**Centre for Personalised Medicine podcast**

**Season 3 Episode 4**

***Evolving health system boundaries***

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(Our podcast logo features a section of the artwork [‘A Lifetime of Measures’ by Aneesa, aged 12, from Oxford High School](https://cpm.ox.ac.uk/centre-for-personalised-medicine-art-competition-2022-23/), the stunning winning entry to our 2022-23 Youth Art Competition).

**SPEAKERS**

Rachel Horton, Anneke Lucassen, Ali Kay, Sally Sansom, Susie Weller

**Rachel Horton**

Hi, I'm Rachel Horton. I'm a junior research fellow at the Centre for Personalised Medicine, or CPM. In this series of the CPM podcast, we're looking at the themes we've identified in our new strategy, and today's topic that we'll be talking about is evolving health system boundaries. Joining me to discuss it, I've got…

**Sally Sansom**

Sally Sansom. I'm a junior research fellow at the Centre for Personalised Medicine, and I'm a researcher in the health economics of genome sequencing for rare disease diagnosis.

**Ali Kay**

I'm Ali Kay. I'm also a junior research fellow in the CPM, and I'm a researcher of the expectations and experiences of new genomic technologies.

**Anneke Lucassen**

Anneke Lucassen, I'm director of the CPM. I'm also a consultant in clinical genetics and a professor of genomic medicine.

**Susie Weller**

I'm Susie Weller. I'm a fellow in the Centre for Personalised Medicine and also senior researcher in the Clinical Ethics, Law and Society Research Group.

**Rachel Horton**

Thank you so much for joining me today. So we've got lots of the CPM team here to discuss a really interesting question. And I guess the obvious starting point is, what do we mean by evolving health system boundaries? And I'd be really interested to hear people's perspectives on that.

**Anneke Lucassen**

We had quite a bit of discussion about this while we were doing the strategy, didn't we? And I think one of the things that has become clear over recent years is that people are accessing healthcare at a different stage, with different levels of knowledge. So people are accessing social media a lot for healthcare advice or information, before they get to their GP or doctor. And that was one of the things we wanted to look at, because we thought it'd be very interesting to see what difference that makes.

**Sally Sansom**

Absolutely, I think in many ways, it represents a shift in medicine towards patients being more involved, or having more autonomy in the management of their health, extending into areas beyond what we would consider a traditional clinical setting, and of course, promoted by things such as new technologies, wearables and, of course, social media and the like.

**Rachel Horton**

It's really interesting because I think in all the themes in our new strategy, I think in some ways ‘evolving health system boundaries’ is the one I find it hardest to sort of pin down? And I guess that might be partly in the name, because it's about evolving boundaries and things, but it feels such a relevant and important thing to reflect on in the context of personalised medicine, but like so many things you could look at, and yeah, I guess this sort of… Was this, was this one of the first themes that kind of emerged as being part of the strategy? Or was it something that came up kind of towards the end, trying to catch those bits of personalised medicine that weren't covered by, you know, our other ones? Which are diagnosis and treatment, risk and prevention. In our pillar themes.

**Anneke Lucassen**

I'm not sure if it was first or… I think it was somewhere in the middle, it came together, and it also spoke, in part, in my memory, anyway, to the difference between diagnosis and screening. So we were very… picking up on Sally's point of wearables and things. We were very aware that people now come to medical attention because their watch device has picked up a heart rhythm that tells them to go and seek medical advice, and that that's then investigated, for example, and that really highlighted the difference between coming to healthcare with symptoms or signs of a disease or condition, and having… being not aware of them at all, but having something- some data produced, that makes you then go to seek medical attention.

**Ali Kay**

Yeah, that's right. I think we were thinking about both the technological innovations that are impacting on personalised medicine, but also that there is… any health system sits within a socioeconomic context. And when it's first designed, it has a very particular socioeconomic context. And over time, that background evolves, and then the health system needs to evolve with it, and we needed a theme that would capture those different elements so it goes beyond the technological aspect, and considers also the different people and organisations and policies that would sit within that evolution.

