EPISODE 5: CLIMATE CHANGE'S IMPACT ON HEALTH

Garry Aslanyan [00:00:09] Hello and welcome to the Global Health Matters podcast, I'm your host, Garry Aslanyan. Increasingly, we've all been experiencing the effects of climate change. Most climate change predictions show an upward trend in temperature for at least the next nine decades. On average, global temperature is expected to rise by up to three degrees in Africa by the year 2050. Climate change is as much of a local issue as it is a global issue and requires collaboration of various stakeholders, such as governments, NGOs and the scientific community. Rural communities whose health and livelihoods depend more directly on the environment have a greater vulnerability to these effects. Climate change has caused these communities to also be increasingly affected by neglected tropical diseases. These challenges are pushing researchers to identify and develop adaptive strategies in response to climate change and the associated burden of disease. For this episode, I had the privilege to speak to Paul Gwakisa a few weeks ago who shared with me his rich experiences in working with the Maasai communities in Tanzania. Today, I'm speaking with my colleague Pierre to reflect on the valuable points Paul raised. Pierre is the programme officer at the chemical and health branch of the United Nations Environment Programme. Hi Pierre, thank you for joining me today.

Pierre Quiblier [00:01:40] Good afternoon. Pleasure to be with you Garry.

Garry Aslanyan [00:01:42] To start off, Pierre, you've had a very interesting career from studying political sciences and business management to journalism, and now you're working with UNEP. Could you maybe tell me how your early experiences shaped or informed your career?

Pierre Quiblier [00:01:59] Well as you know, I originated from the French Alps and so very early on, being confronted and living as close as possible to our wonderful mountains, the challenge to climb them and their magnificent beauty, and I think that that has probably led me to take the environment very seriously early on. But I must say that also the link to policy, my father having been always involved in associations, sports associations and so on, and the capacity to live together and within a policy that makes sense to each and every one. That is something also that has convinced me perhaps to take this long road of environmental policy development.

Garry Aslanyan [00:02:52] Great, thanks. We're ready to hear from Paul. To give our audience some background on Paul, Dr Paul Gwakisa is a professor of immunology in Sokoine University of Agriculture in Tanzania. He leads a research group in the Genome Science Center whose interest is on vector-borne diseases. His over 30 years of experience researching have contributed to better understanding of the relationship between people, livestock and rural livelihoods.

Paul Gwakisa [00:03:29] Our project base is the Maasai Steppe in northern Tanzania. This is south of Kenya in East Africa. This is home to pastoralist Maasai people who live far from urban areas and usually with large heads of cattle and usually close to wildlife areas. Now the area, the Maasai Steppe is a large grassland area with unpredictable rains and long dry seasons that lead to long droughts. So the droughts, as well as the ecology of the area and

the culture of the Maasai people, prompt seasonal movement of the people with their livestock in search for water and pasture. In doing so, this pushes them to encroach into protected areas close to wildlife where they encounter disease vectors, including tsetse flies that transmit trypanosomiasis. Hence, the people become vulnerable to these diseases. Now, the first major effect of climate change, therefore, is drought and frequent movement, or call it pastoralism. The droughts affect livelihoods, food security, as well as human and animal health. Secondly, I would say that climate change in the communities we work causes a combination of health effects through emergence and reemergence of diseases. Recently, we see reemergence of diseases which were previously controlled or eradicated. Due to climate change, diseases are now reported in new ecological areas where they never occurred before. But also prevalence of some diseases has increased. For example, a cattle disease called foot-in-mouth disease, previously occurred once a year, but now the disease may occur two or three times per year. The third effect of climate change on the health of animals and humans is likely due to increase daily temperature and erratic rainfall. The land supports growth of Allium invasive plants, which are poisonous to livestock. Such invasive plant species are a big problem in some parts of the Maasai Steppe and influence quantity and quality of pasture, thus affecting livestock productivity and susceptibility to opportunistic diseases. In the long term, this sums up to insecurity at household levels. And lastly, competition for land use, or I would call it human-human or human-animal conflicts. Climate change causes this. An example of human-human conflicts would be in terms of a competition for land use, like between crop farmers and livestock keepers. But an example of a human-animal conflict would be when humans encroach into wildlife areas. Any such conflicts over years increase human displacement and poverty.

Garry Aslanyan [00:07:04] So we just heard from Paul Gwakisa, and clearly the lives of Maasai people in northern Tanzania have significantly been affected by climate change.

