

Hypot-enthuse_ Carina Fearnley on warnings and alert systems...

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SPEAKERS

Carina Fearnley, Maymana Arefin, Malcolm Chalmers

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Malcolm Chalmers 00:08

Hello and welcome to Hypot-enthuse the podcast as the faculty of mathematical and physical sciences at UCL, or as we like to call it, MAPS. My co host, Maymana and I are here in late December. Just before the end of lockdown, though I think we'll be getting to discuss that later. And we're here with Dr. Carina Fearnley. Carina is an associate professor in the Department of Science and Technology studies, and is the director of the warning Research Center, a UCL cross collaborative center based in the department of sts Carina, thank you for joining us.

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Carina Fearnley 00:44

Hello.

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Malcolm Chalmers 00:45

Now we're here a few hours before your due to go on. Well, I was about to say go on stage in Lima. But obviously, due to the current situation occurring, we'll be sat in her living room. Yes, I'm being transported to Peru here to Lima, Peru. But before she's about to give a talk to an audience in Peru, the subject of this talk is gonna be early warning systems. Kareena, could you What can you tell us about your talk? Could you summarize your

entire talk for us in about 30 seconds?

C

Carina Fearnley 01:11

Yeah. So I recently wrote a paper that was published in the International Journal of disaster risk reduction around early warning systems for pandemics and basically trying to discuss how we can learn lessons from other natural hazards. So hazards like volcanoes, earthquakes, hurricanes, even the weather, which we experience either daily or much more frequently, where there are early warning systems in place and alert level systems. And some of those lessons that have been learned about these hazards and being implemented in different countries around the world or even internationally, can be applied to the pandemic context, of course, with an eye to the particular nuances of a virus or a disease. Of course, that needs to be taken into consideration. So we don't need to reinvent the wheel, we can actually learn from those lessons and apply them in in this context. And really, on top of that, it's it's really also recognizing the fact that, well, we knew a pandemic was going to come, and we weren't prepared for it and really thinking about what we could do for the next time.

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Maymana Arefin 02:17

Okay, that sounds really fascinating. So do you think you could actually start by telling us the differences between sometimes they use as a warning and alert to hazard I think those are all separate things, but we colloquially sometimes just kind of interchange them?

C

Carina Fearnley 02:33

Yeah. So hazard is really an event that happens that essentially poses a threat. Of course, if there's no one around, it's a bit like if the tree falls in the forest, and no one hears it did, did it really matter that it fell? And so actually hasn't been themselves aren't really that dangerous, it's actually society and ask or potentially, the impact that that that hazard has on the environment? For example, if you're looking at in that context, that that is it is it poses a risk? And then so when we get into risk, it's about how do we manage that, that risk to try and mitigate against the impact of that hazard. So disasters are actually not really caused by the hazard. They're caused by our response and our society response to that. So early warning systems or any warning system is really about trying to give people a bit of a heads up about something that's going to happen so they can prepare for it. And that can take different guises. So I published a paper with my colleague at UCL Dr. Simon de feu, a few years ago. And we actually said, you know, warnings can exist for like three kind of types of hazards. So you've got the topic of volcanoes, which is one close to

my heart, which is all about being anticipatory. So we we don't know when the volcano is going to erupt. So we anticipate it and we, we need to get people off that volcano before it erupts. Because when it erupts, it's too late. But then we have something like a tsunami, for example, we have an earthquake, we know that earthquakes if they happen underwater can generate very large tsunamis. And therefore, we can respond to the fact that you know, a tsunami has been generated, and then give that warning and say, guys, you've got 20 minutes or you've got 20 hours to get to safety depending on where you are. And then the other type of kind of mitigation strategy, we can have something as permanent so like we can have flood defences in place, so it doesn't doesn't matter when it rains, or how much it rains. We've got permanent flood defences, dams structures in place, and therefore we don't really need a warning because actually the infrastructure is designed to cope with it. But warnings themselves are typically thought as something that's like a siren that just goes off and people respond to it. Or it's a piece of technology, we get a message on our phone, for example. But actually warnings are way beyond that. In fact, you know, warnings just simply do not work if you just get a siren going off and classic example is you know, you might be sitting in your office in the fire. It all goes off. And everyone sort of goes, Oh, oh, no, you know, it's going to interrupt my work. Or maybe I should go and get a coffee whilst I've got to leave the building, you know. And actually, if people knew that it wasn't a drill, for example, they might actually respond very differently. So the thing about warnings is that actually, it's an investment in terms of preparedness, you need to make sure that people understand what, what the hazard is, what kinds of warning, they're going to get the timescales, what they can do in response to that. They need to be educated about all that information, but equally the public or the people who are going to be affected need to speak with the scientists and the people designing the system to make sure that it's effective for them, like what do what do these people need. And so a warning system is hugely complex from, you know, from everything from the scientists monitoring data, deciding indicators, deciding when to give a warning, designing that warning system, communicating that people acting on it, people believing it, because, you know, different nations have different relationships with their governments as well. And then, and then acting on it, knowing what to do, and being able to do what they have to do as well, you know, evacuate to high ground, for example, not not easy if there's no high ground around. So you need to have evacuation structures built in order to deal with that. So warnings are hugely complicated. And in many ways, I see them as one of the key tools in disaster risk reduction measures to try and manage what are natural hazards that can then lead to disasters. Now, just to come on to the final bit, which is alert level systems, alert level systems are a type of warning system, that is essentially usually a four or five, six level warning system that is designed to communicate in a very shorthand way, what's going on. So for example, with volcanoes, we have some normal behavior, don't worry about it all next level is something there's some unrest, we might want to think about that, then it's all No, actually we're starting to see a small

