**Episode 4 Transcript**

## TRUST, COMMUNICATION AND TWITTER DURING THE PANDEMIC WITH ANDREW KEHOE AND ROBERT LAWSON

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**Fitzgerald, Des:** Hello I'm Des Fitzgerald and you're listening to a podcast from the Pandemic and Beyond, a project funded by the Arts and Humanities' Research Council at the University of Exeter to show how research in the Arts and Humanities is helping us to live through, make sense of and recover from the covid 19 pandemic.

One of the unusual aspects of this pandemic is that so much of it is taking place online from the dissemination of official information to people sharing graphs with scientific papers from jokes and memes to downright disinformation, scare mongering. Online discussion and information sharing, has been central to how a lot of us have experienced covid 19. What does this online activity in all its need and volume actually mean for how researchers analyse and record what the pandemic has been like for people and how they've made sense of it. I'm talking to two members of an AHRC project trying to work through these issues. There’s Andrew Kehoe and Rob Lawson both associate professors in the school of English at Birmingham City University.

Andrew I might start with you, if that's okay, your project is called Trust and Communication- a covid online visual dashboard, maybe tell us a bit about the background and what it is that you guys have been up to.

**Andrew Kehoe:** Well, the project title is a bit of a mouthful so congratulations on getting through it, but in basic terms it's about looking at the language of covid on social media and specifically Twitter. So, Rob and I are both linguists who approached things from different perspectives, so I'm in a Corpus Linguistics field which is looking at things on a large-scale top down, whereas Rob is interested in sociolinguistics so looking at how different groups in society use language differently, so looking at specific examples of language use. We've both been interested in language on the web for quite a while in different perspectives. So, I've been looking at language on the web since about 2000, looking at different aspects of how people go about their everyday lives, increasingly in an online environment so looking at things like blogs and newspaper articles and comments. Even things like eBay items and how people sell products online so that's my perspective, Rob's is a bit different in that specific examples of language use in society.

**Fitzgerald, Des:** I'm going to draw Rob in, in one second, before I do maybe Andrew, you might tell us what Corpus Linguistics is,

**Andrew Kehoe**: Good question

**Fitzgerald,Des:** I know that’s a major part of getting our heads around this project.

**Andrew Kehoe:** Well, that is, it goes directly, it's not a very transparent term. Doesn't really tell you very much about what we do, but basically a ‘corpus’ is a body of text, that's where the name comes from. So, what we do is we build a very large collection of texts, known as a corpus and then we used software tools to find patterns and trends in this corpus. So, we're looking at things like the most frequent words in the corpus and how this is changing across time. Also, which words tend to appear closely together, and very often so the words that are on the same topic or that kind of define each other's meanings, tend to repeatedly appear close together within our quite narrow span of text. So, in basic terms it's about finding patterns in large amounts of data. It's not a very good term because it doesn't really tell you much about the focus, which is really data mining or finding patterns in large scale language use.

**Fitzgerald, Des:** It’s very unusual to have an academic term that is useless, but we'll have to add this one to the list, Rob where do you come in?

**Robert Lawson:** So, like Andrew says, I’m a sociolinguist, I’m interested in how people use language and context and so when we're sort of looking at the funding call that came out last year about researchers looking at covid 19 from different kinds of perspectives. What I kind of wanted to do was try and bring together the different kinds of skills and expertise that we've got and the School of English, in addition to myself and Andrew on the team we've also got Mark Mcglashan, Tatiana Tkacukova, Selena Schmidt and Matt Gee and so the six of us kind of pulled together and thought, you know what can we do to try and put something out there in the public eye, that can kind of help people get a better grip on, you know how people are talking about you know covid 19 and all of the various restrictions and lockdowns and quarantine, and so on, on social media and that's kind of what I'm really interested in. Is how people use language to talk about the world round about them, ultimately, and so this is kind of one of the first four ways into kind of medical research or sort of language in healthcare, if you like. A lot of my previous work and actually ongoing work is akin on language and gender, language and masculinity, in particular. So, this was a really interesting kind of departure for me into something quite new, and so what we wanted to do the six of us was, kind of ultimately put together a resource that would be out there in the real world, that people could use to mine, examine, analyze language use around about covid 19 and what we found was there's loads and loads of databases and sort of Twitter conversations. Millions and millions of tweets that would usually be off on you know, a kind of open access repository something like GitHub and so on, but the big problem with that is as much as they are usually useful, people tend to need you know kind of specialist skills to be able to download them, access them and then analyse them and so there's a massive barrier to entry, in terms of kind of exploring that data. And so that was kind of the starting point where, how do we convert all of this really rich data that's happening on social media and as Andrew says happening on Twitter specifically and actually turn it into a kind of open access database that people with no kind of background in linguistics can access, use and explore and kind of look for their own interests as well, and so that was kind of my driving point was how do we kind of turn this, this really rich source of data into something that we can put in the hands of you know, the general public as well as non-linguists, and you know healthcare, legal studies and a variety of other areas.

