PAUL FARMER: I'm going to talk about building the health system so that technology, or platforms, again, some jargon that I really learned from people with trainings like some of those in this room, how can we use those platforms to innovate? You've heard all the expressions since then, Leapfrog, Leapfrog innovations, disruptive innovations.

One of the ways that that can work is to not have systems. Sometimes, you can build your own. Another is to have decent elastic ones. So I'm going to talk about that part. How do you deliver services? What is health systems strengthening?

And I would like to end fairly early so that this can be a good discussion for me as well. And my colleagues are here too. In addition to Hamish, [? Renee, ?] and their team, with me today is Claire Pierre, who's worked in IT and health systems in Cambridge, Massachusetts, and in Haiti, and Emily Bonson, who is-- anyway, I'm her right hand. Let's put it that way.

So I want to talk a little bit about basic health design. And we'll be focusing on Haiti and Rwanda. However, in each of these sites, we've tried to use information technology and other technologies too, again, Leapfrog. Now, that's a lot easier in a place where there's stable electricity, which is to say a lot of the places we work actually do have stable electricity, Russia, the United States, urban Peru.

The other sites, however, have very disrupted electrical supply. So for example, Rwanda in 2004, 2005, was about 5% on the grid. Haiti is a shockingly low number for the Americas. We had a lot of challenges. So when I say build systems, I literally mean build systems. And this is as simple a diagram as I could come up with.

As Hamish said, Partners in Health is focused on three-- he didn't say it this way, but let me say it this way-- three levels of care, community-based care, which is done largely with community health workers, community health workers who we usually call accompagnateurs, people who are accompanying their neighbors with chronic illness, they provide the natural human network to amplify a lot of the technological innovation that is being developed now.

So if you hear about a point-of-use diagnostic, or therapeutic-- I've heard story after story about what's coming down the pike-- it's hard to imagine those technologies being rolled out effectively, equitably, especially those most vulnerable and in rural regions without community health workers. That would be one argument.

A second is that the community health workers should not be called upon to provide services that are beyond their or anyone's means. For example, there is a romanticization in international health, what used to be called international health in the '70s and '80s, a romanticization of the capacity of community health workers to solve problems, which is really hidden enthusiasm for spending very little money in resource poor settings. And one day people will go back and analyze how this ideology worked.

But let me give you an example. When you hear the traditional birth attendants can very much reduce maternal mortality, just skipping the blood banks, the cesarean section, and modern obstetrics, I would ask you all to be very suspicious of such claims, because I don't think there is adequate evidence to prove that true. So the first thing that we've done in some settings is to actually build health centers.

Now, health centers in the jargon that we're using and developing, are usually nurse-led programs. But nurses are also rare, just as rare in the developing world in rural regions as are doctors, senior managers, et cetera. So that's often the first step, so it's health center enriched.

And then finally, some fraction of the care that would be delivered in any of the settings where Hamish, and I, and others have worked would be incomplete without hospitals. It just doesn't work that way. You could manage very effectively-- I believe you could manage most chronic infectious disease. And I'll say this in front of Leo and see if he buys this, most chronic infectious disease I think can be best managed in a clinic setting, or community-based setting.

Take HIV disease-- there's more seats up here-- the highest standard of care for AIDS is probably community-based care. First of all, that's the way you deliver a therapeutic on a daily basis. Second of all, you also are reducing risk of exposure to the leading opportunistic infection killing people with HIV in the places we work, which is tuberculosis. And a lot of that happens at the institutional level. So community-based care is better in many ways.

However, people have complications, whether people have broken bones, and obstructed labor, and acute pneumonia, and you know, again, these-- and of course, any kind of complication of pregnancy-- these are really best managed in a hospital. So this is what I'm talking about when I'm saying health systems strengthening. There are these three components. Again, as they say at MIT, it's not rocket science. In other words, we can do this part without you guys.

But there's a lot we can't do without you guys. And I'll show you what I mean. First of all-- and Hamish already said this-- and I've used these pictures before at MIT to-- actually, this is not an unusual clinical story. It's pretty much the kind of patient I see all the time, young person with HIV disease, and another problem. In this case, he's got two. He's got tuberculosis and probably inanition and malnutrition just due to those wasting, consumptive diseases. It's hard to tell in settings of food insecurity how to apportion responsibility for someone's wasting. Is it the disease or the lack of ready access to food?

Anyway, this patient, his name is Joseph, who was of course, giving me permission to use his images, and to broadcast them across the world. We've already done that. When Jim Kim-- who some of you may have heard of-- was at the World Health Organization, he said, send me pictures, before and after pictures. This is before the establishment of some of the big AIDS treatment integrated prevention care programs.

I sent him these two pictures and many other before and after pictures. And he used these two in this glossy brochure. And I said, you know, I'd like a copy of that for Joseph. So I gave it to Joseph, and thinking he would be very impressed with that. And he just looked at it and said, yeah, I'm a star.

[LAUGHING]

He later went, by the way, he later went to one of these giant AIDS meetings. How many of you have ever been to one of these things? It's beyond me, some of you. This is with 10,000-15,000 people. Anyway, I went to one from Rwanda directly to I think it was Toronto, was definitely Canada. All those Canadian cities look alike to me.

[LAUGHING]

And he came from Haiti, this guy. And I learned that one of the cardinal rules of public-- I learned many-- when you take someone from rural Haiti and they've not been to a place like Toronto, there are some things that I know all about. Be careful on the escalators. This is how the card for your hotel room door works, et cetera. But I did learn one of the important things in public health that we should all know is, you just should not give anyone keys to the minibar.

So anyway, the amount of funding has gone up very substantially as we know. This is vertical funding. Is that bad that it's going to be broadcast to Taipei, my little jokes? The amount of funding has gone up in part as a way of countering a lack of really intelligent response to a novel epidemic. So that's always going to be the case.

And I think it's not unrelated to the question you're asking in this class, how can we use new technology to promote health equity? But also, how do we take on new problems? And it's not as if we've ever lived through the stunning changes that occurred at the-- epidemiologic changes-- that occurred at the end of the 20th century where you had the leading infectious killer of adults, tuberculosis, persisting, and then joined to another killer in synergy, which is HIV. And it surpassed TB as the leading infectious killer of adults in the world today, young adults.

And they were linked together, and they were invading especially Southern Africa, I would say. That's where it was. I mean, all over the world in every urban area there are huge outbreaks, or large outbreaks of TB and HIV. But this burden of disease was especially enormous in Southern Africa.

And at the same time, you have a third-- anyone here anthropologist? There's actually several anthropologists at MIT. There was a third collision. And that was with a therapeutic regime. Like, this collision didn't occur in the late 19th century, but in the late 20th century. So it also meant that for a while, in any case, we had during this period of time we had to say, well, how do we treat these people?

And you heard lots of arguments that it wasn't sustainable or cost effective. But you really in the end, had three collisions, HIV, TB, and therapeutic regimes, in other words, treatment for tuberculosis and HIV, which would lead to more complex problems like drug resistant disease. And then if one of them is airborne, as is the case with TB, I mean, this is a very-- to use the jargon from my field, medical anthropology-- this is an incredibly biosocially complex set of problems.