volcanic explosion or some significant hazard, or, you know, we're in a big catastrophic blowout, you need to really be aware of this. And so we have that with our weather forecasting, as well, you know, warnings about rain and storm, and we'll think about do we want to go on holiday or take an umbrella with us that that day, and, and so, you know, these alerts help give a heads up as to what's going on, so we can prepare for it. And in many ways, the, the the work that I'm doing is really about how could we potentially apply such a low level system to infectious diseases, or to COVID, for example, and we've seen an example, t systems here in the UK, and we see systems in places like New Zealand, South Africa, Vietnam, Vietnam, South Korea, have been incredibly successful. And so you may also consider why is someone who studies volcano alert level systems interested in COVID alert level systems? Well, this year, I've actually come to reflect on the fact that volcano alert level systems are actually some of the most diverse alert level systems in practice in the whole world. They take a huge range of designs, and they've been operating for many, many years. And they deal with vast amounts of uncertainty, unlike weather, which is a little bit more certain, not always, but most of them are certain. And they also have been evolving. So many countries or nations have improved their systems over the years have gone, this hasn't worked, this has worked, we need to adapt to it. And so because in many ways, these systems have evolved organically in these different nations around the world. We can learn an awful lot about alert level systems generically, and then apply that to COVID. And so I think volcanoes can provide some very important lessons learned and observations to take on board.

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Malcolm Chalmers 09:11

That's really fascinating. I mean, there's always three or four fascinating things that you raise there. One thing which came to mind, with regards to warning systems for things like volcanoes, obviously, there are huge cultural differences throughout the world. I mean, if you live 50 meters from a volcano, the warning system is going to be much more important than if you live 300 kilometers away from one. So I would assume that countries like New Zealand, which have had natural disasters, fairly recently have got a much closer working relationship with these warning systems than say, the UK does. It makes sense that different countries would have different systems, then something like COVID comes along, which is less affected by geographical boundaries. I'm wondering is there any any difference in how countries have adapted their existing systems to deal with this threat and whether you can see any connection between how the existing systems of a country like New Zealand have worked in comparison to something like the UK,

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Carina Fearnley 10:14

and New Zealand, were very quick off the mark in terms of developing their alert level

system. And that was very advantageous. And it may well have been that New Zealand had already prepared a draft alert level system for infectious disease or epidemic because they're that much closer to two places, which have had outbreaks more recently with MERS and SARS and so on. But it is a nation that is very well versed in terms of alert level systems for tsunamis, earthquakes, severe weather hazards, landslides, they've got it all really interesting. And so it's a nation that's very attuned to, to the fact that we have natural hazards as places like Japan as well. So in that sense that there is a much greater awareness of the value of alert level systems and warning systems than perhaps here in the UK. But to be fair, and the UK does suffer from a number of different hazards, we've had a lot of flooding in recent years. And perhaps it's more a reflection of the fact that the UK hasn't perhaps devised effective warning systems, or been able to communicate these within the public. So there's great enough awareness that has somewhat perhaps led to a slightly more in effective awareness, generally within the population of alert levels and warning systems. So I think it's a bit of a missed opportunity here in the UK. And of course, even with volcanoes, one of the biggest hazards of volcanoes or ash clouds, and as we know, from the Ico to corruption in 2010, those can travel a long way from the volcano. And that impacted the UK too. And so I think, really, it's perhaps the difference is just the frequency and the scale of events or the severity of events. But you know, of course, flooding is a deeply serious and dangerous hazard in itself. So it's very difficult to compare nations. And I think one of the issues that I've been challenged of when looking at COVID alert level systems is the issues around standardization. So certainly, standardization is a really important thing, because it makes it easy for everyone to understand, like we all use a red, Amber green traffic light. And if we started using different systems, we will be having a lot more car accidents, right. So it's important, we have standardized systems, because everyone from the person standing on the beach, looking at the tsunami wave coming towards them right through to the Prime Minister right through to the head of the United Nations, everyone is able to understand that one system, and it's very clear, hopefully very clear, and well known. And that's very useful. But what's actually more important is that a system is designed to help that local community, and that may not work from one local community to another in the same country or another in a different country could because we have such different cultural, social, economic or political contexts, and, and religious beliefs as well. So there's a need to really make sure that we are able to accommodate the local, but within a broader standardized system. So there needs to be flexibility where you can get that snapshot. And that's really what an alert level system is. And, and to make it work on a local level, you have to have additional information. So like bulletins, or information statements, or slight tweaks locally. But of course, a pandemic, unlike most of our hazards, I think the you know, if we look at asteroids, that's a global hazards, if we look at tsunamis, they can be incredibly International, especially across the Pacific Ocean. But pandemics in particular are you know, there are no boundaries. And much like volcanic

ash, you know, it just doesn't respect boundaries or cultures. And therefore, what we're looking at here is actually a need for Standardization across different nations. Because we need to be able to communicate that information. And one of the reasons we need to give that information is because epidemics and pandemics are actually even though an environmental hazard and natural hazard. They are different. There are different nuances that are bespoke to that. And those differences are actually very hard to know, when we're leading up to a crisis and identifying it. So we might see that the people are presenting themselves at hospital with a funny pneumonia. And people might be like, well, that's just, you know, system, a different seasonal flu or pneumonia this year. And then there'll be a sort of critical mass building up and then people will be like, well, what's going on here? Maybe we need to do some testing. You know, in the meantime, this is now spreading all around the local area national International. And so the problem Good news is that once you actually identify the point that actually we have here an outbreak of something new, that's very dangerous, it's actually too late. So we can't respond to it. And we can't anticipate it right, because because we by the time you identify, it's too late. It's not like the murmurings of a volcano that we can see something's going to happen. And that makes it incredibly challenging. And those are the particular nuances of something like COVID. And so really, the only way you can kind of deal with that is by having a permanent mitigation structure in place. So it's our flood barriers, basically, we need to have warnings and alerts in place, where countries can openly say, oh, my goodness, we think there's something up here, we need to start perhaps raising awareness, people need to start thinking about, you know, being a bit more careful at airports and travel. And as more and more certainty comes into play, things happen, like borders start shutting, we start to eliminate this, and you know, shut down eliminate, basically, which is what New Zealand did, and they did it very successfully. And the thing is that most disasters, most disasters are actually caused by politics. And of course, any country where there's something weird presenting itself is going to want to make sure that they know what's going on what's happened. They don't want to present themselves in a in a poor light. And so actually, that's very challenging, because emergency managers or civil protection are a bit like, we don't really care whether there's a great big uncertainty, we don't really care what the cultural contexts and so on are, we just need to manage the situation because that's their job, right. And so essentially, the the challenge is negotiating those politics and enabling nations to be able to be more transparent in a safe way. So that so that nations can actually respond more effectively.