**Susie Weller**

And I think it also speaks to some of the research that we've been doing looking at patient and healthcare professional experience, and particularly patient experience, and thinking about those that are… thinking about the boundaries between clinical practice and research and where they sit and how patients and individuals see those- whether they're taking part in a research project or whether it's part of clinical practice, and the kind of fuzzy boundaries between the two.

**Anneke Lucassen**

I think that's so interesting, isn't it, because the NHS is supposed to be about developing treatments based on the best evidence. So that in itself, sounds like it would integrate research seamlessly. But more and more, I suppose, since the Declaration of Helsinki, research and clinical practice were seen as entirely separate, yet advances in technology, and genomics in particular, only really works if you can integrate research and clinical practice a bit more than it was.

**Rachel Horton**

It's caricaturing a lot, but it feels like in some domains, like with direct to consumer stuff coming into the NHS, there's anxiety that that's kind of… that's difficult, and it puts challenge on the NHS responding appropriately to a test that wouldn't have been clinically indicated, often from the perspective of the person who's then kind of charged with helping with the results of it, different to the kind of standard route of you in collaboration, decide a test is appropriate, and then you're sort of both expecting to have the results to contend with.

Often, I think of that as more of a sort of challenging thing, and sort of a boundary that you know perhaps needs to be held… well, not held, but like that, there's an important purpose to that boundary in some ways.

Whereas in research and clinical care, often it feels like sort of that that boundary is quite artificial and often quite unhelpful when people insist that things have to… like, which one is it? Is it research? Is it clinical? Which kind of protocol do I follow for how I have this consent conversation, or what I then do? And the kind of, I don’t know, the opportunities of these boundaries and being able to shift them, and knowing when and why?

**Anneke Lucassen**

Yes, I mean, I think the boundaries shifting can be both helpful and very unhelpful, but we can't do much about that. I think it's better to be *aware* of them and make them as positive as possible. Just picking up something that Sally said earlier about might be a good thing, because they might enhance people's autonomy, and make them more able to make informed decisions when they do get to meet healthcare professionals.

But of course, when that goes wrong, they might feel *less* empowered because they're getting information, wrong information from the wrong sources, and just picking up on your direct to consumer example, that came to light several years ago now that if you had a particular secondary analysis of a direct to consumer genetic test, that actually that was more likely to be wrong than right, and yet the health service boundary there said, “Oh, well, you're not eligible to be referred, so you stay over there”.

And actually looking at that boundary, and how it was evolving was really helpful to say then to general practitioners who were mainly coming across this problem, think about this, and think about that, and they might still need referral if these factors are met.

We did some exploration with patients and publics at the time. And the thing that sticks in my mind is that they said “we thought we were doing the NHS, the National Health Service, a favour by having these tests, and paying money for them, because we know how broke the NHS is, and now you're telling us that the result is *less* good”. And there was a sort of disbelief about that because they'd paid money for it rather than having a free test.

**Rachel Horton**

I suppose for some of these evolving health system boundaries questions like direct to consumer testing, that's quite a key consideration. I suppose, in that to purchase a direct to consumer test, you need to have the money to do so. And so to what extent this links into like other CPM themes of interest that we’ll be discussing, like equity, and I guess the purposes of holding a well, not holding a boundary, but the purposes of a boundary. It's an interesting question to consider.

**Ali Kay**

I suppose one purpose of a boundary is to make it clear who carries responsibility for, for example, data, the storage of the data, you know, protection of that data, misuse of that data. And that's maybe an area that has hit the press a bit more recently, because certain direct to consumer testing companies have had data breaches or may have a change of ownership, and that may affect where the data travels to.

**Anneke Lucassen**

Yeah, but is that any better? I suppose you're right, people… you can say, “well, this is the responsibility of someone” in, outside a boundary or inside a boundary. But I would say that. The NHS has had data breaches and data problems. So does it make that much difference where that boundary lies? I don’t know the answer to the question.

**Ali Kay**

I’m not sure. But also, we had an interesting chat, Sally and I about where you were allowed to take your direct to consumer test, and you couldn't take a particular type of health test in Australia, could you? And I wondered whether these national boundaries matter very much anymore, because people can just travel and take tests elsewhere.

