

Season 3 – Episode 2 – Dr. Beate Sander

Transcript

Christian Coté

Welcome to behind the breakthrough, the podcast all about groundbreaking medical research and the people behind it at Toronto's university health network, Canada's largest research and teaching hospital. I'm your host, Christian Coté, and joining us on the podcast today, dr. Beate Sander, award winning scientist at UHN's Toronto general hospital research institute and a leading researcher in the field of health economics and infectious diseases. During the covid 19 pandemic, dr. Sander's research, is required reading in health and political circles, providing predictive modeling on everything from masking to ICUS capacity. Dr. Beate Sander, welcome to behind the breakthrough.

Dr. Beate Sander

Thanks, Christian. Happy to be here.

Christian Coté

Let's start big picture, if you don't mind the field of health economics, talk to us about how it originated and why do we need it in health care?

Dr. Beate Sander

It's really a field that is looking at what new interventions, new technologies. Basically, anything we do within the health care system provides good value for money. And that's needed because generally, I think no budgets are unlimited. So no matter where you look, there are always some kind of constraints. So nobody has unlimited money. And so generally policy makers will need to assess if their new technology is new drugs, new vaccines, a new program in terms of how well does it work? Is it effective? Is it safe? But then also think about what do we get for the money we spend in any type of interventions?

Christian Coté

I just want to get a sense Beate, when did this start to emerge as a field that was adding value to health care?

Dr. Beate Sander

In different, different times in different countries, I've been around for a long time now, ready to I'm getting much older, but for sure, maybe I would say 30, 40 years in the big scheme of things. If you look at signs, it's a fairly new field and Ontario was one of the first provinces to actually really implement this idea of what falls under health technology assessment and economic evaluation and used this type of information for this policy decision making. So whether a new drug should be publicly funded or not. And so it's been taking off a lot in publicly funded health care systems like the U.K., Australia, Canada, where we very carefully look at value for money. For example, at the national level, also look at value for money for vaccines. There are many more interventions, for example, in public health that we didn't look at previously, but that are now of interest in terms of making sure we use our resources as wisely as we possibly can.

Christian Coté

A good illustration of how health economics works, is one of your first papers, I understand arising from your 2011 PhD thesis where you assessed Ontario's move to free flu vaccine for everyone in the¹

province. Prior to your analysis, no one knew if this program, which was introduced in 2000, was beneficial because it had never been evaluated. So what made you look into this?

Dr. Beate Sander

well, we basically knew that influenza vaccines generally are effective also some years a bit more, some years a bit less, but generally it's a good thing. We also knew that there is some population groups that are specifically at high risk. So people that have comorbidities, people of older age, health care workers are at higher risk of being infected. And so most of your patients already had a program, which we call a targeted program, where basically influenza vaccination was publicly funded for those at high risk, but in also health care workers. And like you say, Ontario was the first province to introduce a universal program and it seemed to improve overall population health, opening up immunization to everyone would prevent disease in more people. And another kind of effect of opening up the program to everyone would be that you could actually increase vaccine coverage rates in everyone. So not just the ones that it was promoted to, and it's what kind of pilot program, but kind of just taking away barriers. And so everyone had basically just show up easily and get that vaccine.

Christian Côté

What did you find?

Dr. Beate Sander

Well, we did find that I mentioned already that the program was working so we could improve vaccine coverage rates, which don't actually mean that the program would reduce the number of cases by about two thirds. We also estimated that it would reduce the number of deaths from influenza by more than a quarter. And so that means even so, the upfront cost of vaccinating more people is higher. So you're almost double compared to a targeted program. The downstream costs in terms of avoiding hospitalization almost offset that cost? And so it was something that we would consider good value for money.

Christian Côté

This paper of yours, like based on your PhD thesis, had quite an impact. Talk to us about that.

Dr. Beate Sander

Yeah, I think that at the time, most Canadian jurisdictions, most provinces had a targeted program. And so following this analysis was recommended and rolled out in many, many Canadian jurisdictions, I think was 10 at the time, and I'm not sure about the exact number now, but there is additional benefit. We can ramp up vaccine coverage and there are costs avoided down the line. And so it's good value for money for a province to introduce this type of program.

Christian Côté

That's kind of fascinating to have such impact with, like your PhD thesis paper, what did you think of that?

