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Hello and welcome to FIReS webinar 2. In our previous webinar, we listened to our colleagues that come from clinical backgrounds so nurses, doctors… We learned from them a lot of the challenges that they were facing during disasters, conflict and other disasters tonight or today.

So we will be listening to other analysts have really been excellent speakers who often we don't see when we go to hospital as always and can't see them or talk. But they are working always in the background.

They're working 24 hours, seven days a day, seven days a week. So they're literally nonstop people working as well. And those most used to be don't listen to them. We don't really count because we don't see them. They continue to deal with us as patients.

So all what we expect is just that we want to see the doctor and the nurse just to look after us. Well, actually, we don't really know that there are certainly people who who are also not contributing to the doctor.

So tonight they again. So we have a number of colleagues who come to come from the UK, from Italy or from Turkey or from the US and yourselves as well, joining us through to learn from them from their experience.

They have all, you know, local or international experience in a number of issues engineering, supply chain and many other others as well. So it will it would be a really nice session for all of us in order to perhaps to to help, you know, engage with them.

You can use the chat. So if you can just post your comment or question there and then my colleagues will be picking that up and then we will take it and the question and answer session. So work on what you're going to do tonight is will have three presentations first and then we'll have a question and answer session for about ten minutes. And then after as we go to the second set of presentations. We have another set of questions and answers. And of course, on the a panel to discuss, you are more than welcome to start in our question to starting with your questions and comments whenever you feel it's appropriate.

So I'm going to start introducing my my first speaker and Chris Howlett, who joins us from the Mid and South Essex NHS Foundation Trust. Chris is going to talk to us about the hospital's experience in COVID 19. Chris, the floor is yours and thank you very much for your contribution.

Thanks for that introduction, Nebil, and hello, everyone, thanks for joining us this evening or as Nebil says, it's probably morning and afternoon in some parts of the world where people are listening. I was always advised not to start a presentation with an apology, but I'm going to do exactly that on this occasion because just to warn you that my office is right next door to the hospital helicopter pad and I never know when the next helicopters coming in. So if we get some noise disruption you, you'll know what's going on. If my hair starts to blow in a different direction, not is very much of it.

That's the reason why. And so if we can just go on to the first slide, please. I'm going to run through over the next ten, 15 minutes, some of the experiences that we have admitting surface exposed lose trust during the current pandemic.

But before I go into those experiences and they're very much from the focus of the impact on the estate and the state services for the organization. I'll tell you a little bit about the organization if you could click on to the next slide, please, Chris.

So this is who we are, mid and south Essex NHS Foundation Trust with an organization that provides acute hospital services across mid and South Essex, we operate with a budget of over 1 billion. UK pounds is about £1.2 billion where we spend on health care, for the population, for acute services each year.

And the estate that's included within the trust includes three main acute hospitals, which are listed on the slide. That's a total of about 330,000 square meters of estate. Within those hospitals we've got 64 states is 6500 beds, and we provide a full range of acute hospital services.

And some of the sites run regional specialist specialty services. And I'm speaking to you tonight from our Springfield Hospital, which is based in Chelmsford in Essex. Here we're also regional specialist burns unit. So it's a big, complex estate that really have to respond in a radical way.

When we went into the first wave of COVID in particular, if you can take it onto the next slide, please. What I'm going to talk to you about is the experience through the first two waves of COVID, because those two waves, which are indicated by the timeline and the slide here had the greatest impact on health care provision in the health care state in the UK. And you note from the graphs here that cases are low in wave one, and that's largely a function of inadequate testing. And therefore there wasn't the capability across the system to identify the number of positive cases that were in the population.

However, we did have good data on the number of hospital admissions through COVID and also the number of people who sadly passed away through Cambridge. And this shows you the impact of those two waves across that one year period.

And in fact, we can go to the next slide, please. So what was the early impact on the NHS for many states perspective? Very early on in wave one, we realized that we had to take some very straightforward measures to segregate infectious and noninfectious patients and the impact that was different depending on the presentation put into the hospitals. So through our emergency departments, we had to strain people on the basis of confirmed infectious patients, which were red. We call them red patients, those that. So they come into hospital with symptoms but are not tested. So we have to treat those patients as potentially infectious and those that came to hospital with any symptoms and known as not being infectious. And so that required us to redesign our emergency department streaming really early on so that we could create that segregation and help reduce the risk of cross-infection within the health care environment very early on in the pandemic.

We have we had a large or a big increase in the number of patients presenting with respiratory illness, which some of which requires intensive care and ventilation, and that required a rapid expansion capacity for patients presenting with those conditions and typically in an acute hospital site such as the three that I've described to you in an intensive care unit with maybe 20 theaters, we perhaps would have 15 beds within that ICU, 15 to 20 beds, and we were finding at peak times we needed a much greater capacity for patients requiring ventilation or breathing support. So we had to expand that capacity by extending into, for example, theater recovery areas to ensure those patients could be cared for appropriately. We had to rapidly increase the number of beds that were designated for COVID positive patients. And the net impact of that was we had to reduce the number of beds used for surgical and planned work, if you like.

So very quickly, the elective work that we do in hospital, that plan surgical work had to be canceled to provide sufficient capacity for COVID positive beds. We also had to implement social distancing measures. So guidance changed about this in the early days.

But we implemented a two meter social distancing rule and we applied that both in staff areas and in-patient areas, which meant we had significant reduction in capacity, for example, for outpatient clinics and diagnostic services, simply because we had to keep all patients separated.

We had to quickly introduced increased military capacity, which we did through a range of different measures, but mostly by bringing in mobile military capacity and some of the aspects of health care you wouldn't necessarily think about, but the support service aspects of care.

We had to rapidly increase capacity for pathology PCR testing, and that was addressed in the early days on a continental basis, so there was some regional and national support for increased testing. But a lot of the emphasis was trying to increase local testing facilities in the early days of the pandemic.

We also have to increase capacity for taking samples from patients and later on in certainly ways to and into 2021 for providing vaccination spaces. And there was a massive increase in the requirement to store PPE as part of infection control measures, so they would have the major impacts through wave one and into wave to.

Can we come to the next slide, please? I'll talk to you a little bit about the impact on oxygen, because this is one of the systems within our acute hospitals that was most at risk through the increase in the number of patients presenting that required support without breathing, ventilation or continuous positive air pressure support.

Next slide, please. So what we found very early on in the pandemic is a patient numbers increase that required that assistance with ventilation and breathing was that our oxygen systems and I'll keep hospitals. These are systems that are supplied from a VIP.

If you're not familiar with that term, that sort of vacuum insulated evaporates. So it's like a big central storage tank on the site for liquefied oxygen. But that liquified oxygen then evaporated and is transmitted around the hospital system through a pipe, a pipe system on all three of our sites.

We were quickly in a position where those supplies were compromised because of the demand of oxygen at stripping the design capacity of the system and the results of that, we had to put in some rapid improvement measures to ensure that we could continue to supply oxygen to our patients.

And the main measure to start with was improving the data. We had to monitor the capacity and the peak loads within the system. So we we installed some digital telemetry. So on live basis, we could look at how much oxygen was being used across the hospital.

We also had to ration the use of oxygen and through our clinical body, we made a decision to reduce the safe levels of O2 saturation for patients, and that was dropped by two or 3% below what the normal saturation levels we would expect to insist on.

And that's helped to reduce the demand to some extent. And we also implemented a O2 monitors, so these were people that walked the site to make sure that we weren't wasting oxygen that was available in the system, making sure that valves were closed off of bed.

Hence, when patients didn't need oxygen and so on. And as a contingency, we increased the availability of cylinders and we also brought in some oxygen concentrators for patients that need lower volumes of oxygen support. And next, the next slide, please.

I don't I haven't got a lot of time, so I'll skip through the next two or three slides quite quickly on a department level. We have to rapidly introduce a range of improvements. I've mentioned one or two of these, but ventilation in our estate is often reliant on fresh air opening windows.

Not that many areas of the patient environment are mechanically ventilated in the newer buildings they are in the older buildings. Not so much so. Bearing in mind pandemics in the winter, opening windows in itself caused the problem. But we managed to improve ventilation standards to some extent through windows introduction of some additional mechanical ventilation.

I've already mentioned a bit about social distancing. We installed temporary screens in public areas and in ward areas to try and improve segregation between these. We implemented enhanced cleaning for all domestic 14. Obviously, there was a PPE regime in place throughout the pandemic.

We also restricted access into our hospital buildings so that we had to increase our security cover so that only authorized visitors could enter into our sites. And that was to try and reduce again the potential of people with infection coming into the hospital and spreading it in an uncontrolled way.

I think one of the biggest challenges for hospitals, though, that in the early stages of the pandemic, the end, the guidance that came out through the Department of Health and NHS England changed quite quickly. It was often slow to be produced, but once there was some guidance in circulation, it changed regularly and quite quickly.