**Fitzgerald, Des:** How people might make use of it is something I definitely want to come back to and but just before I do. I mean it's hard to kind of, because this is an online resource that's kind of quite visual, I guess, but as much as you can kind of paint a picture for us in words. Can you give us an impression of what it looks like? What will people see when they go to the website?

Andrew Kehoe: It's basically, we call a dashboard. So, it's kind of like a user-friendly system that shows you the key information that you need to know about this collection of data. So, it will start off by showing you the most frequent words in this whole corpus so we've got 84 million tweets in there, and this will show you the most frequent words across that whole collection. And then, if you click on individual words, within that list, you can view how the frequency has changed across time on a graph, so it will show you day to day during the pandemic how the frequency of the word was changing. And we're now covering the whole pandemic from January last year to the end of April this year, so it's quite a wide span of data, so we can, we can do that. It also shows you, like I mentioned earlier, the words that appear in the same tweets as each other. So, if you choose a word like ‘vaccine’, you can see what other words tend to appear within the same tweet. So, it'll be kinds of vaccines and people's reactions to vaccines, reactions in different ways and perspectives.

**Fitzgerald, Des:** Andrew, for someone who's very non-technical, like me, I mean it just seems extraordinary. Like how did you do that? How did, how does one get 84 million tweets and where does, you know how does that happen?

**Andrew Kehoe:** Well, a lot of the credit for the technical side goes to our colleague Matt, who we’ve mentioned. Matt Gee, who's a software developer, as well as a linguist, so he's able to do that. But In terms of getting the data we had an arrangement with Twitter, which allowed us to download these tweets from the, from their database basically through this API or application programming interface. Which means that you can access their backend really and download large amounts of tweets based on a specific query or search term. So, we look for all tweets containing covid or covid 19 or coronavirus that were from the UK during this period, so we downloaded it gradually, in that way, over time.

**Fitzgerald, Des:** So, you actually had to work with Twitter to do this, there are, are they a collaborator? I mean how do they, I was going to ask how do they think about this? But I guess yeah.

**Robert Lawson:** Kind of ultimately a sort of business arrangement, you know. Twitter is business right, they’re in the interests of making money, ultimately. And one of the kinds of services that they offer to academic community and researchers, is that you can work with them to download data, pretty much of any sort of queries as Andrew mentioned. So that was the kind of agreement, that we had with them, they've not said much in terms of the, of the outputs that we put together. The dashboard we had some kind of restrictions round about what we can show. So, we can’t show, for example, individual tweets because that breaks, you know, obviously confidentiality ethics and so on and so. The data that we've got is kind of ultimately aggregated data, so you can’t sort of drill down into specific tweets or specific users. But that still gives us a kind of a good sense of, an overview of the kinds of conversations that people are having. But yeah, working with Twitter. you know we mainly went through the legal department at BCU. They say, I saw the contract with BCU, I think it was something like 9000 words, Andrew is that right? That the legal team had to go through with the contract, with Twitter. But ultimately it was a way that, probably the only way to be honest with you, that we could get that amount of data, unless we started downloading data from January last year, kind of on a rolling basis. There's different ways and means that you can do that, but the API that Andrew mentioned, that's kind of one of the efficient ways of collecting data after an event has happened or while an event is ongoing. Usually can get you know, as Andrew said 84 million tweets which is a fairly substantial amount of data to then kind of try and explore in and data mine as well.

**Fitzgerald, Des:** That's amazing. I'm going to at this point of the podcast, maybe give a shout out to my neighbor. Who has chosen to spend six months of lockdown doing a total refurbishment of his house and so may lurk in the background of this podcast unfortunately, but we're going to have to soldier on anyway. And I mean Andrew maybe, I think you’ve painted us a good global picture of what's going on there, but I think, can you give us. Maybe an example of what makes this approach so powerful or kind of example of what you guys have been able to do, or what you seen other people, been able to do with the corpus that you’ve put up there?