Now, that's not what I'm going to focus on today. I'm just going to say the platforms that you build to answer those questions that I just posed are the very same ones that need new technologies to promote good outcomes, but also just to manage. And I'll show you some examples.

So some of you know that-- and I think Leo and others should be proud of this-- that a group of Harvard faculty got together. I mean, people look at this, say, Harvard consensus statement? Is such a thing possible? But we got together-- and not just Harvard faculty, but Jeff Sachs was here then, and a lot of infectious disease doctors, and some economists, and public health figures and said, we really need to abandon this idea that we have to choose between prevention and care, a noxious idea. We have to have integrated prevention and care for HIV, and we have to acknowledge the complexity of the epidemic.

So we wrote that together. And we were really pushing for something. This is a policy piece. And we were pushing of course, for the creation of multilateral or bilateral programs that would fund much more ambitious responses to these ranking health problems. And those became PEPFAR, and first, the Global Fund, I guess, and then PEPFAR. And then this failure of imagination, which was I believe caused by a socialization for scarcity, was countered by resources. And that opened up the space to build the platforms that I'll describe, and also created an acute need for better management of information.

And now, I will skip over this. I told you we talk about accompaniment. But we have good reason to believe that this is the highest standard of care, because we've been taking care of people in so-called resource poor settings as your term you're using in this class, who are still a decade later or more doing very well. Like, this is another patient of mine first at home dying of AIDS, and then 10 years later at Sanders Theater Harvard giving a talk. And that's a very gratifying thing for a doctor, or a nurse, or community health worker as you might imagine, or anyone, right, to have a family member who comes back from the dead, as the Haitians say, it's very gratifying.

And when this happens over and over and over again, you have a lot of satisfaction, but you also have a huge challenge of managing information. And that challenge occurs at each of the three levels that I mentioned at the community level for the community health worker, or accompagnateur, at the clinic level where care should be coordinated, not in the hospital. And then finally, at the hospital how, do you track people who do have complications and do get sick again?

Actually, this guy later got-- can anyone guess? OK, he's been treated now for a smear positive TB and for HIV, and he's doing well. What do you think now the new and deadly-- the people in Southern Africa know this-- what's the new and deadly complication?

AUDIENCE: MDR.

PAUL FARMER: MDR. So he got MDR. May I ask who said that? Yeah. So in other words, we used to believe in the '40s and '50s-- now, I personally was not around in the '40s, so I didn't personally believe anything in the '40s-- but we used to believe, as they say magisterially in medicine, that you couldn't get tuberculosis twice. But we didn't have the diagnostics, molecular diagnostics, to show that was a false idea. You can and do get tuberculosis multiple times. You can even have multiple infections at the same time.

And then we said, well, once you treat someone for TB, they're good, because they have natural immunity. That also wasn't true. So this problem that Joseph had and already survived, that is his second bout with TB, MDR-TB, is going to happen more and more and more. And so again, the complexity of this-- and Hamish mentioned some of our work in Peru-- the complexity of this is just astounding.

You have multiple drugs. You're talking sometimes about 10 or 15 drugs a day. You have as he said, thousands of patients. I'll show you how many tens of thousands we're talking about. And you have to manage the complexity for every patient, but also the complexity of the program. And at the same time, we have to strengthen health systems.

Now, what does that mean? I already told you that we're getting an influx of vertical money focused on AIDS. But with that money, we have to make it do several things at once. One, is to strengthen community-based care, right? But the other is to build all those levels, those three levels of care, including hospitals.

So we developed, I think, along with others, but this language of health systems strengthening to describe what it is we were doing with the AIDS money we received in, especially after 2003. And this is an example of a place before and after. Now, it is by the way, all solar powered as well. And although the person who set up that system in Haiti and with us in Rwanda and elsewhere died in the earthquake, but we've made a lot of progress on other Leapfrogging technologies, including how to power these hospitals.

And we learned how to make better hospitals. This one was a few years later. Actually, a hospital redo in 2003, the first place that we use Global Fund money, this is in Haiti. And then we just rebuilt it again from scratch. And I'll talk a little bit more about that at the end.

Now, this model of three levels of intervention, public, private, partnerships, I could go on. I don't even know if model is the right word. That is, we also want to strengthen which health systems? The public health systems, because those were the weakest. Now, there are some places where people are not at all sanguine about doing that and are going to stick with the private sector.

But in general, in Latin America and Africa, the places where I work most, or to say nothing of Siberia, this is a good idea to strengthen the public sector, and in general. I'm not saying we have to be ideological about it. I'm glad I'm getting a weekly update call on TV. I told you, Hamish, that I love technology, but not that much.

[LAUGHING]

HAMISH FRASER: Goodbye.

PAUL FARMER: As if he were ever on those weekly update calls. I'll be ready when it comes back. So from the Dominican border to the coast-- and many of you have been to this part of the world-- we follow this model more or less, and started serving a lot of people. How many people? Well, I just pulled this yesterday from the PIH report, annual report. And there's this helpful part in the margins. In fact, whoever made this, I wish I could claim to have made this nice report, but this is very helpful, certainly helpful when you contemplate information technology and managing systems.

When you start reaching this scale, and this is more patients served-- I'm not going to talk about quality of care today. Although, I believe the programmatic care like for HIV is very good as I said, but this is many more probably than the big hospitals in Boston where I train, the o-train. This is a huge, huge scale.

Now, you'll hear people talk about scale that involves hundreds of millions of patients. And I'm sure that happens now and again. But it's really, we're still struggling to get there. And some of you were involved in the creation of the Brigham electronic medical record. And I was lucky enough to be in that first cohort of American doctors who became accustomed to having electronic medical record.

But the way I got the idea to push this forward in Haiti and to recruit Hamish, which I did, was actually getting on board a plane. Do you remember this? Every time that you go to American Airlines-- and believe me, I would put George Clooney to shame-- they can't print out the boarding pass if they don't have the right information in there And it's a program that they code, they wrote, or stole, I don't know. But this was something that American Airlines used not as open source, but they developed their own software. Some of you will know the name of it. I certainly remember the name of it.

And if you don't have all the right information, it won't print the boarding pass. How many times have you seen this? So my frustration was goading. I already told you I'm a specialist at guilt-tripping. But I couldn't manage to guilt trip people into making sure that every time a patient came in to clinic they were weighed. Does this ring any bells?

And I thought, well, that's what dock their pay if they don't weigh the patient? Although, people do that now. They call it-- what do they call that?

[INAUDIBLE]

Yeah, exactly. I just call it good old-fashioned Catholic punishment. But it didn't work on a systems level, right? So we're going to go around to each clinic and try and shame the nurses? Of course not, it doesn't work.

But we asked Hamish and Darius to rewrite our code so that you couldn't prescribe if the patient wasn't weighed. It would just give you a message like I just got about the TB meeting. Now, this was quite a while ago before this had ever been seen. Remember, these are areas of the world where there's no electricity.

So we also had to generate the electricity, put in place a satellite hookup so that there could be automatic uplink of this information, and actually build the hospitals. I mean, that's an unusual set of demands. Again, I just called that building a platform as if it were easy.