Dr. Beate Sander

I'm not sure if I thought much about that at the time. I think it's never a single paper that leads to any policy change that comes later. I think there's always a body of evidence that comes together at the right time and the right way and that is reviewed by some experts committee and then just some

deliberation. And then there is a decision or it just feels amazing to be able to make a contribution to that process, to be able to provide one piece of evidence that kind of goes into those deliberations. And you kind of heard those committees to make a decision. And as a health economist, of course, it's amazing to also see when this type of information is used, in addition to all the clinical information that we already have.

Christian Côté

All right, let's turn to your research and the covid 19 pandemic. Actually, I want to start several months prior to the pandemic, October 2019, when you give a presentation that I find is really prescient. This was at a UHN event called science in the 6ix. And by the way, to everyone out there listening, it's on our UHN YouTube page. For anyone who'd like to watch. Now at this event Beate, you are profoundly accurate in foreshadowing what was about to unfold around the world. I'm curious back then, was the likelihood of this pandemic a certainty in your mind?

Dr. Beate Sander

Pretty much. I think I was pretty certain that a pandemic will occur in my lifetime. I think we all experienced SARS, h1n1. We knew at least about zika wasn't zika in Canada, but it did spread around the world. There was an Ebola outbreak like, I think things had happened. Of course, the optimist in you always hopes, like maybe not, maybe not later. It's kind of later, it's later, it's later. But I think what I hadn't maybe fully grasped even at that time, was the extent of what evolved now with covid 19. The extent of what we are experiencing right now. I think that was probably kind of, I'd say, beyond my own imagination. Even so, we kind of working with it and we looking back in history looking at the 1918 pandemic, and we know it's devastating and we know what's coming could be devastating. But to kind of live through it, it's just very, very different.

Christian Côté

Absolutely. Okay, so during the pandemic, you're leading Ontario's covid 19 modeling collaborative, where you provide the province modelling on all types of scenarios and their potential impacts, which then inform the province's public health decision making. I'm curious at the outset, back in March 2020, what directives were you given?

Dr. Beate Sander

No directives. I don't know how we started in my own team, and I said many, many teams that provide this type of modelling. Right. So you're one of many. How we started. I can tell you, it's March 15 Friday afternoon sitting in my office with my postdoc, talking about covid, of course, and what's going on in the world. And as modelists we thought well, you know, we really should do something like how this could play out in Ontario, maybe reject one of the models we have, and I called in another one of my PhD students who had some model that we thought might be helpful. And so we keep talking and then bring in one of my other students who is also a critical care physician. So we kept talking about what could we do? And that was at the time when we came all this news came in from Italy, which was really disturbing. Right like we kind of saw ICUs overflowing. And it's kind of our interest was in this type of planning. And so we started modeling and on Wednesday we had something ready. So we started basically Saturday morning and we had our very first version ready on Wednesday morning and that went out. And yeah, the rest is history. Not quite yet, but that's how it started. No directions.

Christian Coté

Okay, so I'm curious then, as day by day, week by week unfolds, what are the what if your group is deciding are the most important to model?

Dr. Beate Sander

At the time, if you go back to March 2020 and I just spoke about Italy, so that was kind of the scary example and it was okay, what if something like Italy's happening in Ontario? So what would that look like in terms of our ICUS capacity? Like how many patients would need would be admitted to hospital? How many patients would need ICUS care? How many patients would need ventilation? And how does this relate to the capacity we currently have in the system? And of course, there were other examples. So Italy was kind of the scary example at that time. There were other countries like south Korea, which had done really, really well at that time. So we kind of looked at this and thought, okay, what if we follow the trajectory of south Korea? What if we follow the trajectory of Italy? What if it's kind of something in between? And that's how it started. And then over time, it just became more refined and refined, and then we would look at different types of interventions and so on.

Christian Coté

So it's like you were self assigned. Can you, can you walk us through the process? Like, how do you get access to the data and gather what you need to power your projections?

Dr. Beate Sander

No, it very much evolved over time. In the very beginning, there wasn't a lot of data, so we very much looked at experiences internationally. That kind of data came from any type of report. So it could be government report, a lot of media reports looking at media reporting on number of cases or risk of hospitalization and so on. I know then kind of there were all those grassroots type of initiatives where people got together and collected and scraped that data off the internet and put it together in an easier format and we were able to download. People started putting out all the studies and preprints. And so things improved over time. And then you started to have Ontario data and it wasn't great in the beginning, but got better over time. And then I think I should absolutely mention modeling consensus table that was founded. I think we started end of March, mid-March, and with that there was an agreement and still is an agreement with the ministry of health to access data. So basically, there are the models that are part of that table, has access to data that we can use for our predictions and then basically are also able to report and it takes approval everything for that. But so I think there's been tremendous data source, especially in the beginning. I think right now, most of that data is publicly available. I think this was pretty unique and different to how research has been done and how those relationships have worked. And in that, you kind of bits in the ministry data were able to set up this portal where they would put in data. We can download that data, for example, on case numbers, hospitalizations or this kind of stuff.