We had to quickly respond to that changing guidance to make sure that we had the the right environment in place as far as possible, particularly in issues of PPE, for example, where the guidance changed at some stage almost weekly, particularly where there were aerosol generating procedures being carried out and the type of masks that had to be worn for those procedures. Next slide, please. Some of the other considerations and impacts on the estate was that a lot of stuff that normally come to work in our hospitals, we have 15,000 staff work across all three hospital sites and during the height of the pandemic, a lot of our support services staff.

So these are people that work in our finance teams and our human resources teams and other back office staff. A lot of those staff were enabled to work offsite again to minimize footfall, to reduce that potential of cross-infection.

And we had to rapidly roll out new technology to support that, and it resulted in a large proportion of our state being substantially underutilized throughout the pandemic. And that still remains the case to some extent, particularly for the non-clinical of state.

There is a slow return, I would say, following the the end of the third wave, particularly the latest wave where more and more people are coming back into the workplace, and I think it's that we're working through whether or not that's a lost opportunity for states rationalization because we've proved a concept through the pandemic that there is a potential for quite a number of different roles across the NHS that don't have to come into the hospital environment to perform their duties. Some of the other considerations around the estate was there was a massive loss of income to the NHS through a carpark income, for example, because we didn't have visitors.

And a little staff would not come to site. We lost a lot of money through hospital retail outlets, but also we had a significant increase in costs with things like enhanced cleaning and site security. And the net impact of those, the loss of income and the increased costs from farm estates in our firm.

Points of view on just one of our sites was typically three to £5 million a year. So it's a big it's a big impact. It was a sort of 5% net drain on the AFN budget over the course of that period.

There was an impact on our capital project progress. So we had lots of live capital investment where we were developing our buildings, installing improved equipment, building new services. And a lot of those projects were impacted because of COVID, both because of loss of workforce and restriction on visitors.

Disruption to supply chain. And. And the last slide, I think it's my time is up. So we're very much in the recovery phase, and there are a number of questions that remain that require a lot more research and looking into the data through the experience of the COVID period.

one of the questions for us is to what extent should we reverse the state's configuration changes that were implemented during the pandemic? And certainly that the moment is an unanswered question for the non-clinical state, particularly the office estate.

We we have a we have a a dilemma in the NHS in that the pandemic has caused a significant backlog in the number of patients waiting for surgery in particular. And the NHS target is to increase our elective activity to 110% over the next few months to try and start addressing that backlog.

But that brings significant challenges when we don't necessarily have the estate to enable that increase in activity, particularly with the likes of theater capacity and support services for theaters like Sterile Services. We also that necessarily have the staff to enable the increase in activity either.

Have we learned the lessons from the design changes that we have to implement rapidly during the pandemic, for example, improved ventilation resilience of our oxygen systems, the flexibility of the design of our buildings to enable that streaming between red and blue and green infectious, maybe infectious noninfectious patients.

The lessons learned from that haven't fully come through in the revised guidance as yet, and I think there's a lot more work to be done to understand how we need to design our buildings in future so that we are better prepared.

Prepared for any future pandemics. Was our emergency preparedness fit for purpose leading to the pandemic? Absolutely not. We were not prepared, and our emergency planning process wasn't sufficiently understood, developed or robust enough to cope with the overwhelming increase in the number of patients that were presenting.

So there's no question there's a there's a big piece of work to be done in understanding how we prepare better, not just for future pandemics, but for other major changes that could present service interruption. And I think it's something like climate change as another example of an area where we simply haven't done the work that we need to do to prepare for the future changes in health care. I think they're the main points I wanted to share with you. I'll leave you with really the question about how much more work do we need to do on the lessons learned and how does that need to feed through into the guidance that we then work to in designing our future state and designing our future estates and facility services? Thank you very much. Thank you very much indeed. This is an excellent representation with a lot and a lot of food for thought and big questions are not easy questions to answers.

So answer. And so I think we will hopefully, you know, follow those up in the question and answer session. Now, colleagues, please allow me to invite another other really good speaker as well. What about name, who joins us from San Francisco, California and walked has got an excellent international experience, even though he's he's based in California, the sunny, nice place. But Iran's actually my city, and it's a big organization that works internationally. And what are you? Are you ready to to share with us your work, your experience and who I am? Can you hear me?

Yes, we can. Okay. I'm hitting my start button. All right. Well, let's go to the first slide. As Neville said, My firm is engaged in planning, designing, constructing, operating health care facilities around the world, and I'm going to share with you perspectives both from larger facilities and as well as facilities in low resourced areas, which I think are frequently overlooked in many of these discussions. And one of the things I'm going to try to do is I've tried to think about what are research questions, right? So I'm in the world of trying to do stuff and in a way, I rely on researchers to help me know what to do.

And so I'm going to try to ask questions that I think will be useful, you know, in this area of resilience. I think one of the challenges that we have is resilience. Planning is a lot like buying insurance.

You can buy a lot of insurance and spend a lot of money on insurance, but maybe nothing will ever happen and maybe something will happen and then it pays off. But maybe it will never happen. And so I think the world of resilience is really a risk management kind of a game.

And in some ways, what the research community I think can help do is, you know, at a fundamental level, help us gauge risk both the likelihood and the magnitude and the implications of risk in various scenarios. Chris just mentioned, obviously the pandemic in great detail.

You also mentioned climate change. I live in California, right? We are one in every eight acres of California has burned in the last ten years. So we are dealing with wildfires, with air quality, with lack of power. The kind of challenges we're facing increasingly are all over the place.

All right. So anyway, next slide. I want to talk for a second about a study that I just finished for the National Fire Protection Association. There was there's there's a. In sizing electrical systems, we frequently find that our codes in the United States result in systems that are wildly oversize relative to the actual energy consumption of the electrical systems. And that results in hazards because we have an increased hazard of our flesh. And obviously, we're wasting money and we have lots and lots of data about what happened in a normal day to day basis. But everybody would say this is pre-COVID, right?

They would say, Yeah, maybe there are oversize today, but when the pandemic comes, then we're going to need all that extra capacity. And lo and behold, the pandemic came. And so we were able to deploy meters at every circuit in a number of hospitals around the United States, and we're able to correlate electrical loads versus patient loads

. And generally speaking, what we found was across the board, we didn't see the kinds of surges that we thought we would. And I think that's really, really instructive because it is possible to over plan and to over insure, right?

And so one of the things that we need from the research committee in a way is to help us know which systems need more resilience and which don't. So let's go on. I wish I could spend more time on all of this stuff.

It's all. There's a huge stories behind all of it, but next slide. I want to distinguish for a minute between the idea of design and operations, because those are two aspects of a resilience. Thinking right as a design professional part of my job is to try to anticipate what might happen and put in place systems that can react appropriately to changing circumstances. But if the systems aren't able to be operated for whatever reason, and there's a myriad of reasons, particularly if we deal in international contexts, then it doesn't matter how good the design is. And part of the research, I think, has got to focus on both halves of that equation.

Next slide. So I'm going to talk for a second about a paper that was put together by a group out of the U.S. called the Facility Guidelines Institute. Next slide MGI creates something called the guidelines for health care construction.

Some of you may have heard of the air guidelines that was the previous publisher. If you go to the next slide, you know, Chris mentioned earlier the well, sorry, OK. Here they are. This is a this is a document that was put together in the wake of the the virus trying to assemble the lessons learned from health care systems around the U.S. and not just health care systems, but all of the different ways they tried to respond, whether it was repurposing existing space in the building, putting patients in a convention center, building tents for patients, right.

All the different ways we tried to respond in different places. And what were the experiences and what were the lessons learned? And I think one of the key things that came out of this, the first, by the way, this is free.

It's on their websites available to all. I wrote a big chunk of it. That's why I know about it, but anybody can access it. But one of the first chapters has a whole section on planning. And how does an organization think about what risks it faces?

What are the probability of those risks? What are the implications of the risks? Which ones do we want to manage and which ones do we want to ignore? And then how could we mitigate those risks and how could we do it without spending a fortune that we don't need to spend?

These are all very, very complex questions, and they're not they're not trivial. And I think there's a world of opportunity for good research here and obviously then to help people on the ground prepare for things that matter. So the real question is, how do we quantify the risks?

And if you go to the next slide, I'm going to have to go through fast because I have a lot of ground to cover. I want to talk about a document that Ashleigh is putting together with the World Health Organization right now.

So Ashleigh is the imaginatively named association, sorry, American Society of Heating, Refrigeration and Air Conditioning Engineers, and they write standards around ventilation and their standards are increasingly globally referenced. At least Ashry is right now putting together what they're calling an infectious aerosols position document.

And this is a. Advice to policymakers about ventilation systems. Again, we woke up after the virus right to the issues of ventilation. And if you go to the next slide, what I think is one of the things that's really critical is maintenance level and I were emailing before about this issue of maintenance.

You know, again, the best system in the world won't work if we don't maintain them. I can tell you in the U.S., one of the big issues is staffing and how much staff will a hospital put on and they measure it here by square foot per person.