If I'm on service at the Brigham as an infectious disease doctor and think that a patient should have a brain biopsy to find out what's going on in some infection, or supposed infection, then I don't have to build the operating room and put in the electricity at the Brigham. It's all done. I don't have to do the surgery or anything like that either. But this is what I mean by building a platform in a rural area.

Now, just back to what you're doing in this class, we knew way before-- and again, thanks to American Airlines and those boarding passes-- we knew way before this e-health-- I'm not going to say craze, because I think it would be better if it were a craze-- we knew a long time before that that we needed this kind of assistance. Again, that's why we recruited Hamish and started a health informatics team and then later tried to develop these open source systems that could manage this kind of complexity.

But we also knew early on that there is no way-- have you ever seen a file room in a hospital? Yeah, it's pretty sad. We still have them everywhere that we work. The paper files-- which if you're seeing patients with chronic disease, they come back many times, right? It's not the same as managing a fracture, or even a childbirth, right?

The patients come back with chronic disease every month. And then you have to do what? You have to find their chart. And again, a lot of people are nodding because they've known how hopelessly outdated the system is, and probably was 100 years ago. But now, we have alternatives. So that's where we're trying to go and why we need more help, not less help.

Now, we took this system, this platform to Rwanda and also to Malawi, the SO2, and through partner organizations to other settings. But this same model we did with the Clinton Foundation was designed to fill in this empty space in rural regions. And GOR means Governor of Rwanda, CF, Clinton Foundation, PIH. Our MO by that time was to build a local sister organization. So some of you here have worked with the sister organizations, whether in Peru, or Haiti, or Rwanda. That's the idea is you're building local capacity.

But by then, in 2004-2005, we had one hopes learn enough about the limitations of our past platforms and could build new ones. And that's why actually Hamish, and Darius, and others actually spent a lot of time, moved to Rwanda with us to create this system a little bit more rapidly than had happened in Haiti where it had happened organically, or Peru. Could we start the right way from the beginning?

Now, the answer to that is still no. We're still not there. But I think we've made a lot of progress. And I'm hoping that Hamish and maybe Claire will have some ideas too.

So this is what we did. We went to a rural area, and we did the same three things. We did delivered services, which are largely clinical services. We trained local people, capacity building, and we built the systems. Again, this was literally rebuilding infrastructure or building. And of course, we saw the same kind of effects on patients as we did in Haiti or anywhere else, you know, where you go and actually deliver high quality and I say, community-based care to people with chronic wasting disease. You have the same response.

And one of the things that struck me in working in Africa, even as late as 2005-2006-- and again, I've mentioned the countries I mean-- is that people often were skeptical that we would see the same results in rural Rwanda as we had in Haiti. And that wasn't true. Of course, we did see the same results. But I understand after many years of hearing, well, there's medications, but we can't get them to you, it's not cost-effective, it's too complicated, they were pretty skeptical when we showed up that this was actually going to work.

I was actually at Princeton in that year, maybe 2004, giving a talk. And it was full of very self-confident young people, I'll tell you that. Hopefully, you guys are more modest at MIT, as nerds tend to be. But anyway, so we're in the-- did that go live to Taipei? I don't know if that's good. So we're in this big auditorium and someone says, oh, you're never going to make this model work in Rwanda. And I said, oh, really? And this is someone who looked to me to be all of about 22-years-old.

And I said, really? Why is that? And they said, well, this history of violence, and division, and started-- he, it was a he of course-- started naming the different ethnicities. And I said, well, we'll see. We'll see how it works.

It actually worked even better in Rwanda, this model of community-based care linked to health centers than on to hospitals. This guy, I will-- my medical colleagues have heard me make this joke before, but I'll try I'm going to do it again. He goes from looking like Skeletor to needing Lipitor. So that to me, is a really successful intervention.

But this time around, we actually worked with Hamish and team to try and develop this from the get-go. So I mean, I could be wrong, but this is a picture from Rwanda, right? And it is definitely Rwanda. I can tell by the table actually more than my colleague, where we put in place high speed internet access, and started working on a locally adapted electronic medical record right then and there. Now again, that was-- how did you put it diplomatically-- that I was prodding you or, I was annoying this team.

AUDIENCE: Constructive criticism.

PAUL FARMER: Thank you. Because on the program side, as the doctors and nurses do, we wanted immediate not gratification, we wanted immediate results, stock management, patient management. It just was because our goal in going to Rwanda was take what we had done in 20 years in Haiti and do it in five in Rwanda. That was an explicit goal. We didn't really know much about strategic planning or how to use language like that, but that's what we said from the beginning, that we would go-- somebody at the Business School Sloan ought to write a case about this. That was our strategy.

So what's your strategy in Rwanda? And the answer was to do what we did in 20 years in Haiti in five years, because it's a country that's much more organized. And this was again, not in the '90s. This is 2005. And I think people on the Rwanda team feel that we have succeeded, and we could not have done it without struggling with some of these issues of how to manage information.

We also had help, expert help that we didn't have 20 years ago in Haiti. And who were they? This is in Rwanda, but these are not Rwandans. These are our Haitian colleagues who went with us to Rwanda and were very credible mentors for the training that went on.

Some of you may know Dr. Leon who's worked with us for 20 years. He's a very good teacher, of course, because he's a teacher, as was the entire Haitian team that went there, they've actually done the work. They're not cruising into an urban hotel to give a two-day long workshop. These are people who went and lived with us in Rwanda from Haiti with real credible experience to share. So that part went I think, quite well.

And then finally, you have to have a there there. You have to be able to deliver the resources somewhere that is not appalling. And we were sent to an abandoned hospital. And again, some of you have been there. And it looked like you might imagine. It looked like it had been abandoned. And we had to rebuild that as well. Although, later we found that the best health system design was when we could build from scratch and not have to redo. Yeah.

AUDIENCE: A little cross on that.

PAUL FARMER: Got a little cross. That's an X.

[LAUGHING]

Thought you were a Scot. I thought you were a Scottish.

AUDIENCE: [INAUDIBLE]

PAUL FARMER: I thought you were going to say something constructive too, but. So you know, and then as the years went by, there were at that time in 2004, there were four of 30 districts that had no district hospitals at all. And we were assigned to three of the four at our request. We said, we'd really rather go to a place where there's the greatest need, but also where you could show that this is more than possible in a setting like this, again, without electricity.

This is in Butaro in the north. And don't look, Hamish. Ignore the little beeps and blurbs. And there was no electricity there either. And this is probably about 400,000-500,000 people without a hospital. So we went into the health center and transformed it into a hospital with the Ministry, of course. And then we built another one, this time, to our own specifications.

Some of you have probably heard from a group with actually some MIT involvement as well called Mass. At that point, this group hadn't formed, but it's a design, mostly architects, but also some engineers, who are working on social justice projects. And they were born really in the process of-- if I can say that, I think they say it quite a bit-- they were really born out of doing this work with us in Rwanda. And you can see that looks like-- I say, that looks like an artist's rendering. That's a photograph. That's what the hospital really looks like. It's a very beautiful hospital.

