Episode 7 Transcript

Topic: Longevity for me, but not for thee? Longevity protocols and ethics of healthy ageing.

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Transcript has been edited for clarity.

00:01

Welcome to Mason Institute Investigates, a podcast series produced by the Mason Institute, funded by the Edinburgh Law School. In each episode we investigate current national and global issues involving ethics, law and policy in health, medicine, and the life sciences.

00:19 Leyla

Hello and welcome back to another episode on Mason Institute Investigates. I'm Leyla Noury and I'm joined by Dr Ilke Turkmendag from Newcastle University to talk about her research on longevity protocols and the ethics of healthy ageing. Welcome to the podcast and thank you so much for joining me today.

00:38 Dr Turkmendag

Hello Leyla. Thank you for inviting me.

00:00:40 Leyla

So, could you tell us about yourself and what motivated you to research this topic?

00:46 Dr Turkmendag

Well, I'm a senior lecturer in law, innovation, and society at Newcastle Law School at Newcastle University. So normally I teach medical law, research methods and medical device regulations. I'm interested in the social and ethical issues associated with health technology and especially the new ones, and more generally, biomedicine. So, my Masters degree was on science and technology studies, but then my work took a more sociolegal turn during my PhD and beyond. So far, I looked at the social and ethical issues around donor conception

and the regulatory issues around cross-border reproductive care movements by the fertility patients; the regulation of mitochondrial replacement techniques; reproductive tissue donation; epigenetics, and more recently, the heritable genome editing. So it's been always, my work has always focused on human reproduction and genetics. And I apply insights from science and technology studies, medical sociology, law, and bioethics. So healthy ageing or longevity technologies was not under my radar until the pandemic.

And you asked what motivated me. So, during the pandemic, I used to take long walks. I think everybody did. And I started listening to health podcasts. So, I have a British Academy funded project on epigenetics and it's finished now. But I had that on my mind, and I was already interested in science communication, and mostly how scientists represent their research findings about health. And in epigenetics, we tend to see sensation headlines. A lot of hype, like online media will tell you, you're what your grandmother ate, or you can sue your grandmother because you're sick, that sort of thing. And it's all that simplified and sensational messages will get public attention and that's why probably journals and universities do that in their websites. So, I observed the same thing about ageing and longevity news. I found myself drawn to the sensational claims made by longevity researchers who announced that they're very close to find out how we age, why we age, and how we can reverse ageing. And they were also recommending using certain supplements; red light therapy; use of sauna, hyperbaric chambers. There are big ones in Los Angeles, apparently. Plant based diets, more on the Mediterranean side with some fish; intermittent fasting etc. It's a very, very long list. There's a long list of things that you need to do to expand your lifespan. So naturally I wondered if there was truth behind these claims. And to be honest, I fell down the rabbit hole of longevity.

I think it's worth noting that some claims about longevity were evidence based. There has been some breakthrough in longevity research, so scientists might be close to understand how they can reverse ageing. Yamanaka, a biologist from Kyoto University, won the Nobel Prize for discovering a cocktail of proteins that reprogram adult cells into stem cells. Since then, some researchers, including the ones that I have been following, they argue that proteins can turn back the clock for entire organisms, and perhaps one day humans. So, there's a group that used gene therapy to deliver some of the Yamanaka factors into old mice, and they extended the mice’s lifespan. And the separate team, led by Harvard Medical School geneticist David Sinclair, who I had been following during the pandemic and beyond, followed

a similar strategy to reverse ageing in mice. So, he has this theory of information, theory of ageing, which shows that our bodies get old because of the cumulative loss of epigenetic markers. So, this actually nicely links to my previous research about epigenetics as well, and recently actually you might have seen on the news that the team tested this on mice, and they successfully aged mice and then reversed the ageing. So anyway, it's unknown whether these treatments can be used in humans; if they are safe; if the researchers can decode ageing, which is more complicated process for humans and we are not mice, obviously. But until then, I think longevity fans will stick to longevity protocols, which I was exploring, the daily things that you can do to extend your lifespan, and these are pioneered by the longevity researchers now.

05:07 Leyla

That's an impressive and fascinating development in the science of ageing. But why is there a sudden boom of interest in these longevity protocols and the need to age healthily on social media nowadays?

