World TB Day Roundtable Discussion: TB Today: Old Enemy, New Hurdles
Stop TB Partnership, Global Health Council, BD, Scientific American Magazine and The Earth Institute at Columbia University
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JOHN RENNIE: Well good morning and welcome. My name is John Rennie. I am the Editor-in-Chief of Scientific American and it's my pleasure to be the moderator for our proceedings today. We're very glad you could join us for what I hope is going to be an extremely informative and in some respects I hope inspirational discussion of tuberculosis and the state of our efforts to try to prevent it, diagnose it, treat it, control it, ideally eliminate it from the face of the earth.

Today as you know, March 24th, is World Tuberculosis Day, which commemorates the occasion back in 1884 when the famous Dr. Robert Koch presented his discovery of the tuberculosis bacillus to his colleagues in Berlin. That day marked a turning point in the humanity's struggle against an enemy whose grip has really only strengthened as our populations have become more concentrated and more urban. It would be nice to say that day represented a magnificent turning point in our long time struggle with tuberculosis and in some respects that was true. But it has been less true than I think we would all like to say. There have been tremendous successes in repealing the toll of tuberculosis thanks to the efforts of public hygiene particularly back during the late 19th Century or

early 20th Century, but TB still takes a tremendous toll on the world today particularly within the less advantaged nations.

Most Americans have the luxury of not really knowing very much about tuberculosis. It exists at best sort of on the periphery of their awareness. And if they think of it at all it may be colored with a sort of romanticized claptrap about John Keats and other poets who died some sort of spiritually illuminating death that helps inform their genius. This is of course a horrid, horrid myth.

Tuberculosis is a wretched, grinding, awful condition and it kills people in the most miserable ways. And today, World TB Day which we'd like to think would be an exception, is not. Five thousand people will die of it today. And 99-percent of them will be in developing nations.

It's because TB strikes those with weakened immune systems that it has also in these last few decades been able to join hands with HIV and the other great modern infectious scourge of our times. And it is further complicating the management and treatment and control of both of those conditions.

And making matters much, much worse is that now we're seeing in recent years the emergence of antibiotic-resistant forms of tuberculosis both a multi-drug resistant strain that survives the two most powerful treatments, Isoniazid and

Rifampicin, and now an extensively drug-resistant strain, XDR-TB, that even stands up to the second line of drug treatments. So the frightening prospect is that if XDR-TB were indeed to become widespread we would essentially have rolled back the clock in a sense on our treatment of TB by a hundred years.

Notwithstanding those kinds of disturbing realities there is still tremendous hope in what we can do about this if we have the will to exercise the tremendous tools and knowledge that we have at our disposal. We have today a wonderful grouping of experts on the subject of tuberculosis, both here in our dais and here in our audience.

And what is my pleasure today is to be able to try to facilitate a conversation with all of them and try to draw out the questions that you may have and can pose to them because they are so well set up to be able to answer that, better I think than really any other gathering on the subject that I think most of us in the general public would ever have. Following the sort of brief conversation with our panelists there will be an opportunity for you in the audience to be able to pose your own questions and I certainly hope you will take advantage of that. And actually your questions and your comments today are a very important part of today's proceedings.

You will notice that there are comment cards on your chairs as well as at the check-in desk and at the photography exhibit outside this room. We would like to encourage you to fill in those cards and then return them to the box that's located at the front of the photography exhibit. Your thoughts on what you've heard today or really just any thoughts that you have on tuberculosis would be very, very welcome. As you can tell by the cameras, today's event it being videotaped and it's going to be posted on the Kaiser Family Foundation's HealthCast Site tomorrow evening. And if you'd like the exact web address please just check in at the check-in desk. They will be happy to help you.

And finally on a little more celebratory note I am very glad to announce that in honor of World TB Day, Ed Ludwig the president and CEO of Becton Dickinson and two of our panelists, Jorge Sampaio and Giorgio Roscigno will be ringing the closing bell at the New York Stock Exchange this afternoon. So that will be a wonderful note. With all that in mind I think I'd like to turn the microphone and attention over to the esteemed Jorge Sampaio for some opening remarks.

Jorge Sampaio is the U.N. Special Envoy to Stop TB and he is the former President of Portugal. Mr. Sampaio's been centrally involved in a wide variety of social and political reform movements throughout his long career. In 1979 he was

elected to Portugal's parliament and became a member of the National Secretariat of the Socialist Party. And from 1979 to 1984 he was a member of the European Human Rights Commission of the Council of Europe where he played an important role in defending fundamental human rights. He was elected Mayor of Lisbon in 1989 and then re-elected in 1993. And of course, he has twice been elected President of Portugal in 1995 and 2001. In May of 2006 U.N. Secretary General Kofi Annan appointed Jorge Sampaio as the first Special Envoy to Stop Tuberculosis. In this role Mr. Sampaio works with the Stop TB Partnership to raise the priority of TB management on international political and developmental agendas. Mr. Sampaio.