Pierre Quiblier [00:07:17] Yes, definitely. And Paul has provided us with a perfect, most comprehensive description of how climate change and human activities in fact, has impacted every corner of our ecosystem. And climate change as a result of these human activities puts the health and the well-being of billions of peoples at increased risk. We can characterize, as Paul has characterized, all the risks affecting his population, but all populations all around the world are affected by direct risks related to climate change. These direct risks are extreme weather events, floods, droughts, wildfires, we've seen them in Australia. We've seen the recent drought affecting one of the richest countries in the world, Germany, with the most capacity to address these increased risks, and more than 130 people died out of sudden flood in their country. That's for the direct effect of climate change. But when we look at the indirect effects of climate change, these are important on securing our food and water security, as well as all the spread of climate sensitive infectious diseases, as described so well by Paul in his in his description of increased risk affecting his population.

Garry Aslanyan [00:09:01] So what you talk about is really something that you probably have seen in plenty of examples from other places or other examples in the region. Let's say in this case, of course, it's in Africa, but as you mentioned, in other places. So this really is one example of many.

Pierre Quiblier [00:09:20] But what is important is that if we can see that climate change affects everyone, we could say yes but it affects also some more. It's that there is a certain injustice in this climate change and their effects. If most of the greenhouse gases that are responsible for the effect of this climate change originate from wealthy countries. We could say that their biggest impact, the health impact, the impact more most of developing countries and mostly vulnerable populations. They impact more the small island developing States with the sea level rise. Let me remind you that most of our cities and urban development occurs within 60 kilometres of the coastline. We are putting our people most at risk in this. The polar regions....

Garry Aslanyan [00:10:23] Clearly, so many different things are involved here and you work for the Environment Programme, what do you do around this? How do you approach this? It sounds so overwhelmingly sort of challenging and so big. How do you approach this?

Pierre Quiblier [00:10:43] Well you know in the past we thought that by strengthening our environmental ministries, bringing the environmental voice forward, building our scientific capacity to understand these environmental threats was extremely important and that regulations could be negotiated and that we could build conventions and regulating most of these threats and convincing our decision-makers that engaging and committing to these various conventions is possible and would be the best way. Despite all these efforts and some progress, the challenges remain immense, as you just said. And so it is now more and more through integrated approach and integrated policy and tools, bringing together various experts in various sectors such as the health, the environment, how can we work together in a more integrated manner? This is the focus of our policies and the development of these policies these days.

Garry Aslanyan [00:11:53] You mentioned something in advance of this discussion about a plan that was developed in Africa for health and environment ministries. Remind me again, what was that?

Pierre Quiblier [00:12:06] That's probably the Libreville Declarations that you're referring to and which I had the greatest pleasure and honour to contribute to its initiations, development and implementation. And that was a very important event in giving and providing and making the best out of the African leadership in promoting an integrated approach. When ministers of environment and ministers of health gathered at Libreville in 2008, they recognized that individual actions would not be enough, that we needed a global action. It's that whatever the efforts of Paul, or whatever the efforts of the most determined Maasai, cannot do anything in pushing back the threat due to climate change.

Garry Aslanyan [00:13:00] When you say integrated, you mean between health and environment.

Pierre Quiblier [00:13:04] Between health and environment. But that individual actions, whatever their importance, and they remain very important. But you need a global commitment. You need a common effort. You cannot combat, battle, all these effects of climate change by yourself. So when these health and environment ministers gathered, first

they recognized that at the regional level we could make an important contribution to the common objectives at the global level, and that they could take a leadership toward a transformative change, transformative actions at the continental level. They realized that if health and environment sectors work together, or within a strategic alliance, they realized that the value of environment and health could be brought forward and to the highest of the policy decision-makers working on economy and development frameworks. Because that was important to change this economic and development framework. So that is very important. That created an unprecedented intersectoral dialog between the health and environment sectors.

Garry Aslanyan [00:14:25] So how do these ministers of health and environment hear from people like Paul?

Pierre Quiblier [00:14:30] When we gathered in Libreville, when we gathered again in Luanda, and again in Libreville in 2018, most of the communities and their experience was also communicated to the ministers. The ministers themselves have all along these 10 years of intersectoral dialog, at their level, also came up after having consulted their communities and strengthening the message and the importance of involving the community and of developing also policies that would be relevant to these communities.