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Maymana Arefin 16:57

That's an brilliant answer. Thank you so much. I think I just wanted to tease out kind of two of the main challenges, which I think you've drawn out that so especially because actually, I'm a master's student of Science and Technology studies. So a lot of issues you're talking

about are very heavily sort of sts issues, one of them being scientific uncertainty, and then another being kind of this, this really interdisciplinary nature of what you do. So navigating political alliances, tensions. So I was wondering, because of these two, very sort of different challenges, one of them being coordinating across so many different actors. And the other maybe being How do you predict what a hazard is doing? or How can you? How can you respond to something that when the data is changing so often, and so this must pose kind of quite significant challenges to how you communicate effectively? So just wondering as to how, how you kind of navigate those two issues?



Carina Fearnley 18:00

That's a really good question. I wish I knew the answer to that. And, you know, I'm, I'm, you know, currently put in research grants to try and investigate this further, because clearly, I'm not a specialist in disease outbreak. So I don't really know how, how they work. I know the UN have their own warning system. And they've had that in place for a number of years for quite a few decades. And they are trying to exactly focus on that issue of how do we reduce the scientific uncertainty and communicate that around diseases, and there have been successful worries like Ebola was a success story that was able to be managed down. And the death toll was was pretty small, given how incredibly dangerous virus it is. And so there have been success stories. And there's lots to be learned from those. But I think the very nature of Yes, there's scientific uncertainty, because we don't know necessarily what a particular virus is or how it's going to impact people. And of course, at the beginning of this pandemic, knows a lot of uncertainty about what can we can we touch things, how does it transmit and all this kind of thing. But, but in many ways, the sort of scientific uncertainty is we're kind of ignorant of it actually, because we don't know that something's happening until there's a critical mass that's developing that suggests there is something and that's where we need to make sure that you know, hospitals and medical units are really keeping their eye on this and being able to transparently communicate this and flagged this for investigation. But as I said before, the issue is at that point is kind of too late. And so then, so then it is like we need to we need to take action and and as you say the way you the only way you can respond to that is by having policies in place already. So that it's very quick. So we we're not sitting around debating what we're going to do, there's this weird thing. Everyone goes, there's this weird thing, let's go to the shelf, let's get the plan off, let's discuss it right, you're supposed to do this, we're supposed to increase our protective equipment, hospitals need to do this, schools need to do this, we need to tell the public, this is the alert level system, let's start getting everything in place. Because then you're much more agile, and you can adapt to the situation, right? So that's, that's what needs to be done is all that preparedness, and that needs to happen on a national and international level. So that as you start to rise up the alert level, should there actually been incident, then you are then prepared, and you can act and the public are

informed, and they are aware. And you know, that's no easy thing. It's no easy thing, it's certainly easy for government is easier. So I should say, for governments, and for emergency managers and civil protection to develop these plans, they're doing it all the time, for all sorts of hazards. It's not so easy to say, hey, public, you need to be aware that an asteroid might fall on your head, or that a supervolcano might happen and change the climate and we will have famine for, you know, hundreds of years, maybe 1000s. Or, you know, you're going to get this virus that's going to ruin your year. And you're going to spend your time in your four walls this year, you know, so when the public already concerned in many countries about health, education, security, more importantly, food, clean water. And so actually, you know, there is a pecking order here. And you do have to have some, some pity for the poor politicians who are trying to balance those very immediate needs with those very sort of far off kind of precautionary investments that may not play out. But of course, as we've seen, when they do play out, they can be incredibly costly, both, you know, mentally, socially, economically. And so it's really, really hard. But yeah, the good news is that actually, preparedness for a pandemic, or preparedness for a flood is pretty much the same policies and procedures, it's just applying it to a different hazard and finding what that bespoke is that a bespoke hazard requires. And so that, to me seems the best way of dealing with it, because of not the scientific uncertainty, it's actually the scientific ignorance of something going on.

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Malcolm Chalmers 22:26

So this was something else that fascinated me. Obviously, with these kinds of situations, there will always be changes, especially with novel viruses like this, as your scientific understanding develops, the approach that you're going to take will obviously change. However, when you look at the what the UK has done, the first warning system we had was five discrete tiers. And we were immediately told upon being shown these five tiers that we are at level 3.5, which shows that the warning system that doesn't account for the different levels that people may be at. Then after that, we brought in a three tier system, which was immediately followed by suggestions that some areas should move to three plus, which again, shows that the three tiers don't take into account all of the possibilities. Now, obviously, you could go too far in the other direction, a tier system with 57 different levels wouldn't work, people wouldn't be able to distinguish the differences between them. So when you're designing these systems, should governments be building in some redundancy or some room to expand as the scientific knowledge increases? Is there a limit where you can say, well, that amount of precision isn't actually helpful? When it comes to a tier system?