**Andrew Kehoe:** Well, what makes it really powerful is the fact that you're capturing so many different people's perspectives and opinions of the pandemic, I mean you couldn't do this manually because obviously there's, so much, so much data in there. So, it's rather than being focused on one person or one group of people's opinions, it's capturing public opinion really on a large scale. Now, obviously there are limitations, because the whole public is not on Twitter, for example. So yeah, those things come in there, but it's kind of the most efficient way that we've got, at the moment at least, of capturing large amounts of people's opinions in the UK during this specific period.

**Fitzgerald, Des**: And Rob maybe I'll ask, I mean what are some of the key things you've learned so far? I mean, I guess, because this is obviously a big methodological endeavor, right? I mean huge amount of the work is just front ended in kind of building the dashboard. I don't know, is that basically still where you are or are there kind of other things you've kind of learned or you're starting to see now in the data?

**Robert Lawson:** Yeah, so what we wanted to do in addition to the dashboard was put together two kind of case studies, almost as kind of proof of concept. We wanted to be able to give people a sense of like here's what you can do, here’s what you can search for, here's what you can try and kind of analyse using those case studies as kind of baselines, ultimately. So, we put together our team, put together two case studies. One by Tatiana Tkacukova in kind of public reactions and perceptions to kind of government guidelines and government actions. So, that's do with kind of mandatory mask wearing in shops or lockdown restrictions and so on. So, Tania looked at that and then our other colleague Mark McGlashan put together a case study on misinformation. Looking at the kinds of things that were being shared that were related to mess information but also kind of the conspiracy theories that were circulating on Twitter roundabout covid 19, all the way from it being a kind of weapon released in a lab in China through to, actually, and always have also dovetailed with vaccine and vaccinations is as well roundabout kind of anti-vax discourse and so the idea that Bill Gates was microchipping everybody, listening to their conversations. Through to some cases the idea that, the pandemic was a hoax as well, actually it wasn't happening. So, misinformation kind of really circulated really closely with a lot of conspiracy theories and kind of fringe beliefs. So, those were the two case studies that we, that Tania and Mark put together, then. Hopefully, within the next week or two of those will be finalised, proof-read, copy, edited and so on, and there'll be available online on our dashboard as well. So, people, users can go on there, they can download them, they can have a look through they can see sort of what kinds of tools that are available on the dashboard to put together something of their own. So, there's different kinds of things that we can talk about in relation to both of those, you know, one of the things that we found from the government reactions, the public perceptions of the kind of government actions was that people were actually quite welcoming or positive about different kinds of healthcare interventions that were put in place. Things like the mandatory mask that they were actually quite supportive of the, of these different interventions. Which we became really interested in when you know a couple of weeks ago this came out in government, that the government were really concerned about people's willingness to follow the kind of lockdown restrictions, they talked of things like lockdown fatigue, behavioral fatigue that people would really quickly stop following the rules. But actually, what we found on our Twitter data, was that people generally over the course of the pandemic where quite support of these kinds of measures and actually were really critical of other people who weren’t following the rules. So, we, one of the really common hashtags that we found was covidiot [#covidiot], which was being used to kind of criticize those people who weren't wearing masks, who weren’t social destination, who weren’t following the rules and so there's a real sense of kind of support, at least on Twitter about maintaining these kinds of strategies.

**Fitzgerald, Des:** I mean, I was going to mention covidiots myself, because I was on the dashboard myself this morning, and it is really user-friendly right, I mean it is, if I can use it anyone can use it. And covidiots is one of things that really stood out to me as well because I mean just that the power of just being able to track the kind of frequency of that term overtime really begins to tell you a really important story, right? And it's, I think that, for me, is where the power of this is, you suddenly very quickly start, a narrative starts to emerge or a kind of a structure in which you can start to build a narrative.