05:19 Dr Turkmendag

This is a very good question, long one to answer, because I think there are many reasons. So, I think it's good to start with defining what ageing is. We all know that, you know, ageing doesn't look nice always and some of us know how it feels like. But technically ageing can be defined as a decline in the ability to maintain biochemical and physiological function leading to severe disease. Now these diseases include cancer, neurodegenerative disease, cardiovascular and metabolic diseases. We have to remember among all those diseases, cardiovascular is the biggest killer one. So, most people die as a result of cardiovascular disease. Statistics from 2017 shows that 70% of old people die because of cardiovascular disease, rather than ageing itself, but what if we could change this?

One area of anti-ageing research concerns longevity, which is the length of the lifespan independent of the biological ageing process. So, what does this mean? What this means is sometimes our biological age might be different from our clinical age based on various factors that include the environmental exposure to certain things, stress, diet. So, it's closely related to epigenetics in that way. And actually, there are companies who can test you and you might test your blood and they might come back to you and say that you're 10 or 15 years younger

than your chronological age or you are maybe older than your chronological age. So, some of the factors causing this different kind of biological ageing are controllable and some of them you can't control them so longevity researchers share how you can slow down or reverse your biological age, and they profess look at these tests and the test shows that actually you are younger now after you followed our protocols. And you might agree social media is an efficient and low-cost tool to disseminate their research, and also, they gain public recognition this way. I think it's their preferable medium, and this way they can translate their research in the lab to longevity protocols that anyone can apply and also their work gets funded, and they get recognition and it's good for publicity.

So, in my view, pandemic played a role in this, and this is why longevity protocols got so widespread. It's because we got isolated. I think many of us felt that we could not get medical help that we needed because we wanted to give the priority to those who were affected by the pandemic. We got frightened by external health threats that is totally out of control. There's this disease comes, and you know the world is totally paralysed by it. And we got more focused on our own health, like how to improve our own health. We started using and purchasing home test kits, I think using the COVID tests made us more familiar with that kind of home testing. We started reading health news. People started listening to health podcasts. So, I think pandemic made an important impact in individualization of health risk, including healthy ageing.

And during this time, longevity experts engaged with public directly through social media and I would say that them and their followers actually share sociotechnical imaginaries of reversing ageing, extending lifespan. A little bit sci-fi future where people can live very long and are treated by precision medicine. Another factor could be the quantified self-movement, like using personal data gathered through self-tracking technologies like we use these watches, we track our steps. So, this also helps us to monitor ourselves, measure ourselves, because what you can't measure, you can't control, and some people might find this self-empowering stuff helping so, that's another thing, I think. And another reason is availability of affordable tests, health tests, self-monitoring devices, supplements and also telehealth became important I think especially during the pandemic.

And I think also the rise of functional medicine discourse also plays a role which focuses on preventive medicine than treating the symptoms. Another thing is of course, claims making. I'm going to say claims making activities by the prominent researchers like Professor David Sinclair himself, because this is important at the moment. Longevity industry reached a point where further advancements is only possible through public persuasion along with of course increased capital and the research, but in my opinion, persuasion is central and that's what longevity leaders are doing, and this involves constructing ageing as a disease.

So historically, ageing has been viewed as a natural process and we didn't see it as a disease and longevity researchers actively trying to change that understanding. For example, David Sinclair says that if ageing were a treatable condition, then the money would flow into research, innovation, and drug active development right now. What pharmaceutical or biotech company could go after ageing as a condition if it doesn't exist so it's really, really important for them to construct ageing as a disease and actually we can see that that they openly talk about that in their work, especially on their podcasts or their website. I think finally why it's so popular is because also anti-ageing is highly associated with preventive medicine and there is a shift from treatment to prevention and it's not just on social media. There's a lot of governments work as well. Healthy ageing as a social policy in Western countries emphasise notions of responsibility taking responsibility for your own health, self-management and example is the UK Public Health England and Centre for Ageing Better. They both emphasise putting prevention first, as a central principle. They say that people should, from an early age, be encouraged through education, awareness raising and empowerment, to have control of their own health. So, there is actually an individualization of health and personal health management. And you can see that with World Health Organisation's classification of disease as well, the 2019 version of it, merely classified it as a cause of disease, of ageing. So, acknowledgement by WHO of ageing is a major disease risk factor actually opened the door to treating ageing as a disease.

