

**TIME Global Health Summit  
How Can Malaria Be Contained?  
November 2, 2005  
9:00 a.m. EST**

Real progress has been made in combating the diseases of poverty, such as smallpox, trachoma and guinea worm. But other diseases, like malaria and TB – which many in the developed world believe have been eliminated – are still major causes of death. If eradication isn't possible, then what will it take to contain these killers? Speakers consider the challenges and possible solutions.

**Panelists:**

Dr. Paul Farmer, Member, Board of Directors, Partners In Health/Program In Infectious Disease and Social Change

Dr. Maria C. Freire, President and CEO, Global Alliance for TB Drug Development

Bishop João Somane Machado, United Methodist Church, Mozambique

The Hon. Charity K. Ngilu, Minister of Health, Republic of Kenya

Dr. Steven C. Phillips, Medical Director, Global Issues and Projects Medicine and Occupational Health, Exxon Mobil Corporation

**Moderator:**

Philip Elmer-DeWitt, Sciences Editor, TIME

At the TIME Global Health Summit, held in New York Nov. 1-3, TIME magazine convened leaders in medicine, government, business, public policy and the arts to develop actions and solutions to the world's health crises.

More information, including archived Web casts of sessions, transcripts and downloadable photos, available online at [www.time.com/globalhealth](http://www.time.com/globalhealth).

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PHILIP ELMER-DEWITT: So, let's get on with the panel – the first panel, which turns out to be mine.

So, could the members of the malaria TB panel step forward as I call your names. Dr. Steven Phillips, Medical Director for Global Issues and Projects at ExxonMobil Corporation, could you come on up, and take the far seat.

Joao Machado – Joao Machado, the Bishop of Mozambique, the United Methodist Church.

Dr. Paul Farmer, professor of medical anthropology, Harvard Medical School, and co-founder of Partners in Health, come on up.

Charity Ngilu, Minister of Health, Republic of Kenya.

And Maria Freire, President of the Global Alliance for TB Drug Development.

And to get us started, let's get a clip from "RX for Survival."

(VIDEO)

DEWITT: All right. So, we're going to spend the next hour talking about malaria and tuberculosis.

And the question before us is basically this: With all the collective pharmacological, biological and medical expertise available to us, why are we losing this battle? Why are 1.2 million or 3 million, depending on how you count, people dying of malaria every year; 1.7 plus million people dying of TB? And why is the situation not getting better, but getting worse?

And we'll try to get to the factors that created this problem, the barriers that make it hard to solve, and see if we can't find some strategies for just overcoming them. But first I want to just cover the basics. Let's start with the diseases.

Paul, you're a clinician. You probably see a lot of malaria and TB in the countries you've been in. Tell us what these two diseases look like. When then come into the clinic, how do they present themselves?

PAUL FARMER: How long before you gong me?

(LAUGHTER)

UNIDENTIFIED PARTICIPANT: About a minute.

PAUL FARMER: One minute. Oh, that's easy. Thank you, Phil.

(LAUGHTER)

Malaria is a very acute disease. Someone comes into the clinic, you know, a mother and a child for example, and they'll say, "Well, I was OK." Usually they won't say "fine." I was OK, and then suddenly I started having a fever and a shaking chill." And this is malaria in contrast to tuberculosis which is a chronic disease. You know, someone will say, "Well, I lost 15 pounds and was coughing and had night sweats."

Malaria is very different. It's acute and the clinician, the doctor, the nurse, the community health worker is sitting in clinic hearing about this extremely nonspecific problem: fever, chills, and one of the biggest problems is, well how do you diagnose malaria. A lot of the times you just say, "Well, I think it could be malaria. I'm going to treat it." But as it the disease becomes resistant to the safe and cheap medications like Chloroquine, it's harder and harder to do.

And the drama, and I know I'm out of time, the drama of malaria is that if you don't act quickly, it can be rapidly fatal, and tuberculosis tends not to be rapidly fatal. But malaria, you know, a kid comes in and you know, two hours later they're dead. And you can bet that in the household there won't be a bed net, there won't be insecticide on the wall, because of whatever fashions, international fashions or environmental movements will have taken that tool away.

The other kids, the other family members with malaria in the household won't have diagnosis, much less treatment.

UNIDENTIFIED PARTICIPANT: We'll get to the (bed net). Thank you, Paul.

OK. Now let's talk about the bug, the science behind it. Dr. Phillip Stevens, you got involved in malaria because it started to kill Exxon-Mobil workers building a big pipeline across Africa, and Exxon-Mobil doesn't like its workers to die, so you got involved in trying to deal with that.

But you know a lot about the lifecycle of this, and it's a complicated lifecycle. And we're going to try to keep this short, so focus, if you want to learn about exactly how malaria works, Google it and someone will explain it to you. But let's focus on what it is about this lifecycle of this parasite that makes it hard to beat.

STEVEN PHILLIPS: Right, and I'd like to keep the audience awake, so I won't go through the whole lifecycle. But I think the practical question, Phil, is what does it take to beat the disease in terms of the parasite characteristics.

And, you know, the parasite's interesting. If you look at it from its own viewpoint, it doesn't want a whole lot out of life. It wants to have a human blood meal and to reproduce. And it has very ingeniously co-opted the mosquito to help it get some human infected host, and back to the mosquito again.

So from the standpoint of beating it, you have to simultaneously attack the infected human host with the proper antimalarial, and also get the mosquito, and in terms of why that's important, typically, like Paul said, see infected patients with malaria one at a time in clinics, but to beat malaria, you've got to think population. You've got to think geography. You've got to think villages, districts, on up.

UNIDENTIFIED PARTICIPANT: OK. We'll get to that stuff too.

All right. On TB, Maria Freire, you're like the world expert, one of the world's experts on TB drug development, so tell us about the bug and what makes it hard to beat.

MARIA FREIRE: Well, you see tuberculosis is a very old and the microbacterium is a very old and wise microbacterium. It's a very old problem for humanity. It has an impermeable layer. It has four, the membrane and the cell wall essentially renders the microbacterium completely impermeable.

