

Episode 8 – Kidney disease in our changing world: challenges and opportunities

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Peter Kotanko

Welcome to the Renal Research Institute's Frontiers in Kidney Medicine and Biology, where we share knowledge and advances in kidney research with the world.

In today's episode of Frontier's in Kidney Medicine and Biology, we discuss the intersection between kidney medicine and the United Nations Sustainable Development Goals.

My guests today are nephrologists Dr. Valerie Luyckx and Dr. Marcelo Tonelli, both collaborate with the World Health Organization, the International Society of Nephrology and other international bodies to advance the field.

They have made significant contributions and raise awareness in the kidney community on this important global topic.

It's a great pleasure for me to welcome Dr. Valerie Luyckx from Zurich, Switzerland and Dr. Marcello Tonelli from Calgary, Canada, to this week's series of Frontiers in Kidney Medicine and Biology.

Actually, the topic of our talk is really kidney disease in our rapidly changing world. And both of my guests have a lot of experience dealing with global questions regarding kidney disease.

I want to start off with a question actually, Valerie, for you. Can you say a few words about the United Nations Sustainable Development Goals? What do they mean? What are they? Just to ground our audience.

Valerie Luyckx

Okay, thank you, Peter. And thank you for inviting me to participate. So the United Nations Sustainable Development Goals or for short, the SDGs are actually 17 goals that evolved after the millennium development goals which were adopted in 2000. In order to try to improve health, but not only to improve health that was not the primary goal. And were finally adopted by all the countries that are signatories to the United Nations in 2015.

The largest goal is reduced poverty, to improve equity, to improve the health of the planet, and the circumstances in which people live and work, as well as protecting the environment, and encouraging peace and collaboration. Because there was recognition that we need this extremely holistic approach to try to achieve healthy people living on a healthy planet, which is really the best way forward for all of us. And, so each of these 17 goals are aimed at achieving components towards the bigger goal, and only one of the 17 is actually related to health.

Peter Kotanko

Yeah, so that's very interesting. And I think those goals are more important than ever. I mean, when they look at them. So I'd be interested, Cello, how did you actually become interested in those SDGs?

Marcello Tonelli

The SDGs are a transition from the Millennium Development Goals, which were the first set of goals, and I became aware of those when I was a junior faculty member in Edmonton. And I was really struck. The Millennium Development Goals were more focused on health, but they were equally aspirational to the sustainable development goals and they had targets like, we're going to halve world poverty, we're going to cut rates of HIV infection by 50%.

And, so, a lot of the goals were about health. They were also about development and the link between health and development. I was just fascinated by these. They were quite different than you know. I love being a nephrologist. I love focusing on kidney disease. There are many reasons why nephrology is a very attractive career. But on the other hand, you're looking at a very focused piece of the health equation. And what I liked learning about the Millennium Development Goals was how broad they were, how they were so bold and ambitious, and how they highlighted the links between good health, wealth, development, security, all the kinds of things that we would aspire to for our children.

So, I became interested in them back then, and I followed their progress. I wasn't involved in any way. But just as an admirer as I watched development agencies act on these aspirational goals. I think the one take-home message for me from all of this was that what gets measured gets done. You know, we've heard what gets measured gets managed, and the bottom line is, if you don't look at something and measure it systematically, you're not going to see improvement.

So I became interested in these goals back at the time of the Millennium Development Goals.

I tracked their progress, and I've been very interested to see their evolution into the Sustainable Development Goals, as Valerie mentioned, which are less explicitly about

health, and broader, about societal benefit. And I think this topic came to your attention because of the work that Valerie led on how the SDGs might link to kidney health. And, so that was really Valerie's idea and her leadership that put those two ideas together, expanding on how, what's in it for nephrologists?

Peter Kotanko

You're absolutely right. It was really Valerie's work that caught my attention. I think also the attention of other nephrologist colleagues, globally. Valerie, how did you get involved interested in the SDGs actually?

Valerie Luyckx

I think you know, as Cello also just mentioned, the millennium development goals were great. We were all quite enthusiastic, exactly as he said, what gets measured gets done. And the bottom line as nephrologists, the focus from the health point of view was maternal and child health, HIV, TB and Malaria.

When countries sign on either to achieve the MDGs, the millennium development goals or the SDGs, they are then required to actually show their progress. And a lot of the development agencies also started to put money into these four categories, and countries were achieving progress, but basically forgetting everything else or not forgetting everything else, but diverting a lot of resources to achieve these very defined goals.

