interest at that point.

For our patient cohort, we text all of our patients who are already linked into our care to advise them of the signs and symptoms of monkeypox infection, and what to do if they presented. And we made avid use of our social media pages and our trust website to link in national bodies and governmental advice on monkey pox infection, which was more patient-targeted and professional. Next slide please.

We developed a hub-and-spoke model within our trust, all walk-in activity was immediately suspended, and we started to triage patients via telephone and video calls. And we trained up our staff on how to actually perform that triage specifically for monkeypox and how to try and avoid stigmatizing patients who are contacting our services. And they were then, based on the triage outcome, you were then sent either to a hub or spoke sexual health consultation appointment. Next slide please.

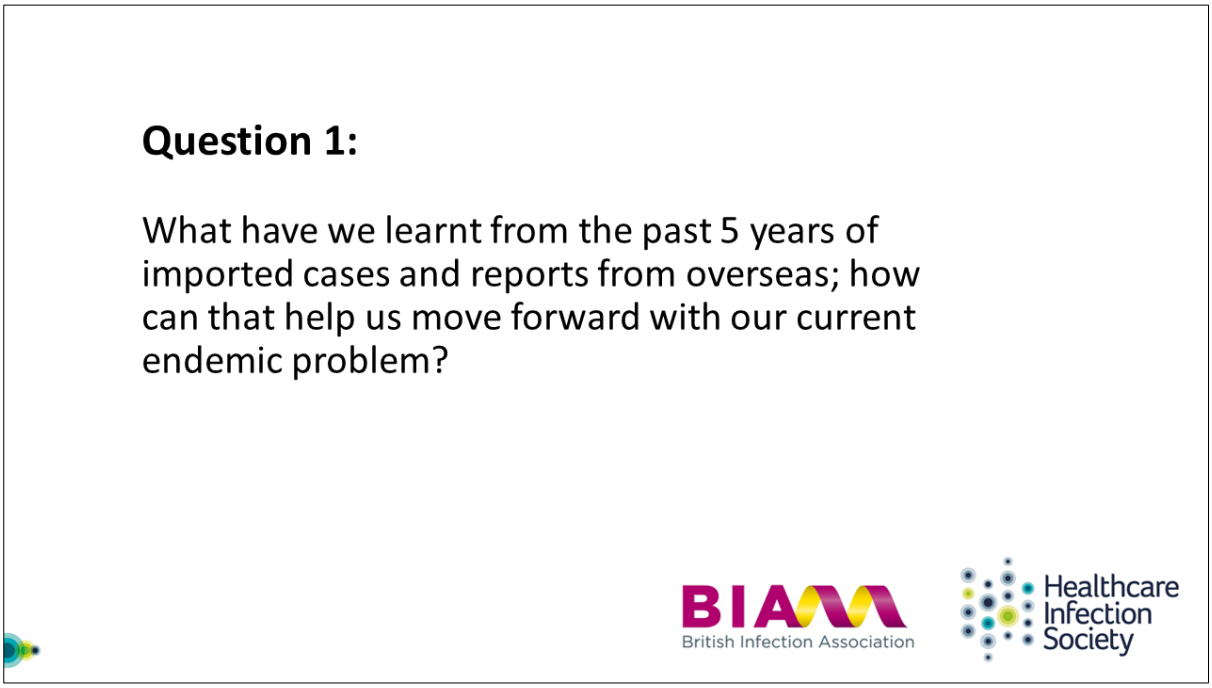
Within our hub site, we designated a single sexual health clinic that was adjacent to an acute hospital as a monkeypox testing site that was to allow for any acute admissions that may appear during testing. We also trained a select group of staff to try and reduce staff exposure to any monkeypox cases. And we collected ripple samples as appropriate. But we were also able to perform STI screens as needed, provide prevention measures like PREP and also offer treatment for STIs all in a single site location. Next slide, please. At our spoke sites, we were still aware that we may come across monkeypox cases despite our triage system, and so temperature checks were put in place. We had lesion pictograms throughout the clinic to try and allow patients to self-identify lesions before examination. One-way systems were developed. We re-instigated social distancing and mask wearing within the clinics as per

COVID guidelines. And we would ensure that PPE was appropriate even on non-hub sites as we assumed that we would come across monkeypox on them, staff would need to have PPE available to them. We also stopped all on-site testing of samples, which we used to do on our rapid machines, and all STI samples were directed to central lab testing. Next slide please.

And finally, results-governance was also a major issue for us with the quantity of testing we were performing. So we established a specific team to manage incoming results and sexual health was well placed to do this, with our health advisors, already trained in results management as well as contact tracing. All positive cases had a review of their symptoms via phone call. They received advice in isolation, and that HPA teams would be in contact, and all the outcomes were reported to the daily HCF meeting. We created a virtual warden in our hospital EPR system to allow us to manage our well-over 150 cases within the community. And we undertook 48 hourly welfare checks, both via text message but also phone calling those designated to be of higher risk.

Finally, negative cases received results with via text message and were discharged back to community care. Thank you very much.

Tom Fletcher 08:10
Thank you very much Joe, that was really a good snapshot of how things were in the beginning. So that leads us nicely to the first question. So, could you have our questions visible? Yes. Okay. So, first question:



Over to you.

Thanks very much, Sam, and thanks very much, Joe, for rattling through in five minutes there what is a remarkable amount of work by the Chelsea and Westminster team to coordinate and manage 150 cases of monkeypox is remarkable, really. So.

But on to this question, specifically, in terms of what have we learned from, you know, overseas cohorts, and in the last five years of imported cases of monkey pox, I think it's important to remember whenever we get re-emerging disease or emergence in a new location

that actually there often is very robust and useful data that's previously been gathered in non-endemic settings. The first thing I'd say is in reference to the question, now I'm a bit more optimistic than the questioner that it doesn't become our current endemic problem, and this is an epidemic and an outbreak that we control, and it doesn't become endemic in the UK, I guess I'm still optimistic in that sense. But I think we're certainly in a better experience now to deal with this unprecedented outbreak in the UK, given the cases that we had imported in the UK recently that were reported in the Lancet ID. But also, at the time when we had those cases in Liverpool and London, and other settings, what we did was speak to colleagues overseas, and Nigeria has managed a lot of cases, but also looked back at a large cohort in the US when they had almost 50 cases that were relatively similar to the outbreak that we're having now.

The other important area to think about is animal models. So, often when you get a disease when there's not ongoing transmission, you learn quite a lot from the animal model, particularly with evaluation of new therapeutics that is more relevant today. So, I guess if we go back in time, most people will know that monkey pox emerged at the time of smallpox kind of eradication, really. And the first human cases were around that time in 1970, when it was clear that there was a pox-like virus in Central and West Africa, that was occurring when there wasn't known to be smallpox human-to-human transmission and clusters, that drove the identification of monkey pox in humans. And what we learned pretty clearly that it was a less severe disease than smallpox, it occurred in clusters, often signifying a point-source introduction and then human-to-human transmission, it was quite unusual in that sense to go past a couple of generations of transmission.

So we knew that for a while, and we also, from the very beginning, knew some risk factors. So it was worse in children, worse in pregnant women, that was the early data that indicated that. More recently, you know, we had a small number of cases imported into the UK in the last five years, which totalled seven, that were reported in a case series, including a healthcare worker, and the familial cluster that was occurred in the UK. What's slightly different when you look at, and this is common to all emerging viruses, particularly, when you have a small number of cases imported into a highly-resourced setting like the UK, you can intensively study them. And all these cases that came in, were evaluated in the HRD network, and join the SR protocol so have intensive sampling. So actually, even from a small number of cases, you can learn quite a lot.