**Robert Lawson:** Yeah, and what was, what was interesting was right in the start of sort of lockdown, when the pandemic kicked off last January, February, March. What we found really quickly was all of a sudden, there was this entirely new discourse roundabout coronavirus and roundabout covid 19. All of these new words that were emerging and so last year I wrote an article sort of talking about why these new words sort of emerge and a lot of its to do with just helping people find some way of talking about this, this new normal, these new circumstances that we're facing. And then from there as you see what the dashboard allows us to do now is exactly that kind of, trace these narratives over time and so one of the things that we did on the dashboard was, have a kind of timeline of notable events. So, healthcare events, government announcements and so on. So, what we wanted to be able to do was show where peaks in particular words or hashtags concurred with kind of official announcements or government guidelines that were released. So, people as their looking at something like masks, for example, you see particular peaks when mask wearing became mandatory in shops round about I think it was June or July last year. Though it’s kind of peaks coincide with particular announcements, so that's another really nice way of doing exactly what you say, which is kind of charting this narrative. And ultimately, I'm really glad that you said it was user friendly because that was the big thing that we wanted, because we know that a lot of people, a- kind of don't really know what linguistics is, fewer people still know what Corpus Linguistics is. And so, what we wanted to do was something that was user-friendly, accessible, that could be used by people with no specialist knowledge. Because what we ultimately want to do is kind of get this into the hands of journalist's, healthcare professionals', policymakers. Those people who might be able to use some insights that you know can be derived from the dashboard to potentially influence the kind of decisions that they make, the policies that they implement as well.

**Fitzgerald, Des:** Andrew that's critical isn't it, I mean, the capacity for people who are not only outside linguistics but outside the academy to interact with this and to use it and even just to play with it or to do more than play with it right. I don't know, do you have a sense in your own heads of what you'd like to see people do with this or have you any emerging idea of what people are doing with it.

**Andrew Kehoe:** Very good question actually. We would very much like people to try it and in ways that we hadn't thought of ourselves already so to try to address different kinds of problems because although we built this corpus specifically to look at misinformation, I mean the search terms we used are quite general so any tweets to do with covid or coronavirus. So, potentially there's a lot of information in this corpus that’s just there to be mined really on different topics, because obviously, the coronavirus is affected every aspect of everybody's lives during this last, this last year. So, it's not just covering misinformation. It's not even just covering the virus specifically. It's covering everything that was going on in people's lives during this whole period really in the UK, specifically, because all of our tweets are specifically from the UK. So, part of our problem really is we don't know who to focus our dissemination on because it's potentially useful to everybody, even the general public, so you know it's a really potentially wide audience for this.

**Robert Lawson:** But we've been working with colleagues at BCU, we’ve got a steering committee of kind of senior academics at the university in different areas who we've been working with over the course of the last sort of six, eight months or so from journalism, from law, from healthcare studies, to try and think about you know who can we get this in the hands of. As Andrew mentioned, as linguists our networks are pretty limited to other linguists, and you know we can go to an academic conference and we can present, unless we can publish it in a, you know, an article, and you know in a journal and that kind of thing, but those kinds of routes of dissemination tend not to be the kinds of things that the general public, you know will read them or will use. So, we've been working really closely with our steering committee to try and get it into the hands of lawyers and legal studies. So, we're working on an event, it's hopefully going to be happening in September, where we'll look at how the dashboard can sort of inform issues to do round about human-rights and mandatory vaccinations and you know wearing masks. I shall have a lot of the health care interventions, but up against individual freedoms, as well so that's a really big conversation that's been happening in legal studies obviously. One of the big areas that we want to work with is where the healthcare industry is as well, and so one of our steering committee members, Professor Maxine Lintern, has been doing a lot of work as a kind of conduit between senior members of the NHS and the nursing areas as well, to try and get the you know our kind of data into the hands of those people. So, one of the case studies that Tania put together, I think has been sent to, is it Jonathan van Tam, Andrew is that right?

**Andrew Kehoe:** Yeah apparently, it’s going to him, it’s also gone to parliaments public accounts committee, they called for evidence recently, so we submitted, but that specific report to that committee.

**Robert Lawson:** But one of the really good ones that we, I used, that we never realized that would you know ever end up happening. Was a Poet ended up using the dashboard to put together some creative writing as well, so you know when we were having our original discussion about you know how could this end up being used, we had these high sort of full on ideas that it would be policymakers and maybe Boris Johnson would read it, and ooh change is approaching and so on, but actually the, you know the poem that was put together on the basis of the dashboard was something that we had never foreseen, so that was really good as well.

**Fitzgerald, Des:** And it's free the poems I read on it right? I want to just change tack a little bit, I mean one of the things- I'm sorry I did quite a bit of reading on the project, this morning. I think, I'm not sure it was one of your colleagues. Who said that the, I mean one could always think of the dashboard almost an equivalent of a kind of Samuel Pepys diary of this moment and I thought that was a really kind of potent image, I thought. I don't know, could you tell us a bit more about that or why you think that or?