JORGE SAMPAIO: Well, thank you very much. It's a great honor to be here today. I thank all of you that come out to this initiative and I just wanted to start by saying that I have lived through two World TB Days, in 2006 and 2007. And the difference is very considerable. So I'm very happy that not only the sponsors are there, the audience is here, we are at Columbia University. I don't know if ringing the bell at the stock exchange at this precise moment is an extraordinary idea, [laughter] but so let's hope for the best.

Why a United Nations Secretary General's Special Envoy? Precisely because it was felt at the time that the TB community

needed someone, at least by the principle, to perform or make advocacy.

In other words, in relation to as what you have just said it's kind of a forgotten pandemic which in fact was coming back in force. And this is what I've been doing. Some of you I know well. I've been with the community of those who work with this. I'm not a scientist I'm just a main lawyer and as you heard a politician now in retirement. It gives me more free time. I have no votes to win which is a very good thing. And I have always had a keen interest in public health matters for many reasons. And I think because really the main one being that we are dealing with a fundamental human rights problem when you attack some of these pandemics. Especially if you go to developing countries you are staggered at the views that you can in fact take.

So we need science, we need money, we need commitment and we need to have politicians picking up the issue and raising it to profile of the top of the agendas, because there is something which I think is extraordinary. How can we, not speaking about HIV/AIDS death toll which is bigger and malaria which is smaller than TB, but we are dealing precisely now with something that kills 4,600 people per day and has millions of new cases every year. And now has two added complications to

which I will refer later and I'm sure that the scientists present will develop.

There are four core messages which I think have to be presented. Progress exists but it is too slow and stalling. The 2008 WHO report on TB was issued last week referring to data collected of course in 2006, and progress against tuberculosis slowed in 2006 with the number of the new cases and deaths from the disease climbing. This reason is that rapid strides have been made in previous years but some countries are unable to keep up with the pace while some are just beginning to accelerate their efforts.

The members are reporting but I would point out two, three; 9.2 million new cases of TB in 2006. It's not just 10 or 20, it's 9.2 million, at least if that's what the report says and we have all the reason to believe in it, with 709,000 cases among people living with HIV. And here is the new paradox because now you have antiretrovirals to keep people with HIV/AIDS living and they die because of tuberculosis which on top of all of this is a curable disease. This is really a dramatic circle to which we have to pay great attention.

The second point which already was mentioned is the 490,000 cases of multi-drug resistant TB. And of course as you have heard and I will not repeat, multi-drug is now extensively

drug resistant TB. The XDR-TB is now appearing and devastating areas for example of South Africa for many reasons.

So we are not only having a pandemic which is still there very strongly, but we are now have two strains of resistance to the usual and normal drugs which immediately takes us to the need for research, the need for new drugs, the need for new approaches in terms of what can be done in scientific terms to find new drugs and new medicines.

Now, I think that worldwide an estimated 61-percent of all TB cases were detected, which is only a 3-percent increase from 2005. And I have explained the reasons for this slow down because before there was a 6-percent increase for many years. And I think that once you detect and once you diagnose in fact the reported treatment success rate is impressive. It's 85-percent up to now which at least means that we need to deal with health services especially in the areas of the world where health services are nonexistent or barely existing at all at the community level, at regional level, et cetera. And of course laboratories everything that goes with the needs presented by the diagnosis of tuberculosis.

Multi-drug resistance of course is a new development. It was the first time in years I think that one of the main reviews in Washington wanting to speak with me, and I have tried before several times, was because when this gentleman,

American citizen, was traveling in the plane and he had to be who was in fact passing on to everyone.

And the fact that suddenly a disease in your country which was supposed to be absolutely controlled and no longer important became very important because of multi-resistant TB. And the previous report of three weeks ago showed that multi-drug resistant TB is increasing and therefore putting us in front of a very big challenge, which is not the front line normal, I would say, Type 1 TB, but a developed type of TB which poses very serious problems in many countries. And we are not away from that.

This is what my striking point is. If you take European countries, mainly those who were the former Soviet Union at the periphery of the European Union of 27, they are full with multi-resistant TB. And they are obviously a menace which has to be addressed as in many other countries of the world.

A third development which I want to end up my initial comments are the deadly relation between HIV and TB. This is now a striking chord which is happening in nearly every country of the world. So to give you an idea, and I've said the first numbers, but in fact the TB/HIV signifies that only 22,000 TB patients were tested for HIV in 2002. This has increased to 700,000 in 2006, but of course we are far away from the target

which is 1.6 million. And in fact that fact that, just to give you an idea, the main cause of deaths in those who have HIV as I have mentioned before is precisely the TB illness as such.

So I have been pushing and I have the pleasure to tell you that the Secretary of the United Nations has endorsed a forum to take place on the 9th of June of 2008 this year before the General Assembly Special Session on AIDS. The 9th of June is a session dedicated to HIV/TB and to in fact introduce in the way we look at the deadly joining of these two pandemics in a horizontal way. Not only in science but in political attitude to the development of combined programs because I think there lies a need of a change of mind in the sense that okay, keep the vertical programs that everyone has but you do have to have in those programs a horizontal approach to something which is now more and more deadly.