Now, and just for the data at the bottom, people ask a lot-- and in fact, the last time I gave a talk here at MIT I was practically assailed with questions about sustainability. And I was trying to figure out which professor was responsible for that, but couldn't-- the idea is, that you work in the public sector for a number of reasons. One, as Hamish said, referring to some other work of mine, which I kind of forget about is that when you're thinking about a rights based model, who confers the right to something, the right to health care, the right to education? The public sector.

So working with the public sector has that advantage as well. And then getting to scale, any kind of scale, I believe that the notion of scale, as we anthropologists would say, has been somewhat fetishized. People talk about scale all the time. And you're never quite sure what they mean, at least in public health. But because they're always talking about national scale, but there are also subunits of the nation, and in this case, the district, that are important to work with. And that's what we've done mostly is work with the district level. So that's the model replicated with the same challenges that we'd seen in Haiti and elsewhere, but a little bit more of a head start, I would say.

Now, let me just give you some outcomes and then open this up for the discussion. First of all, Rwanda, we had bet heavily as we decided in 2004, we bet heavily on Rwanda being a good place to bring to scale a rural health project. The Clinton Foundation had bet heavily. Our partners in health had bet heavily on it. And I think we were right, because at that time, I can tell you, there wasn't a lot of enthusiasm among some of my circles on the right side for working there. But happily, we made our own assessment and we said, this would be really forward thinking people to work with on the district level and on the national level.

And in fact, the Director of the National AIDS Program who has been to speak here before, Agnes Binagwaho, has since gone from Director of the National AIDS program to the Lead Technical Position the Minister of Health. So we've got to grow. We've been able to grow with her. And this is what she's done along with many, as she would be quick to add, that I don't think has been done anywhere, and that is universal access almost to antiretroviral care.

And there was a lot of talk in 2004 about well, there's a small number of patients in sub-Saharan getting care, but it was more like a tiny number than a small number. I have in all these years of doing this work, I've never seen someone living in a rural area of Africa and in poverty, except for sites that have come up with PEPFAR or the Global Fund. I had never seen anybody on care. I saw people who knew their status, knew their CD4 counts, but they weren't getting medicines. Or if they had, they had received them only irregularly by paying some astronomical sum for them.

And so this is a huge achievement. And Rwanda is not-- I mean, it is post-conflict. It was very poor. It's still very poor, but it was very poor back then. And to go from zero to now, I think they're up to 100,000 people, that's pretty much complete coverage. Now, they're looking with active case finding for others who need care. I don't want to overstate this, but if you get to 90,000, you're probably talking about 85% of all people living with HIV who need care acutely on therapy.

Now, we have not worked in all those sites, of course. Hamish has concerned himself with the National Program, as have I. I have worked along with a lot of my colleagues in three of those four districts without a district hospital. But through the electronic medical record, through e-health, through policy discussion debates, and later a training center that we built in this rural region, the first place we went, we've also participated we feel in a stunning reversal of fortune in Rwanda. And let me just give you some numbers.

First of all, when you integrate these programs-- this is language from Julio Frank, the Dean of Harvard School of Public Health who was Minister of Health in Mexico, has actually visited us in Rwanda-- when you integrate-- again, I showed you an AIDS program, a vertical program, same for a family planning program, it would be a vertical program or a tuberculosis program-- when you can integrate that into a health system strengthening model, you can have impacts far beyond what the intervention is designed, or the vertical intervention is designed to do. And that's what I think we see happening in Rwanda.

So looking at child mortality, and maternal mortality, and juvenile mortality, this is again, a stunning reversal on the national level. And it's actually been wonderful to be part of Rwanda during this time this past decade, because trust me, after 1994, there were a lot of people who were only too happy to write off Rwanda as a place where recovery could occur. And many other maimed states and weak states have still struggled. And I've seen that in Haiti. But Rwanda really did turn things around. Glad to talk about that.

We made our contribution there as I said, with the Ministry and the Clinton Foundation, and many other partners, and then set off to other settings. And again, rural Africa, this is part of an initiative we called in 2004, the Rural AIDS Initiative that Clinton launched that year. And it was pretty much the same thing.

Now, let me close by talking a little bit about two things. One is conscious attempts to tackle this challenge of information technology and health systems strengthening. And the other is, as you might imagine, what are some things that we didn't plan for, and I'm not going to say couldn't. But there are some contingencies that happened in Haiti recently as you all know, that we were unprepared for. And I'd like to open up some reflection on how IT could be and can be useful there.

Now, we've developed along with many partners, this GHD online platform, which we'd love to make sure it gets improved and used. That's another thing about-- we we're just saying, Hamish and I were quite skeptical 10 years ago about what he calls telemedicine. And it's just that it was so much discussed, but so little implemented, right?

So you go to the places I worked, there's no electricity. There's certainly not going to be telemedicine. But again, now, we have to revise that because with new technologies, including broadband access in rural reaches, you can imagine a much more robust platform-- to use that much abused word-- using telemedicine, but also, this platform, again, which should be linked to other efforts. As you can see, there's lots of members in a lot of countries. And a lot of them are NGOs, hospitals, academics.

And this platform is again, open source. I bet you I learned that term from Hamish and Darius. I had no idea what that meant probably 10 years ago. And it was a bit of a struggle for us. I was looking for expedients and saying, no, speed it up, speed it up. But I think the purists were saying, the open source part is really important. Some of this code will take us a long time to rewrite, but we should do it ourselves so that we can say this is an open medical record system platform. And so I'll just say publicly, thank you for that teaching.

Now, the contingencies I want to close with is-- and again, Claire Pierre, and many of you have been down to Haiti to help. But Claire Pierre actually lived through a lot of this with me. And I'm glad she's here. But it was a very difficult time, as you might imagine, after January 10. And this is the nursing school, the main nursing school. And this is 4:53 the afternoon.

So when you think about health systems strengthening, there's the three levels I talked about, community-based care, health centers, and hospitals. But there have to be people in there delivering services. And the loss of a generation-- or I mean, everybody in the second year class perished and their teachers did too pretty much-- the loss of a huge number of health professionals just in one day-- you know, again, people weren't prepared for this. And rebuilding Haiti actually means rebuilding in all those three levels, including the tertiary Medical Center level.

And then of course-- I say of course-- Haiti, the earthquake was followed temporarily by a cholera outbreak, which some people call a secondary spike in mortality. But it wasn't really related so much to the earthquake as the terribly weak water system. So I'm saying this as a limitation of health system design because it actually occurred-- and I gave a talk about this at MIT last year-- this epidemic occurred right in the area where we had been working for such a long time. So it's a pretty humbling reminder that building health systems has to be linked to other systems, water and sanitation, education, food security, at the very least, shelter, I would throw in there too. And of course, why not add jobs?

I tried doing that with the Global Fund grant. I would say, oh no, we can't have just an AIDS program. You have to have a women's health program. They said, women's health program? This is not the Global Fund for women's health. And I said, well, how are we going to do prevention of mother-to-child transmission without thinking about the moms too? And don't we want to promote family planning? Anyway, so I'm kind of a pro at that too, broadening the mandate of others without their knowing it.