**Robert Lawson:** Do you know I wish, I wish I could take credit for this um, but it was actually. So, we've just had today our record released on the conversation and so that's available online actually as of last night. And the editor that I was working with, it was him that suggested that that was a parallel. We had spent that time talking about how the database that we had put together was a kind of cultural archive, it was a snapshot of you know people's views and experiences and lived realities of covid and sort of coronavirus over the course of the last 18 months or so. It captured you know pretty much every possible experience you know from you know, furloughs to vaccinations to people losing their jobs, to people recovering from the virus to you know in the worst cases people losing loved ones and family members and. And so, what we kind of looked at that database was this snapshot, this kind of cumulative snapshot of yeah reaction, you know attitudes round about the coronavirus over the last 18 months and yeah. As we were talking with the, as I was talking with the editor about this, it was him that put together the Samuel Pepys thing, so I wish I could take credit for that insight but that's a shout out to Alex Kane there, the conversation who put together that particular point.

**Fitzgerald, Des:** That's where they’re paying the big bucks, I’m sure!

**Robert Lawson:** Exactly yes.

**Fitzgerald, Des:** I mean under this, there's another serious point to that that you gesture at already, which is that I mean one of the things about Sam Pepys diary of course is of course he’s a very elite man and we're moving around his time and, so that gives a very skewed account of what you know what it was like to experience that space. And, similarly, of course, I mean it's not anywhere as limited, but not everyone is on Twitter right and there's a kind of a skew of what kind of voices are present there and I don't know is that something you were able to deal with or think through or where you up to with that?

**Andrew Kehoe:** It’s something we've tried to address, in various different ways, I mean obviously the starting point is that not everyone is on Twitter so we're not going to capture tweets from people who don't use Twitter at all. But even with the people who do use Twitter they might not use the specific language that we're looking for, so, as I said, we build our corpus looking for terms like covid 19 and coronavirus but it's possible that the people who don't believe the virus is real or exists don't use those terms at all. So, we wouldn't be able to capture their tweets using those specific terms, so that is an issue of course. It's going to be doubly difficult to know, I mean how to capture information from the whole of society in this way, and these specific groups who believe in the misinformation who don't believe in the, in the virus who believe it's all a hoax or a “plan-demic”, we've actually found in other sources that they deliberately don't use this language to avoid detection and monitoring. They don't even use language at all in some cases, so they'll deliberately just use images or memes and videos within their tweets and no text at all. To avoid this kind of monitoring and detection that we're trying to do so, it does kind of scupper things and to some extent that we can't monitor everything in this way, using our techniques. Because these techniques of Corpus Linguistics, they obviously work best if you've got a large amount of textual data. It's possible to do OCR and that kind of thing on images to extract the text, but even that is not always possible, because some of these users deliberately obscure the images, so that you can't extract the text, so it is a, it's a difficult problem and there's no real one kind of silver bullet or solution that's going to be able to crack this because whatever monitoring or recommendations you come up with that'll just help the people to bypass them in the future so yeah it's difficult.

**Fitzgerald, Des:** I mean the fact that.

**Robert Lawson:** Very much sort of an arms race in a lot of ways of you know those putting together the misinformation using particular strategies that eventually get picked up. So, you know places like Twitter or Facebook and so on have brought on a whole bunch of kinds of measures to tackle misinformation. From you know putting warnings on disputed information and claims, through to hiring more fact-checkers to banning you know persistent offenders and accounts and bot-accounts in particular. So, there is this massive arms race between you know the producers of misinformation and disinformation and the media platforms, where this kind of work gets disseminated.

**Fitzgerald, Des:** The last thing I wanted to ask you both about was, because the Digital Humanities or what gets sometimes called the Digital Humanities, and I don't know whether or not you want to own that term or you can, you can disown it in a minute, if you want. But I suppose the reason I ask is because one of the things we're trying to do in this series of podcasts is to really showcase the kind of variety of, often kind of experimental and novel approaches, that scholars in the Humanities, are taking to making sense of what's going on. And, and I guess, not everyone would think of the kind of, when people think of the humanities, I think, potentially, they don't think of the kinds of work that you and your colleagues are doing. And I suppose the question is really, I mean is this kind of digital work a big part of where you think the Humanities is going or should go or does it have a big role to play in you know how we start to make sense of you know, daily cultural life in the future?