So we have these three problems: the multi-drug resistant, the extensive resistant, and the HIV/TB. So I would very much like to hear suggestions everyone. I'm not supposed to invite but I can take this task and say how important it would be if you would register open at the Stop TB Partnership at the World Health Organization. And all those who are here I would like to see you there at this meeting because we would like to end it with a call for action. A call for action not only political but scientifically-based to show that it is

possible to tackle these experiences, these pandemics, together at the same time. Because we can prevent unnecessary deaths, we can reduce TB mortality, we can promote the right of people living with HIV to be able to attempt health services without the fear of contracting TB and we obviously must develop and implement strategies between involved communities affected by HIV and the TB response.

So this is what I wanted to say to begin with. And I am very thankful because it's not that when I went around the world last year to be in contact with those who are preparing the G-8 meeting, I mean, tuberculosis was something coming from the sky. I'll not mention the countries nor those involved in the drafting, but it was difficult to introduce the words tuberculosis.

And when you start developing numbers and when you start saying that now you have the multi-resistant, now you have this connection with HIV, then the interest opens. And I think the response is necessary from, of course the scientific world, the industry world because in fact to develop new drugs I was in my team's past employer. I know what this means very, very well, but we have to have a certain change of mind when you're dealing with a lack of market in the normal kind of approach. And I think there's a need for public/private partnerships in this role of scientific approach, scientific

discoveries, new vaccines, new drugs, and of course, a major problem with which I finish my initial remarks.

We are dealing with 400 million people shortage in the medical services throughout the world. And this is a dramatic thing because I was speaking with the Health Minister of Malawi and I was called to be present at the inauguration of the national emergency plan to stop TB. And she said, "We form doctors but they go away." So we have no doctors, no nurses, they go to England; they go to Amsterdam et cetera.

So this I think is a dramatic challenge to those who have a lot in the aid for development. In other words you are, in fact everyone is contributing to aid and at the same time you are not contributing to the means to challenge the illnesses or the pandemics which the aid is supposed to be addressing. So we have to find a system, either rotating, either scholarships, or something like that, because you don't simply have the people at the local level to in fact follow the treatment or follow the diagnosis or follow the laboratory that is needed to decide.

So this is what I've been doing and I'm really very, very, very happy that it looks easy to be here and it's due to you and your efforts, all of those in this room that have played most of the efforts to put this at the forefront of the political agendas. So thank you very much.

JOHN RENNIE: Thank you very much, Mr. Sampaio. Thank you. Let me also at this point move on to start to introduce the other members of our panel and if I may start closest to myself and then move across, first of all is Dr. Giorgio Roscigno who is the Chief Executive Officer of the Foundation for Innovative Diagnostics.

Dr. Roscigno has 20 years of experience in the pharmaceutical industry and in the medical and clinical research of anti-infectives on top of years of field experience in Africa. He's been closely associated with the clinical work that led to the development of Rifampin and Rifapentine for treating TB. In 2000 he was one of the founding members of the not-for-profit Global Alliance for TB Drug Development, for which he became the acting CEO and later the Strategic Development Director. And in 2003 he joined FIND as its CEO. Dr. Roscigno.

GIORGIO ROSCIGNO, M.D.: Thank you very much. I'd also like to thank everybody for organizing this wonderful meeting on the occasion of the World TB Day. I think it's a great opportunity for me to be here. And me from my corner here I would like to say something about the diagnosis of TB and that's why I'm here. And I think that as Peter Small very well said in one of the sessions of the last Cape Town meeting on the International Union Against Tuberculosis and as he put it,

"at the core of the TB epidemic the root is the failure to diagnose." And I think that nothing has been said more clearly than that. And more and more we are now recognizing that really the big problem we are having is diagnosing TB patients.

TB patients are diagnosed too late, are not diagnosed first of all or diagnosed too late to be cured and that really spurs a lot of the TB mortality. We all have been complaining about TB microscopies and old technologies more than 100 years old. We all know that the sensitivities of current microscopy is around 50-percent and is in fact much lower in the HIV-positive patients.

And I think this is the base of the fact that detecting today a TB patient can take between one week to have a sputum microscopy done because the patient has to go three times and take three different sputum, even though now recently it has been recommended to have only two sputum and then they have to wait for the result to come. Or if they are sputum-negative they had to go for a culture which with a solid culture media could take up to between three and six months. In this time patients are left undiagnosed and if infectious they continue to distribute the TB bacilli to the community, to their family and perpetuate in fact the cycle of TB.

Now in order to improve all this obviously health system as President Sampaio said is really the critical part.