[LAUGHING]

Anyway, so this is squarely within my remit, right, infectious disease, epidemic. And we've been trying-- and again, I'll be glad to talk about this if anyone's interested-- we've been trying to respond obviously, with by reinforcing water and sanitation, but we've said, wait a second. We've been here a long time and we've failed.

We don't have a lot of confidence that a bunch of USAID contractors are going to come in and solve all these problems. We've been working here for decades. We've heard all this before. We have to think of new technologies-- again, back to the theme of this course-- not just to count the number of people affected like John Snow did, but to prevent infection as he did by taking the handle off the Broad Street pump.

And so I think Hamish worked on this. I believe others have as well. We are working with humanitarian and disaster relief outfits to try and find out where this epidemic was going. And to do what was our job to do at the very least, which was reduce what's called case fatality rate, the number of people sick who actually got. I'm happy to tell you I think in Mirebalais now, which I'm going to return to in a second, I don't think we've had any cholera deaths recently.

So we have a lot of cholera, but the staff there has been trained to make the diagnosis, deliver the care. And that's a good thing, but it's still not going to get rid of cholera from the island. So we have to do this long-term work. And we also have to-- I think I skipped one slide because I didn't want to go on too long-- but we've also launched an integrated prevention and care program that includes a vaccination. I may have thrown that back in.

But back to this model, right, again, not rocket science. I'd argue that 20 years from now when people are writing books about health systems strengthening, they'll basically describe this, community-based care, health center enriched, hospital link, and there'll be better language for it, a new jargon, and hopefully, new research posts and new contracts with USAID. But I'm kidding. But this is the basic model. And again, it's not rocket science.

Now, we also considered very strongly what should be our signal effort post-earthquake in Haiti. And we were already building yet another community hospital in this town nearby there, which I happen to be working in in 1983, as in the year between college and medical school. And so I was pretty excited about building a community hospital in Mirebalais. But after the earthquake, we went back to the drawing board. Literally, I say we. We, this time, we turfed this over to real professionals to redesign the hospital.

Again, I said, we had a pretty good community-based design. Health centers, we were doing OK. Although, I still think a lot of them are dangerous as far as nosocomial infections go, especially in Southern Africa. But our weak point, some of us felt was still the quality of the design and construction of the hospitals. And then throw on top of that the earthquake in Haiti and the destruction of the medical infrastructure, the training infrastructure, rather, in the capital city, because that's where all of it was happening, 95%. And then the loss also of 20% probably of the health professionals in the earthquake, of the practicing health professionals. So this is loss or maiming, let's say. So this is a cause for system redesign, right?

And when President Clinton started talking about Build Back Better, Build Back Better, we're asking what does that mean? And we thought, this is what it means. We're not going to take shortcuts this time on construction. And that means, obviously, things like building code. This hospital was designed to California earthquake standards and beyond.

But also, how are we going to power it? If it's going to be a medical center rather than a community hospital, we're going to go back in and then put in the solar, because we've been doing that as I mentioned, our chief partner, the implementer died in the earthquake at American. But we knew we had to do something very different. And so we redesigned the hospital and built it. I say we. I didn't do any heavy lifting.

But we've actually managed to get-- and here, I always try to make a tribute to one of my former students, David Walton, who is the project director, but also to former construction company magnate who started a construction company here in Massachusetts when he was 22-years-old. His name is Jamie Ansara, built a big company, sold it. And then since the earthquake, has basically been down in Haiti. And some of you, if you ever get to meet him, he's a very quiet, somewhat gruff, but terrific guy.

And together, they put together a team that has people from all over from the United States, Dominican Republic, and especially Haiti, and built this really terrific hospital. So I'm going to stop here and open it up for discussion with the summary point that there in order for you guys-- and those of you who are interested in technology, not all of you are actually going to generate the technology-- but for those who are interested in technology and how it works, remember that you need it they're there to a platform that is built. And sometimes, that platform is already halfway there, 3/4 of the way there. But sometimes, it's almost absent completely.

And that's where I hope people like me come in who are not on the cutting edge in terms of technology development or new tools, but we're in a way, in the cutting edge of health system design merely because we're going back and saying, well, you can't really skip over that step. You actually do have to have hospitals, and health centers, and community health workers. So thank you very much, and I look forward to our discussion.

[APPLAUSE]

HAMISH FRASER: Thank you, Paul. Really appreciate it.

PAUL FARMER: I'm sorry, I went over a little bit.

HAMISH FRASER: We've plenty of time, actually, so that's not a problem. A couple of things, first of all, we'd like to get some questions or comments from the students in the class first of all, if that's all right. I know you have a few ideas that you would like to ask Paul about. Just a couple of quick comments about some of the things that we discussed in the lecture, I mean, one just about open source, in addition to making software available to other organizations and countries, one of the things that we keep coming back to is the fact that there are differences, and there are different requirements and different customizations that are required in each different country.

And as the very varied nature of the environments we work in, by using open source, we give control, and leadership, and ability to actually manage those projects to people working in different countries. And that's particularly true in Rwanda where we've trained a lot of people who are now able to program the systems. So I think in addition to the kind of almost like a human rights approach of making these technologies available and really empowering people, it's also really essential to allow them to be adapted to the real needs on the ground rather than something that looks similar, such as the requirements in Haiti in Rwanda, which are superficially similar. Many things are the same, but actually are not quite the same.

And the other comment I just make about the cholera outbreak, that I know that there's many people in the MIT and Boston community who've been looking at the question how do we actually understand and measure what's going on there. And so Paul commented about some of these issues in one of the slides. And I know that many people here have been interested in that question, and they've been looking at a whole range of different ways that we can look at what's going on, which communities have good water supplies, how can we even track which pumps are actually functioning using cell phone connections to those, how do we overlay that with social networks, and actually manage to track the cholera outbreak through those as well.

So I think there's a lot of areas where there's overlap. But I will not take over this. Just first of all, I'd like to say, do any of the students in the class have questions?

PAUL FARMER: Yes, please. If you don't mind introducing yourself, just in the hopes that I will stay in touch with some of you.

AUDIENCE: My name is Sherry Ward. I'm in the MPH program over at the Harvard School of Global Health in the Global Health department. Thank you for coming and thank you for the presentation. And I also wanted to say thank you. I heard you speak in Mirebalais in January.

PAUL FARMER: Did I cry or not?

AUDIENCE: It was a very emotional time, but it really affected the way I think about delivery and resource in poor settings. And I wanted to thank you for that.

PAUL FARMER: Well, thank you for coming all the way to Haiti to hear it.

AUDIENCE: It was great.

PAUL FARMER: Thank you.

AUDIENCE: My question is, what has been your experience with any mHealth technology, and either yourself, or with partners in health that was very successful that you felt made a big difference in patient outcomes? And why do you feel that those specific programs were successful?

PAUL FARMER: Well, I'm going to tell you again, as the outsider, and then ask Hamish to comment on that, the outsider, meaning, the insider clinically. If I had to choose one, leaving aside the electronic medical record, you said Mmobile, right? It would be the cell phone, the use of cell phones by community health workers in Peru to manage complex pharmacopeia, these regimens that are sometimes have 10, 12, 15 medications.