Garry Aslanyan [00:15:20] So what Paul is doing really is very interesting and very much needed, because basically he provides the evidence to policy-makers to build their thinking as they discuss these things. Let's hear a bit more from Paul as he explains the relationship that Maasai people have had with environment and how diseases such as sleeping sickness are emerging as a new threat again.

Paul Gwakisa [00:15:52] To understand the lives of the Maasai people and how climate change has influenced them, one has first to appreciate that the lifestyle of Maasai people is completely intertwined with the welfare or rather the health of their cattle. Cattle are central in Maasai livelihoods. We also say cattle are the lifeblood of the Maasai people because they serve as a source of income, food as well as security. So climate change directly influences the livelihood of Maasai people because it affects livestock grazing patterns, nutritional status and health of their cattle. So the social, ecological and environmental factors force the people and their cattle, to take pastoralism not as an option, but rather as a coping strategy for sustainable livelihoods. In Maasai culture, and Maasai lifestyle, seasonal migrations are very common and these have important traditional values, a) in terms of preservation of pasture resources, allowing the pastures to recover between seasons, but also the seasonal migrations have a traditional value in terms of avoidance of disease infested pastures, which are usually shared with the wildlife. Working with the Maasai people, I got to learn from the Maasai elders that they describe their relationship with the environment being quite delicate and it is guided by ecological landmarks such as specific trees or permanent water sources or grassland pastures, or other resources on which their livelihood depends. You may be surprised to hear this, but some sites in Maasai communities are conserved as sacred sites, based on historical narratives and are protected by community laws and norms. There are Maasai taboos and bad omens related to destroying such resources. This is so strong that decision-making at family or community level many times is embedded in the relationship

between society and environment, and these are protected by unwritten cultural rules which are invisible to an outsider unless you have been trusted and welcomed into their daily life. So in brief, to give you a picture of the Maasai culture and the Maasai life, the Maasai people have kept their culture over centuries and regardless of an individual's level of education or wealth, their daily lifestyle, habits and choices are strongly influenced by culture. For a number of years our research in the Maasai Steppe focused on a disease called African trypanosomiasis. This is a zoonotic disease, meaning it's a disease which is transmitted from animals to humans. And in humans, the same disease is known as sleeping sickness. This disease in humans affects close to six million people in east and southern Africa. Now, in Tanzania, sleeping sickness used to be highly prevalent in the Maasai Steppe, like 20 or 30 years ago. However, due to effective prevention strategies, sleeping sickness is no longer perceived as a major public health problem among pastoralist communities now, and hence the disease has been listed as neglected. However, we as researchers know that changes of climate and changes of land use threaten to trigger reemergence of this disease. So our focus was and remains to use multi-sectoral and transdisciplinary approaches to understand how changes of climate and changes of land use influence the social life of the Maasai people and their adaptation to sleeping sickness. As I said before, this disease is zoonotic. It affects animals as well, cattle in particular. So the disease can affect up to 90 percent of a cattle herd where it causes abortion, infertility, a significant drop in milk production, as well as death, and hence causing reduced household income. And I told you before that cattle are central in Maasai livelihoods.

Garry Aslanyan [00:21:17] So Pierre, when talking to Paul, it's clear that there are some other important aspects of addressing climate change and really the relationship with the environment is influenced by culture and religion. We already talked about how some of the research done by Paul and his colleagues gets to that discussion of policy-makers, how do these other aspects get discussed? How does that happen?

Pierre Quiblier [00:21:56] Not enough I would say, my dear Garry. It is extremely important. You know, we dedicated a lot of time in understanding the ecosystem services, the biodiversity, the climate change, the pollutions, all these planetary crises. But the causes of it and understanding the cultural diversity and the history and the potential contribution of indigenous people who we have to recognize that they have lived the longest on this planet without having extincted one single species, they know how to manage their resources in a sustainable manner. And that's actually exactly what our dear Paul is saying. He is saying that they know how to manage and they know how to respect the resources because they know that if they manage their resources well, they will be rewarded by the resources. If they poorly manage the resources, environment will strike back and much more violently than anybody in their community could do. So this is a knowledge that is poorly captured so far. And there is an ethical, moral, spiritual and cultural contribution to be made on this, on our challenges to achieve sustainability. And so far, it has been not neglected, but poorly addressed. We should have perhaps a summit on the spirit, perhaps, of sustainable development that could bring our most experienced people, and particularly the indigenous people, and their contribution in helping us to track the roots of sustainability. This is a very important aspect, and it is wonderful to hear a top level scientist such as Paul recognizing the importance of local knowledge and how we could bridge this local knowledge with the best of our science