And we need really to strengthen the human resources part of it which is trained health system workers, trained laboratory technicians, and laboratory and EQA system, external quality assurance. And I think that this has been completely neglected for the last 10 years at least. But now suddenly people recognize that microscopy, that the laboratory is really the cornerstone of TB control. And we can not have any successful TB control program if we don't have the good laboratory system.

Now once we said that we also need new technologies and we need new technologies because obviously we can't stay with those long delays between patients appearing and patients being identified as TB patients. So it is a tremendous task to bring new technologies and make this technology to be fast producing results so technologies that can have a very short turn around time. And the same time also technologies that can be as near as possible to where the patient encountered the public health system the very first time, so the lower level of that system should take priority in that respect.

Of course this is tremendous task, but I think that we can be relatively optimistic in what has been achieved in the last three years. I think we have now new tools. More importantly we have a very concerted effort which is expressed in the Stop TB Partnership new Diagnostics Working Group which

FIND has the privilege to lead and together with TBR and many other partners including MSH and many other organizations.

We have developed liquid culture media for the very first time. It has been approved last year by the World Health Assembly and this has been done in collaboration with BD with quite large operational studies which included 120,000 patients in 15 countries. And based on that data, WHO has been able to recommend officially the use of liquid culture media that can now with the turn around time for this technique, can be used in three to four weeks which is an incredible improvement.

At the same time we also have been able to get approved rapid speciation test so that once the liquid culture is say positive with a very simple affordable technology, a lateral flow system, we can immediately speciate whether it's mycobacterial tuberculosis or a typical mycobacteria.

FIND, as we speak, next week we are submitting to WHO for the very first time an affordable molecular diagnostic test a line probe assay which would be able to detect directly from sputum Rifampicin and DianH [misspelled?] resistance within two days. And in the light of what President Sampaio just said about MDR and XDR-TB this would allow for very rapid and generalized screening of potentially resistance patients to Rifampicin and dianH [misspelled?] directly from sputum. We are quite proud to say that in both cases with BD and this

company a line probe assay finally negotiated an affordable price for the public sector.

We are also working, because obviously we need to improve diagnostics as near to as where the patient occurs, so we are also introducing very soon an MAD microscope which is a low-emitting diode microscope which is a fluorescent microscope which we have developed with a major German company. And this microscope together with the bleach methods for sputum treatment can improve the sensitivity of sputum microscopy by 15-percent. And that will be available and to be submitted to WHO by the second half of this year.

And in our pipeline we also have molecular diagnostics that have the potential to replace completely microscopy for infectious diseases. These molecular tests are very cheap. We are developing it with a small Japanese company. They have the potential to work as a technological platform across disease for malaria, [inaudible], human papillomavirus in Africa, schistosomiasis. It seems to be relatively cheap and would have a great potential impact. This would be available in two years from now.

But obviously the real big issue for us is to develop a rapid diagnostic test. The lateral flow technologies that could be used by community health care workers to screen patients the first time they do appear. For that of course we

need quite a major investment from the public governments and the public authorities to spur research, to enhance research, the basic research which is needed for the biology of mycobacteria and tuberculosis. We need to have identified more potential antigens that we could use as diagnostic antigens. And even though we at FIND have a relatively good program in the proteomics and many others do have similar programs, I think that it is really absolutely needed from governments and from partners to really make a very major investment into the basic research.

Another reason why we should be optimistic beyond the fact that what I just said that new technologies are coming, we are rolling them out. The PEPFAR and the CDC and many other partners and together with WHO we have done some very good work in Lesotho and some other countries, I think that the Global Laboratory Initiative just instituted by the Stop TB Partnership and housed in the World Health Assembly are going to provide us the infrastructure, the guidance and in order to strengthen laboratories because if we don't prepare laboratories for introduction of new technologies these technologies will never be really used from what we want to do. So I think that is also a very important thing, the global laboratory initiatives.

We need to maintain the momentum. We need to work together as partners. We need to include as many as possible. And I must add from the private sector we have had quite an important let's say very strong partnership not only with BD but other diagnostic companies. We have FIND and with you eight major diagnostic companies. We have 44 partners in clinical trial sites all over the world. And I think that there is much more momentum and much more interest today in diagnostics development than there was there some five or ten years ago.

The last thing that I want to mention is that the current spending as recently in a paper published by Treatment Action Group has identified spending for diagnostics was less than 8-percent of the overall spending in TB research for any other tool, drugs, vaccines or anything. So diagnostics cover only the 8-percent and it is really something that we need really to address. We need to also work and engage more in terms of expanding and focusing, communication, social mobilization, and engage more and more civil society and patient's groups but particularly in developing countries under the Stop TB Partnership.

JOHN RENNIE: Good. Thank you. Thank you very much Dr. Roscigno. Next I'd like to introduce Dr. Kenneth Castro who's the Director of the CDC's Division of Tuberculosis

Elimination and the Assistant Surgeon General for the U.S. Public Health Service. Dr. Castro is a physician scientist trained in epidemiology with a special focus on infectious diseases. Since 1993 he's led the effort to eliminate TB from the United States in his position as a division director in the National Center for HIV, STD and TB Prevention for the CDC.