11:47 Leyla

So how did you go about doing your research? What parts of it did you enjoy, and was there anything that stuck out to you over the course of your research?

11:55 Dr Turkmendag

Well, I mentioned the long walks already, so I spent a national lockdown listening to podcasts, following Instagram posts, YouTube videos by longevity leaders, influencers, researchers, and biohackers as well, because actually they decoded these kinds of practises a long time ago. So, biohackers actually easily adopted the discourse of longevity. As researchers do, I also reviewed the literature and there's a number of popular books published by longevity researchers to translate their work and engage with public. I started taking notes. As a qualitative researcher, that's what I do, and I try to identify the emerging themes. I wanted to understand longevity discourse and also the agency of longevity, molecules, processes, and supplements. I also wanted to understand the representation of scientific evidence behind these protocols. I wanted to understand competing knowledge claims, what's in common and what's disputed? Because when you go down that route, you will find that there are many claims which contradict each other. So, it's actually quite frustrating, at the same time exciting and interesting for research. So, the longevity researchers and influences say that ageing is a disease, should be seen as a disease. People die of ageing related disease than ageing itself. And they now understand the mechanisms and they know how to reverse it through certain protocols. So, there's a long list of things that you need to do to extend your life, but these are daily activities. That's why I call them everyday longevity protocols. So, it starts with supplementation. But I'm not talking about supplementation with vitamins. There are certain molecules that you have to take which are very expensive. I can talk about it later on and diet recommendations, stress management, sleep monitoring, activity monitoring, metabolism tracking. Certain exercises are recommended. Some of them are not. Breathing techniques and using implantable devices is an interesting one, such as continuous glucose monitoring to watch whether there's a blood sugar spike and biosensors to check different kind of health indicators, red light therapy, cold and heat therapy; regular blood testing, let's say like every month you get your blood tested and then they tell you about your biomarkers, whether your biological age is now reduced by your practices. So, there is a whole lot of things, and these protocols are very interesting, but the material I collected also got me thinking about the longevity discourse on social media, which focused on individualization of health risk management. And that is, I think, one of the interesting things about my work and the work still continues.

14:48 Leyla

What were some of the key ethical issues and the challenges that you discovered in your research? So, for example, you've mentioned the individualization of ageing risk. What does it mean and why is it important?

15:01 Dr Turkmendag

So, one of the ethical issues and challenges was, the first one was whether of course, these everyday longevity protocols make a change, because that's the first thing you wonder: are these claims true? Is it a hype? Is this information accurate or is it based on myths? What are the truths? So that was the first thing. And I also noticed that, you know, there's a problem with translation of research across multiple different species. I thought that construction of ageing as a disease could be, of course, problematic. But when it comes to individualisation of ageing risk, what does it mean and why is it important? This was actually an interesting theme emerging in every podcast. Before they would discuss the things that we should be doing for a better health, they would say - the host would start by saying- that it's your responsibility to look after yourself. It's not the government's responsibility. You should be in charge of your health. One of the health influencers, who is also the director of the Functional Medicine Institute, Mark Hyman, for example, he always talks about becoming the CEO of your health and this statement, becoming the CEO of your health, is quite interesting, I think. I heard this from many different longevity influencers, partly I think because they're based in the US and Canada, and they do not have a system like our NHS. Now, this might be an empowering discourse for individuals who are resourceful, educated, and affluent. But for individuals with a certain socioeconomic status, there are different priorities than reverse aging. And so, eloquently put by Powell in 2001, “a prevention model dependent upon individual consumption choices and behaviours leads to a situation in which the prudent do not need it, while the imprudent do not deserve it, ignoring the fact that it is the resource rich who can afford this investment in self-care.” So that is the issue. I think that it might be good to become the CEO of your own health, but not everyone can become the CEO, and I think that's one of the most important ethical issues we face when we look at ageing discourse or longevity discourse.

17:16 Leyla

So, the presence of these longevity protocols, so looking at what you eat, self-management and so on; all of these protocols do give rise to a tension between moral responsibility for one's own health and way of ageing and the societal expectations for welfare provision. To what extent, if at all, are the two reconcilable?