But not only that, it's able to have two forms, at least, to it. One which is the active form of the bacillus, which we can pretty much take care of fairly short-term, but it also hides in the body and it hides in the cells that are meant precisely to do away with it, the (microphages), so we not only have to attack a fairly small growing and difficult to penetrate bacillus, but one that also lays latent.

A (quarter) of the world has it. So while we have 8 million new cases of active TB a year, 2 million people die, but a third, there's a reservoir of a third of the world that has this bacillus slowly waiting for its time to show up.

UNIDENTIFIED PARTICIPANT: Very good. OK. Now, Bishop Machado, I got that right?

JOAO MACHADO: Yes.

MARIA FREIRE: (INAUDIBLE)

UNIDENTIFIED PARTICIPANT: I understand you had malaria more than once.

JOAO MACHADO: Yes, I can say that 85 times since I was born I had malaria.

UNIDENTIFIED PARTICIPANT: You had malaria 85 times?

JOAO MACHADO: Yes.

UNIDENTIFIED PARTICIPANT: What were you doing wrong?

(LAUGHTER)

JOAO MACHADO: Maybe I can say the wrong thing I was doing is to be a child of poor family, it's just that, and in poor country, where we still see the children dying today because of malaria. This is (mine).

UNIDENTIFIED PARTICIPANT: And you've lost family members to malaria?

JOAO MACHADO: Yes. I had just about 5 years ago two nephews died of malaria.

UNIDENTIFIED PARTICIPANT: And these are nephews of, your brother had died earlier.

JOAO MACHADO: And then these nephew was like my kids because (INAUDIBLE) and they died because of a resistance to malaria, as a doctor said. They (INAUDIBLE). When its resistance, it's very difficult when you are far away from the big hospital where they can give Quinine or something like that.

UNIDENTIFIED PARTICIPANT: So, they were given one treatment and it didn't work.

JOAO MACHADO: Yes.

UNIDENTIFIED PARTICIPANT: And then were given another treatment and it didn't work.

JOAO MACHADO: Yes.

UNIDENTIFIED PARTICIPANT: And then they were put on a ...

JOAO MACHADO: They were gone. In less than a week, the children gone.

UNIDENTIFIED PARTICIPANT: Paul, is this typical?

PAUL FARMER: Alas, especially in Africa and anywhere else where there's drug resistant disease, it is all too typical. And I think, you know, there are other people here are going to know the latest epidemiology, but in many of the places where we work most of the malaria is drug resistant, meaning resistant to at least Chloroquine. And a lot of it is a term we don't even use very much, MDR malaria, multi drug malaria, and the bishop described, I'm sorry to say, a very common scenario in Africa.

UNIDENTIFIED PARTICIPANT: Charity, I'd like to get a feel for the impact of malaria nationwide. You're the minister of health for Kenya. What does this mosquito do to your country?

CHARITY NGILU: Of the two million people who die annually, worldwide, 90 percent of these are from sub-Saharan Africa, and although malaria is not difficult to treat, it becomes impossible when you do not have the drugs, when people cannot afford and they come to the hospitals and they're very, very ill indeed, and if you administer the drugs they cannot pay.

So sometimes, even when you want to treat them and you want to get out of the hospital, they will not pay. So either they come and they'll be treated and they'll not pay.

UNIDENTIFIED PARTICIPANT: Let's get to the paying part later. We're going to get to it. What are the numbers in Kenya?

CHARITY NGILU: We do get 20 million who are at risk of getting infected by malaria. We have about 6,000 women who get miscarriages due to malaria.

UNIDENTIFIED PARTICIPANT: Is this every year?

CHARITY NGILU: Every year, and 4,000 children are born underweight because of malaria. We have the figures for (INAUDIBLE) about in the country.

UNIDENTIFIED PARTICIPANT: And in terms of

CHARITY NGILU: 34,000 children below 5 years of age die.

UNIDENTIFIED PARTICIPANT: How many?

CHARITY NGILU: 34,000.

UNIDENTIFIED PARTICIPANT: And Bishop, in Mozambique, how many children die of malaria.

JOAO MACHADO: (4,000) in 2004, 4,000 children died by malaria.

UNIDENTIFIED PARTICIPANT: Under 5?

JOAO MACHADO: Yes, but I say 4,000 the children who died in the hospital. We have many others who are so far away from the hospital, we don't know how many.

UNIDENTIFIED PARTICIPANT: And then, Charity, a mom with a bunch of kids, how many times does she have to deal with malaria in her family?

CHARITY NGILU: Oh, many times. You know, you could have malaria every other month. You could have children who are sick every other month, or even the entire family. So, that is not, you cannot count. You cannot say once you have it you not have it again the following month.

UNIDENTIFIED PARTICIPANT: And have you calculated what the cost is in terms of sort of work hours, work days?

CHARITY NGILU: Yes. In Kenya we lose 170 million working days annually due to malaria, because we have the people who are looking after the sick, we have the sick people themselves who are not productive, and that affects the number of hours that we lose.

UNIDENTIFIED PARTICIPANT: And Steven, you've seen similar things, you've seen this in many countries in terms of work, in terms of productivity?

STEVEN PHILLIPS: Yes. You know the classic vulnerable groups are pregnant women and children under 5, but there are also a lot of nonimmune people. For instance in our African operations, something on the order of 2, 3 percent are nonimmune, which was the case on the Chad-Cameroon pipeline, and they are highly vulnerable, and I've seen statistics where malaria, in the local population, causes about 5 to 7 percent days of absenteeism per year in working populations, and that's (INAUDIBLE) as well.

UNIDENTIFIED PARTICIPANT: All right. So, I mean in American we eradicated malaria, when?

STEVEN PHILLIPS(?): Not until probably the 1940s or so.

UNIDENTIFIED PARTICIPANT: 1940s. So we haven't really had to deal with it for 50 plus years. TB, there was an outbreak in New York.

MARIA FREIRE: Early '90s.