So, what have we learned in that time? So, we learned that viremia was present, this has subsequently been reported by the DRC. And we also know that PCR positivity persisted, particularly in the upper-respiratory tract, all our cases were positive in the upper-respiratory tract for quite a long time. And we're talking weeks here, which has a real burden on trying to isolate patients in hospitals. So that's quite important both for the patient but also operationally as you manage patients going forward. Also, in the UK, we decided to use, on a named-patient basis, an experimental use of therapeutics, so brincidofovir and tecovirimat we used, and again, even though it's an *n* of one, tecovirimat was thought to be beneficial in the case that we used it in, it has a good level of evidence in the animal model and is a safe drug. So that was quite useful, to use it for the first time prior to then its use in this current outbreak.

I guess the other softer part is that within the network, people then became quite confident in the PPE that we were wearing. So, looking after these cases of monkey pox with the PPE and the decontamination protocols that we put in place for rooms was demonstrated that they worked so gave a bit of reassurance, that's the position that we're in now. The cohort was probably a little bit more severe than the overall cohorts that we have now mostly like 50 to 100 lesions in that cohort of seven. So slightly different from what we see now.

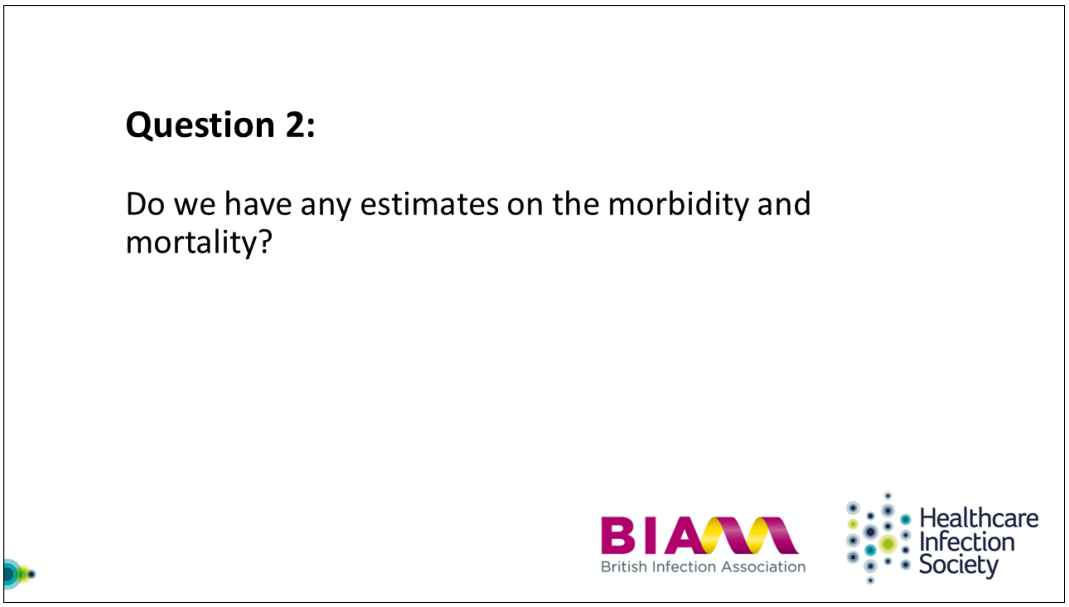
I think if you then go to overseas, there was a very good recent report in medRxiv. So, I'm slightly surprised, that was 200 plus cases from 2007 to 2011, but it actually was only reported in medRxiv last week. So, I'm not entirely sure why it took 11 years to get the paper out. But it's a pretty remarkably robust prospective dataset, which has a huge amount of data in it describing a pretty severe cohort in the DRC. And we're talking about hundreds of lesions to thousands, a pretty low case fatality rate of 3%, throat positivity again, and again, some other prognostic indicators that are important. So again, more severe in children, associated with number of lesions that people have, and also associated with a high ALT.

One thing they did report in these in this cohort with others was higher rates of secondary bacterial infection and respiratory infections. We haven't seen so much in the current UK cohorts. So that's probably, you know, enough from me, and then I'll pass on, Sam, if you're happy, to any colleagues who want to comment on this question of what we've learned from previous outbreaks.

Sam Moses 13:36
Yeah, definitely. I'd like to ask the rest of the panel, if anybody wants to say anything? I have heard the gong... Yeah, I was just on the one question that I had was, I mean, in terms of moving forward, that you said, I mean, do you see a possibility of this going to other risk groups?

Tom Fletcher 14:02
Yeah, I think, as I'm sure everybody on the call knows, that it's largely within an MSM population currently, you know, within the UK, and that is the current sort of at risk group, not exclusively. And another case that was imported at the same time wasn't from that group in the very beginning. I guess our worry is, of course, with ongoing transmission that it gets into more vulnerable populations, into children, into pregnant women, and then those that are immunocompromised, much more difficult to manage. Cat may have a better idea of where this trajectory of the outbreak is going. But, you know, I think there is still a robust attempt to shut this down as quickly as possible with public health measures to stop that happening. So

Sam Moses 14:38
Thank you, Tom. Thank you. So, the next question, and this is to Joe,



Joe Heskin 14:51
Thanks Sam. So, I'll start with morbidity. I think we're only four weeks really into understanding this cluster so far. And that's still quite early from a data perspective, and I think morbidity will be more tricky to gather data on because we're not necessarily seeing the same cases returning exactly to the centres who originally diagnosed them or looked after them, they may well be contacting general practitioners, but looking at, say, the cohort that I'm involved in, we have about 160 out of the 470 cases nationally. And I suppose if we use admission as an indicator of significant physical mortality, we've had an admission rate that's varied between 6% and 12% of our cohort, across the time since the 15th of May, in the earlier stages, we had a much higher rate of admission, we were admitting patients purely from an isolation perspective. And as we've become more confident managing people in the community that has decreased quite significantly, so we're now probably looking within our cohort at about 5% to 6% admission rate, that's predominantly due to pain, and that pain is coming from the burden of skin lesions, mainly within the perianal area.

And I think while that admission rate has been important for some individuals, and they have required levels of management we would tend to associate with post-operative patients, we are seeing fewer admissions again, as we are more prepared, and we can preempt the symptoms that we're seeing that required admission in the earlier stages of the cluster. And we're now providing people with analgesia and with laxatives at diagnosis when we spot those individuals who are higher, who are sort of, showing features that were higher risk for admission at the beginning.

So, I think from a short-term morbidity perspective, it's pain-related predominantly, I think we can do a lot of admission avoidance in those individuals. I think what we're going to see, what we don't fully understand yet, will be the longer impacts of this on people who do contract monkeypox virus. And that would be mental health related morbidity, it's going to be associated with isolation, with financial struggles from having to isolate, with stigma that we've already seen the impact of, and I think the one that we don't fully, or maybe haven't fully appreciated yet is the skin-scarring impact on these populations as well, and we're starting to see that in some of our individuals who are diagnosed in the earlier stages.

From a mortality perspective, there have been no UK deaths from monkeypox so far during this cluster. The mortality statistics reported at the beginning were obviously seen a lot in the newspapers, which was ranging from the 1% we know for the West African clade, to up to 10%, in the Congo Basin clade. And I think if we look at some WHO data there's about 1,200 cases now from the non-endemic regions, and they've not, there have been no reported deaths in those areas, either. If we look at the same number of cases reported in the endemic areas of the WHO African region, about 1,500 cases, there's been about 72 deaths, so about 5% mortality, but again, very much so in the Congo Basin clade where we already know it's a more severe variant.

And I think it's extrapolating that knowledge back to healthcare settings that may have different economic stability, different healthcare availability in a different sort of general population comorbidity status prior to a monkeypox infection as well. And I think what probably what stands out most about the mortality rates is not necessarily how well we've done but how well as an infection community, how much we've tolerated as the mortality rate in endemic regions, and actually, with support to healthcare systems in those areas that I think that could probably be reduced quite significantly. I'm not sure if other people have other thoughts.