How much square footage does one person represent? And because hospitals all have small operating margins, they're always looking for ways to cut costs. And if they have to choose between laying off a nurse or laying off a facility manager, it's always the facility manager who goes and then the square foot per person comes up.

And literally today, many maintenance departments have trouble simply changing the light bulbs that burn out, right? Much less doing the kind of maintenance that's required for today's sophisticated systems that need to be able to respond in emergencies. So I think there's rich vein around the relationship between maintenance and preparedness and certainly resilience.

one of the things that we're looking at in this particular document is we're applying evidence based medicine principles to think about the effectiveness of various ventilation strategies. And one of the things that we're fighting about right now, as we speak, is the fact that the quality of evidence from a an academic perspective is pretty low in the area of ventilation. And so we have some indirect evidence. We have some what you might frame as natural experiments, but we have very little that would meet the rigorous standards of somebody like W.H.O.. And that makes it really difficult to prescribe appropriate designs and then to think about how to operate and maintain.

So again, rich opportunity for research in helping to quantify the impact of these systems on different kinds of situations. Let's go to the next slide. I'm sorry, I feel like I'm rushing too fast. I could take an hour on each one of these.

I want to talk for a minute about microgrids in the in California. We have very high aspirations, you know, even in the Trump years, right? In California, our governor said, Well, if Trump is going to cancel the the climate satellites, California's going to launch

our own damn satellites, and I was very proud to be a part of that. So California is investing a lot in how do we improve because we have to write our we're burning down and we've got to protect our health care facilities. So I'm doing a number of demonstration projects using microgrids right now.

And this is paradigm shifting because in our old way of thinking about hospitals, we have a big utility out there somewhere that provides power all the time, and it's mostly reliable. And then if it fails, we have a big diesel generator and you know, we have two big things and that's all we need and we'll live happily ever after. But in our new, there are new technologies that are available. There are new environmental pressures. There are new ways of paying things. Frankly, there are new laws, all of which are changing how we're thinking. And so this idea of microgrids is a really important one.

But the real interesting question in the way our codes, I sit on the National Electrical Code for the U.S. and our codes are evolving to start to think about how do we model reliability of these microgrid systems? Because if instead of one big utility and one big diesel, that's an easy system to model, right?

We can understand that. And we know what that looks like because we've been doing it for 50 years. But what does it mean if we have some solar panels and so microgrids and some micro turbines and some batteries and they all have different operating characteristics and their varying sizes, and they're controlled in different ways, and they will control with respect to a utility company. And the question is, you know, how do we model reliability so that we can design systems that don't provide too much? But that provide enough right to it to ensure our needed reliability.

And that's a that's a really I think I studied reliability in college and I remember it was a long time ago. I remember how complex this can be, and I think those models, we need those models so that we can do a better job.

OK, next slide. So I'm going to talk for a minute about some of the work we've done in. Let's keep going. Sorry. In low resource areas, this is more microgrids, let's keep going. Well, I had a lot of slides there, let's keep going next slide because I'm running out of time, next slide.

So I want to start by reflecting that a hospital is a little bit like a small city. And when we think about resilience, this right here, I went to Haiti after the earthquake. You'll remember the earthquake in 2010.

This was the waste management system for a local hospital. They would throw it over the wall and burn it. And so as we think about resilience, there are, you know, everything from dietary, from food processing right to sterilization to waste management.

There are so many bodies. What do you do with dead bodies and how do you manage that right? There are so many aspects to a hospital's operation. And all of them have to be thought about not just engineering, right?

And you talked about clinical versus sort of the back of house, but it's so much how do we make sure we have the supplies we need when we need them? There's so many aspects to the systems of a hospital.

Let's go to the next slide. I talked before about maintenance and operation as we've done work around the world. one of the things we find is that many well-intentioned people go into, you know, small clinics. This is the Dominican Republic and put in solar power systems, but nobody knows how to maintain them.

And even if they did, spare parts aren't available right. And so this connection about design and operation, how do we design things? That people can actually operate. And how do we design a culture? I don't work. Well, shoot, I'm going to run out of time.

In Sierra Leone, let's go to the next slide that'll show you see Sierra Leone, where? There is not a culture of maintenance, people don't think about maintaining things, they think about that the answer is always throw it away and buy a new one.

Right. And so the you have to change it culture sometimes or you have to design for a culture of disposability. And so those are not trivial questions. This particular building is a building built by the UN, and it was in ICU.

The NICU had oxygen concentrators. My 15 minutes is over, so I'll finish. But the oxygen concentrators wouldn't work because the utility wouldn't work. And so we went in and put solar panels on the thing and we're now they were losing babies at a rate of about one a day.

And now we, you know, they lose babies at about one a month because now they have oxygen that works. So thinking about different clinical modalities and the realities of your particular situation and how you design around all of that is what matters.

OK, finished. You can turn me off. Thank you. Well, thank you so much. It's said it's up to the great presentation and it reminds me of some old studies, which I'm happy to show you up to the stage where we talk about all these multi agencies, you know, problems of collaboration and other thing.

And as you said, just, you know, the picture we showed that I think is really important and we have a number of agencies that are involved. But again, those are some of those, you know, the background, you know, system people that we tend to kind of forget them.

We don't really look after. Right? OK, so we go to our next speaker. So we was talking from the U.K., we went to California. Now we go back to East. So going to Turkey and Istanbul specifically. I've got Hassan here with us to share with us the experience of Istanbul and the big project that has been going, I think, for about ten years now. Is it Hassan or maybe slightly more than that? Oh yeah. You hear me. OK, I think. OK. OK, good. I think there is a problem with sharing my screen right now. Failing to fix its.

We want to show your slides instead of actually for the nest and make some final touches. OK, so was a last minute tax, but the point? OK. And I think if if it's possible, it's all going to ask the colleagues in the background to work to of on the slides that we have.

Please. Yes. Until. Hassan, your slides are on, so if you just inform us, but then just moved up for us, makes. The problem is I can CD see my presentation on screen. We can see your presentation if you want to.

It's live and we can all see it now. Okay. We have some. Technical problems. I think it's the internet as well. Maybe a little tiresome. It seems it seems us that's the case, right? OK. So, OK, so we can we can what we can do that in this case, I think we can maybe go straight to the session of answer question on answers and then we will have Hassan's presentation put in the next slot of presentations. And if that is OK, so I've got my colleagues and background Humvees specifically. Did you have any questions from the audience?

Yes. Not in the moment. OK. We have a. OK. You're okay with your presentation. No, that's okay. It just lights. Masha, it's, well, my laptop. But it's also funny. It's running. Yeah, it's fine, yet we can't see it.

OK, OK. So OK, so sorry for the interruption. Good evening, everyone. This is from Istanbul, Turkey. And as I introduce myself and Premiere session, I mean, they can apply engineering to working for ABC. My work focuses on the hospital design and science works.

If I tell you a little bit about my office and my employer HQ, I have seen the Government of the Constitution founded in 2010 six and now ongoing. The mission of this unit is to retrofit or reconstruct the public buildings in Istanbul.

It's funded by international creditors such as What Bank, the Council of the European Bank, the European Investment Bank, the German Development Bank, the Asian Development Bank and the Trade and Development Bank. Like the international credit things related to my presentation.

IFC has completed three major hospitals in Istanbul recently. one of them is part of City Hospital. The second one is of me than a city hospital, and the Post Office deals with the best all hospital certificate by LEED Gold.

And when the Cartel City Hospital also said by ETS as the first building certificate of my board ever, in the words of me, OK, so serve my presentation. This is one of the previous works completed in the scope of abseil.

It's a pediatric hospital completed in Istanbul, and you can see it. Yeah, this is all made on a city hospital. The names change the know so and you hear me. OK, thank you. The first hospital, OK, maiden training and research hospital now named as Okmin and City Hospital.

It's a very huge hospital and what's at approximately 1000 and that's capacity. You can see some quarters at is completed and now in service. Interior photos. This is because isolation system. And this is Car City Hospital. It's a very huge hospital, and the bed capacity is over 101,100 capacity.

This hospital has been so expensive by late bolt and edge. This is going to visit hospital. And this is Bush should be was because this hospital was another story, and I'm going to tell about it. And well, when we come to my presentation, I will explain to you how important protection of life lands is in the health care building's design. So here I want to show you now that saying. So this is seismic based isolation system, which we implemented our major hospitals. And as you can see on the right side with other base isolation system.

The building collapse and the baseline isolation system, the building stands against the quake. So. I think this is working. Sorry, sorry, again, it's it's some a technical problem the president is facing. And so. Right, OK. So if if we go back to Chris and to Walt, I've got a couple of questions specifically on with Chris.

Let's look at some other commitments. Also, he's got to give us at some stage. And so if I start with with Chris and Chris, you mentioned, you know, a number of challenges. Some of them are obviously unrelated to the infrastructure itself.