UNIDENTIFIED PARTICIPANT: Early '90s, but otherwise.

MARIA FREIRE: 15,000 cases a year.

UNIDENTIFIED PARTICIPANT: Right. So, how did we get where we are today, in sub-Saharan African and Haiti and other parts of the world? What went wrong? Who wants to take a crack at that?

(Steven Phillips): Let me start, but it's, you know, sobering, right out in the lobby where you have the poster of the "Time" covers. There's one out there that is on malaria, and from a distance it said, "A disease that was thought to be vanquished in the '50s and '60s is back with a vengeance." And I thought, gee, how come I missed this. This is, perhaps a recent edition. I looked at the date and it's 1993.

And so, it's been a long time not winning the war, and arguably, there is even backsliding in sub-Saharan Africa, and many theories, you know, the last two years, some of the critical ingredients are falling into place, political (INAUDIBLE), industry sources, strategies, tools, etc.

I think my own theory is from a business mindset viewpoint is that the missing element is organization and what, in business, we would call management systems, both at the country level and at the global level.

UNIDENTIFIED PARTICIPANT: (INAUDIBLE)

MARIA FREIRE: Yes, I do want to jump in. You know, for tuberculosis, you know, in the 1990s, the WHO declared that by the year 2000 it was going to be eradicated. Or at least controlled. And all of a sudden it boomed. And why did it boom?

Well we have very clear symbiosis with HIV. The treatment takes six months or less, and it works. It's delivered through the directly absorbed treatment, and when that's done it works fine. The problem is that most people feel well after two months, they stop taking the medicine and, as Paul knows, we get, once you do, tuberculosis is a consequence.

So we have a double-whammy here. We have HIV that loads the immune system. TB becomes a huge killer of patients with HIV and it's an airborne disease, so there you are.

UNIDENTIFIED PARTICIPANT: Paul, do you want to say something?

PAUL FARMER: Well, you know, I think that, first of all, I agree with what's been said. And I'd be interested to hear the comments of a minister of health. But seems to me that one of the major problems with both diseases, although the war against malaria is being lost much more dramatically, I think, than the war against tuberculosis, is that there's been this, this really kind of scary enthusiasm for one magic bullet, and what we needed all along, going back to malaria, was not just better bullets. It's a bad metaphor of course.

But we need a vaccine. But until we have a vaccine, we have to, you know, think about insecticides, think about bed nets, think about therapy and think about aggressive therapy for the critically ill: the people that we heard about, you know, pregnant women. It's very difficult to treat without all of the tools you need.

And unfortunately, I think the public health sector has been so accustomed to being starved of resources, that there are these inappropriate enthusiasms for narrow approaches. We've seen it in tuberculosis too. You know, that this approach is going to solve, roll back malaria or solve the TB problems, and you really need, you need a lot of funding and a lot of new tools and (INAUDIBLE) was done in either case.

UNIDENTIFIED PARTICIPANT: Let's talk about some of the tools.

CHARITY NGILU: I think in the area of treatment of malaria, there needs to be some formal commitment from those people who really want to see us eradicate malaria, because we know that malaria can be prevented and it can be treated and it can be cured. But if it's not done in good time, obviously, we'll have cases that will come, keep on coming again and again.

And some of the things that need to be done is to ensure that, while we encourage people to use insecticide-treated bed nets, we think it's important that we try to cure them of mosquito, at the breeding sites, and that helps a lot because you reduce the number of malaria.

UNIDENTIFIED PARTICIPANT: We'll get to the breeding sites. On the bed nets, Charity, you were telling me that a British NGO donated a lot of bed nets to Kenya, but there were strings attached.

CHARITY NGILU: No. (CSID) did them, support us with bed nets, in fact up to 1.5 million bed nets, but they were being marketed. Social marketing, they called it.

UNIDENTIFIED PARTICIPANT: Social marketing. What's the theory there?

CHARITY NGILU: It is that you buy, you buy the bed net. But for those who are supposed to buy the bed nets, they just cannot afford, so eventually we said them, we have the bed nets.

UNIDENTIFIED PARTICIPANT: \$5 they were charging?

CHARITY NGILU: Yes. And then they were not moving. So we said to them, why don't you bring down the price? Or even give for free? And they went to half a dollar. Then it started moving, and they were able to give as many as they want, 1.5 million nets to the people. And for those mothers who still cannot afford the half dollar, we just say give it for free, because it is much more expensive to treat than to actually give a free bed net.

PAUL FARMER(?): What a terrible notion for a minister of health to think we should give something away for free. I'm sorry, but you know, this, I'm relieved that ministers of health would say, well, what good is there really in just marketing something. This is like a religion, by the way, that I think has damaged public health very significantly. And I know I'm speaking out of order.

But the idea that something is valued more because it's purchased is widely circulated in public health circles and in (INAUDIBLE), but there's no data to show that that's true. You know, you get a good – tuberculosis care is not sold. And there's, you know, we need to, somebody needs to prove to me as a physician that selling it is better. I think making sure that families have it is the best way to go forward.

STEVEN PHILLIPS(?): Social marketing can be poisonous around poor people.

UNIDENTIFIED PARTICIPANT: Bishop Machado, you have, in your hospital, your church runs, you have a program where pregnant – women who give birth are given a bed net for themselves and for their new child. Tell me what happened with that.

JOAO MACHADO: Yes. Is a national problem, but in our hospital, we took this problem as (INAUDIBLE) malaria. When women come to deliver baby in the maternity and go out with bed net for her and the children. But you know, African families are more than 10 in the family, and bed net with one or two, what means that? And sometimes you know a (culture), the husband is the one who can have (INAUDIBLE), and around (INAUDIBLE), no this is mine.

UNIDENTIFIED PARTICIPANT: So you give a bed net to the mom and the (dad takes it)?

JOAO MACHADO: What you are doing.

UNIDENTIFIED PARTICIPANT: Yes. OK. Let's have a little about (INAUDIBLE) control with malaria. This doesn't apply to TB. Do you think they should be spraying with TB?

MARIA FREIRE: With TB?