Sam Moses 18:30
Thank you, Joe. I mean, anybody want to pitch in, add any further context?

Luke Moore 18:35
I think it's just it's something that Tom said, which triggered off a memory about the coinfection with other respiratory tract viruses that were seen elsewhere. But Joe, in your cohort, have you got a handle on coinfection with other true STIs amongst this cohort? Are we identifying a lot of ghono, chlamydia at the same time?

Joe Heskin 18:56
So, I think from an STI-specific perspective, we'd have seen about a third of cases had concurrent STIs as well, that was somewhere between predominately looking at gonococcal infection and syphilis infection as well. And we were probably empirically treating for a significant number of infections at the beginning where we saw sort of widespread lymphadenopathy. There was a lot of concurrent LTV use, but certainly we're seeing quite a predominance of STI amongst our cohort.

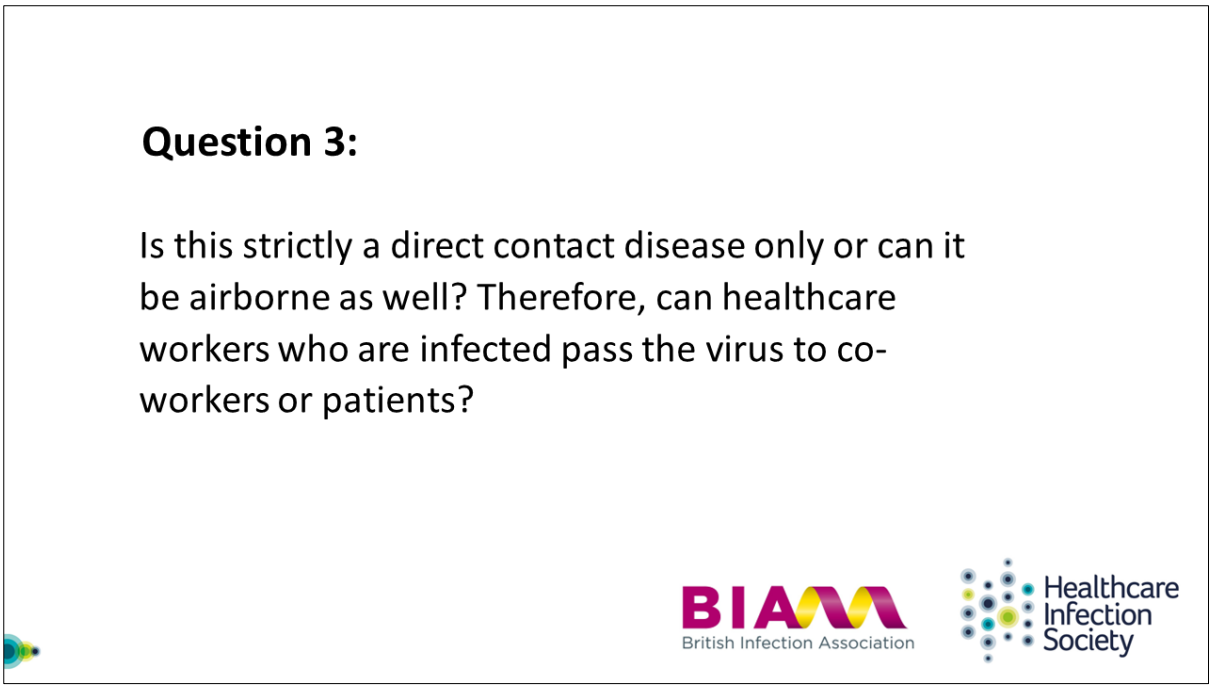
Luke Moore 19:22
And I guess that emphasizes the need to shore tests for monkeypox using ripple pathways, but also to think about how we can safely test for other STIs at the same time in this cohort, right?

Joe Heskin 19:39
Yeah, absolutely. And I think that comes back to why sexual health services are well-placed to look after this community who are currently undergoing the predominant impact of this. We still need to function in sexual health settings and provide that testing and treatment for them as well.

Catherine Houlihan 19:58
I've just done that. Can I just jump in and add the additional testing for other viruses, which look like they might be monkeypox, is extremely important and we take phone calls about this all the time vis-à-vis 'not tested for enterovirus', 'not tested for...', and of course this needs to be done for the for the benefit of our patients as much as the STIs do for different groups.

Samuel Moses 20:19

Thank you so much, Kat with exactly the point I was going to try and ask you because I think exactly, very good. We had a similar situation where we faced quite a lot Varicella Zoster. And, you know, there's a lot of worry about monkeypox, and it's really important, yeah, totally agree. Okay, then, is there anything more to add? Okay. Right, so let's go on to the next question. So now this question is to you, Kat.



Catherine Houlihan 21:08

Great. It's a great question. I think what, what is clear is this is a contact, predominantly contact, transmissible disease, and that's direct close contact. And what we know is that that is from people with lesions, from a lesion which is packed full of virus to a mucous membrane, from a lesion to non-intact skin, and even from a lesion to skin. It is, are potential routes of transmission. And I think that, and all of that fits with what we know from rapid epidemiological surveys, including things like data that that Joe's presented, but also the sort of epi data that UK HSA perform, just looking at the risk groups and their exposures in the past and the incubation period. So, there's a large majority who've had sexual contact in the past, or close intimate contact in the past, 21 days, so during the incubation period, and a number who have had sort of risky sexual exposures. So, it all fits very well with contact. And importantly, that being said, we have, and Thomas said this, we've detected it in our in our seven UK cases before in throat swabs. We're detecting it now in throat swabs not as commonly and not with as low Ct values, but we do see it in throat swabs. And so, the reason that we then put out guidance around if your patient has, clinically looks like they've got monkey box and they're coughing, then that would be a time when you would use upgraded airborne PPE in order to protect yourself whilst we work out how much of an airborne transmissible disease this is, because it cannot currently be ruled out. So, things like aerosol generating procedures and things, I mean, we go by this as a contact and a probably a droplet transmissible, but we can't rule out the possibility of airborne at this current time. So, there's clear guidance on that. I think in terms of healthcare workers they're, so obviously there is the possibility because healthcare workers are in physical contact with each other and with patients. And so, what we've done at UK HSA therefore is put out this very cautious guidance around what we do with people who are known contacts. So, we've categorized them and the high risk contacts we've asked

them to be excluded from, from work. And that is a more conservative approach than you might have seen the recent publications from WHO and CDC don't do this, and UK HSA and the UK are very aware that we are more cautious. And the thing is that we have, detected this current outbreak before other countries, we have more cases than other countries. And we probably have more data coming to inform the way we manage this outbreak. So, there's a very active process to attempt to look at the transmission from contacts to cases and to look at, and how we're doing that. So, we're currently trying to use our own evidence to inform our own guidance and not reflexively follow other places. But we, we're aware that we are more precautionary. And we think that that is something we will stick with at the moment in terms of excluding healthcare workers who have had a high-risk exposure to monkeypox. And it's really important just at that point to say, we're, we're fairly certain there's no transmission before symptoms. So there, there are people who will be excluded when they're completely asymptomatic, and there probably was no risk of their transmission. But nonetheless, we still advise that. So, yes, there is a risk, but hopefully we're identifying anyone that might be at risk and they're not coming into contact with other healthcare workers or patients.

Samuel Moses 24:55

Thank you, Kat. Anybody else anything further to add? If I may, Kat, just on a quick follow up just to say, is there any thought or any data at all to say that in terms of the respiratory risk, any correlation with density of lesions, more cutaneous lesions? Or is that just not something we can really tell?