And I would say that that is probably-- and my colleagues are doing that in Mexico, in Rwanda now, in Haiti. But the Peruvian, it looks to me like the community health workers really can't work without it and their handheld devices. Am I right or not?

HAMISH FRASER: I mean, actually in Mexico in particular, dental services work, looking at how you can simplify the prescribing of certain medications, and providing that support is probably the most advanced one that we've been looking at. I mean, I think there's a huge amount of energy in mHealth at this point. And many people looking at different ways that we can use it. I would say that we've had specific benefits. And the other thing we did in Peru actually was with palmpilots before--

PAUL FARMER: That's what I meant, handheld devices.

HAMISH FRASER: And be able to collect that data and improve quality for example, of access to lab data. I know that [? Narak ?] was also interested in this question, how do we actually get the lab data from the laboratory maybe to remote part from patients back to the clinicians caring for those patients? And that's been one of our biggest pushes.

I think, going forward, there's the big question-- this is actually one that I'm very interested in-- two randomized control trials we talked about in the class looking at text message reminders for patients to take their HIV medications, and showing that there was a benefit to that. But at the same time, to my knowledge, and I think they're still trying to map this out, this is not as effective as a community health worker [INAUDIBLE].

And so there's a big interesting question that we have not resolved is, how well does the computer model function in different environments relative to the phone? And I believe that the community health worker is actually a much more effective approach. However, there's also the questions of how you organize that. So there's a big interesting question in the public health aspect, which I think is going to be one of the important things going forward in the next couple of years.

PAUL FARMER: If I could just add to that, back to the question of comparing some of the neat gadgetry that has been advanced by MIT, specifically, one of them I remember was a urine strip to test isoniazid levels in the blood to see if you were actually compliant with your regimen for tuberculosis. And I was saying, OK, then you feed the strip into a cool little handheld machine, but you could have given someone a job to be the community health worker and visit the patient.

And accompaniment-- so this is another-- I don't want to sound like a Luddite. I believe that is the technical term, remember, for Ned Ludd. And I don't know if he was a real person. But trying to slow down your peeps, trying to slow down the Industrial Revolution. On the contrary, I'm not. I'm just saying, we need to learn how to measure, especially at the School of Public Health, or in the economics department, the positive impact of actually reducing unemployment.

And community health workers are far and away the largest fraction of workers at Partners in Health, which counts probably 15,000 employees. And most of them have never had a job before. So there's this virtuous social cycle that gets started just by using human labor when you can. And you want to never fail to integrate new technology at the same time that you learn how to value positively giving a job to community health worker, which by the way, still, as I said, delivers a better service, but also has these other things we need to learn how to study.

HAMISH FRASER: I mean, something that we're doing a lot at the moment is looking at how the really effective community health care worker programs, and the training, and the way that those have been set up and managed can be linked to the use of mobile devices. And that's in Rwanda in particular, with their 40,000 community health care workers hired by the government and being trained. They are working really hard on how you can actually link that using initially text messaging, rapid SMS.

But how can we actually build on the strengths of both of those things, the community, and the employment of people who can really get into patients' homes, but also linking that so that you can, for example, ensure that if somebody has TB and it wasn't known when they were in the clinic, that you can get that message to the health care worker and bring them in for further treatment? Another question.

PAUL FARMER: Yes, please.

AUDIENCE: Hi, my name is [? Eden. ?] I'm from [? Front Desk First ?] with HM, a Health Policy and Management program. And needless to say, I've been reading a lot of your books. And I missed a couple of--

PAUL FARMER: Oh, don't say needless to say. Say away.

[LAUGHTER]

I'm thrilled.

AUDIENCE: I've been following your work on that. And I would say, including my professors here, you guys are one of my idols here. And I'm grateful to be here. My interest has been throughout this class and my anthropology studies, how to measure and maintain quality of care within those settings when the priority is in giving access and in maintaining sustainability within the health care system.

PAUL FARMER: How to maintain quality.

AUDIENCE: How to maintain quality of care.

PAUL FARMER: Excellent.

AUDIENCE: I know you did not want to talk about it earlier, but I was wondering.

PAUL FARMER: Yeah, well, first of all, it's not that I didn't want to talk about it. It's just such a humbling topic, the quality issue. So again, we're moving towards scale, but I would say the main reason that our organization isn't in 25 countries, but rather, only in 12, and isn't trying to claim nationwide coverage, is because of a I hope, a humility about quality. We don't believe that it's easy to just go in and fiddle with the policy, and suddenly, the quality of care changes on the national level, sometimes. But it's usually a mix of resources, human, and other kinds of capital, and then the implementation.

So we're very focused on implementation. And even with that focus, I would say that we've had a big quality problem with scale, just like everybody else. So that's what we're struggling. You asked me what measures, OK. Most of them are proxy measures. Like I mentioned one, right? I didn't really say it, but I'm going to say now, when you're looking at outcomes of HIV and TB care, you obviously have-- you can use viral load for HIV. For TB, you can use smear microscopy. Microscopy are some of the new diagnostics. But you can also just weigh the patients.

So again, a proxy measure for quality of services is if they gain 20 pounds like Joseph did and John-- that was the name of the other guy-- then that's a pretty good proxy measure. It's inexpensive, and it can be sent in by a mobile technology. Now, I could go through this for diabetes care. Well, hemoglobin A-1C is one measure, right? So you can imagine, again, a hand-- this time, I would actually say it'd be better to have a handheld device that can actually be used-- a finger stick is painful some of you know-- but get a sample that is able to tell you, well, what's the blood sugar, and what's the hemoglobin M-1C. These are proxies of quality.

You could use as people at this institution have, are the pros now in randomized trials of positive social outcomes. You are using those who do that, work proxy measures. So I've found there's a long list of them. And even in a setting where you wouldn't easily have access to a lab, or you wouldn't have access to a researcher who is registering things using questionnaire, you still, if you have this network, this platform, you still have your community health workers. And they can manage quite a bit of complexity in terms of reporting if they're supported fully. So I think for each of these problems, you can find proxy measures for quality.

Now, I would add in-- and I'm just learning about this. Julio Frank, your boss, he has a mentor I think at University of Michigan, had a mentor, who was the father of quality improvement from the '70s and '80s, wrote a paper evidently in *Milbank Quarterly* in 1960 something. Julio Frank just told me this.

And he, not Julio, but his mentor, one of them said, that there are many kinds of quality. There's technically competent quality, the least we can do. But there's also respect for the rights of the person, the so-called client, patient. And you know, and what about the dignity of the surroundings in which the care is delivered? We've focused a lot on that. And Julio has been helping us. Yeah. Go ahead.

HAMISH FRASER: Any others? The student class?

PAUL FARMER: That is tough.

AUDIENCE: My name is [INAUDIBLE], and I'm a student at [INAUDIBLE] International Health Policy and Management program. And my question is, I know you've done a lot of work with technology and work in mostly on the clinical in curative studies on HIV/AIDS and TB. But also looking at maternal health for example, and you're looking at the antenatal care coverage, a lot of the programs and increasing use of data, I would say, has been focused on incentivizing women through vouchers and cash transfers for them to come to resources. But from a technology standpoint, how would you use technology to get people to value something like ANC?