(LAUGHTER)

Yes, we do that normally.

(LAUGHTER)

UNIDENTIFIED PARTICIPANT: Spraying with DDT.

UNIDENTIFIED PARTICIPANT: Just to be, I guess, whatever, provocative, yes, I do. I mean I love mosquitoes, but I love humans more.

MARIA FREIRE: You love mosquitoes?

UNIDENTIFIED PARTICIPANT: Yes. And I'm – or I love pelicans but I love humans more.

(LAUGHTER)

Yes, I do. I think we need to rank humans over other species in terms of fighting. I mean that's what doctors and nurses do and that's what people on this panel do. But I think that if what's happened since the banning of that particular insecticide, which by the way, you can probably eat a fistful without undo affect, although someone here is going to be really mad I said that.

What's happened is, of course, the mosquitoes have been applauding and cheering and having pep rallies and they're thrilled that we got rid of DDT. And you know, sitting where, where the minister of health is or where people who have to take care of the sick directly on the front lines, it's been terrible, you know.

And it's related to lack of (vector) control.

UNIDENTIFIED PARTICIPANT: Well now in fairness to the environmentalists who fought so hard, the reason that DDT was banned in America was to protect, because we were spraying it on fields and birds were dying and the bald eagle and all that kind of stuff. But your suggesting something less constrained on the field.

UNIDENTIFIED PARTICIPANT: On the houses.

UNIDENTIFIED PARTICIPANT: Just spraying on the inside of the hut.

UNIDENTIFIED PARTICIPANT: The inside of the hut, to spray the walls with DDT will have an extremely profound impact on the ability of the mosquitoes to breed and feed. The nets too, impregnated, the nets help, but I wasn't advocating agricultural use, which is what seems to be associated, as you said, with the adverse affect on the bird population.

UNIDENTIFIED PARTICIPANT: Now, Charity, in Kenya, what's stopping you from using DDT.

CHARITY NGILU: We have not put in our policy to use DDT, but to Kenya also we are very lucky because we do produce (INAUDIBLE), and (INAUDIBLE) is environmental friendly, and people who have to use that one would be much better than DDT. But the policy has not been made as yet.

UNIDENTIFIED PARTICIPANT: But you told me at breakfast the other day that if you use DDT in your country, that the British and the U.S. would refuse your exports.

CHARITY NGILU: We are an agricultural country and some of the conditions are that if you do use vector control and when you kill the mosquitoes where they are and you use some of this chemical, then our agricultural products will not get into the EU market, and that would be very, very harmful also to the economy.

UNIDENTIFIED PARTICIPANT: What do you think about this? Steven?

STEVEN PHILLIPS: Well, what would it take to change that policy? This is clearly a developed country policy with (INAUDIBLE) in the developing world. I think that's fair to say. What would have to happen for that policy to change?

UNIDENTIFIED PARTICIPANT: Well, I think it's a very unfortunate policy and don't know the levers, but I think this debate really kind of exemplifies what's wrong with our inability to attack malaria, which is interminable technical and policy debates instead of getting down to business. And I think DDT in that sense is a red herring. It's certainly a very, very valuable insecticide. There are others. And there's also resistance to DDT and to others, and I think you just need a judicious balancing of the right insecticide.

But what's going on globally is that these debates are actually sapping the vitality and the energy of the battle against malaria.

UNIDENTIFIED PARTICIPANT: Speaking of tools, Bishop Machado, you have a radio with you. Can you explain what that's? Did you bring it up? You didn't bring your radio. OK, we'll save that one. It's a great little thing, but it's a wind-up radio. What did you use the wind-up radio for? Talk about that.

JOÃO MACHADO: Uh-huh. We think that the crucial issue in our country about malaria is lack of education of the people in the rural area, in their own culture, in their own languages. And when we promote the community radios where they can hear a daughter or son from that planet (ph) to tell them that we need to do that, and to do that, and they can say yes. She is our daughter. She telling this, it's true. We need to do that. AND then these community radios, and we use the winding radios or solar radios, which don't need a battery, they can sit down after they come from the work, or the educational (ph) things, they come down and they talk they listen about what is good. And then this is very, very important for education.

UNIDENTIFIED PARTICIPANT: And the message you want to give out is clean up those standing water, is that the kind of thing?

JOÃO MACHADO: Yes, education means, you know, for example, in Mozambique we are in the coast of the Indian Ocean. And then the valley (ph) near to the coast is all part just endemic in malaria, because of the water. And you need to teach the family if you have water, stagnant water near you need to clean out the water. You need to cut the grass. You need to do that. and that you need to do this in their local languages. Because we still have more than 65% of our people are illiterate. They don't know how to read and to write. And you need to go in their local languages. We have more than 13 different languages in Mozambique, for example.

UNIDENTIFIED PARTICIPANT: Let's talk about the drugs that people take for these diseases. TB is particularly difficult. Describe the regimen for TB.

MARIA FREIRE: Well, I knew it theoretically. And then I had the opportunity to go to Lima, where I'm originally from. I went to one of the TB clinics. So the patient takes, in this particular case it was active tuberculosis, 11 pills a day for six days, for two months observed by a caseworker. And then he has to come back for three days a week to take two of those drugs. They have to give them with juice. It's a very complicated regimen.

It works. The good news is it works. And if you observe the patient taking it and they're consistent in taking it, it's fine. But no human beings can be expected to take drugs that don't make them feel all that great for two months, and then continue to take them for an additional four months. And so it boggles the mind. And I don't even want to go into I think Paul can tell you what a multi-drug resistant case is like. It's even much worse.

We have the drugs are a part of it. But what about the diagnostics. Do you know how we diagnose tuberculosis? Sputum.

UNIDENTIFIED PARTICIPANT: Spit.