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Carina Fearnley 23:49

You've hit the nail on the head? Yeah. Because, you know, especially is it more complicated with volcanoes, because you've got different hazards going in different directions as well. So it's like, well, there's ash, but there's no lava flow. So you know, basically, it is impossible for alert level systems to convey all information. And that's the fallacy is that alert level systems alone can communicate what is needed, they can't all an alert level system is a heads up, essentially, you know, my research has shown that essentially, it's kind of like, hey, things are normal, you don't need to worry. The next stage is Hey, things are abnormal, you need to start paying attention, then the next stage is, if you want to have four stages is kind of, you know, things are getting quite serious. Now you really need to be starting to prepare and like now we're in it, you need to be really responding to what's going on. And level four is how will you not dead? Essentially, yes. If you know. So, the idea is that alert level systems are really, in my view, my expertise is basically an awareness level. And there's a limit as to what you can convey in that, you know, that's why we have the information statements, that Why we have bulletins to provide specific information. Now, you don't want to have too many alert levels, it gets really confusing. And the fact that the UK designed a three tier system that didn't have three plus or one or zero, yeah, is kind of a bit reflects the fact that there needs to be real careful thought and how you design the system so that you don't come into these problems, right. And so if you look at, for example, the New Zealand alert level system, you know, for alert levels, and each alert level is tied to very specific actions that you can and cannot do in different facets in life, whether it's work, healthcare, going out schooling, businesses, and so on. So everyone was very clear that at that alert level, this is what the rules are. And that's a very sophisticated and intricate alert level. And it worked really well for New Zealand. The UK, for example, has started off with their national COVID alert to there wasn't actually applied in anywhere but England. But then the other, the other three nations adopted versions of those had very, very little criteria associated with that. And they were talking about different steps between different levels. And, you know, we need step one, two and three, and as you say, half levels, and it's very, very confusing. I think, you know, people keep asking me about what's going on, I'm confused. And I'm an expert, you know, like, I can't get my head around this and would do an exam, if the public can't understand the system, then how are they going to know what they do need to do or not do and make it very clear. And for that to be enforced and regulated as well. So there needs to be clarity. So when we're dealing with something that's so complex, which most environmental hazards are, we need simplicity? and simplicity is the answer, because we cannot provide all those complexities. So just a simple three, four alert level system usually four is generally the standard is enough to be able to convey and it needs some careful thinking about what are those alert levels going to be? What criteria is it to go from one alert level to another? And are there going to be specific measures restrictions guidance associated with those for the public, some nations have been far more effective at doing that than than others. So. So I think that the fear is that we need to develop these

complex systems, we don't, in my view, the only way we can deal with complexity is by keeping it simple. And by expecting the alert level purely to go to raise awareness, and then issuing alerts, information broadcasts that provides more specific guidance. And actually, more importantly, as well as just having everything on a website that's really easy to navigate. The UK Government have changed their website and information several times. And and you know, I've been asked in many interviews this year, many questions about the original national alert level system. And I was just simply unable to answer those questions, because there was no information online about it. So it's hugely important that a government is completely transparent and open about their system, and how their decisions are being made. And of course, we have the joint biosecurity center established. And that's a new center, there's very little information about it, we don't really know how alert levels are assigned apart from this our value, we don't really know how our values are being assigned. And it's kind of depending on the testing and the testings come in slow. So it sort of all kind of makes a bit of a jumbled mess. And this is to reinforce my point, why it's so important to be prepared. Because if you're prepared, and you've got your testing lined up, you've got your alert level, you know what you're going to do, then bam, when it hits, you can just present it, and the public will go great. All governments organized, they know what they're doing. We can implement it, we've got clear guidance. We've got a plan, we've got a strategy, and we can work on that.

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Maymana Arefin 29:13

off the back of that actually, I was thinking so you have an article that you published recently, I think in the conversation, the title of which was the UK government's Ted COVID-19 alarm systems are all flawed ones disaster expert. And for some of the listeners who might not have read that article, do you think you can maybe explain why it was so flawed? Why maybe what you would have done differently? What are some of the kind of key areas where and communicating to the public?

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Carina Fearnley 29:43

Yeah, I think one of the interesting things about the UK COVID level system was that, you know, we had the first transmission registered on the 28th of February, certainly much earlier than the system that was then actually implemented on the 10th of May May was originally discussed by the Prime Minister. And so what's interesting is it took a long time to pull this together. And one would have liked to have thought that there would have been a lot of experts involved. But unfortunately, it's not possible to actually establish what expertise was involved in it in terms of devising the alert levels, I sort of identified seven key things that I felt from my experience of working levels were an issue. And the first thing was that the alert level criteria wasn't clear. And it was uncertain, it was based