PAUL FARMER: Yeah, well, first of all, I'm glad you asked me. But first of all, I think there's a right track and a wrong track. And the right track is the cash transfer part. The wrong track is trying to-- and again, this is-- I have a colleague here, and I'll see how she thinks I do. There's so little knowledge in public health of how structural problems, poverty, gender inequality, travel, transportation, whatever, there's very limited understanding of how those things determine agency, the ability to choose.

So I would say, the wrong way is to try and get people to value things when we don't have evidence that they don't value them. What we have evidence of is their inability to access them. So it's a somewhat subtle point, but I think cognitive approaches to, for example, the promotion of ANC, that is, exhorting poor women to do what you want, I think they're fraudulent. And I also think they're heavily funded for a reason, because what they do-- and I want to see how you think I'm doing-- what these approaches do is to move the locus of the problem into the head of the mother and out of her conditions, right?

They're saying, we have to make you value this, because you don't value it. What's the subtext is, you don't know you're not able to value antenatal care. But actually, we don't have data for that. What we have data for is to show that they don't-- there are barriers, user fees, transport, you know, who's going to babysit the other kids. And a lot of anthropologists would call those structural constraints as opposed to cultural or cognitive.

Now, here's the scam in my view, and I guess I might as well know I'm transmitting this around the world, is that the idea that these are really the problems of poor people is really good for us, people like you and me who go to places like Brandeis and Harvard, because then we get a job afterwards if we can yell at poor ladies and tell them what to do, right? And we'll get funded for that for years and years.

And we'll even be able to repeat the cycle and do research on that as if we didn't already know that antenatal care was good, right? So I think how we use technology, back to the point of your question, in something like making people value these good things that we believe in, include cash transfers, and even heaven forfend, unconditional cash transfers, because after all, poor people have been making unconditional cash transfers to us for many centuries, right? You with me?

AUDIENCE: Yeah.

PAUL FARMER: So I think using those technologies to transfer resources, rather than just reminders-- and I'll be looking forward to seeing the results of those studies. But you know, reminders are one thing-- exhortations, I'm calling them-- but just link these technologies a little bit to removing barriers. Like, for example, if you look at structural barriers to care, again, I mentioned transport, have the voucher, go all the way out to the woman, move the antenatal care to her, or bring her to the antenatal care. And again, think about all these structural problems.

Who's going to take care of the other kids? How is she going to get there? Is there going to be a long line? Is there a hidden fee? Is there an open user fee, right? Because you find out-- people say, we don't have a user fees. And then you go and do research, and there are user fees. They may be hidden. They may not.

So that's just my own personal take on that. Now, I don't go out to a conference on how to make women value antenatal care and say this stuff. Actually, I don't go to those conferences anymore, because I think they're a bit of, as I said, a fraud.

HAMISH FRASER: So actually, there's a question from Lauren, who's one of our students who unfortunately can't be here today, which I think is very relevant. And it relates also to something that last week when I was in Haiti we were looking at our system, which does very close to what Paul was describing with the American Airlines, where each patient is registered.

PAUL FARMER: Only took you 10 years.

HAMISH FRASER: It did take 10 years, and for some good reasons. And so it prints out an ID card, actually, a plastic ID card with a barcode on it. And so each patient visit is tracked. And we can see when they come back. And we can see the same person. And we can link it to the lab data and so on. So it's a very important foundational component, which we hope to really be able to scale up in the [? Mirebalais. ?] Hospital as a critical first step.

But it also introduces and furthers one of the questions that we often get, which is, what are the trade-offs between collecting personal data in information systems and the potential risks, or perceived risks that they pose to patients? And then the question, how do we improve access to care? And it seems like there's a bit of a tension there. So Lauren Rand actually asked a question around that.

PAUL FARMER: I don't know if she's listening now, or is just going to hear this later. But this is a problem that I've-- again, I'm going to use a little political economic notion here. The times I've heard that question most has not been in settings of great rural privation from our patients. It's more from our staff, interestingly, right?

And so the primary-- again, this is a gross generalization, but I think it's true, nonetheless, gross, meaning grand-- that the privacy concerns are tightly tied to class aspirations. So a lot of the people we're serving, AIDS is kind of just the latest problem to show up in their lives, some of the people you've met in rural Haiti. And their primary concern is access, back to the second part of her question is, how can we get care?

I remember being told in-- again, here, that when you go to Rwanda, there's so much secrecy. No one's going to know their status or tell you their status. I went in 2004 out to community meetings the year before we started, some months before, in a village where in the city this might happen. In the village, in the rural area, you'd say, well, how many of you have HIV? And they'd all raise their hand. And how many of your C4 count? And they'd be going 262, 84. And these are very public fora, you know.

And so I would just say, we have to be very careful to respect that question, how to protect privacy. But it's still not fundamentally related. It's not on the top five barriers, back to your question, to access in the rural regions. Even I think in the urban regions, it's in the maybe top 15 as a barrier itself. Now, that doesn't mean we don't have an obligation to take this very seriously, as I know and your team have with unique patient identifiers and sign-in codes.

So you can't log on the system in Haiti unless you use your user ID just like at the Brigham, you know? And so your electronic fingerprint, if you're going into someone's medical record, is there. But again, I think that's us being responsible to not a double standard of care in Haiti and Rwanda, Malawi, et cetera. But again, the concern has come more from our employees than-- who also? I mean, our employees with HIV than from the patients who we've been seeing in these first years.

And I think that's an interesting-- I mean, an anthropologist ought to go in and talk about how some people have these aspirations where suddenly, for the first time in their lives, HIV comes along to spoil their aspirations, whereas, other people have been living a lifetime of disappointment. And you know, again, this is the latest thing to come in and spoil aspirations that were set low to start with because of so much unfairness, again, lack of access to school, primary, even primary school, to a job, to family planning, on and on the list goes.

HAMISH FRASER: And the only other thing I'd say, that the policy issues at government level, there isn't a policy around patient confidentiality, which is the case of a lot of developing countries. So that's another factor. So just to open it up to other questions.

PAUL FARMER: Yeah, I mean, please.

AUDIENCE: Yes, sir. [INAUDIBLE] also from the School of Public Health. So I've got a question too about using the human rights framework in what you do, and the status of technology within that. So given the rise of mHealth, telemedicine, and e-health--

PAUL FARMER: You too with the telemedicine.

AUDIENCE: I am a telemedicine girl too. Do you think that it is inherent in the right to health, technology is included within that? Or do you think there is on the ground tangible, important role for the separate right, of the right to enjoy the benefits of scientific progress? What do you think that is now, given that technology is so central to health today?

PAUL FARMER: Well, I mean, I would say that it is possible to exploit multiple frameworks at the same time. And I'm also kind of a pro at that, right? So three big frameworks are one, the rights-based framework, which I find very useful. Another would be the public goods for public health framework, which the public health people as you know, develop this, they're comfortable with it. You'll find a lot of people in public health who are uncomfortable with the rights-based approach. They think it sounds shrill. I get that.

And then the third, which is the economics development framework, how will we break the cycle of poverty and disease if we don't invest in these new technologies? So I think either way you look at it, these frameworks lead to the same thing, which is valuing scientific progress as the basis of a lot of these interventions. I think that's a healthy thing to do.