Catherine Houlihan 25:21

And so, in terms of a risk event, airborne transmission in terms of correlation with a point source?

Samuel Moses 25:27

It started to correlates to, you know, more while shedding.

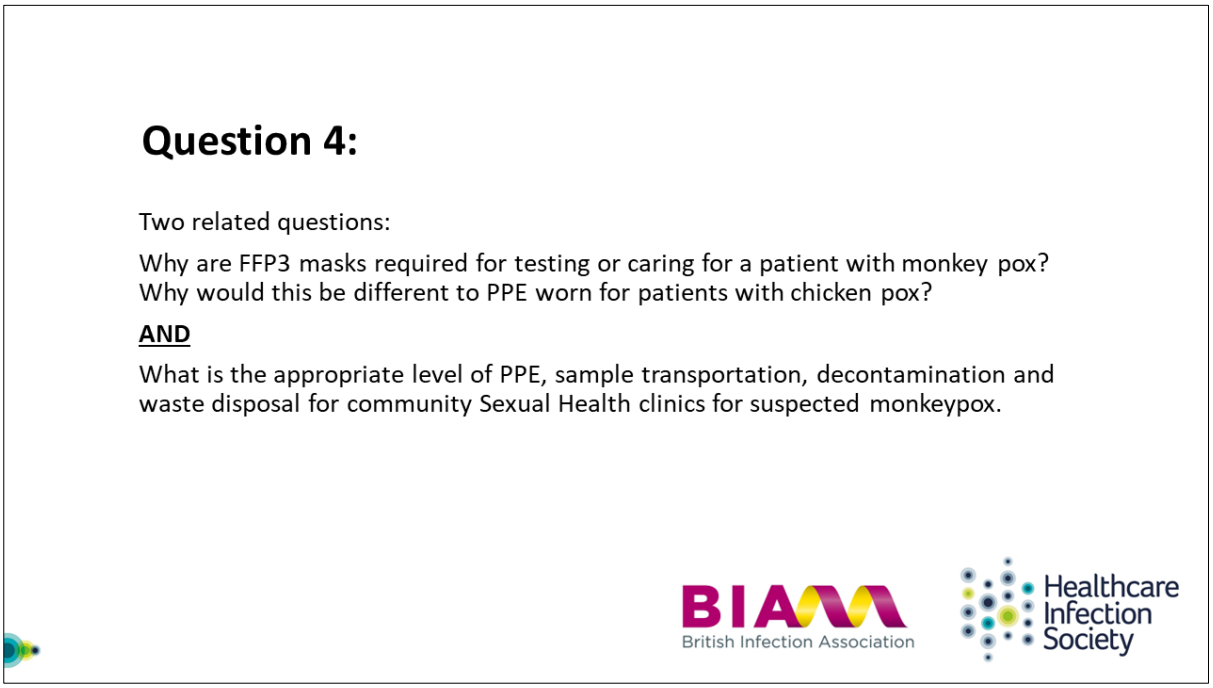
Catherine Houlihan 25:32

Interestingly, we could have had you in a meeting that we had at UK HSA today where we discussed what we, I mean, because we've received multiple samples, we, you know, we were asking for throat swabs and blood and urine, everything at the start. And we certainly in people who are prodromal, who don't have lesions, but they look like a classic monkeypox, you know, they've had a direct contact, they come in febrile and you want to test them. We do still say that we would test a throat swab. So, we are going to prospectively look at those data to tell us what's the, you know, the positive predictive value

of a throat swab, that may end up picking up these people because I think there are huge gaps in our knowledge. And we've got a really excellent opportunity here to try and answer some of those just, just by looking at our data as it comes in in real time. So, I don't think I can answer that. I think, you know, people who are febrile and unwell with multiple lesions and are in hospital we find their throat swabs are, are often positive, but I can't tell you that there's a correlation between the risk of an airborne transmission necessarily, because I'm not convinced that that's a huge part of it. When it is definitely contact. We're being precautious, we're being cautious around the possibility of airborne.

Samuel Moses 26:44

Thank you very much, Kat. Thank you. So I think we could probably go on to the next question. This question is probably easier to answer, possibly. This question is for Tom. It says,



Tom Fletcher 27:26

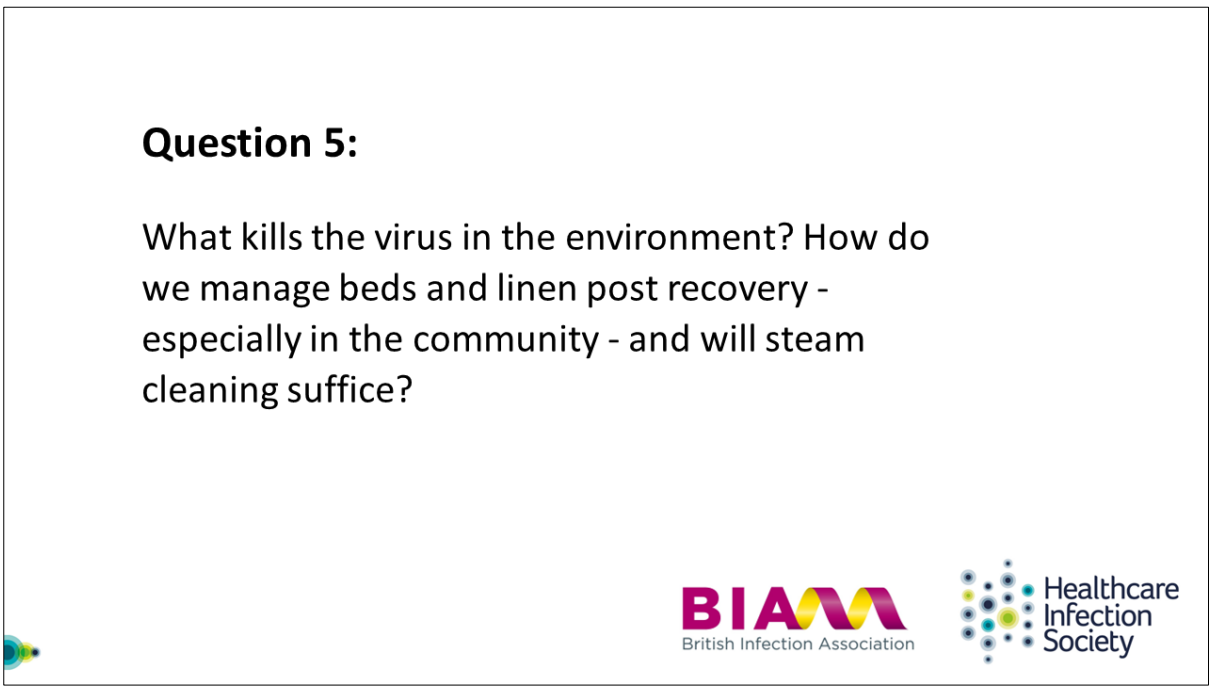
Thanks very much. It's, it's obviously a key question that overlaps a little bit with what Kat has just been talking about. And I'll try not to contradict her or say anything too different. I think, you know, when we did the WHO guidance, the discussion around respiratory protection of healthcare workers was pretty heated. And despite wanting to achieve consensus, we had to go to a vote actually, to recommend what we should wear for this because there is a difference of opinion. So, I guess if we dive into this a little bit around, you know why you wearing a FFP3 mask for caring for patients with monkeypox, and why is that different from chickenpox? I think most people probably accept that we've learned quite a lot in the last couple of years about respiratory transmission. This isn't