Christian Coté

So prior to the pandemic, in your research, it's all theoretical. Now you're working essentially in real time and it's a crisis. I mean, it's worldwide. Talk to us about the pace of research because you have a day job too correct?

Dr. Beate Sander

Yeah, I do. You know, I mean, most of the scientists we already have a very demanding day job, like it's not a nine-to-five-day job to start with and then you kind of just add on another one. What really changed is what you said, the pace of research. I think, you know, we've always done a lot of research that was very policy relevant, but just a very, very different time frame. So now we are talking about days instead of weeks or months or years. But then there's also the pace of, I would say, knowledge to action, whereas sometimes, you know, pre-covid or non-covid work, you do your research, it takes maybe a year or two or three, kind of publish your paper. Some kind of committee may pick it up. Look at it. Make a decision, right? And so now you build your model in a couple of days or weeks and then you refine it. But as soon as the output, or the findings of that are done like you run it, you communicate it and a decision is made. So it's just the whole process is so much faster. After a year and a half, I think we kind of adjusted.

Christian Coté

What was it like to generate this incredibly important work hand it over to decision makers and then sort of what you were saying there a day or two later you see government react based on what you had generated?

Dr. Beate Sander

Humbling, for sure, it's scary sometimes in terms of like, did we really do everything correctly, I think there are huge implications on this type of analysis. So it's affecting the entire province. It's comforting in a way that generally decisions are not made based on one model only. But that there are multiple models and people look at it from different angles and people review it and so on. But again, the time is so compressed that it is a bit scary, but it's also very rewarding. And to kind of remind yourself that you're better off with this some kind of data, even though it's imperfect. And so it's helpful, I hope.

Christian Coté

Some of this can feel overwhelming. Is there a science to consuming or interpreting your modelling so that we don't feel overwhelmed and make good decisions?

Dr. Beate Sander

You kind of want to look at the big picture, right? So what do the predictions look like? Is that next wave? Or you know what? It is predicted to be greater or smaller than what we have experienced so far. What are the measures we can possibly take? So I wouldn't focus exact, on exact numbers because that's not what the modelling is for, it's really looking at the big picture. So there are usually different scenarios. One is kind of so what if we stay as is, what if we open up more? What if we pull back a bit? And so we say, stay, it is, you know, that curve kind of keeps creeping up, up, up and up. Then in real life, at some point you think someone is going to do something so that maybe policy kind of pulling back and say, well, maybe we need to go back one step in our opening, or maybe we need to do some lockdown or some kind of intervention. But it's also individual behaviour.

So people, in the absence of government intervention, people will also pull back. And we know that now from behavioral scientists. So then people don't go to the restaurant. Parents may pull out their kids from school. And so in that sense, something kind of always happens. So this kind of really severe type of scenarios usually just don't happen for that reason. Right. So and that's not expected, but it is kind of laying everything out there off, what if we don't do anything? Where are we going to

end up to kind of saying well yeah, we probably do want to do something before we end up there, right?

Christian Coté

The modeling you provide can sometimes be a source of friction because the modeling, as you say, can influence policy. Policy can then be implemented. That, as you say, pulls back, which can result in effects on the economy. And people sometimes then go back to the modeling as being the cause of people's, say, suffering during the pandemic in terms of the the pull back in the stages. What's your response to that?

Dr. Beate Sander

I think we learned very early on that one cannot separate health, public health and the economy and that the two of them really go together. So if the population is not healthy, then economy doesn't work either. And I think even right after the first wave, there was already a report by the world bank who kind of looked at what were the mitigation strategies in the different countries and how did that affect the economy? And generally, countries who were better able to mitigate the pandemic really did better. And then part of that report already and what we have seen is really again going back to human behaviour. So if there is no policy, humans will pull back and start to withdraw like not going to restaurants and other things, and what they found is that actually this is often worse and takes longer than when we have some kind of restrictions in place. So it's not necessarily better to kind of wait for this, human behaviour changes.

Christian Coté

It's interesting. It's hard to think of this pandemic without your work, your research, providing insight and guidance to government. And there's such a sense of urgency to all of this. How do you navigate? Like, do you feel pressure?