So whether we say, well, just the right to health care will drag in the right to technological advances, I think that's true, because all of the technologies we're talking about that, that I've spoken about today, each of them is a post mid-20th century development, antivirals, antibiotics, diagnostics, and the maladies themselves, right, they've changed at the genetic level, drug resistant TB, drug resistant HIV, drug resistant staph aureus, blah, blah, blah.

I guess, blah, blah, blah is not really good to broadcast internationally, but you know what I mean. So I think that that model is still robust, say, look, if you want to talk about the right to health care, you're going to have to talk about the right to access a new technology. Now, at the same time, does it weaken or strengthen the argument? Because this is really about an argument, right, a pitch for using these developments to promote health and well-being among people who have been cut out of scientific progress.

I think it's also helpful to have people think about the digital divide, you know, what the costs of not having access to these new technologies is in a rights-based framework as well. I think it's complementary rather than corrosive. So I would actually say that working together, like, if we get the IT nerds together with us, the health providers, it's a very powerful thing, ITNs.

HAMISH FRASER: I think we have room for one or two more questions.

PAUL FARMER: Yes, please. And then can we just at least take these three, because they're all in a little triangle, and I said so?

[LAUGHING]

I'll try to speed it up.

AUDIENCE: I'm Jane Gilmer with the Security Studies program at MIT. And I have a question about surveillance and how you think about disease surveillance. We've had a great controversy about H5N1. And that research is-- at least the Wisconsin aspect of it-- is to be published in *Nature* imminently. And the *Science Magazine* will also be published in the Rotterdam results. And both of the countries of researchers have said, that they're doing this research, which is to actually jump ahead of nature a bit with host responses to avian flu H5N1.

They both said that what they want to do is create mechanisms for improved surveillance. So I'm asking you about surveillance, because are these platforms that you have established, and that you're looking at, are they also good modalities for surveillance, which is a huge problem if you look at avian influenza? And I guess, I think behind that question, I think would be a larger question about-- which has already been echoed here is-- are we bringing people into the 21st century? And this is very futuristic.

PAUL FARMER: Is this a Foucauldian question?

AUDIENCE: This is a Foucauldian question.

PAUL FARMER: No, please.

AUDIENCE: No, I guess it's this whole issue of where is basic science relative to what you're doing? And I know you think of this in a treatment mode. The way people are looking at it now is in a surveillance mode. But I can throw you the general question of, where is the link between basic science and treatment as it impacts your project?

PAUL FARMER: Can I start with the second part and go back to surveillance? Because there are multiple regimens of surveillance as you well know. But back to the basic science question, I would argue that no example is more powerful than AIDS than in 30 years, only 30 years that you can go from a new syndrome in at least in this part of the world, and certainly, newly described, identify the pathogen, learn how to diagnose and stage the disease with great reliability, and then have a fairly reasonable treatment regimen developed, suppressive, chronic, but still pretty good. I mean, it certainly looks good to me as a doctor.

All that has happened in 30 years. And I mean, it's all built on basic science laboratory research, the therapeutics, the diagnostics. So I think that is a pretty powerful example of how you can link scientific development to a great need. Again, I mentioned already the leading infectious killer of young adults in the world and a huge killer of children as well and elderly people. I mean, and then there's the indirect cost to the elderly and the young who are not infected, but are affected.

So I think it's a good story for science, for basic science, and that it also gets back to the surveillance question, because I remember some of the things-- indeed, I wrote about this in the '80s about the negative aspects of surveillance of HIV. And there are a lot of people writing about that in the '80s, because we really didn't have a good therapeutic strategy then. But the people did have the ability to discriminate against people with living with HIV in the workplace and in housing questions in this country, and in all kinds of ways in other settings too.

So the negative aspects of surveillance are also out there. I don't know which one you were leaning on, Jean. But in terms of surveillance to serve as opposed to discipline, these platforms offer great potential. And I think one of the-- again, one of the smart things for us to do to show how surveillance of an epidemic is a good thing, is to link that to service, like with cholera. Do you want to count cholera victims? Or do we want to eradicate cholera from the island of Hispaniola, and develop a stockpile for the world?

We want the latter. And we want to count cholera cases so that we can build better budgets, and better interventions, and raise resources to save lives, but we also want to do it to eradicate the disease. So to the extent-- back to the general point here about surveillance-- stop looking at your cell phone, Hamish.

HAMISH FRASER: Watching the time.

PAUL FARMER: So I think the promise of good surveillance comes out of these platforms, and that the net good is going to be huge. We also just have to link that back to the rights questions that were mentioned already. And the right to access is the biggest one.

HAMISH FRASER: So we've actually got about five minutes. And there is a class after this. So I think what I'll do is just a quick announcement and then one more question, if that's all right.

PAUL FARMER: Sure.

HAMISH FRASER: So just for next week for the class, we actually have a class project presentation. So we're looking forward to that. And other people who are interested are welcome to come and join that. As I said, there is another class coming in. So in five minutes, we will need to leave the room.

PAUL FARMER: Everything sounds--

HAMISH FRASER: We'd like to use that last time for at least one more question.

PAUL FARMER: Everything sounds better with a Scottish burr. Like, get out.

[LAUGHTER]

And then I'll stick around outside by the way.

AUDIENCE: [INAUDIBLE] from CCL here. And I was curious if there was an optimal mix of the number of participants in the process, so the physician, the nurse, the community health worker, the patient.

PAUL FARMER: That's a great question.

AUDIENCE: Where does it the stop? Or do you try to engage the whole community, because it's a community-based approach? You engage the whole community, where does it stop before it becomes like an issue like here, where there's so many participants in the process, like third party health care managers, insurance companies, before it becomes--

PAUL FARMER: It's a great question. I will say, given the threats that I just received from your course director, that of all my coworkers who are working on this question of the ideal structure, how many health workers, to nurses, to doctors, how do they fit in with a larger community of people living with HIV, women's groups, community groups, how they fit in with the ministry, it's actually there's quite a number of us in Rwanda working on this project.

And Michael Rich, my wife, plenty of people who are working really on this question-- what should it look like? And I think that that's going to lead to a great efflorescence of knowledge and it's review and publication. But I can connect you to all that right now. And they've already started I think, to publish some stuff from the Doris Duke grant. I don't know if that's true.

But as far as third party payers and the complexities that we've seen in research, non-poor settings, non-resource poor settings-- sorry-- we're starting to see that in Haiti too, I mean, that challenge. For example, this new hospital we're building, looking at Dr. Pierre, we're going to suddenly for the first time in our history, the 200,000 insured families in Haiti out of the 11 million uninsured, are going to be coming to us with actually, the ability to reimburse us. I mean, it's going to be a novel experience, let me tell you.

So we're also going to have to take on that kind of complexity to moving forward. In Rwanda, that was pushed on us with a mutual system, an insurance system that was also community based. But I think we're going to have to get stronger at this in those settings where there aren't many formal structures like that, and then see if we can apply lessons here or from here in going forward. Well anyway, thank you all very much. And I'll stick around outside.

[APPLAUSE]