And one of my research interests and academic interests since being a Fellow with Barry Brenner at Brigham, was the idea of developmental programming. And when one thinks about how the fetus develops, one has to think the mother has to be healthy, because a healthy mother will have a healthy baby, who has a better chance of having healthy kidneys throughout their whole life. And, so in trying to go through that, one starts thinking, what is a healthy mother? She has to be well fed, well educated, strong person in a strong environment, etc. And all of that really takes you back to this idea of primordial prevention of kidney disease, which is really making sure that every mother is as healthy as she can possibly be and as safe and as flourishing as she can possibly be. And, each mother is in a society, and that means the society has to be flourishing. And so really when the SDGs came out I started to think, well, this is quite obvious. You make an extremely healthy person and the next generation will be healthy. And I think the focus on well- being rather than illness is what attracted me as well.

Peter Kotanko

I have to say, Valerie, this is just so fascinating. I mean, when I think back in my personal and professional key reading in the - I guess - 1980s, about Barry Brenner's work on developmental programming on organella nephrogenesis, et cetera..., who would have thought that out of this concept spawns the realization that actually, it's part

of a much bigger picture, right? And that actually, it's maternal health, which is a function of societal choices that are made, and so this is really fascinating to learn. So really, thank you for sharing your story. Now, I'm wondering Valerie, and maybe I'm sure, Cello would also want to add to this: what actually is the intersection between kidney medicine and the SDGs.

Valerie Luyckx

And also, just to backtrack, a tiny bit sorry, Cello, Cello was actually leading together with Profs. Adeera Levin and Kai Eckhardt the Global Kidney Health Roadmap, , and that's how Cello and I, together, got involved in this, because this roadmap was also going all the way from prevention through care. And, so, I think that's how we started to realize that there was synergy, also coinciding with the Lancet Kidney Campaign, at the time. So, I think there, Cello has also facilitated a lot of this moving forward.

Peter Kotanko

Yeah, thank you for adding this important point. Cello, is there anything you would want to add given the way how you got involved?

Marcello Tonelli

I think the first is that on the face of it, the interesting part is that you can trace a line between these broader goals and kidney health specifically. You know, the example that Valerie gave, and that you mentioned, as well, who would have thought that those would link, but I think and that it's very interesting to see those links and to know that there will be a benefit for kidney health.

We're all citizens, we are all hopefully concerned about the well-being of the planet of future generations. And I think the flip side of this is, there's something on this list for everyone. There's something on this list that everyone can get excited about, no matter where you start.

And I think, for me, part of it has been: I'll just pick an example, Sustainable Development Goal number five. You know, I have a daughter who's now an adult, of course. I believe in gender equality and empowering women and girls, but it wasn't until thinking about the MDGs and the SDGs that I realized that there would be explicit benefits for health, generally, and also for development.

Now, that seems obvious after a couple of decades of thinking about it. But I think the second point I just made is that there's something on this list for everyone. And I think it should be getting us outside of our specialist box. That's how I think we can all make contributions in our areas, specialists or sub specialists.

Whether we work in an academic, hospital or community practice. We are the experts, the content experts on kidney disease, and that's great. But we also have a role outside our immediate professional lives.

I think as citizens, people look up to health professionals and those working in the field of health. And I think that's where, for me, that's been this sort of consciousness broadening.

I don't think of myself as a particularly progressive person, but this list has been helpful for me in terms of my personal development about thinking these things and why they're important. So that's been a source of personal satisfaction as a result of the work on the MDGs, these early series in the Lancet that Valerie talked about.

I started reading The Lancet for interest. And it was the only medical journal - still is really - the only medical journal that I read just because I'm interested, rather than because I need to keep up my content expertise. I just read it because I think it makes me a more knowledgeable citizen-scientist. So, that's what comes to mind when I think about the SDGs and the MDGs, before that.

Peter Kotanko

Thank you for sharing this story, and it's always interesting to me, personally, and I guess also for our audience, to understand how people could actually become interested in something. How did they get involved? What I'm taking away that you had different points of departure, in a way, but then your interests clearly converged, and you joined forces to advance this field in such an outstanding way. Now, I'd like to come back to my earlier question. So where do you actually see the intersection between kidney medicine and the SDGs?

Valerie Luyckx

Across the 17 SDGs, and we can definitely make a case for every single one of them. The obvious example is maternal health but there are many others.