today. But we need to do more at our health level, within our health sectors, within the environment sectors, when we do these integrated policies; how to bring the capacity, the scientific capacity of these indigenous people, to recognize their traditional knowledge, to bridge their traditional knowledge with the best of our science and scientists today in addressing and in better understanding climate change, its impact, its origin, biodiversity impacts, the links with zoonotic diseases, how to prevent emergence or reemergence of these pathogens. This is extremely important and I think building the capacity of indigenous people, while recognizing theirs, would be extremely important in the future. We have to convince our decision-makers within our respective programmes, WHO, UNEP, that there is a need to fund this strengthening of capacity of indigenous and local people if we want to have very effective alert systems and preparedness policies in the future to prevent very costly new diseases that are affecting the entire world. And perhaps COVID-19 is one very good example of what will happen to us if we are not able to mobilize local communities and traditional knowledge very early on in our chain of decision-making, I would say.

Garry Aslanyan [00:26:12] I agree Pierre! Mobilizing local communities and using their knowledge is fundamental in helping us face these challenges. We have seen through the work that TDR supports, how engaging various sectors and communities is key in dealing with the remerging zoonotic diseases.

Pierre Quiblier [00:26:31] You're so right, Garry. But you know this is very challenging. It seems very obvious from our expertise, and when we listen to the description of Paul and with his community, but we have been shaped by the expertise and living in an ivory tower, being right, and we don't care whether we are right for the others or not, because our scientific community, very focused, doesn't care and it will be the only one that will reward you. So there is very little incentive to nourish this cooperation, this knowledge exchange. Culturally it's very poor. There's a lot to be improved there because we are not lacking expertise, we are suffering from a lack of expertise sharing, of knowledge sharing in between experts, economists, law experts in regulations, scientific assessment experts in health, in the environment, all these will have to work much more closely together if we want to make some major headway in the future to tackle these zoonotic diseases. Zoonotic diseases represent 75 percent of all infectious diseases and now COVID is a zoonotic diseases. And we expect more and more of these diseases. If we are not equipped with the best preparedness, if we don't have the best early warning system for that, we won't be able to tackle it.

Garry Aslanyan [00:28:31] Let's hear a bit more from Paul about some of the solutions that they have developed in order to address sleeping sickness in the Maasai communities.

Paul Gwakisa [00:28:42] So in order to support the Maasai community in dealing with this disease, we developed in a participatory manner, three innovative solutions. First, we trained Maasai communities, on appropriate vector control using pesticide impregnated traps and pyrethroid parasites on livestock to remove tsetse fly burden. Secondly, over time we used community engagement strategies for what we called ecohealth partnerships, which bring together local authorities, stakeholders from research and the government, but most importantly, the community members themselves and drive the whole partnership. And thirdly, we developed an early warning system for decision-making. Where cattle may be

taken for grazing with low tsetse burden, but with plenty of water and pasture. This was a smartphone based application linking data on satellite images for precipitation, temperature and water bodies with local environmental data on tsetse density, infection and disease prevalence. So any community member any pastoralist, as long as he has a smartphone, can make a prediction where to take his cattle for grazing.

Pierre Quiblier [00:30:14] Extraordinary. Garry, as a discussion, what is in common in all these measures and approaches that our dear Paul took here, is that they are all preventative. They are all along the prevention. There's none of curative here. He's not talking about vaccine. He's not talking about confinement. It's all about prevention. And when the public health wants to take, it's measures seriously, it has to talk about preventive actions. And when you talk about preventive actions, you have to consider your environment. And that's exactly what Paul is doing. And there's nothing better than this in order to protect world populations from deadly disease in the future. It starts at the local level with a preventive policy. Now, the question is, how do you make this understood by decision-makers and funders? Because this costs money also. To build an early warning system at the local level, there's many local populations, how do you mobilize them? How do you sustain the feeding of this? This is very important. If I may, Garry, as an outcome of our Libreville Declaration, we created the ChemObs - Chemical Observatory funded by the Global Environmental Fund. And this was to better predict, prevent and reduce chemical risks. What we wanted here is exactly what Paul is doing. It's sharing the expertise between health and environment sectors to better understand what is the chemicals that are threatening mostly the populations, give a tool, what we call a vulnerability calculator, to determine which populations and which priority issues is most at stake. So there is already this sharing of information between the two sectors and the other industrial and agricultural sectors and so on. And after it is to use also this with another calculator to better evaluate the cost and benefits of the interventions to be taken in order to convince our decision-makers that it makes sense to invest on preventive actions. It is just an example that is going exactly along the line as our Paul.