MARIA FREIRE: Spit. And with a microscope. That's a hundred year old technology. Think about it. People have to look at the sputum and determine how many basilas (ph) there are. In the case you have better systems, you actually get a culture. And the culture takes two months. By the time you get a positive read on your culture it's two months into what could have been a treatment. That's just not acceptable. We have vaccines that certainly the vaccine protects a child only until the age of about 13. We have this reservoir I told you, a third of the world. We have no protection for that. So it's not only about the drugs, it's not only about old technology. We're fortunate that in the case of tuberculosis it works. But we have to do better. It's just a sense of urgency here that we absolutely, positively have to do better than that.

UNIDENTIFIED PARTICIPANT: Well, you mentioned a lot of things that I want to get back to them. There is a faster TB test on display out there that have you looked at that?

MARIA FREIRE: Yes. Yes.

UNIDENTIFIED PARTICIPANT: And?

MARIA FREIRE: Well, I think anything that will help do that is absolutely fantastic. I mean one of the things that, you know, the sponsors, the Gates foundation has put the money and the resources into is the development of tools. And some of them we were called the samurais (ph). You know we're talking about the product development public private partnerships, and somebody dubbed the CEOs of these PPPs, the samurais (ph). And somewhere in the audience are the rest of the samurais (ph). So we have people working on new malaria and cretential (ph). And we have people working on new microbicides, and people working on malaria vaccines. And so we're the future. The problem with the future, of course, is that people have short memories. So while Paul and the people, and the ministers have to deal with diseases here and now, we're working for the disease to help them fight the disease tomorrow. And it's a tough sell. It's a tough sell to tell somebody wait, in five years I'll have a better tool for you. So, if I can do something out of this conference is to stretch that memory. We need to keep the commitment longer.

UNIDENTIFIED PARTICIPANT: OK, we're going to come back to that and what you did with Bayer (ph). I want to back up a little bit though to talk about TB. (INAUDIBLE), you were saying that in your country or your hospitals the TB patients are given the drug and then after a couple weeks they start to feel better. What happens?

UNIDENTIFIED PARTICIPANT: Yes, again education is very important. In some of the people you know TB medicine is not medicine which you give in two weeks and three weeks it's gone. But when you start with these program, after three one months they feel a little bit better. They need to go back to work because the family has no food to eat. They said I'm OK now. I can go and work and I can go and grow something for my family. And then they cut in the middle. And this is why many times we see the deaths because of TB. It's not because the government is not giving the medicine, but because sometimes they don't go until the end of the cure.

UNIDENTIFIED PARTICIPANT: OK, now Paul, what's wrong with this picture?

PAUL FARMER: Well, you know, (INAUDIBLE) I think it's great to do more education of patients. But as the Bishop just said, he said they're stopping their medication because their families don't have enough to eat. So as he was speaking I was thinking that well, do we educate people on agricultural policies to keep African farmers poor so that they have to work while they're coughing their lungs out? It's a very difficult situation. And the way that we've gotten around it is to assume the clinicians, the doctors, the nurses, the community health workers, assume complete responsibility for making sure their patients take their meds every day, regardless of how they feel on that day, until they're done. So, it's a transfer and again, this is not fashionable. But, to use Maria's words, it works. You know, you can think about self-determination or empowerment or any of these other expressions. But you know, what we've done is say OK, we understand people will stop the therapy, as the Bishop said. And therefore we'll assume responsibility ourselves for seeing that they finish their therapy. And if they need enough food they need food while they're fighting off this horrible consumptive disease then we will also supplement their food intake so they don't have to make a choice between going to, you know, to plant yams and surviving a lethal disease.

UNIDENTIFIED PARTICIPANT: The danger of if they stop their meds is what...

PAUL FARMER: They will acquire they can acquire drug-resistant tuberculosis. And drug-resistant malaria, drug-resistant HIV. Each of these infections in fact, the big three, are readily vulnerable to mutations if they're challenged irregularly with the medications or not just having them stop, but having them juggled or last night, and no speeches I remember. But last night a colleague of mine came back from the Dominican Republic for this summit. An American colleague, and he was telling me about the situation

there where I'm sure it's not characteristic of the whole place, where if someone runs out of money and they're being treated for HIV they'll switch the regimen around. Say, OK, well buy this one, it's cheaper. This is a terrible idea, and a great way to acquire drug resistance, altering the regimen based on the ability to pay.

MARIA FREIRE: I want to say something about resistance, because I think we need to point out that we're running out of weapons. So it's not only that we're acquiring the resistance, we really are running out of drugs to treat people with. And I think that's a very serious problem.

CHARITY NGILU: And I'd agree with that. Another thing that has to be done is follow-up. Because they are given drugs but there's nobody to follow up to see that they are taking the drugs because of the acute shortage of health workers, the nurses, as in doctors. They're not there to follow to see that these drugs are being taken. And therefore, that becomes a problem.

UNIDENTIFIED PARTICIPANT: Yeah, well you were saying that even if they have the drugs when you first got your job they didn't have the drugs in the hospitals. Now you say they have the drugs but you don't have the health workers to distribute them?

CHARITY NGILU: Yes, when I got my job we had no drugs in our facilities. But we changed our procurement procedures to ensure that money that is meant for drugs does not go elsewhere, as used to be. And now that we have got all the drugs in our hospitals we find that people will come, we have the drugs, but I don't have the health workers. And yet, I have 4,000 trained nurses who I could hire. I cannot hire them because of some of the conditionalities that we have when we bought off from the (INAUDIBLE).

UNIDENTIFIED PARTICIPANT: You told me that the World Bank and who is it, the International Monetary Fund won't let you pay salaries for medical workers?

CHARITY NGILU: Yes, because the conditions are such that you cannot increase the number of people (INAUDIBLE) and if you increase, then you cannot get loans to do development. In other words...

UNIDENTIFIED PARTICIPANT: The theory is that you should be spending the loan money for development projects, but not for salaries.

CHARITY NGILU: That is what is supposed to be. And that money given for development is seen to be going into waste if you put money into health. I think differently. I certainly think that an unhealthy population is not productive.

MARIA FREIRE: So, can I interject. I want to ask a question. So if you have a limited number of people that you can hire, anything that lightens their load, that reduces the time to treat a patient or that expedites the treatment would be helpful to you.