We all think about access to clean water. We have to remember that there are still billions of people without access to clean water. An enormous amount of schools where children can't wash their hands, where there are no toilets and things like that. There are 4 billion or so people who get diarrhea every year. There's around 800,000 people who die of diarrhea every year and we have no clue, and this is one of the things, hopefully that will come out of the Sustainable Development Goals, the idea that we need to measure the burden of kidney disease better, but we don't know how many of those 800 million people dying of diarrhea are actually dying with AKI or of AKI, if they don't have access to dialysis, for example.

We know that something as simple as educating girls, so improving education for girls and boys, because worldwide, there are fewer girls enrolled in schools than boys. For every year that a woman is educated, it raises her out of poverty, improves the health of her own children, improves her ability to actually earn more. So, there are all these snowball effects.

So each one of the SDGs can, translate into something. We know occupational health for example, with a CKDU epidemic in Mesoamerica or in India, or Sri Lanka, it's people who are working in conditions that are suboptimal.

I think there's another part of this is that, in medicine, we're often going out and asking everybody to help us, give us money. Whereas, here, if we, from health, are also advocating for all the other SDGs, we are also being better citizens, as members of the health system.

And, also, don't forget that as the health system, we can actually contribute very constructively to a lot of the other SDGs, not only for advocacy, but also practically, because health systems are actually very common places of employment, training, education, opportunities, etc.

So, there's a give and take here, rather than health and the health system and the sick, always being these passive recipients of something from outside. And I think this helps us as nephrologist to try to also be more proactive and advocate. And I think the critical thing also is that there are so many other diseases that are linked with kidney disease like cardiovascular disease, cancers, etc., all differentially impacted by the SDGs. But everything then all comes together.

Peter Kotanko

It just shows the interconnectedness of promising questions. Cello, what is your view on this intersection between kidney disease and SDGs?

Marcello Tonelli

I think Valerie put it very well. For those that are interested in a really detailed list, our publication in the Bulletin of the WHO in 2018 has a list. I think I'll just highlight a couple of things. So, the first is just to reiterate what I said before, which is, there's something on this list for everyone.

If you're thinking about kidney disease specifically, you can find a development goal and you can trace a line to how it will improve kidney health, and that's sort of my take-home message. One specific one, I will highlight something that is close to my heart in the health area, the idea of universal coverage for health care, universal health care, UHC, ensuring that everyone has access to a minimum basket of drugs and medical services.

And why is that important? Well, it's pretty simple. We get a lot of the bang for the buck with preventing kidney disease with access to good primary care, cheap, simple, easy to use medications that either prevent kidney disease from developing or slow its progression. So I think that's why every person that's interested in health should be interested in universal health care and strengthening primary health care systems worldwide.

The other point that I would like to make is about the impact of these initiatives, and how does poverty, how does development fit into that? We have just come from the MDG era, where there was tremendous optimism, huge progress, goals being met that have halved this or doubled that. And that's where the SDGs came from. There was a real sense of optimism with the SDGs at the beginning of the SDG era, because economic growth seemed just explosive. It seemed that just by simply continuing to allocate a small amount of our wealth in richer countries, and then even the poorer countries would continue to have growth and they could set some of that growth aside to make these goals possible.

But looking at the world today, it looks different now, doesn't it? We're in the middle of a pandemic. We're all focusing on infectious illnesses. There's retrenchment, there's been a change in global politics unrelated to that. And so we are seeing backsliding on commitments, and I think also some loss of interest and loss of momentum.

So what to do about that? I'm not sure. I think it's just to remain optimistic and to remember that, you know, we are going to emerge from this pandemic, and we have to keep some of these aspirational goals in mind for the future, not just these sterile "Build Back Better" comments that you read in the newspaper, but really committing to do these things by setting aside a relatively small proportion of our gross domestic product in rich countries to address these goals.

And the final point is, I completely agree with what Valerie said, which is that it's nice to think about wellness, not about just taking care of sick people, to think about health as a more holistic concept. And because there are so many goals and so many of them linked to better health in one way or another.

There's an idea called *health in all policies*, which means that when we see a policy made by government, whatever that policy is about, that probably it has an impact on health. The example being, you know, we could pick any policy, but let's pick roads. Let's imagine that a country decides to deprioritize road repair or road development, you know, it can do that – it may be a very valid choice. But *health in all policies* says that when you're thinking about proceeding with a policy, and you're assessing the pros and cons, always remember to apply a health lens.