17:37 Dr Turkmendag

Well, the claims associated with longevity research definitely create novel ethical challenges in that way. There is, of course, the moral responsibility of the individual. Or we can discuss whether there is a moral responsibility for the individual to manage their health, to make sure that they age healthy. And of course, there is an issue about the relationship between the state and citizens: whose responsibility is this? If we focus on the UK, with the scarcity resources that NHS is facing, there is a value in investing in preventive interventions in my opinion. For example, regular blood tests for important health indicators can prevent disease and avoid age-related disease, or at least maybe if we are aware that, you know, if there's a lot of fat in our blood or our body is not able to regulate sugar, maybe by doing the right kind of choices, with the right guidance and information, we can prevent certain diseases. Now, at the moment, of course these tests are not offered on regular basis, unless you're 40 or 50, then that's your birthday present. And if you are lucky enough to be tested, they seem to say little about the wider picture and this is for example, from the Zoe study, we hear that what you see in your blood at that moment may not actually tell much about how you regulate fat in your blood or how you regulate the sugar in your blood. So, we are learning more and more things drawing on the studies, so personalised health analysis is becoming more important. Every individual has different circumstances and therefore everybody has different kind of ways of dealing with inflammation.

Now, at the moment I understand that these tests cannot be provided by NHS because they are very, very expensive. But there are some efforts to make them available to public, so some of the longevity researchers, for example, they are trying to make the biomarker tests available for $1.00 and if it does happen, probably it would be a big public service. Now this is considered the future of preventive medicine and key to longevity or key to avoiding age-related disease. In the long term, not at the moment, these tests might prove cost effective and NHS can use this test to reduce age-related disease which is probably costing much to

NHS than a test, I mean this is not a calculation I can make, of course, this is something that can be calculated by health economists, but if they're thinking about finding a balance, the work that Zoe Health is doing, so Tim Spector, Sarah Berry and their team educating public about the little changes that people, individuals can make that will help, leading to significant change to reduce inflammation like... I just learned, for example, taking a walk or twitching your legs, even after dinner or after you eat something, helps to regulate blood sugar. This regulation of blood sugar is one of the reasons to inflammation and causing age related disease. And this might be sustainable and cost effective strategy if researchers can share these findings in a, you know, bite size podcasts, or in a way that they can engage in public easily, I think that would make a difference. It could be reconcilable if we can find cost effective ways of sharing research findings with public and if researchers can come up with easy and cost-effective things for individuals to do to manage their health.

21:06 Leyla

You've mentioned a possible role for the NHS. What about the allocation of resources in the NHS between interventions that cure and interventions that prevent? Are there advantages to the NHS incorporating longevity protocols in their services.

21:22 Dr Turkmendag

Yes. So many conditions are caused or get worse by patients' own behaviour. I mean we can't deny that, and some conditions are genetic. There's nothing you can do, but there are also many conditions that can get worse with patients' behaviour. But then NHS has scarce resources so should this be really relevant when allocating those resources, for example. So, I would say that responsibilisation of individuals for their health may provide sometimes good incentive, but it is not a reality because some might argue that accessing the NHS would be the last thing on your mind if you have unhealthy habits and unhealthy lifestyle, for example. If you have a substance addiction that making you poorly, not having access to certain NHS services will not necessarily change your behaviour. So you need special treatment and support to change that addiction first.

So we have to consider, to answer your question, I think we have to consider the reasons why people engage in certain behaviour and how to create a supportive environment where they can make better choices. So poverty, socioeconomic status, social environment,

unemployment, mental health issues, and lack of awareness can be the reasons behind the certain behaviour and people should not be penalised for the circumstances that cause that behaviour, but if there is an emerging knowledge about the habit, lifestyle change or a supplement that will prevent age-related disease, like doing strength training, sleeping as much as you can, avoiding processed food or too much sugar, and if that information is not shared with the public with the fear of confusing them, I think that's a lost opportunity. So, I think there could be a point of incorporating longevity protocols to NHS services if there are things that individuals can easily do, and I think avoiding sharing that information is not helpful. So, I'd rather my GP saying 'Ilke, there is an emerging evidence that strength training is better in avoiding hip fractures than taking vitamin D', I would like to know that. And they can say 'I can't prescribe this strength training, but I think it's worth considering'. I would be grateful for that guidance and I would do my best. So I think, what we are talking about is I don't expect NHS to use these interventions, and protocols or prescribe them as they emerge, but if there are things that will make us healthier, happier and I think there's no problem with sharing them. If there are small things that we can do, like taking a walk after a meal, why not?