CHARITY NGILU: It would be very helpful indeed. If I had the health workers today my work would be very simple, because now I have got the drugs.

UNIDENTIFIED PARTICIPANT: Tell me why mothers were throwing their babies out the windows of the hospitals when you came to your job.

CHARITY NGILU: Yes, you see we have a different policy of cost-sharing between the patient or the user fee. And (INAUDIBLE) once again during the days of structure (INAUDIBLE) programs between us and the Britain-ruled (ph) institutions. So when mothers have complications and they cannot deliver their babies at home they come to our hospital. They're expected to pay when they are discharged. Obviously they will get discharged and they will find they have no money. And they discovered a way of throwing their babies to somebody through the window...

UNIDENTIFIED PARTICIPANT: Let's make this clear. If they've given birth and they can't pay the user fee, the hospital won't let them go leave the hospital...

CHARITY NGILU: No, no, no. They will not be allowed to go. They will be detained in hospital as long as it takes. And in some of my hospitals I have gone to find mothers who have been there for over nine months with babies already nearly beginning to walk. So some of them now have find a way of throwing...

UNIDENTIFIED PARTICIPANT: That's why they throw the baby out the window to a relative to receive it and then they sneak out of the hospital.

CHARITY NGILU: Yes, yes.

UNIDENTIFIED PARTICIPANT: And I understand you've introduced a bill to do away with the user fees and it's now between Parliament and the president.

CHARITY NGILU: Yes, the (INAUDIBLE) health insurance bill. It went through Parliament and this is going to help a lot to ensure that everybody can get access to health care without problem.

UNIDENTIFIED PARTICIPANT: OK, we've drifted a bit well, go ahead Paul, you have something to say?

PAUL FARMER: Well, I just, as an American, in my country I mean I like to think of New York as my country. I think it's important to add that this is not an ancient Kenyan tradition, throwing babies out the window. The minister said has mentioned a number of issues already that constrain her ability to govern the health affairs of Kenya. She mentioned the lust for social marketing. She mentioned user fees. She mentioned structural adjustment programs. She mentioned the fact that she has a shortage of health care workers but she has 4,000 unemployed nurses in Kenya who she can't reengage because of rules, and what she called conditionalities. But I just I know that those conditionalities come from what are called the international financial institutions, not from African culture or Kenyan culture. And so, you know, again, this is a gathering of very powerful people, and the press. And you know these are not policies handed down by God on stone tablets. They're policies created by humans and who circulate freely, as do I, in meetings like this one or settings like this one. So I just wanted to add, as an American, that you know these throwing a baby out a window sounds just bizarre and horrible. Which is obviously the point of the minister's, it's terrible. But these ideas did not come from Africa.

UNIDENTIFIED PARTICIPANT: Before we leave this, I want to address the issue of the profit motive of pharmaceuticals. One of the problems we have is we're using drugs for TB that are what, 40, 50 years old. They're taking multiple pills that could theoretically be combined into one. I mean ideally you would like to be able to diagnose a disease immediately, give someone a pill, one pill, and have the patient be better within a week, right? That's what you want. So, and yet we know that it doesn't make sense for a company beholden to shareholders to make a profit to put a lot of money into a place where people make a dollar a day. It's a tough business proposition. So you have now we're getting to the public private partnership. And you have mastered a way to make it incentivized, to use a terrible word. Explain how this works. What did you do with Bayer (ph) and how is this a model for what we can do for other diseases?

MARIA FREIRE: There are about 87 recorded public private partnerships around the world. But there's a handful of PPPs that are actually doing product development. And I think that's what you are referring. And these are organizations that sort of sit in the interface between the public sector and the private sector. And we use we try and use the best for both. We're not for profit, and our goal is to bring the technology from the wherever we can get it, whether it's academia or industry, be it the pharmaceutical company or the biotechnology company, and then move the technology forward. Sometimes, as in our case, we've done it with a molecule that Chiron (ph) licensed to us. We did it ourselves, we're in phase one clinical. Or we've done it in partnership. I see Paul Herling (ph) here from Novartis who is helping us work on analogs and second generation backup compounds for this lead compound that I mentioned. We have agreements with GSK. So we take the best of industry. We try to lower the hurdles for them to be able to move into this arena in a partnership. So it isn't that they know how to do this. They have the resources and the people to do it. And we help lower the hurdles either by additional resources or expertise. Very little is known about drug development for TB. There hasn't been any for 30 years. So the agreement with Bayer (ph) is unique,

because what we have been able to do is to have Bayer (ph) agree to take moxifloxacin (ph) which is a currently patented drug...

UNIDENTIFIED PARTICIPANT: It's a big drug for them...

MARIA FREIRE: It's a big drug for them.

UNIDENTIFIED PARTICIPANT: That's generation (INAUDIBLE)

MARIA FREIRE: It's a fantastic drug. It's currently used all over the world. They've had millions of people use it. It's safe and it's effective. But it's never been used for long-term. And we have animal data that tells us that this drug can get the treatment down by three to four months. So, from the six months I was talking about we may be able to have a new regimen that reduces that time of treatment to three months. And so if you have a limited number of people, rather than treating one patient, you can in principle treat three patients. And so Bayer (ph) has put this drug out for us to do clinical trials. And we have the CDC and the FDA and the EDCTP, which are the Europeans. So the public sector is doing the clinical trials. And Bayer (ph) is providing the drug and the placebo and the registration support for us. I don't know that there's another partnership quite that way in which a company has taken what I think is a very bold step.

CHARITY NGILU: The drug is not in the market just yet.

MARIA FREIRE: The drug is in the market but for other indications. It's not being used for tuberculosis. And what we're trying to do is to put it in the combination with other drugs and see whether or not this combination, which we have a sense will be much shorter, will be effective for TB.

UNIDENTIFIED PARTICIPANT: Let me see if I understand this. Anybody, any doctor could buy this drug and try it for TB and you'd end up having like a hundred little not very well-organized clinical trials.

MARIA FREIRE: Right.