If you're a decision maker, and you choose to forego road maintenance, you will have weak transport infrastructure, which in turn will lead to preventable deaths that you otherwise would have avoided-- avoidable hospitalizations -- and then for the nephrologist it will lead to an increased burden of kidney failure. And maybe catastrophic expenditures related to kidney failure from trauma. And those are real consequences that might not come to mind without explicitly considering health up front. And if you had considered them, maybe you would have made a different choice about the roads.

So, it's just a way of thinking, and I think that it's, you know, I'm a Canadian person and Canada has been a leader historically in the development of *health in all policies*. We'd like to see more **health in all policies** in Canada, but we'd like to see more of it in all countries. I think it helps get us into this SDG mode. That will help us think about how to improve more health, more broadly.

Peter Kotanko

I think, Cello, the example you just gave highlights that the interconnectedness and making a change, place A has an impact on place B, C, D, E, and this is something that really is important to recognize and to consider. Let me follow up with you. Cello what in your mind actually, the biggest impediment to advancing kidney medicine globally?

Marcello Tonelli

Wow. That's a good question. I think very simplistically about kidney health, I don't immediately leap to dialysis or kidney transplantation or something. As I alluded to earlier, my thoughts gravitate towards the availability of cheap, simple, protocolized medications that integrate with the other NCDs like diabetes and hypertension.

So, I think that the two main threats that are interlinked - one is a lack of a system for financing and delivering those cheap simple medications. And the other is siloed thinking, which is that each specialty often promotes its own goals to the exclusion of others, often with the best of intentions. We are kidney people, so we think - kidney disease is important - let's stamp out kidney disease -- and we go forward in this way. It's beautiful, it's progressive, and it's well meant, but it may miss opportunities - the big picture - where, you know, maybe it isn't about kidney disease, maybe we don't even need to measure kidney function. Maybe if resources are limited, we just focus on blood pressure and diabetes control, and that will take care of most of the kidney disease without spending a lot of time and energy on diagnostic tests and follow-up that don't much change management for most patients. That's just an example. But I think those are two of the big threats. And then, of course, looming in the background is that as we emerge from this pandemic, we all retrench to a more selfish way, globally speaking, of thinking, that holds us back on these lofty goals.

Peter Kotanko

Thank you, and Valerie, is there something you would want to add or provide your point of view?

Valerie Luyckx

Yeah, I think something that's slowly gaining recognition, and a lot of this comes from the work of Margaret Kruk who's at the Harvard School of Public Health, she's published some phenomenal papers, is the *quality* of health care delivery.

I think we need the right medicines; we need protocols, we need health care workers to be aware to make the right diagnosis at the right time, give the right treatment, and the person needs to be able to get enough of that treatment at an affordable price to be able to really control the disease.

Let's say, their blood pressure. Because in the study of Margaret Kruk, I think it was 2018 there were about 8 million amenable deaths in low and middle income countries, of which 5 million were actually because of poor quality. So, 5 million people got to the Health Care Center and were not treated appropriately. Three million died because they never got to the Health Care Center. But we often think people don't have access. They don't get to the clinic in the first place. But what we have to realize is, very often, they get there and the quality of care is not correct. And, so, I think it's a huge barrier.

And exactly, I think what Cello mentioned is this idea that we mustn't bring kidney disease as a whole extra new list of problems, diagnoses, etc. It's the same thing as when you have a patient with heart disease, stroke, diabetes and kidney disease. You tell them to follow a diet - the patients get scared - and they think oh no, I have three or four different diets that I have to follow. It's one diet to keep themselves healthy. And I think this is the same thing with prevention of these cardiovascular disorders. We need to simplify it so that policymakers and managers don't have to think we need multiple different programs. We need an integrated approach and a quality approach. And a lot of that depends on all the building blocks of the health system being in place -- sustainably and reliably. And financing is obviously critical to the whole process.

Peter Kotanko

So, we discussed the lipid thing, impediments. I'm really wondering, do you think that or do you see really serious efforts by societies, international bodies, industry to improve the situation and more specifically also kidney health?

Valerie Luyckx

Both Cello and I are involved with the International Society of Nephrology, they are trying to reach out globally. I think we've seen amazing steps forward in the American Society of Nephrology in terms of funding now for transplantation in terms of innovation. I think

the European society is trying and I think every national society is trying to improve kidney care in their countries.

I think in terms of industry, some large companies are trying on a large scale to support, for example, blood pressure control. I agree with that. But I think industry has a lot of conflicts of interest, Regarding the dialysis industry specifically. we know that there are between two and –three million people every year who die because they have no access to dialysis and there is still reluctance to decrease prices, to improve transparency about pricing, to improve delivery of supplies or allow, manufacturing locally, etc.