He's served as co-chair of the U.S. Federal Tuberculosis Task Force and he's advanced U.S. involvement in the international efforts to control TB, serving as an advisor to the World Health Organization and the International Union Against TB and lung diseases. And in an unusual distinction Dr. Castro was promoted to the rank of Assistant Surgeon General in the U.S. Public Health Service back in 2000. Dr. Castro.

KEN CASTRO, M.D.: Thank you. First of all I am grateful to the organizers. I think it's very appropriate that we're meeting here in New York City, a city that had to deal with the unprecedented resurgence of tuberculosis which occurred between 1985 and 1992, and a city which led the efforts of our country to respond to that. Many of the lessons that we learned back then continue to ring true in this day. What I'd like to do in my remarks is cover three main points.

First is share with you the good news and bad news about tuberculosis. The good news is that following that

unprecedented resurgence we've had for 15 consecutive years a downward trend of persons identified with tuberculosis in our country to an all time low in 2007 of 1,293 persons diagnosed with TB for a case rate of 4.4 per 100,000. Now that gives rise to a sense of complacency as well as to the most common misconception that we find in persons in this country, and that is that they think of tuberculosis as a disease of the past. I can't tell you how often I need to explain to my friends and my relatives say, "But why are you working in tuberculosis? Isn't that what our grandparents used to get?" Now these are the relatively good news.

The bad news is that as these decreases have continued for 15 years we have seen a slowing in the rate of decrease. We used to see between 1993 and the year 2000 an annual-percent decrease of 7.3-percent. Now, between 2000 and 2007, we're averaging about 3.8-percent decrease. I'm very concerned about this stagnation in our progress against tuberculosis and this speaks to the need to develop new tools to make a very labor intensive process easier and more achievable.

We're also seeing masked in these statistics a growing problem of health disparities in our country. While the rates have continued to go down in all groups, if you look at non-Hispanic blacks their rates continue to be eight times higher than those seen in non-Hispanic whites in our country. We also

see that the global reality you heard President Sampaio and Giorgio talk about is reflected in our own mix by the fact that 58-percent, the majority of our cases are persons born in other countries. So that really focuses our attention and need to invest in global tuberculosis control efforts. We continue to see about 11-percent of persons with TB co-infected with HIV.

The second remark is that it pays to invest in tuberculosis. And in fact in tuberculosis you pay now or you pay later. Tom Freed and Peggy Hamburg, published a paper in the New England Journal of Medicine in the mid-nineties describing that to recover from the multi-drug resistant TB crisis in New York City it took this city about a billion dollars to recover from it. We've seen other reports such as by Kevin Schwartzman and colleagues in the New England Journal of Medicine in 2005, an article entitled, "The Return for the Investment," describing how both the United States and Canada would see an economic benefit from investing and improving TB control in countries where most of our cases originate.

Most recently we've seen a World Bank report showing also the economic benefit of implementing the global Stop TB strategy in the 22 countries where 80-percent of these persons originate. In fact in that report they showed that we are to sustain a $1.6 trillion benefit over the next decade if we manage to implement the Stop TB strategy. They also showed

that the benefit to cost is a 15 to 1 ratio. There are very few interventions in health where you can actually show that benefit to save lives of individuals.

The last point I want to make echoes what's already been mentioned by those who preceded me, that's that we really need to focus on the public and private partnerships to make this happen. Government alone will not achieve it, nor private industry alone. In fact very recently last month, February of 2008, there was a very interesting world economic forum report talking about businesses need to respond to tuberculosis and they issued a series of recommendations for the prevention of tuberculosis making sure we protect the workforce in many of these countries being ravaged by tuberculosis.

Not unlike previous efforts by the HIV/AIDS community and business response to AIDS, and in fact encouraging us to link these efforts in places such as the mines in South Africa are seeing their workforce decimated due to tuberculosis, especially when you have the triad of silicosis, HIV, and drug resistant tuberculosis come together, these persons don't last long.

So what are we to do? There are three things we need to do. One is we have some tools in hand and we need to make optimal use of these tools. Not everyone with TB now in the world has access to these services. Shame on us.

Secondly we need to invest in new tools. As I say to folks who work in our division, our technology is chisel and hammer technology, we need to move into the power tool era. This is too labor intensive to be sustained over time. We need the new diagnostics that give us a rapid establishment of the presence of TB and of drug resistant tuberculosis.

Do you know that the agar proportion method, the national standard for determining resistance against second line drugs takes 21 to 28 days for turn around time? That's too late for too many people who have drug resistant forms of tuberculosis. And when physicians are trying to make a decision in the dark we really need to turn this around. I also work in an HIV clinic and I can not keep up with the new antiretrovirals being approved by FDA.

And I think this is what we need to emulate. New drugs, not only for people who have drug acceptable TB, but we need to give options to those who now have multi and extensively drug resistant strains of tuberculosis.