**Sally Sansom**

Yeah. Absolutely. So in Australia, the Therapeutic Goods Administration, the TGA, has prevented 23&Me from selling its health results product, so you can still pay for the ancestry results and go through that process, which is exactly the same, you'll just only be able to access one part of the 23&Me portal.

**Anneke Lucassen**

Talking about boundaries, can you not just buy it online?

**Sally Sansom**

You need to have an address, and so you need to be able to ship the product to an address, and it's not in 23&Me's interest to breach regulatory requirements. So yeah, my husband and I waited until we moved to the UK to purchase the test.

**Susie Weller**

So we've been following a sample of patients and their family members over the last few years, most of whom have taken part in the 100,000 Genomes Project, and we've been following their kind of experiences of having had that test, and then the implications of that test, or potential implications for family members, and the wider impact on their lives. And it's been really interesting to see that although the test meant for many of them a great deal at the time, because they'd often been on long journeys, encountered many specialisms, undertaken many tests to find, you know, the cause of their symptoms… Over time, the sort of ebb and flow of the significance of that test at different points in time.

So it might come become more significant if their adult child is planning to have children themselves, and then, or it may sort of fade into the background, as an example of another family, as a child grows older with what was seen as a kind of very uncertain prognosis, but actually starts to hit some of the milestones that they hadn't imagined they might do so. So that following people over time, I think, gives a really interesting view of kind of like the ebb and flow of the salience of those tests and being part of a research project in that way.

**Anneke Lucassen**

And around the sort of boundaries of healthcare as well, I think, doesn't it how they sort of nip in and out of it?

**Susie Weller**

Yes, yeah. And also around the expectations of sort of being part of a project. So many of them run these long journeys, have encountered many specialisms, and being part of 100,000 genomes or other projects was almost a last resort, really, to find an answer.

And many of them don't have, still don't have answers, but to find an answer. And so it wasn't necessarily clear cut. This about being part of research project. It was just almost going to see another specialism, if you like. So it was not always clear cut exactly what they were getting involved with.

**Rachel Horton**

Thank you. I guess it's also a fantastic example of a kind of- something that really sits in that clinical research hybrid space, and the value to be gained from doing that, in that obviously for some people, reaching a clinical diagnosis through a research route, what's that meant for people.

But I guess also what that creates for future boundaries is, is interesting in that, is it migrating more from research towards clinical and as things like this shift kind of further towards the clinical end of the spectrum, does that change, you know, *how* does that change? How you discuss it to begin with, what you do with the outcomes of it, sort of what level of fairness it is to ask people to then contribute data from such a test for further research, because it was research that made that test possible?

**Anneke Lucassen**

Your *offer* is very interesting, isn't it? I'm thinking of the study that Genomics England is doing on newborn screening, which is very much a *research* study that wants to follow up the whole genome over the lifetime of the newborn, but it's *offered* through the NHS. Is that a good thing, or is that a mixed message thing? Is it both?

I think that does speak to that, exactly what we are thinking of that, “oh, gosh, these boundaries are really shifting” in a way that maybe they've been shifting for a long time, but we thought now was a good time to stop and sort of look at how much that influences different discussions and debates.

**Rachel Horton**

Yeah, because there's so much opportunity in the in the shifts, but also so much challenge as to how you sort of, I guess, I mean, you can't invent new sort of legislation or new governance around every single new thing, but that yet, how you sort of can gain the benefits of, like, being in these things, which have a bit of research and a bit of clinical for example, because if everything's set up to be one or the other, and then it ends up stifling, actually, some of the really beneficial aspects of it, that'd be a real shame.

I think, I think I remember Kate Lyle talked about this, and the thing she was doing… there was some point of care test for babies to see if they were, yeah, if they'd be likely to become deaf if they had a particular antibiotic, I want to say gentamicin, might have been vancomycin.