And you know, the the size of the infrastructure in the power plants, things like that. But of course, some of the question which which I think also mentioned as well, and that the question is about stuffing. So I understand that's like many other hospital plots in the UK, the vast majority of hospitals in the UK lost crops around the world as well, you know, lost a lot of that stock or at least, you know, couldn't couldn't have them, you know, ready to to work, to join. I'm just wondering, you know, did you have those kinds of issues as well in your hospital and how did you overcome them specifically in the State Department?

So that's a really good question, insofar as the not only was that a significant issue during the height of weight going into and then but it continues to be an issue now. So even though we're we're in the, you know, the the less dangerous stage of the pandemic in the UK in terms of numbers, numbers of hospitalizations and numbers of deaths, we continue to experience a significant loss of employees at any one time. A good example would be at the moment for the Southend hospital, which is one of the three key hospitals in my portfolio of currently got ten of my state's maintenance team off work with COVID.

So there's been a small outbreak within that team and that that has been a pattern that has existed throughout really in the we've had this experience where generally through probably not robust enough measures taken around PPE, there has been infection within teams.

The same is applied with clinical teams as well. And often this seems to be associated with people dropping their guard when they're in more social situations rather than actually in in the clinical environment. So it might be in the, you know, the restroom, the tea room where people aren't taking the precautions that they might be taking when they're in clinical environments that enables that nosocomial infection rate to increase. So we've got over it by and large by using contract staff and agency staff to supplement, but also we've had to reduce service provision. And so, for example, with our catering services, at times, we haven't been able to provide a full range of the normal patient menu and we've had to go to a reduced menu because we haven't had the staff to to service the the normal standards. And again, that continues to be a problem today, even though we're through that, that was in that stage of the pandemic.

Thank you. Thank you, Chris. Not answered my second question, actually, which was how how did you deal with it? And obviously you didn't answer that. So thank you very much indeed for that. And I think I think perhaps, you know, I'm following up from Walt's presentation, which is the complexity of health care.

And I'm sure you did certainly mention that as well in the presentation. And because I think you talked about the PR, you talked about the number of of things that. If if we ask, if we put it in a nutshell, what do you think, if you had, perhaps would would make your life much easier.

Among all those problems, perhaps I don't know exactly what particular kind can be. Because Is For You study. Sorry, I wasn't sure if that was a question to two cite. Apologies for you. Sorry. So it's hoped that you would make your life a lot easier.

I think that said, that's a huge question because there are so many aspects of. Complexity in terms of providing the services that my team provides and providing safe environments for for health care. Well, I suppose the simplest answer and one that you probably all expect to hear would be having access to greater resources, particularly finance, because that is a limiting factor and more mentioned in his presentation that, you know, if the budget's going to be cut to safeguard critical services, the first thing that's going to go those back office functions and investment in those back office functions, that's been typical throughout my career in the NHS as being absolutely the case.

And so making my life easier would be having access to the resources that I need so that I can properly maintain the estate that I'm, you know, I'm responsible for and that that is an internal dilemma. I think the last serious attempt to try and cure that in the NHS was through the introduction of PFI contracts, which we don't want to go into today. But but those contracts were predicated on funding for lifecycle costs and for performance measures to ensure that they, they PFI providers had to invest in maintaining the environments that they were responsible for.

But it's really expensive and that's, you know, that's why that's fallen out of favor affordability. So give me more money is the answer. I think that's that's that's really the question now to ask what's he? He said something really interesting, which I found is they have this kind of KPI where, you know, staffing is calculated, but per square foot isn't. That's one. And so do you think, Chris, that something like that's perhaps for the UK would help? I mean, with our somehow social system, because obviously in the US is more kind of capital capitalism system.

So I don't know exactly if our system works would benefit from those kind of ideas, those kinds of models. So so we have something called the model hospital, which is essentially a benchmarking system to identify costs of all aspects of health care provision, including maintenance utilities right through to the cost of a hip operation.

There's a metric for all of those and a lot of these states and facilities. Benchmark metrics are expressed as cost per square meter number of trade stock, a square meter

number of cleaning staff. You need to clean a square meter of health care state, so we have quite good data now.

Of course, the NHS to determine what the what the benchmark norm is, but it doesn't work very well because it's those benchmarks are not always triangulated with quality. And so just you're measuring an input measure rather than measuring the output as well.

So you're not necessarily getting a true comparator and that's one of the one of the issues for us is not having the ability to compare apples with apples and essentially. Absolutely, thank you so much, Chris. What can I go to you now and ask you?

Perhaps, you know again, I understand that you haven't really had a chance to push it to finish your your last couple of slides, even though there were a number of quite interesting questions that some of them are directed to the infrastructure itself and.

If I ask you, I'm going to be really, really kind of in my dream here, OK, and say, what is the best thing that you think, you know? In the case of health care, perhaps would benefit if we have it.

I think that. And that's an impossible question to answer. That's why I was really glad you asked it of Chris, I was hoping I could escape. You know, I think from a practical perspective, there are practical things that could be done.

And I think in some ways, focusing on those is maybe more important. That metric about square foot per person in a way. I would love to, you know, in the US, as you might imagine, all of these capitalist consulting companies are trying to show health care systems how to save another penny.

And they're all, you know, squeezing those things down. But I don't think there's good information about what is the impact of that on the ability of an organization to effectively maintain its systems. And you know, the if the if the filters aren't changed appropriately, then the ventilation doesn't work right and we don't have protection from the viruses that we might be fearing. And so I'm not quite sure how you would quantify cost or risk that goes with that. But I think there's a real research question there about

what is the impact of varying staffing levels on both everyday effectiveness and overall resilience.

So I think that would be a really interesting question to tackle. It wouldn't help me much because I'm a designer, but you know, I think another thing that I would really love to see and I do so much work with people in developing countries, in resource constrained countries, and I've really tried to think about how could I set up some kind of systems, some kind of network, some kind of educational coaching? I don't even know what it would be, some kind of a system. I've worked through the International Federation of Health Care Engineers trying tried to figure out, right, how could we put in place some kind of a system that would help people in those situations? I'll give you just one other little example. I don't know how much time I have. Be careful. Would you get me started? But you know, in the U.S. at least, and I think in many other countries, when we get to, you know, after we've used a piece of equipment for two or three years, we decide we want the new one. And so we decide we're going to package up the old one and send it to Haiti or something right for the the poor people to use. And those things get to Haiti. And there aren't necessarily the biomedical technicians who know how to operate and maintain and repair those much less spare parts.

I think we need to design some kind of a system to better support those kinds of needs because we could have such an impact so quickly. I think on on healthcare, I'll give you one more. Sorry, I could go on for a long time, but this issue of energy, I'm going to frame it as energy poverty.

There's an increasing amount of work being done around the health impacts of lack of energy. And an example it's not just about, you know, we did a health care facility in the Philippines where we put solar panels on the roof and we had one of the midwives tell us that it for the first time in her life, she could deliver a baby with two hands because before that, she had had to have one hand to hold her cell phone with the flashlight on it. And so she was always delivering with only one hand. You know, what is the impact of lack of energy on health care outcomes, I think could be a really important question. And even there, you know, sometimes it's about do you have electricity for the housing for the staff so that you can keep a staff person a midwife, right, so that they want to live there and not go to the big city where they can have a different kind of level of housing?

So there's so many research questions about resilience and engineering systems. I could go on forever. Hopefully, that gives you something. Thank you so much. And yes, I mean, you are just opening plenty of cans of worms that perhaps deal with the health care,

even though I was going to ask you actually about, you know, developing countries and their needs because obviously all of us are human Adobe and we all need the same health care. However, the need to go to it, I think, is that is the difference here. That's hospital fever highlighting. And I think it is certainly, you know, we need something, you know, in order to to do it or to help the people in developing countries. And I think that there is a much, you know, a lot of work is needed is needed out there. And it's not. Perhaps it's a slightly different or perhaps it's majorly different from developments in the developed world, like we are struggling to get financed to think that things like oftentimes that they have.

And so they have they have other challenges that they have other other issues. So I'm just going to follow that up very, very quickly. Please follow that, which is do you think that developing cultures in this case don't have the resources?

Or do you think that they have the resources? Well, they don't know. They don't have the know how somehow, someway, somehow the know how it is going to be. I think it's both. And I think they compound each other.

I'll give you one quick example from the COVID crisis. So we worked with W.H.O. as sort of a help desk for ministries of health around the world when they needed help to convert a building into a COVID hospital.

And you know, the W.H.O. came in and they had these ideas. OK, we need sophisticated ventilation systems like the ones Chris talked about. But the problem was not only could we not get them, but they didn't have the energy to operate them afterwards or the ability to repair them if it came to it.

So I think there. And so part of what we need is what are the systems that can be deployed that will actually work in those contexts. And so I think I think it's both. Thank you, Wolf. I think that's that's really good.

Good, good to talk to, to close with and go, I think, to our next our next session. Somebody got it. And how do we have any any questions from the audience? No. OK, that's fine. Right, OK. So, Hassan, are you are you ready to to?