on the the R values, and the the R value is, of course, a very tricky thing to identify. At the time, we weren't testing a lot of people or test results, or testing the testing process isn't, of course, 100% accurate, we're getting false negatives or false positives. And so you have that in any medical situation. But of course, you know, yes, we needed an R value, but what was that R value? And how meaningful was that if testing wasn't widely available? So how did we really know what the R value was to determine that alert level so and also, it kind of made a very clear statement that actually, the alert level system is being driven by science only, and that the science was the only thing driving why we should raise our alert level on that. And actually, that's not a good thing. Alert levels need to raise more based on the risks. And, and rather than just the science, because the science is only part of the picture here, you know. So another thing that was an issue that identified was this issue of the alerts only applying to England, and then there being a diversity across the UK, which obviously creates generally can create a lot of confusion, we did see it created a lot of confusion. It undermined the authority of the alert level system, and the and in a way of fragmented people because rather than seeing it as a united front, we as a nation, despite all our difficulties, right now, with various discussions, we are standing together as a nation to fight this virus, and therefore we are united and that unfortunately, was a lost opportunity. The other thing, the third thing really is about who decides the alert level and how, and the the joint biosecurity center was set up, was promised quite early on but wasn't actually set up until the end of the summer. And there's very little information on the internet as to what that center is, who it is, who's involved, how they make the decisions, what kind of relationships they have with various government officials, and then local governments as well, and how they communicate. And you know, whether this is a deliberative process or a top down approach, and in many ways, it kind of almost has a sort of secretive kind of, sort of feel to it, like it's a sort of terrorism alert level or something that sort of needs to be kept under wraps, we don't need to know what's going on, we just need to know what the output is. And, and, you know, this, this kind of leads on to another point, which is the alert level system is sort of more based on a security alert level, like the terrorism alert levels we have, and it's kind of it gives you that feel of you know, it gives that feel of you know, it actually sort of being there, but actually the responsibility falls to you to take the actions not you know, we're just telling you what the alert level is, but the responsibility lies with you and, and that was kind of the the whole UK slogan as well as and it stay home, save lives, protect the NHS, and it was all about you taking responsibility, and so on. So it kind of in a way, again, reinforces that not working together as a team to kind of combat this this situation, combat sorry, that's a very, very war based word to kind of fulfill the terrorism wording there. The other thing is not the public have not seen the value of the alerts. You know, stay alert, control the virus save lives, there's been a lot of confusion about it, when they first issued the alert levels, we have different steps involved in different steps had different actions, but they weren't linked to alert levels. And so they were like, well, what was the point of the alert level? Because actually,

we're just, we're being told what we can and can't do. So what's the point of the alert level. And that kind of undermines the authority of the warning system, when you're issuing stuff outside of it, it has to kind of all link together. And the low level systems can't operate independently. They need to be established, designed, used between all the various stakeholders as well. And that's something that I don't think, was particularly well established. And I think that's why we saw then the development of the local COVID levels because it became very clear that very different part different parts of the UK require different needs and requirements. And so they decided to then have this as we see a standardized system but it's you know, you can be in a different Tier or a different location. So that's kind of locally adapted within a standard system and And finally, with the the original system, you know, how it was used in the media, it was very poorly presented in the media, very few articles dealing on it or discussing it. Not very user friendly table showing what was going on. And of course, if you look at the alert level, there's actually no links or guidance as to what you should do at each alert level. The action is very, very basic, you know, like current social distancing measures and restrictions that set Well, what are the current restrictions for that, is too flexible. So. So there were a number of issues that will run with that original system. on the basis that the first system wasn't really working in October, Boris Johnson then announced the local system that was been put into place. And of course, we can see a number of things that are identified as flaws have been rectified, there are now specific guidance. It's much more localized. It's but nationally standardized, it's less of a security Rubik, there are better graphics, we do have the sort of different tiers colors that are being standardized and used, albeit that Scotland has extended on that, rightly so. And the other nations have also made their own changes to it. So some lessons had been learned, and some are still in place. But you know, I still think you know, through just your everyday chit chat with the people that you can interact with is that, you know, people are still quite confused is still not very clear. And although there's a lot more information on the web, it's still not very necessarily clearly presented. And, and from a very personal perspective, I found it incredibly fascinating this year that I have been trying to publish articles and discuss these issues around alerts in the hope to help improve these systems. And there's been very little interest by the media or organizations to discuss this systems, which I find fascinating, because every single person in the whole of the UK is discussing which alert level they're at and what they can and can't do, or going, what are the rules? I'm not sure what is it two or three bubbles that we can have? Fascinating. It's in everybody, every single household, yet nobody seems to want to talk about it or get any expertise. It's and of course, I'm not the only expert in that in the country around this. I'm sure there's many others. And it would be wonderful if there was more out there, but it really, there really isn't. So it's been a fascinating story for the UK.

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Maymana Arefin 37:31

Yeah, no, off the back of that. And I guess I was just wondering how, because the situation has gotten so confusing and mistakes were made early on. I'm wondering where do we go from here? Like is, is it too late to kind of, especially with the public, this is kind of an issue of trust. At this point, I think, when so many, sort of the alarm systems were so confusing for such a long time, maybe people don't have the faith now to kind of look into the systems in detail, because they kind of think, Oh, well, it would change anyway. Or, oh, it was kind of arbitrary in the first place. So what do you do in that situation? Is it better to kind of try and rectify something or switch completely? Or like, what do you think is the best way to go forward after that trust maybe has been lost?

C

Carina Fearnley 38:17

It's a very good point. And I think the credibility and the accountability of the system has been undermined, and in a way it's undermined by the establishment of the new system, rather than establishing a system to begin with preparing it and then rolling out as a successful system that doesn't need to be modified very much. What to do going forward, it's very difficult, you know, the National alert level system seems to have just fallen off the radar or people talk about is the local system now, trust is so important when it comes to warnings and hazards. And, you know, now nations where there's not a huge amount of trust between the population and the government can have very unsuccessful warning programs, and which can result in significant deaths. But equally those nations can set up their own sort of bottom up grass roots, warning services and functions that they then believe and trust in sort of kind of the power is then turned to to the people. I think in the UK, I think with the correct expertise of which we of course have a lot of in science and technology studies in terms of public policy, communication, public engagement, fostering and building credibility. I think it is possible to turn it around. There are no specific examples I can think of at this point where that has happened. But it does happen, of course, when governments change, but that's a bit more of a clean slate. But I think that if the government was honest and said you were having a review of our system, we want to clarify things for the public. And we've Got the expertise in. And therefore, we would like to present this slightly adapted system, preferably across the whole of the UK, then I think I think that would be well received, because I think people are feeling confused. And it does feel like the rules are changing all the time. Even if they're not even if it's just gossip, you know. So it's very, it's very challenging. And it shows you the importance of getting it right to begin with, and building that trust. And, and in many countries, the way that it they've been so successful is because that development of alert levels and warning systems doesn't sit with government, like the actual core government, it sets with civil protection, emergency managers who, of course, are part of government, but their civil civil service. And so they have that detachment from the broader political