**Anneke Lucassen**

No it was gentamicin. So Manchester, pharmacogenomics team were looking at… they wanted to implement a point of care test about something that had been available for a long time, but it took, it took about two weeks to get a result. And the point here was that if you knew in a newborn baby that they've got this particular genetic variant, you wouldn't give them gentamicin, because then they’d become irreversibly deaf, and waiting for two weeks is not an option when you've got a sick neonate who needs treatment.

But as you rightly said, Rachel, the whole system got a bit clogged up because that was seen as *research*, and therefore parents needed to give informed consent to take part in that research study, and that wasn't possible when… in the sort of heat of the moment of their baby being admitted to a neonatal care unit.

So in the end, they had to sort of play the system? That's probably not the right way of putting it. They had to sort of say, “well, actually they're going to consent to usual care”, which would involve taking a blood sample, and then afterwards they would, once they decided on the antibiotic treatment, they would then say, “do you mind that we’re evaluating this point of care test as part of a research arm?”. Which seemed a bit of a sort of silly squidge really, to do something that everybody agreed was the right thing to do, to move from a test that took two weeks to a test that took 15 minutes, or whatever it took.

So I think you're quite right, Rachel, that once the governance systems get hung up on their existence or their activity, you can get some sort of duff decisions that suggest there is a very clear boundary between the two. When there isn't.

**Sally Sansom**

I think that's such a shame, because if you think about the NHS being a national healthcare delivery service, you know, quite unrivalled in in other countries, it lends itself so well to research. Obviously, there's differences in different regions on how different services are performed, but I think you know, by and large, they're probably going to be the most uniform of any country compared to, you know, those where there’s public and private systems and and different actors and levels of government that are involved in in delivering those services. And so I think you know, for example, the Newborn Genomes Project could, in some ways, only be delivered through a service such as the NHS, where it is able to be rolled out nationally.

**Rachel Horton**

I think it's so true, though, that in… in so many ways, the NHS is in such a beautiful position to be like a learning healthcare system and using that opportunity, but in a way that people feel comfortable with.

**Anneke Lucassen**

We have to realize that the NHS is struggling. So ask busy health professionals to do an extra task, or what seems to them as an extra task, rather than integrated task, is going to be met with some resistance, probably, and that's a particular part of the climate now that *could* be so different, I guess.

**Sally Sansom**

And I think that's potentially related to the perspective of technologies which are causing these health system boundaries to evolve, such as, for example, direct to consumer genetic testing. I really wonder if the willingness to engage with those results would be different in a much more privatised health system.

And you can, of course, imagine more perverse incentives at play there, where it's the health system's aim to provide more and more services in order to increase their revenue. And so whether that would actually result in improved patient benefit is unclear, but it would, I'd be very interested to know if the perspective on these tests was different in public and private settings.

**Anneke Lucassen**

And I think it probably is, from all I read about- certainly in the US, it seems very different. But whether it leads to overall differences in healthcare, or… certainly if you look at mortality data, it doesn't seem to be any better in those settings. There are some disadvantages to screening everyone for everything all the time, and that those disparities that you start off with trying to correct are probably worsened by that, aren't they? So you, as you bring forward, as you screen people more, you're actually widening the disparities.

**Rachel Horton**

I guess it's a useful point how evolving health system boundaries, as they evolve, and maybe partly because of their evolution, there's also an evolution in what, like, what a diagnosis means, what a disease is, almost. In terms of, if you know you've got a genetic risk factor such that you're very likely to develop a disease- what does that mean? Do you have it? Do you have it pending? Kind of, I mean, you sort of, you don't but you've got that susceptibility and…

**Anneke Lucassen**

And what, do we, when do we start treating that? There's always, it's very easy… already, we've seen with statins, for example, that treating of a risk starts then being conflated with treatment of a disease. And I think that's a very interesting space to think about, particularly with advances in technology and predicting what you might be at risk of in the future is going to be more and more treatments of risk than treatments of diagnosis, I think.