Dr. Beate Sander

I feel pressure, but it's more out of, I would say, a feeling of responsibility and knowing that, myself and my team and all the other modeling teams that we have the expertise to provide knowledge and to provide this type of evidence that is helpful and that can lead to a potentially decisions that impact the pandemic trajectory in a positive way. And so that would save life, that would make things better. So I think there's two things going on. There's this sense of responsibility to the public, to decision makers, to all kind of stakeholders, but to the greater public good. I say and then there's of course, also with just scientific curiosity right. So I mean, that's why you become a scientist. So yes, I'm curious how things are going to play out over the next four months. And you know, if I have the knowledge and expertise to kind of look into that, of course I will like, I can't keep myself from doing that. Like, that's just impossible.

Christian Coté

I'm curious. Like, you're a mom, you're a daughter, you're a wife. Would you ever allow yourself to react to the model you were revealing?

Dr. Beate Sander

Generally, yeah, of course, I'm worried, I'm worried, just the same as everyone else right, and sometimes I'm not sure if it's kind of better or worse to kind of maybe have a better sense or if I kind of

know ahead of time what I think will be coming. So once the things are in the news. It's not new anymore to me because I'll look into that. It's my every day, all day. That's what I do. And I mean, we do the modeling right, so I kind of feel like I know what is or I think I know what's going to come up or things may play out differently. But so far, I think the modelling's been pretty much right on.

Christian Coté

I want to go back to science in the 6ix, another time in the presentation where you mentioned when you talk about the potential for a pandemic and you concluded that the poor would suffer the most. And it kind of has played out throughout the pandemic. Was there any way to avoid that prophecy?

Dr. Beate Sander

I think there's always a way to avoid that. I'm not sure there is the political will to avoid death, and that's the problem. And that's the same locally or nationally as well as internationally. I think in Ontario, we have seen and, you know, I've been involved in work, so we have work that shows that essential workers, people who live in multi-generational regional households have been disproportionately affected by this pandemic. And often those are also population groups who have a greater proportion of comorbidities, so also putting them at higher risk of severe disease. In some of the work we did that informed our hotspot vaccination strategy, was with this in mind in terms of levelling the playing field a little bit. But of course, there's always more you can do and internationally just look at the vaccine rollout, where so many countries have literally no vaccine and we are talking about booster doses. So I think there's a lot of inequity and unfortunately, the poor did suffer the most and are still suffering the most. And yes, there are ways to avoid that or to minimize that. But it needs the political will to do so.

Christian Coté

You're modeling throughout the pandemic. Do you believe it saved lives?

Dr. Beate Sander

Yes, I do believe it saved lives. I think that's important. Like, again, to kind of map out what could happen to inform action. And so I would think that if you contribute to mapping out those two attack trajectories, that then will lead to action that in some way you would contribute to saving lives and minimizing the pandemic impact.

Christian Coté

I'm curious what the pandemic experience has taught you thus far about how we should invest research and preparedness dollars?

Dr. Beate Sander

Yeah, I wish there was more investment for preparedness, and I should focus on research primarily. But I think there hasn't been a lot of funding into research to build capacity to do this type of work on the fly when it's needed. We were not really prepared for something that wasn't quite influenza, I would say that most of the plans, for example, assume that we will have a vaccine within three to six months. And so that did not happen despite the vaccine being developed really, really fast. I think we really need to invest in our data system. So everyone is kind of counting something and someone has data on critical care and some other pockets, it's a reportable disease data and the case numbers and then hospitals somewhere else altogether. And so to kind of have those data systems that can be

accessed by scientists quickly and that are all connected already and being crucial, I think not having had that in the beginning was challenging. And I think the last thing I do want to mention is what also kind of what's really important throughout the pandemic is to have scientists who speak multiple languages in a way of being able to collaborate with other scientists across disciplines because this is absolutely multi-disciplinary. So you cannot kind of sit within your small area, but then also experts who can speak with decision makers and with the public and kind of convey that information so that it makes sense to others.

Christian Coté

Do you think there will be another pandemic in our lifetime?

Dr. Beate Sander

Unfortunately, yes, I think so. I don't know what the extent will be. I don't know how it will look like a kind of hope, there is nothing like covid again in our lifetime. I hope we are better prepared next time.