UNIDENTIFIED PARTICIPANT: So one of the things you've done is organized it for them. And you have a well-managed clinical trial. And that's something that is useful for Bayer (ph) and protects their drug.

MARIA FREIRE: But it's also useful for us. Because at the end of the day, see, what I'd like to hand the Minister, and what I'd like to hand the pastor and what I'd like to hand Paul and anybody in this room is let's say a ten-day treatment. I can't do it, because the science isn't there. We can talk about that. But if we have a combination of regimens in a blister pack, for example, which you can actually take and it's a ten day treatment let's say a two-month treatment, which is more realistic within the next five years and it's a combination treatment. I mean that would lighten the load enormously of the people in the field. And if we could I have a debate whether it should be once a day or once a week. Because we're this early in the process, like our colleagues for malaria, we can actually formulate the new generation of TB drugs differently. We can have a formulation hopefully that can be once a week. Or we, if the science allows us, we might even be able to have a formulation that lightens the load again for the caseworkers. So it's a symbiosis with people in the field.

UNIDENTIFIED PARTICIPANT: (INAUDIBLE) you have one more remark, and then I promised the audience.

UNIDENTIFIED PARTICIPANT: No, I think that's a great example of a six (ph) for one drug for one disease. Apropos of last night's conversation, I think that there could be a higher level look at how to maintain access and affordability across the board for drugs for neglected diseases on the one hand, and on the other hand preserve the word that you used, the incentive, for research-based pharmaceutical companies to invest in research and to protect their intellectual property rights. And those two goals, interestingly, are not mutually exclusive in that what's not happened is a very high level look at how do you actually deal with a system that would fulfill both of those .I know the Institute of Medicine is looking at that. But I think all these diseases have much more common structural fixes than the world currently has devoted to it.

UNIDENTIFIED PARTICIPANT: OK, now, we're going to we have scattered in the audience I'm told they want to be referred to as microphone engineers now, not just mike handlers, with paddles. So if you raise your hand a microphone engineer will come to you and there we go. Microphone number two.

DR. GINA GROWALEST (ph): Thank you very much.

UNIDENTIFIED PARTICIPANT: And could you introduce yourself?

GINA GROWALEST (ph): I'm Dr. Gina Growalest (ph) from (INAUDIBLE). I'm in charge of the nationalities (ph) Commission. Very interesting talk. But I have four remarks.

UNIDENTIFIED PARTICIPANT: OK, and you're going to have one minute to make them.

GINA GROWALEST (ph): Cost-sharing, having necessary workers for running the programs. Use what is necessary for control our own government. And the rules and conditionalities for access to loan and to development. Those rules are not dependent of our people in Africa. (INAUDIBLE) from people in Washington, New York, Geneva, Paris, Brussels. This overcomes all the problems we have to save lives. So you people who are voting in all those countries, please help us to fight mosquitoes, to fight the (INAUDIBLE) just making your government remove those rules (INAUDIBLE) and make our people die, and who overshadow all our work and effort. And all your work and effort. Thank you.

UNIDENTIFIED PARTICIPANT: Thank you. I think that was a speech, not a question, but I appreciate it. Anybody want to comment?

UNIDENTIFIED PARTICIPANT: It's a good speech.

CHARITY NGILU: That is what needs to be done, actually.

UNIDENTIFIED PARTICIPANT: All right, microphone number three.

BARA AQUILLE (ph): I am Bara Aquille (ph), I am the CEO of Nigerian Food and Drug Regulatory Agency. I have some comments. I'll try and do it in one minute. Well, (INAUDIBLE) Africa it is almost impossible for anybody to tell how many times he or she has suffered from malaria. We (INAUDIBLE) suffering from malaria from about three months. There is something in the blood that prevents children of other three months from having malaria. And that is why we suffer for our life (ph). So from three months you had to come most every month, at least three times a year. And even as adults. It's not only malaria is not only prevalent amongst poor people. Even the rich people are not spared. But we can say that poor people suffer more because of the poor environment. Even at my level of (INAUDIBLE) there is no way I will not suffer from malaria at least twice a year. Because even with guards and everything in my house, I still walk out sometimes, I forget to cover my legs. Or you open the door and mosquitoes inside my house. I have suffered from malaria this year four times. So you can imagine what is happening to others.

UNIDENTIFIED PARTICIPANT: You know what? That was your minute. Thank you very...

AQUILLE (ph): Oh, yet something more important.

UNIDENTIFIED PARTICIPANT: Oh you have one more thing? We'll give you one more, thirty seconds.

AQUILLE (ph): We have talked about treatment, prevention. But I want to (INAUDIBLE) this audience today on the importance of their education. We can't eradicate malaria by using something like (INAUDIBLE) insect technique. (INAUDIBLE) insect technique has been successfully used in U.S. to eradicate fruit flies. And used in other countries. Why don't we try and focus on source (ph) to eradicate instead of prevention and treatment. And let us remember that no public (ph) drug that you are talking about, (INAUDIBLE) resistance is cured by no (INAUDIBLE) drug. Thank you.

UNIDENTIFIED PARTICIPANT: OK, good. Well there's actually a question there about what about eradication. Who wants to take it? It sounds like she's asking for the kind of thing, the magic bullet, Paul, that you say has led us down a garden path. And I know, Steven (ph), you feel this way.

PAUL FARMER: Right, and I think magic bullet in terms of science is definitely worth pursuing. In the avenue of the vector in terms of sterilizing it and preventing it from reproducing in the area of a vaccine...

UNIDENTIFIED PARTICIPANT: Is there work being done on that?

PAUL FARMER: There is work being done on that. and I think the problem is that these are complex issues with no clear time horizon. But they must be invested in.

UNIDENTIFIED PARTICIPANT: The Gates Foundation I believe is putting money into that.

PAUL FARMER: But it's not either or. I think breakthrough science and knowledge behind that needs to be invested in, but at the same time there are, as we all know, interventions here and now that could save lives.

UNIDENTIFIED PARTICIPANT: Go ahead.