To continue with your presentation or do you want me to? Go to other colleagues first and then give back to you. You hear me. Yes, yes, yes. OK, I'm just I'm so sorry, OK, so for an interruption, that's my laptop was frozen for several times.

So when I was sharp, when I share the presentation and when I OK, so just start talking, it interrupts, you know, interrupts and the frozen OK, so that I could not, OK, so continue my presentation. OK, so what we're going to do with that in this case?

And just to make sure it's not OK, so let me that which are the previous version of the presentation. And then if you can just look through as I saw, please let let me try. OK, so last time, OK, so to upload my presentation to the system.

You see it now. Yes. OK, so. OK, great. So based isolation system over the road, over the earthquake resource, like the cities in the regions and regions, Istanbul, Tokyo, Calabria, Italy and California is Iran the poorest countries? The buildings are designed according to the codes and standards, which have been created under these spaces with huge earthquakes and specification of the territory. And with the development of the building technology, the base isolation system has also been made in many countries, which not only makes buildings stand against the major earthquake, as well as allows the building to run in an interrupted service and operation.

And would you would buy those isolation system, as you can see in the presentation, in this light? But what if you don't protect the life clients during an earthquake? And what if the all connection are broken off and whether we're going to deal with a building still standing but out of service without electricity, water and gas?

Normally we use some kind. The story is to present achievements. Like, it's the rubber stoppers. The cables to keep the steady air to to keep the devices steady. And there are some vibration stoppers, as you can see in the slides.

Those are so useful. Okay, so tube protective equipment during an earthquake, but in a base isolation building. I plans, which are coming from the greats and getting into your building. As you can see in the slide, OK, so just we use those flexible hoses.

They are moving and they give flexible, OK, so move during an earthquake. So and they are not. They are not breaking off and frozen again. OK, we'll try to offload the presentation for you then, Chris. Oh, please, it's going.

And there just to continue with would. Yep, there we go. To help you have your presentation, here are some. And it's saying it's so. Christiane, we can we can see a presentation here now. And you have already the lifelines protections, as you were talking about as us, exactly slide where you thought they were with the buttons that are not working. Because that's what you get, you can just tell us we are a. The slope of the lifelines protection, well, where you stop, so if you just tell us, talk to us and then tell us the next and then we'll move the slides for you.

OK. It seems that Hassan. It is, yeah, we have some technical problems again, unfortunately. Right, OK. I think if we can move to our next speaker, then Professor Ying Yang J. And she joins us from the UK and she is one of my colleagues in the university and she's she's going to talk to us about about supply chain and and and share with us her experience with this within this area. Yes. You. Do you hear me? Yes, we can. Right. Thank you. Thank you. I'm going to share my screen so that you can see my slides.

Yes. Right. My last chance. OK, thank you for you wanting to present my research in this webinar. Can you hear me? My network doesn't seem to be going, get me. Yeah, and I'll continue. Okay. It's all right, so I'm going to talk about it from a different perspective.

1000 health care, mainly about building community health care, fighting resilience and resilience. A couple of times in this evening's webinar. But from a supply chain perspective, what do we mean by supply chain resilience in particular for the health care sector?

I wanted to talk two major pieces of research we have conducted recently. The first point is to evaluate community health care supply chain resilience, using a major service provider survey with the public, with the potential and existing patients.

And then the second one is to evaluate the resilience using American natural language processing of feature data. We found a way to communicate our community health care supply chain resilience and through the first lockdown period in the U.K. in response to the pandemic.

Here is a simple illustration of a health care supply chain in the UK. When we talk about community has a supply chain, we're willing to talk about, for example, details of the managed, centrally managed by clinical commissioning groups, CCG groups and patients we use as referred to as customers only ourselves.

It can be anyone. And we also obviously have interactions with our community pharmacies. We have got and prescriptions for town hall on goods and to both GP's and community pharmacies, Adobe suppliers to buy medical equipment, devices as well as pharmaceuticals.

Just simple illustration of the health healthcare supply chain research we have conducted are of major electronic survey with the public during the first lockdown period in 2020, and we also did big data analysis of nearly four millions of Twitter data from different groups.

Yes, the GP groups, CCG groups, pharmacies, pharmaceutical suppliers, butchers and alcohol and the general public. So I would talk about these two major research projects. When we talk about resilience, a more refined definition of supply chain resilience is defined as in a number of assets, including adaptability.

For example, in response to this and also in the market positions, it's to do with how the supply chain still respond to disruptions caused by disasters or pandemic. Whether or not the supply chain has increased to, for example, flexibility in introducing alternative services and turning to products or multiple supply chain has got enough redundancy because some stock, like Chris just talked about. If they haven't got enough, for example, PPE, equipment or devices, they haven't got enough facilities and hospitals to respond to a surge in downs. So this is about adaptability to how adaptable you are.

Depends really on the flexibility and redundancy and how quickly you can respond to disruption depends on your, for example, effective and adequate responses at the level of responses that you can provide under that disruption. And then we examine the market position because usually, even though supply chain players take actions to respond to these disruptions, whether or not this is a feasible or effective approach or reaction we evaluated from the example exact patients or customers perspective, whether or not they are satisfied and whether or not that has influenced the relationship, for example, in our research, live between patients and the health care providers,

whether or not there is a sufficient level of, for example, serving product differentiation. And then we summarize whether or not this community healthcare supply chain has good outputs, such a level of resilience. So this is what we are going to examine. Maybe straight areas practically, for example, including the access to medical information before the bill, remote that access to medical consultation.

But I not to get cheap appointments, whether or not you can order and collect prescription medicines. So we are going to make a comparison before during lockdowns and through the primary survey with about 307 patients, we found that during the lockdown period, it is a significant shift from AD to take calls into the information collection to online. Information access, so as you can tell from here, it's in the blue by sleep three lockdown world the orange bar represents a daring lockdown can see before lockdown GP and the pharmacies and hospitals that are many resources to access medical information.

But since lockdown, after the first during the first lockdown and there are lots of apps and also lots of information slice that have been launched to offer multiple sources of information to patients in the public about to click on the symptoms of COVID and how to deal with symptoms at home.

What do you need to do if you have tested positive? And so these codes, for example, symptom tracker of NHS app have got the use of them, has got significantly less secondary. We examined is about consultation, for example, whether or not you can book appointments with your GP, see the lockdown period again, comparing the before lockdown period and during lockdown period, we can see the appointment appointment mode in 2019 and the appointment of an amendment in 2020. Again, there is a major shift from face to face. This is before lockdown, 80% consultation was delivered face to face in GP's surgery, where during lockdown we can see there's rapid shift to phone consultation and or online consultation. So they said that there's major changes here. However, in terms of waiting time, the waiting time refers to how long you need to wait to get an appointment with your GP. There isn't any. There isn't a big change.

But just before the lockdown in 2019, over 50%, for example, an appointment can be made within the same day or within one day or two days at senior citizens. Waiting time have been observed during the lockdown period, so that shows maximum is rapid.

A shift to a true online and offline consultation actually is quite effective. Patients, if they didn't have the need to to see the GP, they can still get deployment within saying they're waiting within two days. So this is a sign.

The inbound medical call, which is obviously this key, especially at the lockdown period, is if you have chronic disease, if you have other disease or whether or not you have developed COVID symptoms, it's important you can. The medical supplies community healthcare service provider can maintain that continuity in providing the medical services treatment to the patients in terms of ordering medicines before and after lockdown. This diagram basically shows how it has shifted from different mode. For example, before the COVID, if most of the patients collect and get prescriptions from a GP and collect medicines from the pharmacies, where after that there was a significant shift, for example, from here to online to online prescription and online medication or medication collection. I do apologize if it's not very clear, but I will explain it in the details in the next slides here. So when we examine the health care resilience during lockdown and the risks we dimensions, as I have introduced at beginning of the foundation in terms of adaptability, we have verified that there is increased flexibility and in terms, for example, access to Medicaid, medical or medical consultation, particularly because we have shifted to an online phone consultation. But there isn't much redundancy in terms of capacity, for example in GP's or more supplies or more GP's, and because some of the GP also got infected in COVID as well.

And so there isn't such a redundancy in terms of medication collection. Again, because of the online prescription, online ordering on medication and even free doorstep delivery of medication really has helped the patients to use the service again in terms of distribution and dispensing, saying we, the pharmacy struggle of getting enough pharmacist again for all sorts of reasons because of it. And one important finding from an access to medication was patients actually find they are too many sources of information during lockdown. Lots of government information from sources and lots of patients actually got lost when they have to to or.

Nation, which sometimes are not consistent or are not very reliable. I think this is a lesson we need to learn when we respond to a pandemic, especially in the very digital in the digital period when we have lots of digital technologies that we can use in terms response.

I think patients feel at ease. Response is quick and effective in terms of giving medical, for example, a consultation and also medicine collection and altering generally leave satisfied a positive relationship with the pharmacist and patient and patient and the GP.