predominantly a respiratory pathogen of course, but this artificial divide between airborne, aerosol/droplet is probably not true, is it? So, it's a continuum and people probably are shedding small virus particles when they categorized as droplet transmission. In the UK in terms of why was it chosen that you would use a higher-level respiratory protection for looking after patients with monkeypox, that first comes down to the sort of the general principle of the HCID network where we have an agreed set of PPE that is used across airborne or contact pathogens that includes an FFP3. There's a different debate about how long monkeypox should be an HCID, which I think also polarizes opinion, too. But that's really why that was selected at the beginning. I think, and as Kat sort of highlighted before, there's a precautionary approach to this. And I think whilst we can recognize what the dominant modes of transmission are, when you've got something that's new and a different setting, and maybe with a slightly different virus, then given the importance of protecting healthcare workers, a precautionary approach around respiratory protection is where WHO ended up really. When you take chickenpox as an example, it's sort of a good example and then not one really, isn't it because most of the healthcare workers in the UK are immune to chickenpox. So, the consequences of exposure to that virus are very different. And we know that chickenpox produces more virus particles, has an airborne risk. And so, you know, some countries still recommend them N95/FFP2-3 for looking after, after disseminated varicella and others don't based on the fact that all healthcare workers are immune, but it should still in hospital settings, we all remember, be managed as an airborne pathogen in a side room, ideally a negative pressure because of the risk it presents to immunocompromised or other people. So, it's slightly different but sort of linked, particularly in endemic settings where you, there is that discussion, is this monkeypox, is this varicella, and sometimes it's not clear. And so that's where the respiratory protection for that group sometimes comes in. I guess, you know, the other factor that is relevant to monkeypox about respiratory protection is when you're looking after confirmed cases, we know that from previous experience in different centres in the UK, there's quite a lot of environmental contamination from the patient, wherever you swab in that room, after they've been there, you pick up virus, and reasonable levels of virus that's probably viable. And with that in mind, you know, there is that sort of, and scabs being put off by people who have a lot of lesions, we know that a risk of transmission is around the bedding change. So, the case from the UK, the healthcare worker that was infected previously, the high risk activity was thought to be a bedding change during that time. And we recognize that when you do a bedding change, you may generate virus particles into the air, either in dust or in small scabs. And again, you would probably want a higher level of respiratory protection, I would argue when you're doing that. The other thing that I would add is that at the moment, as Kat mentioned, we're trying to understand this better. So, there is a lot of air sampling going on around confirmed cases. And those activities such as bedding change, to try and understand that risk of transmission more. So, I guess that's the first part of the question. The second part of the question is a little bit different, isn't it? So, it's about what should we do when we're in a sexual health centre, such as the ones that Joe's team manage looking after patients, looking after or assessing patients with a suspected area. That's a bit more challenging, isn't it because you'd hope those patients aren't so severely unwell at that stage, many of them might not have monkeypox. But having said that, you might be an environment that isn't as

well ventilated in a small sexual health clinic as a negative pressure room. You are going to be taking diagnostic swabs, probably from the back of the throat and potentially breaking a vesicle, fluid to get off that swab as well. So, the current recommendation for the UK is in that settings, a fluid repellent surgical mask, you know, a pair of gloves and an apron. I slightly struggle with the risk assessment in terms of, you know, put on a face shield or eye protection if you risk assess that's needed. Because it's a bit late when you're in a room to do that risk assessment to decide you want to put on the eye protection. So, I've always struggled with that. And I always think that whilst many people on this call are infection experts and are able to do that risk assessment, PPE recommendations should normally go down to, you know, our colleagues, you know, cleaners who don't have that ability to make that robust risk assessment about PPE. So, I'm not convinced about risk assessing eye protection. And again, I think about respiratory protection and cough, we're not seeing it as frequently in this cohort, but from the DRC 40 to 50% of people would have cough at baseline. And again, I don't want to be in the room with them coughing before I decide I want to switch my fluid repellent face mask out for an N95/FFP2. But I think you know that data is ongoing, we'll have better understanding of the transmission shortly. I think the rest of the question may be better covered in one thing I think we're going to cover later, which is around how have you managed samples, and what do we do with equipment and stuff in that room? That might be better covered, I think by Luke who's got a question on that shortly. If that's okay with him.

Samuel Moses 32:49

Thank you, Tom. Thank you. Anybody has to add anything further or you can go to Luke, so Luke, a question for Luke. Next one. And that is,



Luke Moore 33:14

Thanks very much indeed. So, as Tom alluded to, well he didn't allude to, he stated it verbosely, that there are viable monkeypox particles all over the rooms in which confirmed cases inhabit, which brings all kinds of environmental cleaning and many of those of you who keep an eye on UK HSA, or PHE as was, guidelines will have noticed that in 2018, there was a specific monkeypox environmental decontamination guideline that was withdrawn fairly toute suite in May 2022. And then replaced, well not replaced but just people were signposted to the national infection prevention and control manuals for all four of the nations in the United Kingdom. And it's those that that kind of hold the nuggets here. So, we must remember that monkeypox is an enveloped DNA virus. So, it is reasonably easy to disrupt it and by that I mean alco gel for hand decontamination, detergents and especially chlorine will kill this thing. So, it is not, it is not hard to do so in that way. I guess we need to think about the three different elements which are inherent in this question. So, in inpatient room decontamination, then linen you mentioned and then outpatient decontamination. I think inpatient's easy. We need to just reaffirm to those of our cleaning staff and clinical staff who manage these patients, and at the moment as we've said in the conversation so far, most of these are being, most of these patients are being proportioned to the HCID units but whether that continues much longer will have to remain to be seen. So if and when these patients do inhabit yours and mine inpatient areas, as they do for Joe and I at the moment, we need to just be having those staff communication discussions that Joe was alluding to in his preamble around the need to: declutter environments, basic IPC good practice; be very cautious about single use and multiple use items, basic IPC good precautions; and then ensure that our decontamination of inpatient areas where these patients temporarily inhabit is with high, with detergent followed by 1000 parts per million chlorine. And if you can't use the detergent, chlorine and you've got to go up to 5000 parts per million chlorine, as we do as a normal IPC intervention, for a normal, normal, contaminated environment where we're doing enhanced cleaning. For linen, as Tom mentioned, our, the potential cause of our healthcare associated infection was in linen. So as with all contaminated linen from inpatient areas, we should be: bagging it at point of care of that patient; it should be being bagged in a water soluble bag and then double bagged in an impermeable bag, and then that goes through the contaminated laundry pathway. It's exactly as normal, we need to have no fret, fretting about this. And then the last bit, which is where the chaos ensues, which is the outpatient areas, the sexual health clinics and for our primary care colleagues who call me a lot about this, about what we're going to do in those kinds of ad hoc areas where a patient may or may not have it, they may be in a room for less than seven and a half minutes in some primary care encounters, predominately with their clothes on, predominantly with most of their lesions covered, and they may of course go on and then not have it. And I think we need to be sensible about that. And we need to decontaminate areas as we normally would when we have patients with potential skin lesions, where their skin is falling off in that area, we need to be assured that the soft furnishings from our consult areas have been removed, which is basic infection control good practice. So, I think we just need to be sensible, and I'm sure that Kat will lambaste me for

not being more detail oriented for the outpatient areas. But I think we've got to be pragmatic in these areas, which are seeing high throughput of patients. Thanks very much.

Samuel Moses 37:32

Thank you, Luke. If you don't mind, if I can just sneak in another question that's come in online, it's kind of linked to what you're saying? Perhaps not, maybe the risk that people are leaving things not cleaned for some period of time. The question is, what's the duration of survival of monkeypox virus outside the human body? And what about it on dry surfaces, you know, compared with contaminated liquid media extract, etc?

Luke Moore 37:56

I'll demit in lieu of Kat for that detailed knowledge. Kat?

Samuel Moses 38:02

Yeah, okay.