agenda on whatever's going on that at that time, and they're able to just focus on the critical element of the disaster. And so they're responsible for designing, developing, implementing and changing it. So we can't just go, oh, Boris Johnson did this, you know, well, the government did this is that actually, this the head of civil protection or emergency management has implemented this, and we should respect them, and their profession and their team in terms of devising that. And I think, in the UK, we don't actually have a very strong civil protection or emergency management structure in place, it's kind of within the local authorities. And, you know, nations like Italy, for example, have a very strong civil protection. And despite, you know, the horrendous death toll that they had, they were they were pretty unlucky, but they've managed it exceptionally well. And nations where we see strong civil protection, where the decisions around this are not in main government like Japan. Chile, for example, is another one that they've really done really well. And so I think that's, that's a way of mitigating against this trust. So you know, for example, if they were to, if the UK government was to say, we have now built a team, we're going to lead it with our emergency managers, and this is the new system. Maybe people would have another, go believing it. But I think perhaps removing it from central government is key.

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Malcolm Chalmers 42:19

So I believe in the UK, with the various press briefings that we've had, as well as Boris or Hancock or someone from the government. You've also had Chris Whitty, or Johnson, Van Tam, or someone standing there, giving this idea that it's not just politicians telling you what to do, scientists are backing us up as well. But then the government have taken some approaches which the scientists haven't necessarily been behind. I've heard the word human shields being mentioned a few times, I'm wondering if there's any suggestion that they've stood someone like witty up there to deflect some of the accusations that have been made at them. Secondly, I wondered if there's any difference in how you approach these kind of warning systems for COVID because of the effect of conspiracies. So my understanding, for example, is we can't currently predict earthquakes very well. But we can predict hurricanes and tsunamis, even if you're only given 30 minutes or an hour's notice. I would assume that in a country like that when you put up a tornado or a tsunami warning, you don't then get hundreds of people saying tsunamis are a myth. But it seems that with COVID, that whatever the scientists say there's a percentage of people who think that the entire thing is made up and can be disregarded. And I wondered if that had an effect on the kinds of warnings or the kinds of alert systems you can use? Because you're not just having to inform people. But you're also having to argue that you're justified in providing this information in the first place. don't have that?



Carina Fearnley 43:49

Absolutely. You've asked me to question there. So I'm going to ask the first question. And then I asked the first question, the second question, because even though you didn't formulate it as a question, you did actually ask me a question. So one of the challenges that any government faces when they are briefing the public about a warning is to give a unified voice. And the problem is that scientists may have one opinion about what they want to do. Emergency Managers might have another opinion, the business treasury secretary may well have different opinion on what they want to do. But the challenges is that you must always give a unified voice, you must all as they say, be singing from the same hymn sheet because it reinforces the message. It means that there's clarity and you're not generating confusion amongst the people giving the orders and that then therefore creates credibility, accountability and clarity, very, very important in a crisis that you do not get side voices. And quite often, it's the people who are into conspiracy theories that do quite often create a lot of confusion in those instances. However, what we've seen in the UK is we've actually seen quite a number of times where various chief medical officers health officers have in a very subtle way contradicted what was being done. And I know currently we are having discussions about what should or shouldn't be done at Christmas, even though the law has been passed on what is going to happen at Christmas. Again, that creates confusion, and it undermines the policy itself. And so it also highlights an issue, which is that these issues are complex. We can't just rely on the scientific data to make this information because the scientific data isn't the answer to the problem. The problem is actually how we as a society cope and manage it. And that goes beyond the science. Yes, the science is very important. But it's part of the story. And I think one of the particular interesting aspects of the UK, for example, has been utter dependence and reliance on scientific information to guide the decision making process, when actually, it's the Civil Protection and the emergency managers that should have been doing that. And they have been completely, as far as I and my colleagues and other colleagues across the extended network of practitioners are aware, there's been very little engagement with those people, they are completely missing. And that is one of the biggest issues that we've had. And so we have these power struggles that we're seeing in these presentations about the information that's being given. And, you know, Chris, witty and in one sentence was kind of like we've got these new local alert level systems, which you've designed, but they're not designed to be good enough, because we're already beyond tier three. So it's kind of like, Well, why didn't you design them to have another tier then you know, so it's kind of like, it's an interesting, and, as I said before, it puts individuals into very difficult positions. But really, it shows the importance of communicating, discussing, and making sure that there's a lot of deliberation and discussion and agreement and buy into what you're doing before you actually issue that information. And that takes time, which is why you need to be prepared, so that you can just cut to the chase when things happen. In relation to conspiracy theories. Yes, it's very