Garry Aslanyan [00:33:02] Pierre, you correctly point to the importance of both the health and environmental sectors collaborating. Let's hear from Paul again, who also emphasized the importance of multisectoral and transdisciplinary collaboration in realizing the One Health approach.

Paul Gwakisa [00:33:21] The success of any research project depends very much on collaboration between all stakeholders. It is of very high importance that all stakeholders feel ownership of projects. And stakeholders, mean the community members, the researchers, local government authorities and all the way up to central government authorities. So over the years, I have developed a triangular approach for implementation of my research projects whereby project objectives are derived from communities, then solutions are engineered in the laboratory using multidisciplinary approaches. And finally, findings are shared and tested and disseminated back in communities. Such a triangular research implementation assures a strong local community participation, equity, social innovation, capacity building and the sharing of best practices. Over the last five years or so, we knew that our research success depended much on our relationship with the Maasai people, and trust building between them and us. So we took the local people not as study participants but as partners in research. At

the end, we wanted to co-create innovations with communities so that we can introduce culturally relevant solutions and apply a broad approach to health improvement in which vector-borne infections, trypanosomiasis inclusive, is reduced and the community resilience is enhanced. I see opportunities for future work and as I said before, we need to take into consideration a transdisciplinary approach. Research should not be just theoretical, but the research should be interventions, really. And that is how communities can be addressed so that problems that are really faced by communities can be researched upon. So research objectives should come from the communities and recent solutions then should go back to the communities. Like this, we may be doing research for implementation and not just research for publications.

Garry Aslanyan [00:36:11] So Pierre, when we talk to Paul, he really underlined this important aspect, that not only what is being researched but how it's being researched is super important and also I really love the way he described the need to cocreate or blended approach to knowledge creation, where you have the scientific and local approach and also allowing for a bottom up approach where the community informs what's happening in the process of research or understanding of the trends that are happening. At the global level where your work, is there a way to harness that knowledge or these approaches and try to apply them in some of the strategies? How do you do that?

Pierre Quiblier [00:37:14] First, what an insightful and visionary experience and testimony from visionary statements from our dear Paul again. What is important here in this techno blending, and all of this possibility of intersectoral dialog and to connect all these various stakeholders and identifying problems to come back from the community, to come back with the solutions for the community, this is really what needs to be done. And this was already a challenge to be done at the community level. And fortunately, our dear Paul and his community is showing us the way. Still I have to say that we are far from this result at the global level. If you think about it, we still remain within forum of experts based on sectoral forum. We have our World Health Assembly, we have our United Nations Environment Assembly, we have the development sectors, the agricultural sectors, the industrial sectors, but very rarely we have all these sectors working together and identifying the problems together, coming back together with the solutions, implementing, intervening together. This remains because we are still expert at competing over limited resources rather than cooperating in order to make a difference at the community level. And we have to admit that. We still have to define some forum where research we can have this techno blending to provide the best assessment as possible at the global level, as Paul is describing it. We still have to provide a forum to provide an intersectoral dialog between the health, the environment and the economic sectors. We still have to have a forum where multisectoral engagement of the public sectors with the private sectors and the civil society can have really a negotiation process, identify who is responsible for what and committing and engaging a set of engagement that is still needed.

Garry Aslanyan [00:39:50] Is there anything done to address that?

Pierre Quiblier [00:39:53] No, we tried. We have, for example, within this regional forum through the Libreville Declaration where we facilitated for the first time this intersectoral dialog between the ministers of health and the ministers of environment. And we have reached but it is still a battle, a struggle to convince all the donors, all the funders to recognize the value of this intersectoral dialog. How much can it create in terms of research? How can it make our policy more effective, less costly? All this needs to be also brought forward. I would say we need to come up with results on the few examples that we've been able to develop with scientific evidence as well as economic evidence. It's not all scientific, it's also how we can make the best of this scientific knowledge in translating this scientific knowledge into economic types of arguments to convince these decision-makers that there is a value in preventive health and in working together between the health and environment, as Paul is doing within his research field with his Maasai community. This is a concrete example that needs to be expanded at the global level. There's still a lot to reflect and most of our researchers can reflect on this, on how we could have negotiation processes in the future that can be more integrated. Perhaps along the lines of the Libreville Declaration.