Catherine Houlihan 38:04

All right. I think that's, yeah, I mean, that's a topic for ongoing research. There has been, there are both multiple samples taken from Liverpool from patients from when they were inpatients and sequential over time post cleaning. There are samples taken up in Newcastle where we still detected DNA, what needs to happen with these samples is that they need to be put to culture. But there, I mean, there have been several studies of this. It's a DNA virus, so it's got more survivability, reportedly than an RNA virus would. I think this is another area that we are going to shower with findings in the next sort of 2, 3, 4 months. I think, I certainly know that that Tom has a lot of samples, Tom.

Tom Fletcher 38:54

Yeah, it is a really important question. I'm going to ask another one to Luke in a minute which is even harder. But as the people on the webinar probably realize, we decided we would save all the hard questions for Kat because she works for UK HSA, and bring her in on all those when we struggle to answer them. But I think as Kat mentioned, this virus persists for a long time in the environment, particularly in scabs. It's a terrifying amount of time, potentially, that you have a viable virus in the scab. And in the hospital, I think that's fine because we are going to do robust cleaning of hospital rooms, terminal cleans, etc. that will protect them. The much more difficult area is this unusual setting that we're in now, the patients with monkeypox the vast majority do not come into hospital apart from their diagnostic test, they're then followed up by Joe's and Luke's team in the community. And then some of which have had reasonable numbers of lesions, and they want to go back to their normal life after their period of isolation, and how do you clean their home because in 2018, we used to send industrial cleaners out to clean everyone's soft furnishings and everything else. And now, it's a bit different and people are getting on with cleaning it themselves. So that is not easy. And it's a resource issue and a numbers issue to a degree because there's hundreds of patients who are now isolating at home and how do we clean that? I don't know, Luke, if that's come up with the patients that, you know, the 150 that Chelsea and Westminster got at home or whatever that you're trying to manage, and this question must come up a lot because they want to get back to life and how do I clean my house?

Luke Moore 40:10

Very much so. And I think the guidance that UKHSA put out around home decontamination was useful. Before this for decades we've been managing patients with PVL incrusted in all soft furnishings within a house. And we know how hard that is to shift and the recontamination and the onward household contamination to that. But I think we learned a lot from that bacteria to draw analogy around the importance of walking through the house, not you as a doctor, but the patient themselves walking through the house thinking about where they're going to contaminate and laundering as much as possible. I think, for multi occupancy houses, it's going to be in trouble. And particularly where those multiple occupancy houses are not first degree relatives, and you've got all that onward transmission. I don't know how UKHSA looking at cat is going to handle that.

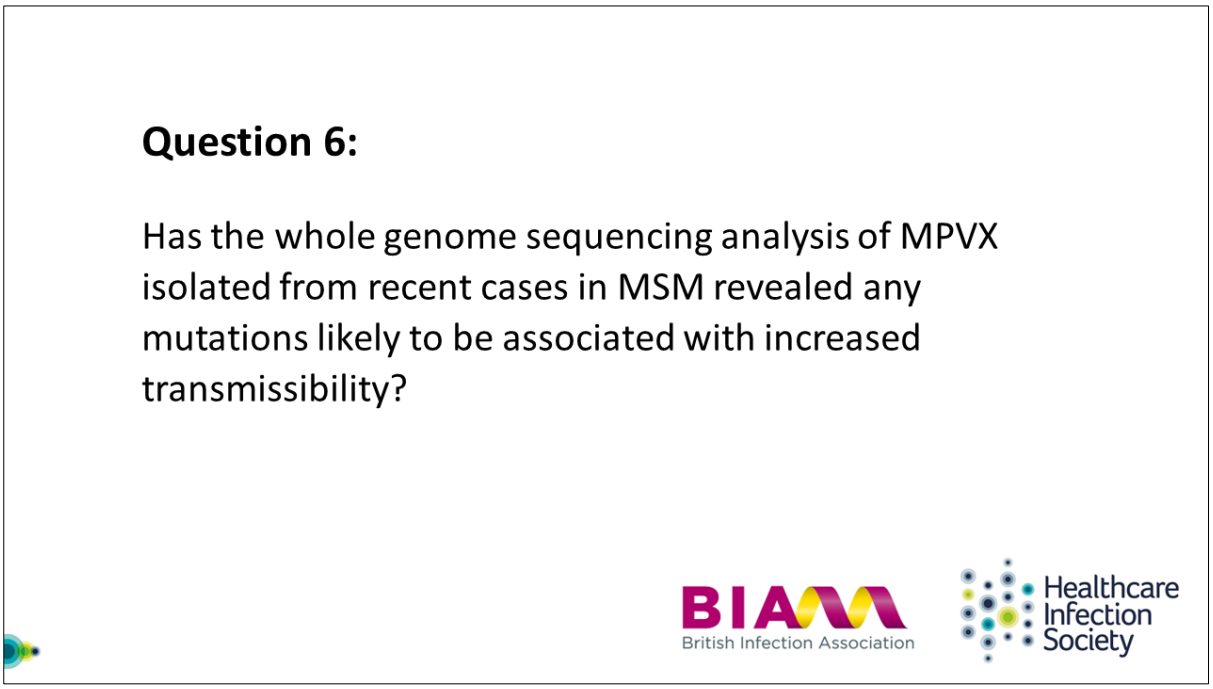
Catherine Houlihan 41:07

Yeah, I think that the HCID network, which meets every day and discusses all these, these patients actually looks at the home circumstances and multiple occupancy. And, and this is why some people unfortunately end up being admitted just for isolation purposes, or, you know, sort of other solutions, like finding another space for the family to live in. Or contacts, especially children, immunocompromised, and pregnant women. Yeah. So there's huge financial part to this, which was mentioned by Joe at the very start.

And then yeah, the I completely agree with the practical use that that you mentioned, Luke in the, in the clinics and things and the guidance that that is around household cleaning is really hopefully very practical and very easy to use and should maintain some kind of safety. And again, to evaluate the context of that we are looking again at people who are household but not sexual contacts, and they get followed up and we should be able to say what the secondary attack rate is within households who are non who don't disclose anywhere sexual contact, or, or close, intimate contact, should I say it's not, not always sexual, but a close intimate contact. So, we hope to have some data that support this kind of pragmatic approach that has been taken.

Sam Moses 42:24

Thank you, Cath. Yeah, just as a virologist. I mean, a similar question came to in our local environment as well, we just say there are two elements to it. One is how much is survived. And second is how was transmitted, what's the mode of transmission? That's also quite important. There poxviridae, you know, as a family, they can survive up to seven days in an environment in a dry environment. Yeah, but the route of transmission also is a key part, isn't it? Let's move on to the next question.



This is for you, Cat

Catherine Houlihan 43:16

Great, yeah, so there's a few interesting things to say about the monkeypox virus. And so it's a huge virus, it's 197,000 kilobases. And what's nice is that we all understand viruses a bit better, because we can compare them to COVID, which is our benchmark, I think, so although that's an RNA virus, we all know, it's 30,000 kilobases.

So, and it's, so the other thing about so it's, first of all, it's a huge virus. And so you might think this is great, we can analyze it, and we can learn loads, we can't, it's a very slowly mutating virus, so it makes one to two nucleotide substitutions per year. So, we're going to struggle looking at transmission. But

what we have been able to do as as I guess, a kind of global community is share sequences, which is one of the major benefits of what happened in the awfulness of COVID is that we've now got genome sequencing globally, which is really exciting. And we've certainly done our sequencing of some cases in the UK. And that can be found on the technical briefing.

And there's been on https://virological.org/ etc, other sequences shared and discussed. And what's really interesting about this, this clade that we're seeing circulating in our current group, is that compared to the 2018 virus, which was sequenced, it's got 48 differences in its nucleotide sequence, which is more than one would expect for that time period, just even for people like me who are not great at maths.