difficult because a lot of people like to predict things and predict is a word that's used a lot. And, you know, 10, we tend to use the word predict in the hazard world, when we can get a pretty good idea that we can predict something will happen within an hour or so or we can even predict within a 10 year period, you know, but the idea is, we feel certain it will happen within a period of time. And quite often, with earthquakes, we can't predict earthquakes, but we can detect them. And we can sometimes get a one minute warning with tsunamis, we can't predict them. But if we've got an earthquake, we can say it's probably generated a tsunami. And then if it has, we can say we predict it will hit at this time. The thing is that these are all very kind of tangible things that we can see. And we see in disaster movies, and so on. And despite there being some really good disaster movies around pandemics. Actually, this is something that's invisible. And it is something that until you see the consequences of it's actually hard to believe. And of course, we're all exposed to lots of health scares, whether it's cancer outsiders, heart attacks, you know, just even more generic, things like seasonal flu that we all experience, or chicken pox or whatever, because they are so every day, we've got this sort of weird, challenging idea of the idea of you know, we've got the health service in place that will help us but then we've got this thing that we can't see, we're not quite sure how it's going to affect us or this disbelief. And of course, whenever there's sort of disbelief or ends, visibility is rife for people to, to make all sorts of theories up. And I think that's been the issue here is, you know, the complete disruption to everybody's life has made people feel like perhaps we're doing this for nothing, because they're not actually experiencing it. But of course, we hear frequently from those in hospitals, and how horrifying this year has been for so many of our NHS staff and other key workers and those working at schools and so on. And so it's really challenging to manage those conspiracy artists, if you like. And, again, this comes back down to trust and faith in your government and the credibility of the system, you are always going to have people that will come up with some kind of story. It's so important that your system, your whole system, your whole management of a crisis is robust, clear, accountable, and transparent. Right, because that's the key thing because if people can go onto the internet, and they can see what their data is, so volcano observatories, for example, quite often will have their live data streamed online. So if you wanted to, you could spend all day monitoring Mount St. Helens looking at data. And so when there's a blip, and the alert level goes up, you can go, Hey, I can see that data, I know what's going on, I don't need to be an expert, I can see that. And so it builds trust and credibility. And that kind of thing, I think would be particularly helpful in this case, we don't need to assume that people are stupid, people are actually very capable of dealing with basic data, if it's presented in in a good form. And they're good with dealing with complex data, if it's if it's presented in a good form. That's why so many people read the brief history of time by Stephen Hawkins, you know, one of most complex subjects in the world, but millions of people have read that book, or certainly bought it anyway. But um, so you know, again, it comes down to dentists head down to science, communication, and being

able to do that. And I think the government's got a long way to go in terms of engaging with good scientific expertise in terms of communicating this and integrating it into a program, there is an additional issue as well, which we're going to see a lot of in 2020, which are those not conspiracies, but those who are anti Vax. And so the, the vaccine is going to raise a lot of issues, everybody's asking whether you're going to have the vaccine, or didn't take 10 years to develop. So therefore, we're a bit concerned, when actually, it's just the time scales have been compressed because of the urgency, not necessarily anything else. And so we're going to see a lot of challenges around those people who are, you know, rightly concerned, everyone should, you know, has a right to be concerned about the vaccine, you know, like they've already said, for example, pregnant women can't have these vaccine because that hasn't been tested as to how it would affect a child in utero. So. So you know, there's, there's a lot of important things that need to come out there. Because if we don't get everyone vaccinated, we're going to be in this situation for a long time. This is all the things that we cover in sts around science, communication, policy and trust. And we know a lot about vaccines and anti vaccine vaccination campaigns. And we should be drawing on the experience and the knowledge that we've got from those to help us build a robust program for this this coming year,

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Maymana Arefin 52:20

or maybe perhaps a bit of a lightener. Actually, you mentioned that, that there are some good disaster movies out there. Do you have any recommendations if we want to really be

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Carina Fearnley 52:30

disaster movies are very popular, and they can very successfully convey some of the complexities involved in disasters, and the films that do that particularly well, or those that have really engaged with people involved in that hazard and crisis. So, you know, Dante's peak was a volcano film that was very much research with the United States Geological Survey based on a couple of real stories that were merged. And, you know, films like Twister, for example, were fantastic films really gave you an insight into tornadoes. And, indeed, pandemic is a very good film that, you know, fighting in a quiet sort of frightening level has predicted what has happened. And, again, that was done with consultation. And I think, what's interesting, we were talking a little bit about prediction earlier. Thing is like, we all knew this was gonna happen. And so it's kind of a bit crazy that we're all surprised about it when you watch a film like pandemic and you see how much that's played out. In reality, you kind of think Well, yeah, I mean, they are they are important, as are documentaries on television. And not just documentaries about the science, but documentaries on how it impacts people. And I think, towards the early part

of the Coronavirus, we had a lot of horizon specials and documentary specials around what is this virus? What can it do? Let's get this health visit this health expert in the actually what we also needed to be seeing was what how do these how is this going to play out? How is this going to impact our society? And sort of get some sort of imaginary futures if you like so that people can measure their expectations? I mean, we were all talking about how long is this going to last? Should we cancel our summer holiday? Should we be canceling or summer holiday next year? You know, should we booking? Should we be booking our ski holidays and things like that? You know, and what are we going to do for Christmas? You know, and I think one of the one of the ways that an alert level system like that used in New Zealand was very, was very useful is because it helped show a pathway to a new normal that could be there managed and I think that helped drive people to achieve that. And that's why it's been voted as one of the best responses for COVID in the whole world and various forums and surveys that have been conducted.

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Malcolm Chalmers 54:54

So you mentioned earlier that 10 things which could be done, we'd like to go into a little bit more Thought about those?