There's a great level of differentiation as well. But again, what the survey also find out. Actually, lots of patients are thinking about moving to flex on private services as well, because the vickovich, because they're expecting quicker and higher and better quality and as quality of service.

And like Chris said, at the beginning of a quite severe backlog of the operation, for example, in the surge of surgery in the hospital, this is another reason why most of them are considering should move to the private service providers if they can afford.

So this is just a brief introduction from the survey in parallel with this study, with a different kind of research using big data analysis, data mining and natural language processing of huge numbers of future nature of the natural language processing or in breach court.

And they is actually a branch of artificial intelligence studies. How machine understands human language without going into details. I'm just going to talk about how we use MLP to conduct clicks on sentiment analysis, whether or not, for example, a prediction tweets is a positive, neutral or negative.

We're going to you and they help to classify topics. You classify different tweets to see whether or not a particular group of tweets is about example supplying of medication. A group of tweets is about, for example, patients getting appointments with GP's.

So we use them now to conduct topic classification or use machine learning and to and the sentiment analysis and all the way to do the class of Adobe classification. This just give you an old view on the types of issues, and we have collected a number of trees.

We had collected tweets from pharmaceutical suppliers, not only FOX, also medical devices. I guess these are just some examples and names of supplies we collected and a large number of tweets from 200 sausages in different parts of the UK.

We also collected treats from pharmacies where sponsored to and boots, etc. So also please have collected from the general public in the UK. So nearly four tweets were collected and these Twitter data. Obviously, we need to them. This is just some information.

As we collected data from March, for example, August 2020, we use the some of the tweets collected by Georgia State University East pilots a lot like Neglect A with their Twitter data on daily basis for use, some of their data points there.

So you order to contact a sentiment analysis on which we have developed such machine learning models. I'm not going to go through the details, but just want to show you. Usually the first we process coming next in sex and symbols and numbers, and also to do something because Asian will stop worse, for example, you I mean those wars. And then to extract useful features, we can see what other important works in the treaties and then entered the political machinery, autos and other in three or neural network, for example, and then process that. So here are results.

So from this newly formed state here, we analyzed these sentiments for suppliers of pharmacies, for cues and customers. So suppliers generally quite positive, as we can tell. So this remained at least over or near 0.5. This is positive again.

Pharmacy pharmacies relatively positive as well go to mid-July or secedes again. Very positive sentiment. But the customers the general public were quite negative during the first period of lockdowns in March and June. They get slightly more neutral to the whole pandemic.

And the main findings from the topic IDs. This is what we have thought, so we can identify topics within treats using this FDA and using different things and use keywords in it. What we have found is OK, there are risks, even if from the beginning around, for example, medicine supply disruption and panic buying and stockpiling as well, even paracetamol, for example, we're out of stock, obviously because of Brexit. If you close the border at the border flow for lorries to transport pharmacy vehicles and medical equipment from Europe, and also because of Asian countries dominance in supplying and APIs to the active pharmaceutical ingredients.

So it makes it very challenging for pharmaceutical manufacturers in Europe getting the sufficient ingredients of supplies flowing, for example, in China. If we do serious people here in this lovely old quarter where it's far more long, long and in-house work also got it.

And because of lockdown, we had to take public transport and work and we were at risk. So a lot of risk were identified and the frontline workers, once lack of TDs and pharmacies even had no access to some of important medications.

So what happened and what has happened is the whole supply chain has so much to respond. So these types of occurrences of mitigation and action is taken by GP surgeries and pharmaceutical companies and the pharmaceutical suppliers. So that's where it was a public.

So what have they done, obviously, by the some of these GP surgeries started sharing medical records so that you don't have to go to your usual GP surgeries to receive a medical treatment and you can go through different surgeries if they have availability.

And they also have used airfreight to transport medication because of the the lock closure of the border and also the long queues of memories. And obviously, as I have explained to him, introduced a phone consultation, tele consultation to provide medical service and treatment.

And we have also pharmacies actually have also shared their inventories so that they can share the inventory stock so that they can guide and device patients to go to different pharmacies. If there is, they will set up. A lot of volunteers helped, for example, to distribute medicines.

Also, they are trained, for example, to test patients for Unkovic infection and online pharmacies, obviously helping introduce, as I have introduced and lots of others and pharmacies and CCG. They also have shared good practices. They are doing online training as well, and they provide, for example, free of services to Popovic and under the also the public in the community. Providing lots of services to our front line workers with, for example, free hotel rooms, free public services, as well as donations to support the whole general topic. So overall, all of this mitigations have positive impacts on the whole health care community supply chain.

We could see that from April onwards, patients could see online Typekit within within a day. Life has been short and our partners serve as well, and they can still follow routine appointments to do general regular checks as well.

And also COVID testing capacities for successfully increased because of volunteers. People who graduate from medicine schools and from pharmacy schools have joined the pharmacies and adds the front care has there and obviously online services have significantly helped the hosts in.

So from this analysis of the Twitter data, we can obviously analyze the risks. We can analyze medications taken by different stakeholders, as well as to evaluate the impacts post the the small Adobe aged resource for us to use is an alternative source to collect some risk that underlies resilience of the supply chain.

It also provides some real, real time analysis and very intimate immediate analysis because Twitter is generally future data generated every seconds from all over the world. So I think it's a sort of interesting sort of methodology to analyze an important problem of the supply chain risks and how to stop here and leave messages sharing why research project to find it. And thank you very much. Any question please get have. Thank you very much indeed. And local information there with great research and question that you had. Thank you very much indeed. And let's go to Italy now, and we have Danielle who was joining us to talk to us about the temporary hospitals and setting up temporary hospitals. Perhaps the world hasn't really seen those temporary hospitals as we've seen them the last couple of years, so we don't really know much about how they get set up or they get operated and everything. And that's why we've got an area here to help us.

The floor is yours. Do you hear me? Yes. I try to share my. Green. Well. Do you want us to do it for you? Any other stuff helps. Maybe specifically with the size, the size of your presentation, I believe.

I don't know. I just try to do because before I. OK. You see it. No, not yet. OK, maybe it, maybe now. Well. So if you wanted to share it, it's better, maybe it's fine because we are so.

Thank you. We have your presentation loaded now, just if it is now going to move these slides and then we will do it for you someplace. OK, I don't see so. Do you still have the same issue because you can we can see the presentation here, or maybe I can look at mine and your golf.

Hi, there is no problem. That's fine. That's fine. OK. OK. It seems like we have some picnic issues with Danielle as well and. I always want to watch TV, always see life and the problems of life, but it seems that we are experiencing life problems here as well, right?

Okay. So I think while this is being resolved, it's hopefully soon. So if we if we if we go back to two years now and ask you a few questions about her research because I think it's it's quite unusual research too.

So we don't see that every day, basically, you know, to to learn about the supply chain and the issues with with the supply chain. And if I may ask you for perhaps just a simple question now just to, you know, while we're getting the Daniels's presentation sorted out and you I believe that you said that you your data was collected from Twitter isn't young. The second the piece of research project is collected from. Yes. If this is just curiosity, perhaps no, this has nothing to do with the topic, really. How did you manage to do that?

Is it kind of reading hashtags or is it a different way? Yeah, it's not hard to squeeze data from Twitter. We used to consume Hoover, so there was a package to download real time data from different stakeholders like different viruses wirelessly have Creative Cloud registered people who can download it.

As I mentioned at Georgia State University of Kentucky this year, we also download the complete data on daily basis. The Watch Open stay so we can use that data as well to analyze the data from the public. So these are things a very valuable source of data worth analyzing it?

Absolutely. So if it is indeed, I mean. OK. Right. We we have done L.A., so I don't know what happened, but I think that looks like a question that's always the issue of of of lives. So I understand that, right?

Then your presentation is ready. And I saw it now. So that's OK. So that will give you that tool to talk about it. Thank you. OK, OK. So good evening or good afternoon to everyone. I try to be as quick as possible because I think that we are a little delayed, so I try to be quicker.

So next slide, please. I want to talk to you about the true experience that we have during the COVID 19 pandemic. In their first year 2020 in Italy, that led to temporary hospital, temporary ospital and one field hospital.

And then, in the conclusion, give you some good practice for future to make sense. So next line? And this is the context in which we deploy the temporary hospital in Italy in the first wave and the second wave of the COVID pandemic, we have a terrible situation in hospital because we have more than 450 patients in ICU in the region offer. And in November, more than 400 and there was a little leakage of beds. And in the hospitalization rates, it was 3500 in April and 5250 patients in November. And they deserve this waiver. Given the problem, the difficulties of the hospital to whether the surge capacity and we try to fight it.

Also, we produce Little Mix like these. This is the only indication about the payment, it is our northern region of Italy and the that is that the main payment is a high income country, so people are used to high standards.

I think that this is important consideration because normally we set up the field hospital in low income countries. So people are used to low standard and we are very happy to go in tents in how long a settlement is different because people look at things such as some things are too low or not.