**Susie Weller**

There was one other thing I wanted to say, and I don't know whether it fits with this at all, but we were talking about the screening and, you know, treatment of risk. And I think one of the things our participants have… when they've spoken to us, have, some of them have fed back and said it would, it was a positive experience, because they we were looking at the or talk about the *whole* person, rather than kind of particular aspects of that person. And I think one of the interesting things, particularly with screening, is that compartmentalisation, like physical health and mental health as being separate? And how actually, kind of the screening could lead to increased anxiety and all other kinds of things and that kind of… there's a boundary there that the participants, patients and families we’ve spoken to *don't* find very helpful, between physical and mental health.

**Sally Sansom**

I guess, just related to the point that you just made, and Anneke your point earlier as well, about the comparing the impact on mortality of direct to consumer tests in for example, a health system like the NHS, versus a health system like they have in the US. I wonder if that's almost too hard a metric, and if maybe we're looking at it too soon? Perhaps, you know, these tests might not have a direct impact on health and physical health as often we define it.

But I'm wondering if a patient or sorry, a person or a consumer who decides to purchase a direct to consumer test, you know, receiving their results, going to their health care provider, and feeling listened to and as if their… their action was resulted in in some further action and then being taken seriously, if that could lead to things such as, you know, further feelings of autonomy and self motivation for managing and being responsible for their own health? And the potential flow on effects for that, not only into the future, but say, within a family unit, I think that could be quite interesting to look at, and definitely goes beyond that *physical* health definition and certainly more into the emotional and other aspects of health.

**Anneke Lucassen**

I definitely think that you can't. And I didn't mean to imply that direct to consumer testing and mortality are directly related. I just meant that in societies where private healthcare really plays a large part, like the US, for example, the overall mortality curves are quite a lot worse than they are in the UK, but despite spending twice as much money on health care. And I think that whole screening bit comes in there, doesn't it? Of screening a lot more, and then overdiagnosing a lot more.

And by overdiagnosis, I mean finding, say, cancer that you never would have died from. So you've accurately identified it, but it was something that you were going to die with, rather than from, and that then feeds the whole system, because people are pleased to have their cancer diagnosed, because that can only be a good thing, can't it to have your cancer diagnosed early? And so that increases the amount of screening. And so the cycle goes on.

And I think that does say something about boundaries, doesn't it? Because screening does, I think, mainly sit outside healthcare. It's public health, it's… it's before you get to healthcare, all being well.

**Ali Kay**

And that's a really interesting space, because what we're seeing is that the rise of consumer action in these tests, but within a broader sense of a trend towards personal responsibility towards managing health. And whether that's partly driven by the difficulty in getting a doctor's appointment, or whether it's driven by more push factors, you know, marketing and those sorts of things? It sits within that space. Because it's not just genomic testing is there? There's other types of testing available.

**Anneke Lucassen**

And greater autonomy and personal choice is a good thing, but it might not be a good thing if you're left feeling blamed or somehow responsible for not having acted soon enough or done the right thing for yourself or your family.

**Rachel Horton**

So when we were thinking about evolving health system boundaries in advance of this episode, one thing we thought about was crowdfunding for treatments for when people have got a very rare condition or something like that. And yeah, I wondered what people's thoughts were?

**Anneke Lucassen**

I suppose the issue for the changing boundaries is that we see people in this country, but also in Europe, having a diagnosis, or wanting to avail themselves or their child of a particular treatment that, then is not approved by the regulation. And through social media, they go and crowdfund.

Whilst on the one hand, you want people to have every opportunity they can, and if that is a way of raising money, then fantastic. On the other hand, it's bypassing all the sort of evidence-based approvals that you would want to have, and the way that those families then engage with healthcare, I think, is very different once you've been through something like that. So that, to me, seems an example of a health system boundary that's changed over the years. Since social media in particular.

**Susie Weller**

I think, related to that, with other families who have a diagnosis of a rare or sort of ultrarare disease, then the kind of need amongst some of our participants to find others in the similar situation, takes them across those international boundaries through social media to try and connect with others, to try and make some sense of what's going on, or seek some reassurance, or some ideas about prognosis.