And the last thing we need to do is once we have these new tools we can not afford to wait decades for them to make it into improved program activities. We need to really move them rapidly for use by others. We see this right now in the world. In the United States we've been using for the last 20 years liquid media, which cut the turn around time by about half.

And yet in most countries of the world people are diagnosed on the basis of smear microscopy alone. No culture, no drug susceptibility testing, and clinicians are by and large in the dark. This is something that I find unacceptable and we need to change. So we have tools that need to be better used, but we need to continue to be ambitious to develop new tools. And once we have the new tools turn them into better practice for these persons. Thank you.

JOHN RENNIE: Thank you, Dr. Castro. Finally, let me introduce at this point Dr. Salman Siddiqi who is the Becton Dickinson Fellow Emeritus and Dr. Siddiqi has almost 40 years of experience in research in clinical mycobacteriology. After working as chief of the Microbiology Division of the University of Maryland International Center for Medical Research and Training in Lahore, Pakistan, in 1972 he joined the Pakistan Medical Research Council as the founding director of the National Tuberculosis Research Center at the Mayo Hospital at King Edward's Medical College.

In 1978 he rejoined his mentor, the well-known TB researcher Dr. Gardner Middlebrook at the University of Maryland where he developed a rapid radiometric growth detection and susceptibility test system. And in addition to being a Becton Dickinson Fellow, Dr. Siddiqi is Fellow of the American Academy of Microbiology and the recipient of a

lifetime achievement award from the Pakistan Microbiology Society. Dr. Siddiqi.

SALMAN SIDDIQI, PH.D.: Also I would like to say that I'm really thanking everybody who has organized this meeting. In 1968 when Middlebrook talked me into joining TB research at that time neither Middlebrook nor myself ever thought that the TB would be in such a focus. But Middlebrook, as you know, he had tuberculosis when he was at Harvard. He was admitted to St. Julian because at that time there was no treatment basically. And after two years when he recovered he went back to Harvard.

He finished his medical degree and then he decided to dedicate his life for tuberculosis fight. And he also initiated me into the same fight he said you've got to do something for tuberculosis. And I'm so glad to see that so many people are focusing on tuberculosis and there's so much effort is being given to tuberculosis. And I'm sure that with this kind of momentum we would really combat tuberculosis and we would at least control it, not eliminate it.

I have traveled around the world and I have looked at developing countries and what are their problems, and right now I would like to focus on only some challenges that I see over there for diagnosis of tuberculosis. When I am saying diagnosis I am really focusing on only laboratory aspects of

diagnosis of tuberculosis. As Dr. Castro said that they don't have any health care facilities and even if they have health care facilities they're poor and they depend on a smear only no concern diagnosis of culture smear testing. I'm sure that we can not control tuberculosis because even if you control to some extent the drug resistance is increasing and it would create havoc in the whole world.

So basically coming back to some of the challenges, some of the problems that I've seen, is the first thing: if you want to have a lab in those countries we have to develop infrastructure. They have to develop infrastructure and somebody has to help them out because not only do we have to strengthen the labs that they have, because they are very poor, or we have to establish new labs. And I was involved for the last one year in trying to help them out in establishing new labs. And they found out that they don't have any idea how to design a TB lab. So we had to think about it. What should be the recommendation? How can we go around to have some kind of blueprint or something of how a TB lab should be developed? Engineering, air flow, they don't know how to do it and they don't have any facility to have a proper air flow system so there should be something.

Then the main thing is monitoring and quality control. Once they have that there should be some system to monitor and

make sure that the lab is working properly and is safe. And one thing that I always emphasize and I think we should talk about here is networking because everyone's working in isolation. They don't talk to each other. And so if one person develops a TB lab he would not like to talk to other people so that the other people do not develop the TB lab. So there's something that we've got to think about and how we should develop a networking system.

The second important thing are the human resources. How to find the right kind of people, what kind of people we need for TB work, and then training. And if we have some TB people over there re-training because most of the people don't have proper training and they can not do culture and smear properly. So a big part of our focus and how to handle this is to train those people. And then again I would emphasize the quality control because they talk about, oh, we have drug resistance, we have MDR, we have XDR, but there is no quality control. They don't even know whether the drug susceptibility is proper or not and the expected results.

And the third one, which I think is naturally these days as important as developing the infrastructure or human resources, is the financial resources because now I'm glad to see that there's more and more financial resources available through different funds and different other things. The only

thing is that there should be some initiative by those people to developing countries to do this work. Initial funding is a must so that they can develop the infrastructure of TB lab and number two to sustain that. If they develop it there should be some way so that they can sustain the TB lab and they should working for a long period of time and should come out with good results with the labs also. So these are the things that I think maybe here in this forum we should talk about and see what should we do to help developing countries in developing TB diagnostic labs. Thank you.