So, I think industry tries. I think they may have the will, but I feel there's a lot more that could be done. And, I think the societies try, but they also are not action bodies. They're largely more advocacy and training. The ISN has done a lot of capacity building in terms of training nephrologists and creating opportunities. So, there's definitely hope, there's progress and also, now, patient groups are gaining momentum and having louder voices. And, hopefully that's also going to somehow bring a little bit of a change.

And I'm hoping that this global focus on inequity for vaccines, and this idea that the pricing is still not being brought down adequately for vaccines,.we can leverage in the kidney world now that everyone's aware of the inequity in terms of vaccines. Why not extend this to other, unfortunately, expensive care like dialysis.

Peter Kotanko

I'm so glad you bring this up. I was thinking really, around the question of vaccination, immutability of vaccines. This kind of a lens, that, on a really global level highlights the inequality, and to an extent that it, at least, I cannot remember that has ever been done before. So, I guess, more people now are aware of health inequalities globally, than they have been before the pandemic. I don't know Cello, do you agree with that, or do you want to bring in a different perspective?

Marcello Tonelli

No, I do agree with that. I am just smiling because I I have heard many times, read many times as we all have, how the pandemic has laid bare this or that,and, you know, it sounds a bit snotty, but my response is to people who say that: you just haven't been paying attention.

Saying that the pandemic laid these things bare – well, they were there all along, and it's just, we talk about them a bit more now. So, I do think it's more top of mind for many people today, and we only have so much capacity to think about things, but whether we live in a rich country or a poor country, there are gaps and inequalities everywhere, and there are gaps that we see every day in access to care.

I think I'll just come back to what Valerie said. I completely agree with what Valerie said, I'm a huge fan of the work of the ISN. I think it's been amazing. I think it's actually helped the other kidney societies like ASN to see the value of getting involved because, the ISN's work is a worthwhile endeavor in its own sake, but it's also very rewarding.

And I think that's why the other kidney societies may be offering these things as there's a demand for it. People want the society members to contribute by participating. So that's to be celebrated.

On industry, I think part of it is, you know, companies are companies, and they have a responsibility to their shareholders. They're not there to save the world, and everyone understands that.

I think where there may be opportunities is to show where interests align of society and of industry. So back in around 2003, 2004, I started working with Dr. Guillermo Garcia, in Guadalajara, and I became aware of a company named PISA, which is a Mexican company that makes dialysis equipment, made PD equipment and also made hemodialysis equipment. Ait also helped to run dialysis units, as I recall.

And, what I thought was really progressive about this model was that the company was paid a lot, it provided heavily subsidized materials for peritoneal dialysis, which was most of the patients who were indigenous, couldn't afford it.

The hospital and charitable organizations paid for some of the care, but the company made a big contribution. Why did it do this? Yeah, it did it because I thought that it was important to help Mexicans, but also because they knew this would give them a foothold over the long game, decades long, which has come to fruition, and they're, you know, a big player in that marketplace.

So it's trying to show those pathways where being a good citizen really is rewarding for everyone. And, you know, I'm a little skeptical also, but I think there are some of those opportunities, and that's what we have to highlight, whether they're for vaccines, or they're for dialysis equipment.

You know, on that note, one other thing while I think about it, is SGLT2 inhibitors, so if we're thinking about nephrology, we're sort of at this crossroads, right? We have these super exciting new treatments. And they're very promising and, and if you look at what the companies are doing, and you know, this is what I would be doing too - it's very similar to what we saw anytime a new drug comes out like epoetins for anemia or cinacalcet for hyperparathyroidism.

We're now seeing strongly led corporate efforts from companies that make SGLT2 inhibitors to show hey, there's lots of kidney disease and so there's lots of people that would benefit from our new drug. And that by itself is great for kidney advocacy. But what we need to see is a coupling of that advocacy with efforts to make those medications accessible. Wouldn't it be wonderful if SGLT2 inhibitors were part of that low-cost basket of treatments, and then we could really expand the number of people that were receiving those drugs, which would help the companies, but it would also help the people with kidney disease, keep them off dialysis and keep them healthy.

Peter Kotanko

Absolutely. This is actually a very optimistic outlook, that there are also new, interventions on the horizon. It's not just dialysis; there is the preventive field. There are many, many opportunities ahead. Well, I mean, we are coming slowly to the to the end of this conversation, which I have to say, I tremendously enjoyed and learned so much from the two of you, just because it happened recently. The first xenotransplant from a pig was connected to a human. Do you think that xenotransplantation will actually change the equation in the near and midterm future, or is this too far out? And what do you think will the response of society speak to that?