**Andrew Kehoe:** Yeah so, I mean in terms of terminology I mean Digital Humanities is fine with us, but there are lots of other terms as well, that are not always particularly clear so things like Big Data, for example, which doesn't really tell you much about what the focus is because. I mean Corpus Linguistics specifically that, which is our approach, has been around since the 70s. It's only really gained popularity in the, in the last 10 years or so, as the well two things really. The technologies become more available, so people can actually process large amounts of texts on their own computer. But secondly, the texts themselves have become more available, so people can download vast amounts of texts from the Web, from social media. And they can process it, I mean fairly easily now using some of these tools. It is actually quite easy to do Corpus Linguistics badly so just download loads of text and just mindlessly count things without fully understanding what you're counting. So, that's the danger and that's what we've tried to avoid in this dashboard by making it very clear where the information has come from and how many people are actually tweeting this information rather than kind of being skewed by one particular user or set of users. In terms of Digital Humanities, I think yeah definitely, this approach is applicable to any kind of field or discipline which has text as the main medium really so, anything which is about analyzing and finding trends and patterns in any kind of text can potentially use this kind of technology, this kind of, this kind of approach.

**Fitzgerald, Des:** And Rob the dashboard is up, the case studies are coming up very soon, what are the next steps for you?

**Robert Lawson:** So, I think the next steps for us is probably trying to get the dissemination kind of ball rolling get this dashboard out as much as we can. So, we've got a Twitter account, @trackcovid and so people you know can follow us on there. What we're really looking forward to is people sharing their findings via Twitter, so we can sort of see what other people are looking at and researching. Obviously, we've got you know the other kings of dissemination, and outreach through you know our institution, these you know events were organizing at BCU. So, that’ll probably be the next big thing that we're kind of working on over the course of the next couple of months, we’d really like to try and put together some journal articles as well, because they’re you know, in addition to the kind of social good that we think the dashboard can you know represents. There is a you know really interesting academic angle here as well about the kind of process of actually putting the dashboard together these two case studies that I mentioned earlier on. Those will form the basis of you know kind of wider discussion round about misinformation, government trust, public reaction to various measures that have been introduced over the course of the last you know 18 months or so. So, there’s quite a lot of work ahead of us in terms of the academic bits and bobs that the kind of make up the you know daily life, for you know researcher, so that'll be that. And then yeah, I'll probably just be developing the dashboard to take any account of people's feedback, you know again will be really interesting to see how people are using it. What things work really well, what kinds of things might need improved. Over the course of the last two months as we've been actively developing the dashboard there has been a kind of [unidentifiable] of approach so we’ve you know kind of done things. We've put them out to the world, we've got some feedback from our steering committee, we presented it to you know colleagues. What works, what do you like, what do you not? And overtime, what we’ve managed to do is kind of put together, something that we think is really user friendly, as you mentioned earlier on, but that will likely continue into the future as well. The official end of the project has already happened, so you know we’re kind of done and dusted as far as AHRC is done. Andrews just finished our end of project report that’ll go back to the ARHC and that’ll kind of tidy things up. But we recognize that there's you know quite a lot of work ahead of us. The other thing I think we’d really like to do is try and get some PhD projects out of this as well. There's a massive database here that is ready for investigating from all sorts of different angles and so we're kind of exploring at the moment whether there’s opportunities for PhD students to kind of try and engage with that data in lot more depth in you know what we can do, given our time constraints and try and put together, something that would be sort of really interesting and hopefully inter or multi-disciplinary as well.

**Fitzgerald, Des:** Brilliant, and I guess if people want to use the dashboard and surf the easiest thing they can do is search for trac covid over I guess, t-r-a-c covid.

**Andrew Kehoe:** It’s not the best name for a podcast really, because it's track with no k. So yeah, t r a c covid all one-word. traccovid.com is the dashboard.

**Fitzgerald, Des:** traccovid.com perfect. Well look, that's all we have time for, and thank you so much to my guests Andrew Kehoe and Rob Lawson. The Pandemic And Beyond team are Pascale Aebischer, Sarah Hartley, Victoria Tischler, Rachel Nicholas Benedict Morris and Garth Davis and me, Des Fitzgerald. To get updates on that project on this project and at any AHRC covid projects and find out more about the latest Arts and Humanities Covid 19 research in general, as well as to access future episodes of the series, you can find everything you need on our website, which is pandemicandbeyond.exeter.ac.uk, thanks a lot and goodbye.