JOHN RENNIE: Thank you, Dr. Siddiqi. Gentlemen, let me ask a question to start this off because I think it's one thing that hasn't been at least very prominent in a lot of what your talking about. These days when most people in the general public they hear about the subject of trying to prevent disease the subject of vaccines naturally comes to mind. With tuberculosis there is a vaccine already, the BCG vaccine. Now could you perhaps talk about why it is that that is not administered more widely than it is and also what the state of development of new vaccines is?

KEN CASTRO: I'll get the conversation started. The first thing to acknowledge is that BCG vaccine which is used worldwide for tuberculosis is the most commonly used of available vaccines with over a billion doses administered, yet

look at the global situation with tuberculosis. The ability of this vaccine to protect adults from the pulmonary form of the tuberculosis is quite lousy. And it probably has the most benefit in protecting children from death and meningitis. So I would continue to use it but certainly we would want to see at least a replacement vaccine or something else to protect the adults.

Right now the Bill and Melinda Gates Foundation are sponsoring work done by Aeras Foundation looking at multiple vaccine candidates including recombinant BCG. And the good news is that when you look at the long-term investment we're ahead of schedule. In fact in looking at Dr. Ginsberg I recall that in 1999 she spearheaded an effort with Dr. Barry Bloom to develop a 20-year horizon for a blueprint to develop a TB vaccine. And when you look at the fact that we're doing — Areas is conducting Phase I and II trials, it's very promising. And that certainly would be an incredible new tool that we certainly need to have.

JOHN RENNIE: Good. Anyone else?

GIORGIO ROSCIGNO: I don't know whether anybody from Aeras is here that they think about it. Yes, maybe, Lew wants to say something, yes.

LEWELLYS BARKER, M.D.: Sure.

GIORGIO ROSCIGNO: He can say something about what's in the pipeline for vaccines.

JOHN RENNIE: Sure, absolutely. Lew from Aeras. Yes. Thank you.

LEWELLYS BARKER, M.D.: This doesn't work but I think I can probably be heard. I'm working at a TB clinic and we see patients from other countries who tell us they can't have TB because they got BCG vaccine. Unfortunately that is not the case as you've already heard from Ken Castro. BCG vaccine, which was introduced in 1921 named after a man at GRS and though it almost certainly helps reduce the severity of childhood TB, but to illustrate the problem this billion or so doses of BCG vaccine have been given and it continues to be given to mostly new born infants in most of the world. That's where most of the TB is.

So I guess it kind of goes without saying when you need a better vaccine. The mission of the Aeras Foundation is a better vaccine and for vaccines and to make sure they are available throughout the world. And we are supported by the Bill & Melinda Gates Foundation, by several governments including the Netherlands, Danish and Norway, the CDC in this country and NIH supports basic research. We are a large product development partnership and as Ken Castro already indicated we have a number of vaccines. We have a portfolio of

vaccines. The reason for that is we don't know exactly what vaccine will be the best or even better vaccine than what we already have. So we're trying a variety of different vaccine. There are a half a dozen now that have entered into testing in the clinic in human testing. And our hope is that roughly the middle of the next decade we will have found at least one better TB vaccine that is ready to introduce and help control the epidemic.

So I'd like to say just in closing that we think all the new tools, all the tools need improvement; the diagnostics, drugs, and clearly vaccines. And so I want to thank the organizers of this meeting today to bring that to light and to raise awareness and to support our continuing work in this direction.

JOHN RENNIE: Yes, thanks very much. That by the way was Dr. Lewellys Barker who was the senior medical advisor for the Aeras Global TB Vaccine Foundation. And we certainly will get a chance to hear more from him and from the other members, people in our front row very shortly. I want to pick up on this. President Sampaio you talked very much about the importance of raising awareness. All of you have in different ways, and I guess I want to try to bring this back to what in a sense is – I'm going to try to boil this down to the message of what we best need to try to convince the American public with.

So we have sitting right in front of us Mr. and Mrs. Average American that's sitting right there. In the most self-interested terms possible what is the message we should try to get across to them to make them understand why it is that working on improving the state of our dealing with TB, why that needs to be a higher priority? Dr. Castro, you spoke to a lot of that, but I guess really, in a sense if there are members of the press here, what are sort of those few solid bullet points that drive it home of why it is that no one can just afford to put this off as a goodwill effort for something for other people in other lands?

KEN CASTRO: Well, I'd start by reminding them that contrary to popular belief there are 36 new persons diagnosed with TB in our country every single day. And that worldwide we heard there are 9.2 persons diagnosed with TB every year. In fact the number of deaths on a worldwide scale is about 4,600 per day. I haven't done the arithmetic but that would be a few jumbo jets going down on a daily basis if you were to put them all together unfortunately. It's a very tragic reality.

Now if they were to say, but do I have a risk? The good news is that probably your risk is low but you're not protected until we protect others because TB anywhere could be TB here in our country as we now see it. Also we see it as we travel overseas. So while there may be a propensity to think

of it as a disease beyond our borders many of us, and many of the calls we get at CDC are persons who are being sent by their business to work in south east Asia and elsewhere. And they're concerned about their risk of tuberculosis. Well the way to deal with that is to control global TB. So that's what I would try to get across.