Valerie Luyckx

I think it's obviously hopeful, but it definitely feels extremely utilitarian to generate these animals for this. Also going back to the SDGs, we all know that meat eating is a huge load for the climate; it generates a huge amount of CO2 and all this. I don't know what this pig sort of generation would lead to in terms of climate change, etc.

I think if you're thinking of the sort of millions of people on dialysis waiting for a transplant, this would have to be, millions of pigs. So, there's a lot for me of ethical aspects. I think it's extremely high-tech. It's extremely sophisticated. And so definitely, at least in the short term, and probably even in the medium to long term, this will not be the answer to global transplantation.

And then I think we have to recognize that pigs are not animals that are considered acceptable by various populations in the world, for example Muslims, Jewish people, etc. And, so, in a way this may even discriminate against certain populations. So I think this is complex. I think it's phenomenal that science is taking these steps forward. I think it's amazing, but I struggle a little bit from the ethical side. But again, if you can provide life to people, one has to really think what is justifiable in order to do that. So, I was interested to read about it in the New York Times, but, yeah, I don't think it's a simple answer.

Peter Kotanko

And I think that might be the most honest answer. This is a really difficult question, but we have to face it because this will happen. Cello, what do you think about that specific topic?

Marcello Tonelli

Well, I think you got a much more thoughtful answer from Valerie than you would get from me. I'm from Alberta. It's like the Texas of Canada. I'm a meat-eating kind of a redneck nephrologist, you know. So, yes, there are clearly ethical issues to be resolved with xenotransplantation.

I'm also a not very ambitious thinker, and I congratulate Dr. Montgomery and the team. I think it's wonderful what they accomplished. We need people like that - visionaries - that are going to keep moving in that direction.

I'm confident though that xenotransplants are going to happen. It's just a question of when, whether they're going to be, you use the term short or medium- or long-term success. Because I'm a pessimist, and I believe more in these lower tech solutions. I think that's how we will best meet our short and medium-term goals. But we know from these pithy aphorisms that because of exponential growth, that we all underestimate the benefit over 10-to-20-year horizon, because there's so much growth at the exponential end of the curve as new developments occur. So, I might be wrong, and maybe xenotransplantation will be a viable solution and make a big difference within our lifetimes. Very interesting question. Thank you, Peter.

Peter Kotanko

I find both of your answers really interesting. Just much more to think about. It's always when these sort of breakthroughs happen when one is inclined to be overly enthusiastic, maybe and, and forget about, you know, that there are questions around the corner that need to be addressed. Like the ethical ones that Valerie raised. So, as I said, we are coming to the end. May I ask you, Valerie and then Cello: What is the most important point you would want to bring across to the audience?

Valerie Luyckx

I think the biggest thing is the focus on equity. We need to try to improve equity in all spheres. And I think that's the heart of the Sustainable Development Goals. And I think that's how we, as a society, can actually move forward. And I think that's related to COVID. And I think it's related to kidney disease. It's related to everything. So, I think we just need to be more conscious in terms of trying to support equity wherever we can. And hopefully somehow if we all try to achieve that, problems will almost solve themselves.

Peter Kotanko

Thank you, Valerie and Cello, what point or points would you want to bring to us as the take-home message?

Marcello Tonelli

Yeah, it's an excellent question on a complex topic. For me, I think that my take-home message is that although these goals look lofty, they look unobtainable, pie in the sky. I believe they are achievable. And I believe that the Millennium Development Goals showed us that if we put our minds to these goals, no matter how difficult they may seem, that we can achieve things over time, over decades, that seem unimaginable and I really think we should not give up on these goals. We need to turn our attention back to them. As the pandemic moves into the rearview mirror, we need to turn our attention back to these and make them happen in some way.

Peter Kotanko

So, thank you both. And on that optimistic outlook. I think this conversation has come to an end. I really, really want to thank both of you. This was just a wonderful half hour, and as I said, I learned so much from you, and of course we were only able to touch on a few topics without the ability to go really deep. But I think you provided some very important insights. Really, thank you, and have a good remainder of the day.

Thank you for joining the Renal Research Institute for this episode of Frontiers in Kidney Medicine and Biology. We invite you to engage with us on our social media channels. and look forward to seeing you again for the next episode of Frontiers in Kidney Medicine and Biology.

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