Christian Coté

You're listening to behind the breakthrough, the podcast all about groundbreaking medical research and the people behind it at Toronto's university health network, Canada's largest research and teaching hospital. I'm your host, Christian Coté. We're speaking with dr. Beate Sander, award winning scientist at UHN's Toronto general hospital research institute. Dr. Sander's pioneering research is made possible, in part thanks to generous donor support. If you'd like to contribute to dr. Sanders groundbreaking medical research, please go to www.UHNfoundation.ca/podcast.

Now, Beate, you were born in east Germany, grew up in a small town called Lichtenberg, just southwest of Dresden. Your dad was a veterinarian, and I understand starting at around age seven, you would often join him on calls as he went from farm to farm. How did this early exposure to medical practice say, influence your career aspirations?

Dr. Beate Sander

Initially, I would say it was just fun to do. (laughing) I guess what did get me hooked was really two things, so I think maybe initially a more the humanitarian part in terms of being able to do good but also then decide for the, how does it actually work? I think even in high school already, I kind of pivoted more to kind of humans and medicine in general. And I fondly remember really working as a high school student in a long term care home in our community. And I think this also kind of really shaped where I was going in terms of my interest in medicine in general.

Christian Coté

So logically then that holds because you went on after high school to a nursing degree, you became an ICUS nurse. And the backdrop to this time in your life is the fall of the iron curtain across eastern Europe. And then in late 89, 1989, you watched the fall of the berlin wall. This upheaval in your country. What effect do you think it had on your career trajectory?

Dr. Beate Sander

I think it had a massive effect on my career trajectory. I mean, obviously, I think I wouldn't be in Canada, I wouldn't be here now if that had not happened. With the fall of the berlin wall, like having

suddenly all those opportunities, I had never, ever even dared to dream about feeling all this energy and having an opportunity to just start new in some way. At the same time, also, be honest, be really confused about, like all the things you could possibly do unless you had, like, literally no clue about where your parents couldn't even advise you on what to do because the whole country was in that situation. Maybe I'm not going to be a nurse for the rest of my life. Maybe there are other things that I want to do. And so I went back to school and here I am.

Christian Coté

It's amazing to think though of that pivot, right? Like, so you obviously went and exposed yourself to other avenues in health care, like you went to Australia, you were studying in Papua New Guinea at one point. What brought you to Toronto? And then UHN, this is back around 2017.

Dr. Beate Sander

Yeah, I think at that time, basically, like maybe just one step back, I had my nursing degree. I'd worked as a nurse in an ICUS. I pivoted to do business. I did an MBA and economics and then I kind of worked in a sphere, started working in a field of health economics. I had a master's degree. I was working in Germany. I presented at conferences and I met people who were from Toronto and I kind of started talking and it sounded like, wow, this like a great opportunity? So there are opportunities to work in a world class centre like UHN. And there was the option to pursue a PhD, which I was interested in. And Canada had a history in Ontario specifically, in really using this type of evidence for decision making. So there was very, very strong academic program in terms of training and people that do this type of work. I think it just seemed the right place to be, and I'm glad it happened and I came. And yeah.

Christian Coté

Talk to us about mentorship over the course of your career, the role it's played in shaping your career?

Dr. Beate Sander

In terms of shaping my career, I think what the biggest differences always came about when mentors gave me opportunities. So and trust in my capabilities. One of my very first projects was back in Australia, and I was a graduate student working with the health economists, and the government came to him and asked him about actually to model what if there was an influenza pandemic? And he said, "oh Beate, you want to do that?" And I was like, "I don't know, never build a model. I don't know how to do that." He said, "oh, you can't do it. It's okay." I'm like, "ok, I'll do it." And so that's kind of really how it actually all started. So, so it was someone who gave me an opportunity and who trusted me to be able to do it. So in a way, that's what I'm trying to do really with my own mentees that they all have their own journey. They have their own goals. And my job really is to be there to encourage them to listen, to a facility, to provide opportunities. And generally, I would say, you know, really to support the mentees the best that I can, like their success really is my success.

Christian Coté

A part of research involves obstacles, failure and we're not really taught in life or in school how to deal with failure. How do you approach it?

Dr. Beate Sander

It's part of academic life, so it's happening all the time. How do I approach it in general? I say, take a deep breath. I know it sounds very cliché, but that's really how it is. Try to put it aside for a bit. You know, you didn't get that grant or your paper was rejected or, you know, whatever it is, just close that email and then look at it again. Maybe the next day when you kind of cool down. Vent if you need to? I mean, we do it out all the time, have a good friend or colleagues and just complain the hell out of it. And that's okay. If it's a major setback, I have to tell you, I love to clean the bathroom or the kitchen or something where you actually see, you know, you achieve something after you did that. And I still do that, actually. But it also kind of realize it's just part of the academic life. And I think, you know, not to see that actually as a failure, but as part of your growth. And there is almost always some feedback that is really, really helpful. And so pick the stuff basically, that's helpful, ignore the rest and move on. And you know, you be better next time around, and it's okay., I think.