Garry Aslanyan [00:41:39] We will hear from Paul one last time as he shares his memorable moments from working with the Maasai communities, and especially how much he was able to learn from working with them.

Speaker 5 [00:41:50] Memorable moments working with Maasai communities? Number one is when you are outside the communities, you just don't know enough about the people. You think that you are going into remote areas. Indeed they are remote areas because there's no tap water, there's no electricity there are no flush toilets, so it's a different lifestyle. But then once you enter the community homes, then you start seeing the human side of it all. That these are pastoralists, but they live in certain areas where they have a living and they have a lot of local knowledge and traditional knowledge, let me call it, that makes them survive under those conditions which I just described. For example, they eat a lot of meat, but they also eat other things which maybe in urban areas we don't. But surprisingly, they also use a lot of herbs which help them to keep fit, keep healthy in those environments. So for me, the memorable moments are to get to learn more about the local practices, the local knowledge, the local ways of going around things or issues like health, water, education, etc. When you sit close to Maasai elders, they like learning from you, but then as you want to talk, they also talk. And then you find yourself that you learn more from them. You want to tell them of problems which are academically defined, but they tell you solutions which are locally solved. So this needs a balance of minds to understand that it's not that we are going to teach or to get information, but rather we are going to listen and to enjoy not only the work, but also the social parts, the community life within the Maasai communities. They like giving gifts. They like roasting meat on firewood so that they welcome you to their delicious local meals, which is right in the bush, but very tasty. And I enjoyed doing some of these as well. One has to be there to testify that Maasai culture is really a treasure that should not be lost.

Pierre Quiblier [00:44:56] Thank you. Thank you, Garry, for bringing forward these important reflections. It is of greatest value. And I think history is being written when you listen to this. And it is coming really from the heart. And a good scientist needs to have also some emotion and knows how to tell and to relate to and for observing in a better manner, for understanding

some pattern. I think this is a very vivid witnessing of an experience of tremendous value. Paul said it very well. He said first two things that strikes; the notion of trust is very important when you want to interconnect expertise, but also that local knowledge should not be lost. You know in biodiversity, within the biodiversity community, when we try to assess what we are losing, we have a problem because we don't know what we have. So the first thing in biodiversity is already to know what you have before knowing and understanding what you are losing. I would say it's a little bit the same with our knowledge. And local knowledge would be very important to take stock of all this local knowledge, before understanding that we may be losing it. So that's a first effort that really needs to be done. The third thing that I think is important from Paul is, is this experience replicable everywhere? Is that there is an identity, that there is a diversity that needs to be recognized, and can we replicate this approach everywhere? And I must say that it is extremely challenging at the global level to achieve exactly the same thing. How would you be able to bring within one single environment, host city, all this local knowledge because they are so diverse and so numerous that it might be difficult. But there is certainly some possibilities to represent most of them and to take stock of all this knowledge. That is the task that is ahead of us, and that we do hope that with reflections on how to build integrated policy, we can move forward and perhaps achieve our sustainable development goals as early as possible. One last word, perhaps, is that I would like through you to make sure that Paul will be invited in one of the big forum of our environment, whether within the Libreville Declaration context, or in Nairobi, because I do think and I'm convinced that most of our environmental experts will be delighted and very inspired. That would be great. Thank you. Thank you Garry.

Garry Aslanyan [00:48:14] I want to thank our audience for joining us today and remind you of the additional episode resources we have available on the Global Health Matters web page. Here you will be able to view a video of Paul and his work with the Maasai communities. If you have liked this episode, don't forget to give us a five star rating.

Elisabetta Dessi [00:48:45] Global Health Matters is produced by TDR, the Special Programme for Research and Training in Tropical Diseases. Garry Aslanyan, Lindi van Niekerk and Maki Kitamura are the content producers and Obadiah George is the technical producer. This podcast was also made possible with the support of Chris Coze, Elisabetta Dessi and Izabela Suder-Dayao. The goal of Global Health Matters is to provide a forum for sharing perspectives on key issues affecting global health research. Send us your comments and suggestions to tdrpod@who.int and be sure to download and subscribe wherever you get your podcasts. Thank you for listening.