So we try to have also more attention to these aspects of Sonic's life is. And, OK, next night, this is the day first our first experience, this was the day year or just say for opportunism only that these are big factory that was the ringleader in a class of corner.

These are the spaces in a prison before the temporary hospital and then the next. And there is the hospital store. We in this the first experience that we set up there temporary ospital with about 90 beds, total for the modern outpatients and with the different services you saw infectious disease wards, laboratory imaging.

Mixed lighting. This is the outcome. And so that was the big reason that it was all the cons calling which patients were admitted in the interview. Personal protective equipment or PPE, then a yellow zone that is ultimately in a zone in the green zone, where people or staff can walk without special PPE, and there were drafts of a material was expected to be in place on. These rules of the hospital layout, which is the word the says all the beds were organized in a big rooster about containing six or eight the beds, and there was the trauma.

So we take the critical care or ICU and the about 40 medicine, 250 beds for intensive care and 56 it was. The idea was that scalability because the idea was to. The possibility the opportunity to have a more level of care in the in the single best.

So all the beds are well equipped to be in the same in the same way that to be prepared in case of a condition that the walls are important things walls the walls of the home also because we deal with them one meter tall.

This was to give the possibility to look in the room because the problem of the software is always very, very high tech. Because during the pandemic, the parcel was always a tool. Also an opening night. The implies implies to ever more personal for these events.

So we tried to reduce the number of staff that work inside the next large. And it was important to look at the infectious disease considerations, so each each race that went on and basic to form the red zone, the well protected by Massachusetts or the fetus in which they are put on or put on for the next night visit. And the great advantages of these council, Paula. It was one of the reasons that we choose all these aside, the wars and the possibility to have actual differences separate the hair trigger units. And so in the Arizona, we have a sort of negative air pressure that is essential in case of infectious disease assault.

This was got the advantages of these sites makes these. And the person, as I said before, was a key elements in the service in which a worker was in charge of the project and the management of the building phase.

But then we don't have the personnel to work in stock because we are ten people that are managing and engineering and something. So the people that were in the former the local hospital of Plus plaza person coming from Cuba, about 40 people come came two

from Cuba to help the original people that and the ship they were mixing for six hours because, you know, for the people in the red zone. And something so was the extension of the training ground for people of different people from different countries and for the unique state in which they work.

Next slide, please. And lastly, the oxygen, you know that during the COVID pandemic, the oxygen supply was really a crucial aspect of soul in this experience. We set up the PSA oxygen production plant that is 93% oxygen, and these are state production of oxygen on site without a problem of high pressure order or supply.

This was really important because it does give it the possibility to have it in. So you can see from the oxygen point of view next slide. This is a short video, maybe you can start now, I don't know, you think so, OK, that look, I'm out of 50 seconds in which you can see the the the building phases. You know, it was the only 16 days in which a there the council told it was totally empty, became a hospital temporary hospital that was operational for about three miles, 9090 days. And and its treat about, I think, 200 patients in 30 days, in 90 days.

So it was really important to have a sort of longer for the local hospital. It was totally overwhelming that during the COVID pandemic. And so I think that the I to Hazel and they they did all they they they the role and results.

So next slide. I want to show you about your benefit also, because this was the experience it did was more difficult because in November, in the mountain, there was the heart waver with the many patients and more than ten April and then we were preparing them.

And so we said, stop it. In our power kingdom, about 2000 square meters of parking, underground parking, about 500 beds. This was a really challenging one because in this pilot scheme, there was no single and no hair treatment, no electrical system totally on the way.

And the building phase must be as quickly as possible because the urgency was totally so. They had no use of the beside the oil. Well back was the very beginning, and there was a really closer to the main the local hospital so far and to transfer patients to the horrible hospital makes life easier.

And this was the hospital after eleven days, so we set up the fall under the 5:55 beds. 55 things felt a different type, an inflatable things and the on their Typekit all day. And that's what equipment to move patients is so oxygen for all the patients, or maybe 80% of the patients, but only two beds of ICU and stabilization. Because the idea was to transfer the patient that the goal was to, uh, this was due to the lack of facilities. So the idea was to ever meet patients that came to go home from the hospital.

But the need to apply AC, which some nurses or some caregivers can give them some help and some support. The next slide is. OK, so this was the day like Yalta again, a big red zone in which a person can enter only in the pub in which there were tents and bed and then three nelson, a tunnel in which there were a sort of filter to dressing in the south. And the two and they were sort of clean when I was in the green one and one tunnel so that the waves did were the the dirty linen to exit the dirty material and send the clothes to waste their bodies and something lighter.

So all the passages to all the way to enter, to edit the weather and cover the filters to ever more protection for the infections, be the next line. So there was again, a key factor, so in this case, we seem to have some emergency doctors, nurses and caregivers, but also residents in younger professional that the worker decides to side with is personal experience. The one the rational nurse first patient was one to 30 for the reason that the patients were a mean patients and also in this case, training was essential. Next slide. So the oxygen, you know, they they have the choice was different.

We don't use the the PSA generator because they're in need of oxygen. Well, where was higher than the previous experience? So we put a liquid oxygen plant, and in this case, it was really easy to arrive with the tank and the two supply the oxygen and the oxygen system was about four 80% of beds.

In this case, the challenge was to have some structure to to fix the oxygen to the Earth. And so because it's not so easy. Next slide. So Deluxe, just like that that they want to show you are about some consideration in the guidelines.

I think that in this case, it is really important to the product management in the combination because you have you think that we sit top with these two temporary hospitals for 90 beds in the first guys in 455 beds in the second in six days and in them, they store is essential to have a product management.

The two coordinator and all the actors involved that all logistical people and the people in charge of all reported materials, policemen, firefighters and the staff and the Soit's. The fund is a central clear timeline, timeline, defined chain of command and also OrganiGram and the team working at it with the salt.

This was the organigram of the second experience. You look, so many have in so many roles. Next slide, please. So from a logistic point of view, the important good practice for future to the South Pole is that because the dimension that eating good, the Walsh system, they like to see their proximity with the main hospital, the availability of things to be reminded to choose their side. The oxygen supply that for the COVID pandemic is essential and needs the estimation of the amount of oxygen and the system availability, the safety and security to have the resupply of something like that.

And then the staff, because is always, always a critical and the crucial aspect is needed to have a training specific and to estimate to the person needed the next life piece. So their last consideration are about the need of research, a literature and guidelines and the sharing experience like today that we are sharing experience because we think that is really important to follow the ever continuous updating to look at the doubling or some papers that we publish in the paper about these experiences because we really believe in the power of research and the sharing experience and the last.

Next slide. We think that the take message can be that the eye working in the Soul Emergency Medical Team, so that's our team, so that the worker in case of disaster all over the world after a cyclone and hard work and something like that.

And I think that the skills of EMT are flexibility thinking of sun boxing interoperability. And these are very, very important in the case of COVID 19, that the heat our home, our countries and our families. So this. And it's really important, I think that in case of unexpected events or things going wrong, it's important to find a way to provide them with the resources that you have. But that is really fundamental part of the disaster medicine. So that's all the thank you very much for your attention and Oprah to be interesting to you. Thank you.

Thank you very much indeed, Tony. That's a really good presentation. Another challenge, I think, you know, as as we have the I'm sure that, you know, many, many of

the colleagues you shared with me that it is kind of this kind of product is getting bigger and bigger and bigger.

And of course, perhaps not just research property practitioners as well. I understand that Hamdi has got some questions for us. How did you want to ask them, please? Yes. Well, first of all, I want to thank all the speakers for the quality of the presentations.

I do have some specific questions and some general ones, so I will start with the specific questions. The first one is for Daniella. So the question is staying that in the UK, we have some field hospitals that's still up until the moment with a new purpose to use them to deal with the backlog of patients and to help manage the continued social distancing. It is the same. Is it the same case in Italy? Yes or no? Yes. OK, thank you for your question. The first one, the temporary hospital was not operational because after the first wave, it was the use for the concert.

All we wanted to have other spaces, so it was Ambedkar. But the single one of the 400 5:55 beds intensive is still operating. It is all it is used to the situation, the conven, because there is a bigger space heating and really useful to have the political space, to have a of vaccination and then to wait.

So it is still up and the idea is that we have operational ready in case of the so in case of a new wave that we we hope that not happens. But you know, at the end of 2020, maybe we it can be useful.

So it is still up and running to be ready for and and using the midwife for the vaccination or social distancing or something like that. OK, thank you so much, Danny Glover answer. I will continue with you also.

I have another question. So you already talked about temporary hospitals and field hospitals. We all know that these kind of hospitals may not be planned in advance, and you already mentioned that the time allowed is not so big.

You mean you need to do the hospital in a very short time. So how do you manage to ensure the safety of these hospitals in this quick amount of time? OK, for the sympathy you you means the sympathy for patients or workers in 74, OK.