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Carina Fearnley 55:00

Yes, I would think on reflection of what's happened, particularly in the last, last 10 months or so, I think you know, just to reiterate that any alert level system needs to be transparent, have clear guidance and be freely available. And that the steps that are in those alert levels have very clear ties to particular actions and policies. So it's very clear that when you want a certain alert level, you can do certain things and you can't do other things. Certainly with the R value, we need to expand on that as a criterion. And beyond that to also how other sectors public health, social services, education, businesses are coping with things at that time. And that might determine whether we want to increase or decrease in the low level, we'd definitely like to see the Joy Boy biosecurity center, being a little bit more transparent, and being able to communicate both up and down across government right down to local levels, to monitor what is going on. And there needs to be a very clear tie between alert levels and other systems such as test and trace border controls. And so that and quarantines so that there's a real joined up thinking between all of these things, and that that that is where the preparedness comes into it. I would like to see a more national alert level system, which is across the whole of the UK, the alert level system should be issued to the public through briefings and have very clear website guidance. And we should be seeing a better campaign like posters in workplaces. And around the place to sort of make sure people are daring to certain requirements and measures of each alert level, I think in a final thing is actually really just making sure that

the alert levels are being adhere to. And that means having penalties, and actually following up with breaking the rules. And we have seen some of that. But you know, it needs to be enforced. Otherwise, people might not necessarily actually act on it. So these are the kinds of things that I feel would help strengthen the UK alert level systems. And I think ultimately, for any alert less of the system for any hazard, there needs to be a number of these factors that are pulled together to make them a success.

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Malcolm Chalmers 57:32

So following all of that, you've now been involved in the launch of the warning Research Center, would you like to talk to us a bit about what the plans are for the center going forward? What your hopes are for the work that the center is going to be doing?

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Carina Fearnley 57:46

I'm sorry, I think the idea for the warning Research Center evolved during my PhD studies, partly because there was a lot of discussion around warnings internationally following the Boxing Day tsunami in Indonesia in 2004. And there was pretty much a whole decade through the the first decade of the 2000s dedicated to understanding early warnings. And there was one center established in in Germany that focused on on warning systems. But it has since stopped operating. And I think this year, once again, I found myself aghast at what I was seeing on television and going I'm not sure why this is happening, we should be having warning in place. You know, if we had a warning for the Boxing Day tsunami, nearly 250,000 people wouldn't have died or certainly Far, far fewer people would have died. And I felt exactly the same way. Again, I just thought my goodness, we really need to set up a center that tries to bring expertise together around warning systems. And the idea is that we bring not just academic expertise, but expertise by those practice practicing it. So those like NGOs or humanitarian organizations, we want to go from government organizations, the big government, you know, Cabinet Office, right through to sort of more local governments, working with businesses, working with all sorts of different organizations and stakeholders to try and look at this issue of warnings. And and what I wanted to do was, and I think what really helped me push forward to developing the center was the fact that I could see how I could apply what I had done in tsunamis and volcanoes to a COVID alert level system. In a way it doesn't matter what the hazard is alert level systems, warning systems all have certain commonalities. And of course, they're bespoke to a certain hazard. And of course, they need to be bespoke to a certain context. But there are similarities. So whether we're talking terrorism, whether we're talking a pandemic, whether we're talking a volcano, or whether we're talking even climate change, there are certain aspects that are similar and, and you know, we have rapid onset hazards. We have slow onset hazards like like desertification and famine, too. And so

what I wanted to do was bring all of those all of the hazards together, whether they're now Actual, whether they've been created by human activity, whether they're cascading hazards, whether they're multiple hazards that happen at the same time, there's lots to be learned. And we could be talking to one another and sharing what we've learned through various crises, and applying those lessons where we can to help improve. And so the idea of the center is to facilitate that not just here at UCL, but also globally. And so we've got a whole bunch of UCL expertise working on warning systems from all across the university, many, many different departments, from politics, to engineering, right through to geography, and art, even so, you know, massive diversity. And then we've got international affiliates who are from who are basically world leading warning experts, who will be giving input into the center too. So we aim to launch in 2021, will be hosting the 11th Annual Conference of the Institute of risk and Disaster Reduction, with a theme of why warnings matter. So that's our focus for the conference, which will be on the 23rd of June, in 2021. It will be a virtual event. So everyone's welcome from anywhere in the world. And we will be bringing in international expertise around warnings and discussing why they matter. And that's everything from early warning through to alert. And so as part of that conference, he will also be launching the Warning Center, as well. So we will be devising some online training programs in 2021, for various NGOs and other organizations that are interested in learning more about integrating warning systems into their practices and logistical and crisis management policies. And we will also be hosting a number of networking events to establish what we want the center to do. But the hope is that we will be able to input into mainstream policy, and be able to provide guidance on that, as well as helping practitioners on the ground that need information, everything in between, but also bringing together that research from all around the world and making it accessible. So there's a huge amount of work that needs to be done. So we hope to get started in 2021. And we've got a lot of work day, because because we are the only center in the world. There. We are the only Research Center in the world focused on warnings, there is no other center that we are aware of that that does this. And so we wanted to be the first and we wanted to capitalize on the great location of London, the excellence of UCL to bring together that expertise and and get warnings on the agenda so that people aren't sort of going Why did we not have a warning? I think people need to realize that warnings can help and they need to be part of the process of preparedness for all hazards and of course being able to respond when things go wrong like like we saw with Schnabel for example. So we there needs to be more discussion on there. So we hope that's what the center will do.

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Maymana Arefin 1:03:13

It sounds like you've got a really busy year ahead. Kareena. But thank you so much for making the time to talk to us. That's sounds incredible, really looking forward to hearing

more in the new year.



Carina Fearnley 1:03:23

I also wish everyone a very Happy New Year and hope that 2021 will help us return to some kind of normality. And I really hope above all things that we can learn from what we've experienced to help make sure that next time because there will be a next time, we are better prepared. And again, that's what the center is about. That's what a lot of research is about is to make sure we can identify lessons from crises and accidents and mistakes. But if we don't learn from them, and make sure that we don't make them again, then then that's that's a wasted opportunity. So let's hope that 2021 is a good leap forward for us.



Malcolm Chalmers 1:04:06

Fantastic. All that leaves us time for us to say thank you very much Dr. Carina Fearnley for your time. Anyone who wants to find out more about the warning Research Center can visit www.ucl.ac.uk/sts/wrc