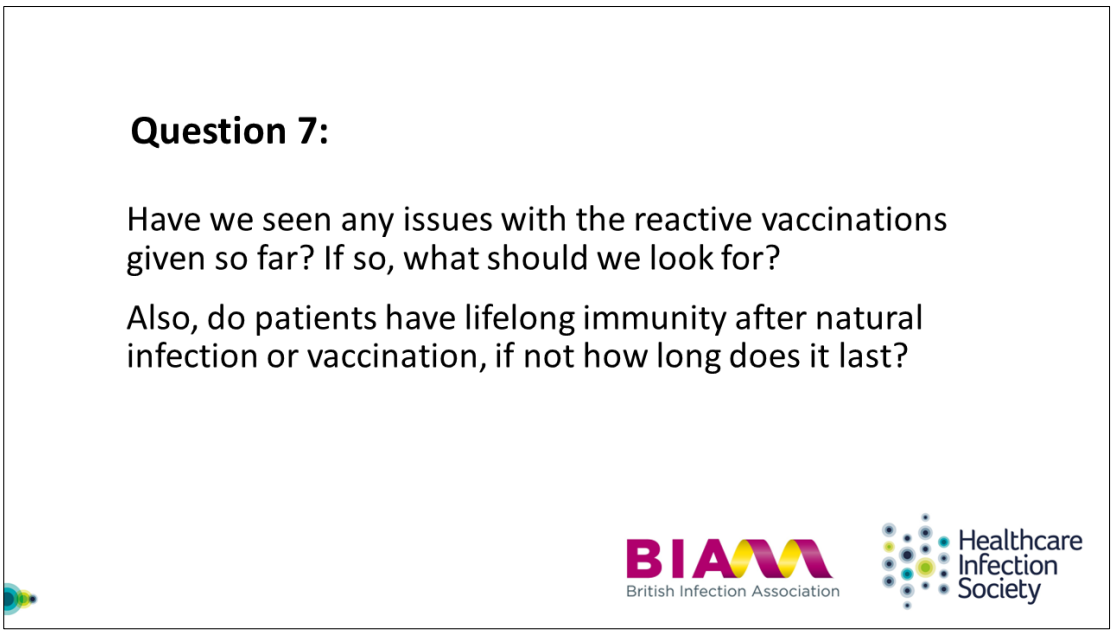
So what did those 48 snips do in terms of change of the virus is a great question. Is there any increase in transmissibility? Is that why we're in the situation we're in? And so those have been looked at there's 21 of those snips which influence protein changes, which would, as we understand influence, potential threat was transmissibility. And those proteins that have been looked at only one or two are coming out as really interesting. And they're not related to transmissibility. At the moment. They're more to do with T cell function and, and potentially some Tecovirimat resistance, which is easy for the virus to acquire.

So very much being looked at very much not having any influence on the transmissibility. But we certainly have something interesting going on with this virus to do with APOBEC3 pressures, and whether it has actually been circulating in humans for a significant amount of time, rather than circulating in animals, and possibly under the radar. So we're all very closely watching when, you know, trying to get to the history of this current situation, how long has it been circulating in these populations? And of course, lots of that sort of research going on lots of attempts to look at this through both testing old swabs, which were not positive for anything and looking back at serological samples to see whether, you know, back last year, sometime, we had some serological positivity and people that we really wouldn't have expected to have, and so lots to come.

Sam Moses 46:13

And here's an important question as Tom and others, anybody any want to add anything further?

Thank you. All right. So, let's go to the next question.



Luke Moore 46:44

Thanks very much indeed. So, I guess the first thing is to is to note that there are three vaccines out there, there's the old ACAM2000, which was before my time, I still revel in my youth. And that was quite, quite notable for its adverse events, particularly locally at the site of injection, but also more widespread, it was not a pleasant vaccine. More recently, of course, we have two other live vaccines, but they are to some degree replication deficient, which means they're safer, and in general, they have fewer adverse events. The one that we have here in the IMVANEX, also known as Jynneos in the US, and then there was another Japanese one, which we don't have access to. We as Joe alluded to in his preamble had an awful lot of health care contacts from that initial weekend. And we went out and we offered a lot of IMVANEX to these individuals. And in the previous seven cases in the UK that Tom discussed, we offered a lot of IMVANEX around then so we've got some experience and I and I would say that we're going to get an awful lot more experience with post exposure, prophylaxis post exposure vaccination over the next few weeks and months.

We see around 25% of people are having local reactions in their arms. We see again about 25% of people having just general post vaccine fatigue, malaise, maybe a bit of fever, but but really nothing else. If you have a topic dermatitis, it's worth noting that around five to 10% of people do get a significant skin reaction to that. So you should introduce that into your screening questions for those of you who are doing scarf contacts post exposure prophylaxis, but I would just reiterate the bit I sped over which is around it being a replication deficient, live virus, which means it is safe for those who are immunocompromised for other reasons. Because of HIV because malignancy immunosuppressives it may not engender as vibrant immune response, but it is safe.

Then the other part of the question was about longevity. So being exposed to monkeypox, once in your life is infrequent, being exposed multiple times in your life (unless you're Tom) is going to be particularly infrequent. So what we can do is draw analogy from in vitro diagnostics. And after IMVANEX vaccine prime which is two doses, at two years, only 5% of people have detectable antibodies, but what does that mean? Does that mean you're protected or not? We don't know if you then go on and boost those individuals again at that two-year mark. Then 99% of them go up and have detectable neutralizing antibodies. And then if you test them two years later, after that boost, then around two thirds have detectable antibodies, but again, what does any of that mean?

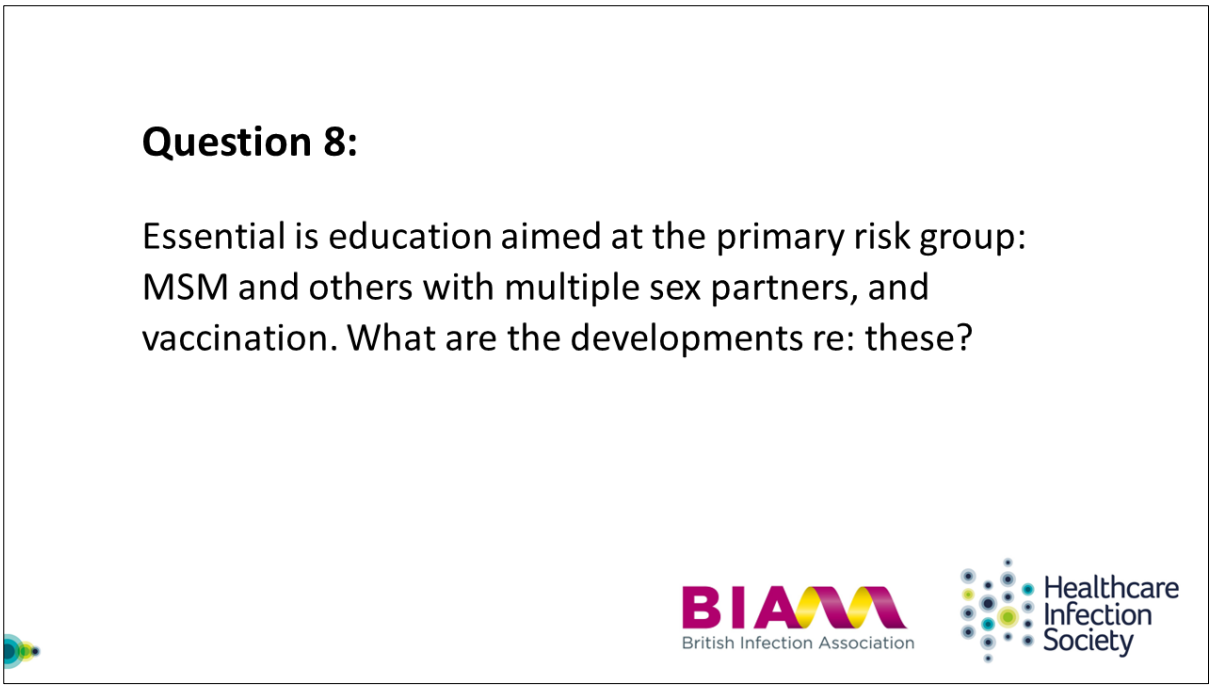
So, I think we are going to do a lot of post exposure prophylaxis this time round. I think that will protect a lot of our frontline healthcare workers. I think there is some some decision making to be made around pre-exposure prophylaxis for the highest risk group that doesn't just mean Tom and those other individuals working in the HCIDs. But it also means people like Joe, who are frontline in clinics and what pre-exposure prophylaxis should be given then. And then I think we will pop down the line that the durability the longevity of vaccines, as more information feeds in. Thanks very much.