So I think that's really interesting, that it shifts people to think about… and then you've got to look at kind of those other families are in completely different healthcare contexts and experiencing different things with access to different kinds of resources. So…

**Sally Sansom**

I think it's fascinating. And one of the examples that has really stuck with me is in Australia, Massimo’s study? So Massimo’s study was run by a father in Australia, I think, in Queensland, whose son had been born with a rare genetic condition for which there was no treatment. And as far as I'm aware, there was no patient group even for him to connect with. It was, it was really ultrarare, and through a genetic testing process, they were able to identify the variant that was causing the condition.

And I believe his father retrained, and led the effort in developing a compound for the condition, which I think is now, or is close to, obtaining approval. And so I think from a crowdfunding perspective, it's quite different from raising money to pay for an existing treatment. This is crowdfunding resources to develop a treatment, and then go through the regulatory steps, as defined by, by the country you're living in. I just think it's super inspiring. And, you know, I would hope that if I had a child in a, you know, born of the similar, similarly rare condition that I'd have, you know, the strength to do that myself.

But you can imagine, you know, many parents, unfortunately, don't have the capacity or the resources or the know how to be able to do something like that, and it does raise questions about equity and so forth, which I think would be interesting to explore. But similarly, I'd hate to see you know someone, someone like that prevented from undergoing or going through such an undertaking for their child.

**Rachel Horton**

It's fascinating as well, isn't it, with patient support groups developing around conditions, and how much can so quickly be learned from that? I guess the PURA Foundation was one incredible example. I think, did they define the condition in 2014 or something, and then within a really short time frame, had this big foundation researching it, and I think it sounds like the same sort of thing’s happening now with ReNU syndrome, and that was only discovered last year. It's incredible.

But then I guess often the position you're sort of then in clinic, sometimes when a parent sort of knows, like, in many ways, knows more from a Facebook group about kind of shared experiences of other people with the same genetic change, and you've got some paper that was published like last year, but is kind of out of date relative to those really people living with it, daily experiences, and how… The kind of evolution in that… the way information is pooled and accessed, very much influences, kind of clinical settings and how those conversations go.

**Ali Kay**

In a way what we're saying is that families make decisions about whether they need to navigate from one health system to another, and so they can access it, either through a back door or… but sort of a visiting passport to be able to go and access a treatment that they can't avail under their own existing health system.

**Sally Sansom**

I'm not sure this is a new concept. Having previously worked in clinical trials, you would hear of patients, and you know, in my context, from Australia, travelling to a country where the clinical trial was being run because Australia was either too small a market or didn't qualify from a patient number perspective. And so I think this sort of medical or clinical research tourism has been occurring for some time, but certainly is interesting to consider in the context of raising funds from other people to support that for sure.

**Ali Kay**

Yeah, I think when I was training as a patient advocate, one of the things that really struck me was that, because conditions are so rare, the community is by default, international. So the conversation is from the start, an international conversation. And many conversations are about, how can we, you know, develop a drug, but get it through multiple regulatory authorities quite quickly and not have a situation where it's available in some countries and not in others.

**Anneke Lucassen**

One of the other, I think perhaps, more positive views about evolving health system boundaries is, it might also lead to new views on how to treat things. So I'm thinking of the example of wearables that show you heart rhythm problems, and through that, I'm not going to quote the research accurately, but the sentiment maybe, they discovered that people with AF, atrial fibrillation, that were entirely asymptomatic, didn't need treating in quite the same way as atrial fibrillation picked up in hospital as part of investigations.

And I think those sort of observations are going to be incredibly useful, and I can imagine there'd be quite a few more of those.

**Rachel Horton**

So, thank you so much for joining me for this discussion about evolving health system boundaries. I think it's such an interesting one of the themes we've got in the CPM’s new strategy. With diagnosis and treatment, and risk and prevention, our other pillar themes, we sort of… it's easier to get a sense of what they are than something that's evolving and changing. But there's so much opportunity in looking at how things are evolving, and it feels like such a relevant and important thing for the CPM to be exploring. We've got lots of events coming up at the CPM that touch on this theme, and it's always something we're interested to talk more about. Thank you very much for listening to this episode of the CPM podcast.