23:54 Leyla

But absolutely, I agree. But on the other end of free healthcare provision, there is also the profit that can be made by influencers and companies when they advertise longevity protocols on social media and elsewhere online. Presumably there is a market for it, but how profitable is it? And also, doesn't the presence of profit give rise to bias in the representation of evidence?

24:17 Dr Turkmendag

Well, yes, the answer would be a yes, in my opinion. The things that I mentioned like red light therapy, anti-aging supplements, health drinks and powders, people, we can refer as longevity influencers and biohackers do advertise these products and sometimes, they would sell them directly or they have partnership with the suppliers. For example, we will hear in the beginning of a podcast that they will say, oh, I have Inside Tracker, they are my supporter and please buy their products. I've been using it. I'm very happy. That sort of thing. And some of them,

even founded or co-founded companies which sell these supplements. Some of these people are entrepreneurs.

And I mean, the one that I would be most worried about and at the same time most curious about is something called NMN. These are small molecules, that one can use to extend their lifespan as claimed, and they're very, very expensive and there are many companies supplying these products. Another one is you might be surprised to hear this, metformin, which is a drug for diabetes Type 2 and people actually are using these medicines and they are highly advertised. Again, you can find them, although it's a prescription medicine, you can purchase them in some countries over the counter or they are sold in grey markets. There is resveratrol and rapamycin, the latter is also a prescribed drug. So, studies show that these molecules may extend the lifespan and you might actually find some of these supplements in your food, but not in the amounts that you should be consuming to extend your lifespan. Hence these are, of course, sold, but there are also risks attached to these supplements. So a study showed that most NMN supplements sold online contain no NMN or very little of it. Although these supplements might cost over 100 pounds, just NMN supplements could cost £100 a month, and if you add resveratrol and the others, we are talking about maybe 500 a month. Some people are purchasing snake oil, basically, and some are even purchasing unregulated substances which are potentially dangerous. So NMN may cause increase in tumours, for example, if you have a history of cancer in your family, so not recommended for those who have cancer or have risk of developing cancer. Resveratrol, some people report that they get very sick. Metformin is a diabetes 2 drug, and obviously it has side effects.

So one of the things is then, yes, these are sold and this is actually an ethical issue. It has potential dangers and risks to people and my research actually shows that although potential benefits of these interventions are emphasised on social media, the risks are not always openly discussed. And interestingly for example, in in October 2022 FDA actually banned the use of NMN as a supplement. This caused a significant anxiety in longevity community, which I've been following and among the NMN suppliers, people who really make huge profits out of NMN. So actually the reason for NMN being banned is as far as I understand, they are investigating NMN as a drug, so it shouldn't be labelled as a supplement. So that's why probably FDA put a ban on it. But of course, as I said before, this cause a lot of trouble among the longevity community, both for suppliers and the buyers. So after the ban, David Sinclair

said that it's in the best interest of the tonnes of millions of people who are suffering from anti-ageing disease and appropriate regulation will bring safety and reliability. Which I agree, probably we need to see these supplements being regulated to avoid potential harms and unnecessary profits by some people and companies.

28:04 Leyla

Now, obviously, some of these technologies may not be available to everyone. What implications does the presence of longevity protocols have for health and socioeconomic inequalities?

28:15 Dr Turkmendag

That's very true. I mean, these protocols are definitely not for everyone. The longevity lifestyle is expensive, and I think that's one of the reasons why it is very, very popular in places like Los Angeles, for example. People from Silicon Valley do invest in this kind of lifestyle. They have their saunas built in their homes. They have their infrared saunas, hyperbaric chambers. So normally it will cost you a lot just to buy the supplements. And I'm not talking about all kind of supplements. Just, you know, two or three of supplements would cost you quite a bit, as I mentioned earlier, and let's say these supplements work; as access to free and high quality medical care becomes more difficult as we saw in the UK as well, these protocols might get more common among the affluent people, and this might create further inequalities in individuals' lives based on their social status, socioeconomic status, their gender, race, ethnicity and class.