Sam Moses 50:21

Thank you. Thank you.

Anybody have anything that further?

Right, let's go to the last of our preset questions. And this is to Joe.



Joe Heskin 50:48

Thank you. So, I think as I said about at the beginning, when it comes to education, communication is key here. And I think we're actually quite lucky in a slightly peculiar sense that the cohort we're dealing with predominantly here has been a group of people who are very involved in healthcare and are very keen for healthcare information, and very keen for healthcare related education. And we know that the MSM community, which is sort of currently shouldering the burden of monkeypox cases, has always been very closely linked to sexual health services. And within the GU sexual health sector, we have a very robust link with our third sector groups who have already provided a huge amount of education around STIs. And I think we're, we're now manipulating that pre-existing relationship to be able to provide a huge amount of education opportunities regarding monkey pox to the people who are being affected by this. And that that's been incredibly useful. I think the message at the beginning was probably not quite correct, both nationally and internationally. I think that was recognized very, very quickly. And we've reset the narrative to link communities back in to UKHSA to the sort of national message and monkeypox.

So, education has been provided. It's been through q&a sessions, it's been through educational talks like this, I think it's very important that these are led by third sector groups. I think infectious disease experts are not always the most appropriate people to lead on those when it comes to community level talks. I think it's fine in a professional setting, but actually getting third sector groups like Terrence Higgins Trust, like perhaps to the National AIDSS trust UKCAB to lead on these and to phrase the questions or the setting more appropriately, is how you're going to be able to connect communities and to provide that education that you need. So, I think that is already already happening.

From a vaccination side, I think I'm going to slightly hand that over to some other individuals on the call as to the communications regarding vaccination, I think there's a lot of decisions to be made as to where those vaccines are most appropriately used. I think they've been targeted towards high-risk groups, and being used in healthcare workers, both as a pep and prep scenario. And I think that's probably the most appropriate use of them at the moment. But I'm happy for anyone else to jump in on that.

Sam Moses 53:16

Anyone want everyone to add any further?

Catherine Houlihan 53:19

I would just add support to what you're saying that those are the groups under discussion, but but sort of in collaboration with important stakeholders within those groups. So, I think there's hopefully, as far as I'm aware, there's a dialogue going on about who should be prioritized for vaccination out with the kind of obvious.

Sam Moses 53:43

Luke, yeah?

Luke Moore 53:45

So, I've got one eye one eye on different social media streams. And there's one question that's, that's vibrating quite a lot out there at the moment, which is, is this a sexually transmitted infection? Or is it a sexually transmissible infection? Or is it just are we associating with that mechanism, just because you are in close proximity to one another for a period of time? I think we all need to just be super careful, as Joe said, around the wording we are, we're using that. I just echo Joe.

Sam Moses 54:21

Thank you.

Right. And there's one question that's come through, which I think in the interest of time, probably I've just mentioned to you is regarding the health and safety requirements regarding lab procedures for swabs for suspected secondary infections, especially when you're going to think about, you know, trying to cover non monkeypox situations as well being able to test you know, what do we wait for the monkey pox negative result of a test or you know, can you just sort of briefly outline?

Catherine Houlihan 54:51

Yeah, I think there's, I mean, this all comes down to clinical judgment. And so, we're always not sort of trying to teach clinicians who understand infection, what their job is and there's a very careful attempt to try and get infection clinicians to triage samples rather than the three clinicians that three consultants that work at ripple to kind of do that. We've of course, got some drafted in help but that in terms of what we should be swabbing it's, it's what is your most probable diagnosis and do swab. And if you really have a kind of a concern, and they've, they've met the case definition, then swab at the same time and run both of those samples together. So, you can locally run a PCR at the same time as sending us a sample that is acceptable, your turnaround time would probably be about the same. In terms of if you courier the sample that that night and we put it we get it before nine o'clock we'll

have it on the random results, early evening. So, I think there's kind of an ability to use clinical acumen here, which is really important. And I think I'm seeing one in the chat, which is *Should blisters or vesicles routinely be deroofed before swabbing*? You're more likely to find virus if you deroof that that vesicle. And I've seen a lot of nodding from the panel for people who have experienced deroofing vesicles, probably more than I have. But yes, deroof that vesicle that's not an aerosol generating procedure. That is just that's just opening up a vesicle. I don't have a lot of experience with whether that's terribly painful and uncomfortable for patients? I see a lot of shaking heads – that's really interesting. So be reassured you're not going to injure your patient or hurt your patient to deal with that. And that is more likely to get a positive we think because the amount of virus that's in that vehicle fluid or in the in the recently deroofed surface.

Sam Moses 56:49

Luke?

Luke Moore 56:54

Yeah, just to echo everything Cat said, I mean, I think we should be debriefing vesicles for HSV and VZV. Viral swabs, I think it is something we should have been doing forever. And just I know people like signposts there is an explicit signpost now to the UKHSA, monkeypox colon diagnostic testing document on the UKHSA guide. website which has a lovely table for your containment levels and your need or not need for microbiological safety cabinets and your what you need to wear when you are testing other blood sciences samples, both within and out with an auto analyzer and how you can do that safely. And having had to do huddles with our hot labs, biomedical scientists' teams, it's useful to have that explicitly there to onward cascade to your lab teams.

Sam Moses 57:49

Thank you, Luke.

I think we have time for one more question quickly. So what time duration is considered as significant contact of monkeypox in the same room for more than one meter away? Such as patient waiting areas and Emergency Department? Who wants to take this?

Cat? Would you like to try?

Catherine Houlihan 58:17

Sorry, I don't think we've put a time limit on the duration of a contact with a patient. So, I think it's being in the same room. I mean, I would just refer everybody to the to the risk categorization matrix which is as detailed as we possibly could have it with example scenarios.

But I think there's an element of pragmatism around all these reported contacts and it's going to depend very much on whether patients are actively symptomatic with coughing and exposed lesions versus having covered lesions and being asymptomatic in terms of in terms of respiratory symptoms.

Sam Moses 59:06

Thank you, Cat. Well, that's nearly brings us to the end. And it's been really great to have this discussion. Thank you so much for attending. And thank you for HIS for organizing this. And GAMA Healthcare for supporting it. We really appreciate this. Certificates of attendance are going to be handed out after the event for those who registered for the webinar and a there will be a recording and transcript which will be available after the event as well. There are past webinars on the HIS website, and you can scroll through there's a ton of information there, which I discovered myself over the last couple of days. So, I encourage everybody to go to his website, look at webinars and there are a lot of future events coming through as well. And with that, I would thank you all so much. Thank you for attending out there everybody in the audience, thank you for giving up your time and thank you for the wonderful panel.

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