Christian Coté

The covid 19 pandemic has given medical science and research it seems an unprecedented public profile. It almost feels like once in a lifetime opportunity to demonstrate how intertwined research is with health care. I'm wondering when the pandemic eventually fades, will medical science also fade back into the background?

Dr. Beate Sander

I think it would be mixed. Of course, I don't know what exactly will happen. I think there is a need for the scientists to kind of go back to a bit of a reasonable pace. So if you're kind of running that fast, you cannot go into a whole lot of depth, which is also needed. So there's different ways of conducting research. So I think to some degree, we will need to actually kind of fade into the background a bit so that we can kind of hunker down and do the critical research that is needed and that needs to be done. So I think this kind of openness that came with the pandemic is generally it's a good thing, and I hope it sticks to some degree.

Christian Coté

As you enter, say, mid-career Beate and you reflect on your success to date. Are there lessons that you can share that might help young people just starting out in their career journey?

Dr. Beate Sander

So I always say, you know, you have to do what you really have fun doing something you enjoy in your career and something you are passionate about and something you really, really care about. It's a long career like that, so you want to have fun and to not worry too much about what are you going straight path or not? And so my experience is absolutely not a straight path, but you kind of pick up experiences along the way that come together at some point, you know, in the best way possible. So I thought, you know, especially with this pandemic, but even prior to that. So kind of having my nursing background and then having a kind of economics background and kind of almost stumbling actually into this field of health economics, which I didn't know about when I was in high school. I mean, who knows, this type of stuff exists, right? And it kind of brought it all together in the best way because I can use my clinical background to better understand the problems I'm looking at. I hope it helps me or I think it helps me to also collaborate broadly with clinicians.

Christian Coté

There's an author and Simon Sinek who talks and writes about leadership and motivation, and he says, "people don't buy what you do, they buy why you do it." Why do you do what you do?

Dr. Beate Sander

I think there is the humanitarian side of things and that changed from being a nurse and kind of being, you know, it's more at an individual level in terms of helping people in general to the work I do now, which informs policy and it's more on a population level. And the other piece to it is really just scientific curiosity. So that's why I do it, yeah.

Christian Coté

During that science in the 6ix talk you gave back in 2019, you also talked about how humbling it is to see the impact of your work. And today it's still humbling?

Dr. Beate Sander

Yeah, absolutely. And I think I'm not sure if it possibly even more just given the pace like this part that we spoke about earlier right like everything is happening so fast and the implications are very immediate and very, very large, potentially. So, yes, absolutely still humbling.

Christian Coté

And finally, Beate, what's next for you? What should we be looking out for over the next while?

Dr. Beate Sander

Yeah. Well, more research for sure and covid, covid unfortunately, isn't done, and probably not for quite a while. So there will be ongoing work in terms of the modeling and informing kind of the day to day or month to month decision making. We are right now as today we are in the fourth wave, so there are things going to come for the fall, but there's also the longer term kind of plan. Again, there's more on covid research terms, you're looking at long covid, for example, there is research should hopefully be informing at some point how we organize our health care system. I think there are things that we need to change, and a system has already changed during the pandemic and kind of how we can maintain maybe some of those things. And going back to non covid things which will also be fun and you know, fall is coming, I'll be teaching, I'll be training our students, which is one of my favorite things to do, really. So other than research? Yeah.

Christian Coté

Dr. Beate Sander, award winning scientist at UHN's Toronto general hospital research institute thank you for sharing your groundbreaking research with us and continued success.

Dr. Beate Sander

Thanks so much Christian. It's my pleasure to be here. Thanks.

Christian Coté

Dr. Sander's research is made possible, in part thanks to generous donor's support. If you'd like to contribute to her pioneering medical research, please go to www.UHNfoundation.ca that's all one-word UHNfoundation. Ca/podcast. And for more on the podcast, go to our website. www.behindthebreakthrough.ca and let us know what you think. We love feedback. That's a wrap for this edition of

behind the breakthrough, a podcast all about groundbreaking medical research and the people behind it at the university health network in Toronto, Canada's largest research and teaching hospital. I'm your host, Christian Côté. Thanks for listening.