So even if we cannot stop more affluent individuals taking up longevity protocols, because these products are available and they can purchase them, I think what is important here is attributing responsibility to those who can't. So, if you are saying that individuals who are not taking up these longevity protocols or anti-ageing medicine let's say, are irresponsible, we are actually responsibilising people and it's very problematic. Because individuals have little control over their environments, social circumstances, their income, and the wider socioeconomic inequalities that affects them. But also, we have to remember not everyone has access to this kind of information. I mean, there would be many people who are totally unaware of these longevity protocols and all this longevity discourse. Most people wouldn't even know about them. So, I think we would agree that we don't want a world where only rich

people can enjoy a long and healthy lifespan, but poor continue to suffer from age-related disease because they cannot access to healthcare or take the recommended protocols to live longer and healthier.

And so, one of the things that worries me about the how longevity discourse - I love the idea of living longer or being disease free. It's great. Who doesn't want that?- But the problem is when you construct ageing as a disease, you're also stigmatising people who age. So, our understanding ageing as a natural process actually protects people from discriminated for the conditions that they cannot control. So this is actually an important discursive change. I can see the importance of dealing with or trying to prevent age-related disease and I understand why longevity researchers are trying to make these claims so that the public funding will come and support them more. But at the same time, we have to think about the circumstances in which people are being discriminated because they got old because they have suffered from an age-related disease and responsibilising them for their circumstances and telling them that 'you haven't been good', you haven't acted like a moral citizen, and you got yourself sick'. So that's I think, very problematic.

31:28 Leyla

So, one last question before we wrap this episode. How should the longevity discourse be promoted to the public, and what are the ways that people can be supported to have greater control over their own health and ageing?

31:41 Dr Turkmendag

Well, a successful translation of the research conducted by longevity researchers may be both empowering and oppressive for the reasons I mentioned earlier. While individuals who can afford longevity technologies and supplements and the lifestyle, may feel empowered because now they are the CEO of their own health, those who cannot afford longer with lifestyle might feel disadvantaged, and this is not quite right. Having said that, the public has an interest in knowing the useful practices that can improve their well-being, say it's sleeping 7-8 hours if possible, taking up strength training, doing breathing exercises to manage your stress, walking after eating to regulate your blood sugar, blood fat, eating prebiotics, cutting down sugar intake, not consuming any processed food and I think some scientists are really

good at conveying this kind of information in bite sized forms without making it too complicated.

I think it's important being transparent about how much we know, what we do not know, and potential benefits and risks, or sometimes being able to say that ‘this is complicated’, you know, ‘I don't have an answer’, or ‘it depends’. For example, a suitability of a lifestyle change depends on your age, ethnicity, where you live, the conditions you can control and those you cannot control. For example, if I were to tell a new mum or dad that they should sleep at least 7/8 hours everyday, that wouldn't be fair because that's not going to happen. Or if you are exposed to environmental pollution every day, perhaps it doesn't matter whether you eat your vegetables, because it's going to be difficult to reverse the adversity. I think paying attention to social context is a good practice for science communication and it shouldn't be left to sociologists or ethicists alone.

So, scientists also can consider the social context and how their claims are interpreted by the public. Like I would like to think that I'm an optimist, I would like to think that there are things we can do to prevent or reduce the risk of age-related disease, especially something like cardiovascular disease. And this is outside the discourse of longevity. I mean, we can still have this conversation without longevity researchers tell us how to live. So, I don't think we need to worry about researchers finding the fountain of youth. I think it might be a long journey for them, but during their journey, if they discover practices that can help everyone to have a healthier life, there is no harm in sharing those practises in a responsible manner. What I'm trying to emphasise here is that this responsible manner, paying attention to the social context, talking to people in an accessible, understandable way; keeping in mind that people have limited sources, they cannot follow every bit of advice; being aware of how your research findings can be exaggerated or misinterpreted, misrepresented. So, there's some responsibility that I think longevity researchers should take in communicating their findings. So, I don't want to say that, oh, we should not listen to anything to do with longevity research, because this is going to cause inequalities. But what I'm trying to say is we have to pay attention to how science is communicated, and we should make sure that it's communicated in a more responsible way.

35:09 Leyla

I think that's a great place to end the episode. Thank you so much, Doctor Turkmendag back for coming onto the podcast to discuss your research with us.

35:17 Dr Turkmendag

Thanks so much for having me. It was a joy. Thank you so much.

35:22

Thank you for listening to today's podcast, we hope that you enjoyed it. For further information, check out the links in the show notes of this episode. If you are interested in contributing to the podcast, we want to hear from you. Get in touch through social media or by emailing us. See you next time.

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