I think that the day I was in charge for the coordination of the hospital, the temporary hospital and if it goes well and they think that they feed the activity during the disaster was my best choice because the, you know, the EMT and the W.H.O. standards the need to have some standards also in case of disaster for you. And you know that the electrical system, a safety and for physical safety and an infection receive it results. We start to plan one evening and then work about ten days for 24 hours per day. It was a really crazy moment and we tried to have all the safety standards on them.

So we put forth we we have the four factors supported to do the final risk and the infectious disease risk. So the filters, the PPE, the difference of life pressure, all of the hair. And so that the answer is that we try to do the best that we can of living is not the same and like in a real hospital, but we try to be really, really close. And also for the things that they say at the beginning that it's not so easy to say, but I think that these are really real, that in a high income country in which people are used to going to a normal hospital with high standards, you need to offer high standards also in a low income country because if we do it, then we did the kind of double trauma. You know, the the position is different cell phone. Thank you. Thank you so much for your answer.

No, I think I'm going back to Professor Young Presentation Professor, he already told us about the importance of social media, and you already showed us the tweets and how you managed to to, let's say, analyze them. And it was really interesting to see that all the stakeholders tend to be on the positive side when the users are more in the negative side. So how practically you manage to translate these findings into, let's say, practical recommendations or practical things that you did on the field? But thank you for the question, Candy. This is why we conducted two different pieces of research.

one is through the secondary data analysis, losing an eye for millions of future data to understand the risks, to understand the unification approach taken by different stakeholders and to evaluate impacts from the public. OK, so the patient's perspective and then we end we conducted in the primary survey these locations and to better understand what did they expect

? So the next is that what we are doing now is to translate those recommendations and also the suggestions, all the gaps identified from the research and communicate your findings with the stakeholders, including pharmacies, including the GS and GP's.

So think that one needs one important point is obviously the technology greatly helped, and we gave him the risks in maintaining continuity in health care service delivery during the pandemic during lockdown. It doesn't replace face to face consultation.

And even though some of the GP surgeries suffer from, for example, loss tests of doctors because of isolation or quarantine, some other some other VPNs, especially in certain areas, actually have redundancy they offer to help. But those services are not taken by exam GP's in certain areas, so that wasn't the issue that need to be addressed.

How do we deploy risk versus effectively and efficiently? And this is something we are communicating with. CCG groups, as well as the House Education England was to help them to plan, for example, protecting planning for resources and deploying resources wherever, wherever appropriate.

So this is currently and it's. Things. Thank you. Thank you, Professor Reading for Answers Answer. It was really interesting to see the results of your research. I have another question from the audience to Danielle again. So the question is saying how was patients who needed further rehabilitation post-COVID that wasn't ready to return home but was ready for discharge from the field hospitals? Where did those patients get transferred to? Was this increased need for post-COVID rehabilitation in the hospital setting planned for in your model? Oh, it's the pain, so because in the first wave, during the temporary hospital, patients can be discharged for the temporary hospital and go home, but also in have some rehabilitation in the local hospital and so be transported with Tom will answer to the physiotherapy or something like that. But in this concert hall, there was many bigger spaces to. The idea was also to have some physiotherapy and rehabilitation inside the drills because it was post-Ebola and the the the solution.

The second experience, it was about a different kind of hospital because this was a sort of the last step for the discharge of patients and because they're in these tents in these the big hospitals with the lower level of care.

There was only two people, two patients. So that can be discharged at all now because maybe they are alone or they don't have anyone that can follow them with the COVID therapy, or maybe they need the supplemental oxygen.

That was only the therapy that the low level, but the oxygen so they come to the hospital and then will be discharged at the end of the fall. And then really, I can follow all the patients up after they were discharged because I think that will be really important for the research that I cited before.

And we are working with the cremating and with Alexandra in order to to have the publication about the Valentino windows better because the highly follow until the open of the hospital and then after during the treatment of patients, something like that.

It was the heart of my hide because the engineering. So I was working my way through tour and they was the activity for these crazy 15 days and it's on so. Thank you. Thank you. Thank you so much, Daniella.

So before pausing the last general question, I do have one more question for Mr. Walt. You already mentioned Mr. Gold in your presentation about the fact that illness is a bit neglected in the said things that you were talking about from your point of view.

What are the factors that are, let's say, included in this legal actions of the of the maintain inside? Well, there are many different situations, and it varies in different countries, right? Often there's a lack of skilled labor. one of the things in lower income countries, there's a lack of training that's available, and often the hospitals are some of the largest employers in communities. They will often hire people and sort of get on the job training. And as they get training, then they get hired away by, you know, the for profit banks in the big cities or something.

So availability of training is often a problem. Availability of staff is certainly a problem. Again, there's often a culture of of disposable nurse. And in some ways, I think we create that as a society, right, as a global society where everything is packaged and disposable.

And so I think that leads to a culture. I mean, there's there's always an issue of funding. I was working at a children's hospital in. Freetown in Sierra Leone, and the hospital engineer couldn't get money for spare parts from the government, it was a government hospital, so this fellow actually was stealing things at night and selling them so that he could buy parts on the black market to keep his hospital running. You know, and that's a very extreme example, of course. But in some ways it's not so different from the U.S. hospital, who is under tight financial pressure and needs to cut jobs.

And so, you know, the financial drivers are certainly a part of it. And I think maybe a last part of it is that the buildings are getting increasingly complex and in so many ways that has ripples and new systems on top of new systems that make things harder and harder.

And that makes it even get harder. So there's a there's there's no one simple answer to the question. It is just a very, very difficult situation. Around the world, and frankly, I have to say, I'll just tell you this one last thing.

You know, I actually did a little presentation yesterday to some facility managers at a hospital where we did some of that research on electrical loads. And when I went there to place those meters, that was early in the pandemic and somebody had walked in on the sidewalk outside the entrance to the the employee entrance, he rose.

Enter here and I use that because I think in many ways the facility management people are heroes too. They are unsung heroes often, but very much heroes. Thanks so much. And I'll take over with. I've got a couple of questions for you.

OK? one from the audience and the other one for myself. Now it's a follow up of questions both. So earlier on we were talking about, you know, what exact skills and what knowledge you do developing currency people need.

And I think this is perhaps I was just done and I was talking about MTF, you know, maybe there is an opportunity there, perhaps, you know, to actually have these kind of programs, you know, to help to help them.

Because as you were saying, I think that the people have got some skills. I've got some knowledge, but perhaps they don't because of the complexity, because of the systems and other bankruptcy, one and one together. So I'm not sure exactly what you think of that, you know, having that kind of EMT kind of collaborative internship type of programs to help developing countries. Yeah, I think in some respects, nobody has really figured it out, and I think to some degree we ought to try things and almost experiment with different structures to see what could work. At one point, I was thinking about getting somebody who would almost travel from facility to facility around the country and spend a couple of days in different places, just coaching people and then sort of making rounds because, you know, often to people just don't have the skill set or the experience

to know how to even set up a preventive maintenance schedule as an example for the systems that they do have.

And so I think there's a there's a wide range of needs and a wide range of ways that we could figure out. But of course, then at the end of the day, somebody has to pay for that too.

And so that becomes a dilemma. Absolutely. Thanks so much, Walt. So the question I have here from the audience is it's about it says, what do you think is the solution to the oxygen supply issues? Almost all hospitals faced when we have to work within our existing infrastructure.

So I think it's kind of a double question here. Suppose it's about, you know, the oxygen supply issues, et cetera. But then also we've got a building stock there and perhaps Chris, that unfortunately is not with us any more about it and talks about the challenges and the existing issues with with the with the buildings and the infrastructure. So what what do you think we need to do? That's an excellent question. I actually worked on that problem early in the pandemic to try to develop solutions. There are small oxygen concentrators, which can be used for various clinical needs, and that is quite common.

That was again, the the nice thing you that I showed you. They they weren't great. If you have electricity, so then you have to the right. It's like peeling an onion. Every problem you solve one problem and it creates another.

But I think those portable units are an option. one of the things that we've looked at and done in a number of places you can generate, you can put in place a larger oxygen generation system that can fill bottles and then transport the bottles.

And I think that is a really good model is to generate on site oxygen because it's not that hard, right? It does take it does take electricity, but it's not that hard and can be done. That sometimes threatens the economic model of the local medical gas supplier who doesn't want you to do that because that puts him out of business. So, you know, the complexity of the questions are really tough, but I think that's what I would do is either have the smaller oxygen generators or put on on site generation system. I think a hospital could even do that.

And so bottled oxygen to other hospitals nearby, or they could come together as a community and invest in a single. You know, I think there's a lot of ways it could be done. Absolutely, thank you so much, Walt.

I think we are already 20 minutes, almost 20 minutes behind the time, so I would like to take this opportunity to thank you all very much in the four year presentations and for your engagement and making us understand again this this really, really big issue of resilience around Africa.

So thank you all again. Thank you to our audience and for that engagement as well. So thank you very much.