MARIA FREIRE: You know, TB we have the global we have what is called The Stop TB Partnership, and we've just put in force our global plan. We have a global plan from 2000 to 2005 and now we have a 2006, 2015. We expect, if the plan is supported with the resources it needs, that TB could, in principle, be eradicated by (2050). I know it sounds like a long time, but the number, but the number, the bug has been around for a long time.

UNIDENTIFIED PARTICIPANT: Paul, is she really getting TB four times a year.

PAUL FARMER: I would think so, yes.

UNIDENTIFIED PARTICIPANT: Is that one ...

PAUL FARMER: Just as you pointed out, it's difficult to know how many times you've had it. The corollary is that it is not unthinkable that people have chronic (parasitemia), that is a chronic, low level ((inaudible)) infection. You mentioned counterfeit or fake drugs, drug resistance, add to that drug resistance and you get inadequate therapy for malaria, and so you can reduce the number of parasites in the blood and reduce the anemia, attendant anemia, but never really eradicate the infection.

And I'm talking about ((inaudible)) malaria, that doesn't have, I know we're not supposed to use ((inaudible)), but a secondary ((inaudible)) cycle, that is ...

UNIDENTIFIED PARTICIPANT: Paul. Don't do that again.

PAUL FARMER: I won't ever do that again.

(LAUGHTER)

It doesn't hide out, it doesn't hide out in the liver. It doesn't have a little honeycombed hide out, like the TB or some of the other malaria, and it's just a low-level ((inaudible)) because it's never eradicated. So it could be new infection, but a lot of us are suspicious in Africa particularly, that people never really clear the infection fully.

UNIDENTIFIED PARTICIPANT: Are there questions? We have microphone 6.

UNIDENTIFIED PARTICIPANT: I'm ((inaudible)). My question is, what do you feel, what would it take to capture the public's imagination and conscious around tuberculosis and malaria. And if you could kind of evaluate some of the existing vehicles, like ((inaudible)) malaria, Stop TB, are those effective? What

needs to be done to make them more effective in order to build the kind of political will that is so desperately needed?

UNIDENTIFIED PARTICIPANT: Who wants to take that?

MARIA FREIRE: Oh, it's about political will. If I had a wish list, you know, I refer to tuberculosis as sort of having the middle-child syndrome. You know, it's AIDS, TB, malaria and so malaria, of course, kills an enormous number of children. It's a terrible disease. AIDS has a very proactive group of advocates. And tuberculosis sort of has been hanging around for a long time.

Getting people to really be proactive about tuberculosis has been a big challenge. Stop TB as a partnership, has actually done a very good job in trying to bring together the people that are in the field with the people that are working in the future.

No doubt about it. Without the political commitment at all levels, at the country level, at the (G8) level, at the scientific level, we will, we will certainly not do that and I think time has a good role to play on this one.

UNIDENTIFIED PARTICIPANT: Bill Clinton has a saying, I think I have this right, but no one ever voted for Ghana over grandma. It's just not in an American politician's interest to be fighting for something like, something for Africa. The ((inaudible)) actually can be changed and ((inaudible)) has a nice rule. He says that 50 phone calls from constituents to a congressman will change policy, if it's not, if it's not like an organized thing, like a, you know, like junk email. But you know, a congressman gets 50 phone calls out of the blue about an issue suddenly feels like a real thing.

So there are things you can do.

UNIDENTIFIED PARTICIPANT: Calls out of the blue about an issue, suddenly feels like a real thing. So there are things that you can do. We have microphone four and then we'll go to three.

MARY ROBINSON (ph): Thank you. Mary Robinson (ph) realizing right the (INAUDIBLE) Globalization Initiative. I think there is one thing that brings this very good discussion together, and that is the value about health. Health is a human right. It's guaranteed in the Universal Declaration of Human Rights, in the Constitution of the World Health Organization, in many national constitutions. And it has as a human right, then there must be access to medicines. And I want to talk, or ask the panel to come back to some of the political issues. Minister Charity mentioned that she can't employ the nurses that are there to help to get access to medicines, because she's stopped by the World Bank and the IMF. Now the control of the World Bank and the IMF is in this country. So, we need to understand that. Also, I would like to hear the panel talk a little bit about the policy of donor government. Why is there not more donor coherence to help to strengthen health systems in the poorest countries, led by the government, by ministers like Charity and have a holistic approach. I am on the vaccine fund in (INAUDIBLE). We are trying to immunize more children. There will be now an IMS – an ISS four billion more to immunize children. But that's only one intervention. Why can't we be holistic about the human right to health, because health is crucial to development, crucial to attacking poverty.

UNIDENTIFIED PARTICIPANT: Thank you for your question. Do we want to take it? Which was more a statement I think.

UNIDENTIFIED PARTICIPANT: No, I think – I mean, I'm not a minister of health, nor have I been president of a country, and that isn't going to happen, but as Smokey Robinson (ph) said, you know, there are – or implied – there are – I mean I would love to hear as well, the panel comment on the implication for the idea that health care is a human right. And President Robinson (ph) went immediately to the next step which is going to have to be about access, because otherwise it stays up in the air and like a lot of human rights notions. But once you use the A word, access, you know, access to care, you really run head on to powerful politicians but who are determining the very – the shape of what Dr. Beneguaho (ph) and Dr. Charity said, what they can do in their countries as they try to fight back. And you know, I – again, I said

as an American, because I am, but as someone from Ireland or United States or Europe, this is where, you know, we can make a difference in the policies, and it's why I came back to New York. And I, you know, I believe that changes are going to come out of this. I don't think it's a statement, I think it's a real challenge. So, how do we do this? Do we just ask the Dr. Beneguaho's (ph) or Dr. Charity's to have to wade through all this mess that isn't of their own making, constraining them to do mediocre health work? Or do we lift the barriers and alter the rules?

UNIDENTIFIED PARTICIPANT: You know, I think we're going to have to end on that. Thank you very much. Before we move on, let's hear it for our great panel.

[APPLAUSE]

END

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