JOHN RENNIE: So it's simply that we are connected to all of these other people in the world.

KEN CASTRO: Absolutely.

JOHN RENNIE: I'm curious also, we talked about the rise of the new drug resistant strains. Beyond TB itself drug resistance has been a big issue in a lot of general infectious disease medicine. Is there any issue that the more prevalent that those sort of drug resistant strains become in TB, does that increase in any level the level of risk that we see more of a spread of drug resistant strains to other types of infection?

KEN CASTRO: Absolutely. In fact if you look at the progress made in this country against multi-drug resistant tuberculosis back in 1993, which is when we started routine surveillance doing drug susceptibility testing of all persons with culture positive TB, we had about 400 persons per year at that time. We're down to about 100. But in spite of those reductions when you look at the profile of these persons, about

three-quarters of them are born outside this country. So the fact is that although relatively less common, we see it very much in our midst. There is a propensity for clinicians who don't see a lot of TB to not even suspect a diagnosis in the first place and when they do not necessarily think of drug resistant TB. And if you have tests that don't tell you the answer to that in a long time what you see is a very tragic sequence of events where someone may be diagnosed but not put on the right drugs. And by the way, do you know what's happening during that time? That person is spreading drug resistant TB. So we really need to change that and it is very much a problem that we see. I'm looking at Lee Reichman who heads the center in New Jersey and we see that quite clearly right here in this hospital. I remember visiting out of Columbia University, Harlem Hospital at the height of the need to respond to MDR-TB.

Another thing that I would like to remind people is when we have those multiple outbreaks in cities such as New York, it's not only patients. We had about 20 health care workers who died with multi-drug resistant tuberculosis. So it affected everyone in the community. So that risk remains there and we're trying to strike the balance between not giving rise to unfounded fear, but avoiding the complacency that prevails right now.

JOHN RENNIE: I think that the – I've mentioned vaccines so I'll just mention antibiotics treatments. I think in a lot of cases those are some of the aspects of dealing with infectious diseases that the public does naturally gravitate to. But Dr. Roscigno, Dr. Siddiqi you both spoke a lot about the issues of that fundamentally it's the underlying infrastructure in a sense of being able to deal with the disease; being able to detect it, being able to have the appropriate kinds of laboratory services that are going to be able to advance all of this. It's important for us to get the right kinds of earmarks for investment and to attract the right kinds of people into those kinds of fields. How do we do that? How do we get more of that in?

SALMAN SIDDIQI: I think it's very important and laboratory infrastructure in general needs to be sustained. And a lot of effort is going on currently if you look at what PEPFAR is doing in the HIV world and putting up an extremely effective network of laboratory facility for CDC count and viral load and it happens in many of the African countries.

Unfortunately in the TB world we have been stuck with microscopy and culture facilities are very few in the majority of these countries. And so I think that if there was any effort to do now is not really to concentrate on TB laboratories as such, but really in a more integrated sort of

laboratory whereby integrating TB, HIV, malaria, and other opportunistic infections under one single laboratory, that's the vision also of the Global Laboratory Initiative. Because we have to get out of this system of having one TB reference lab and one HIV reference lab. I think that when we think about health systems in developing, laboratories, that what President Sampaio was talking about before about integrating TB/HIV, the first most critical point for integration is in the laboratory. If we have one single laboratory where in fact the patients go and are detected for the same TB and HIV and maybe also malaria, that's the first time, the first step toward integration of multiple diseases. So I think, and I know that PEPFAR recently has been recently also upgrading in their efforts in supporting laboratory installment in countries. I know that BD has signed the memorandum of understanding with PEPFAR to also upgrade laboratories in many countries in the developing world. The WHO is very interested in doing so and the Global Laboratory Initiative is also moving in there. So I think it's a very critical point.

KEN CASTRO: John, if I may, at the risk of putting him on the spot, I see Nils Daulaire sitting right here. Nils played a pivotal role at getting new resources to the U.S. Agency for International Development for TB, malaria and other infectious diseases. And maybe he can say something about how

he went about to achieve that because that's the essence of your question?

JOHN RENNIE: Good. Nils, please.

NILS DAULAIRE, M.D., PH.D.: I think the key here as Ken pointed out is the importance of making a substantive case of the importance broadly and then the self-interested case for Americans. The reality is that when you're trying to influence the United States Congress they're elected by Americans not by the other six billion people around the world and so their special interest is their constituents. So the case has to be made that Americans will be safer when TB is controlled around the world. And that is a case that is intellectually sound and morally appropriate. Ultimately it's that and than a lot of work in the pits. [laughter]

JOHN RENNIE: Thank you.

JORGE SAMPAIO: May I join?

JOHN RENNIE: Please.

JORGE SAMPAIO: To develop a little bit on this last point and try to respond to your challenge in relation to the American public. I'm an European so I'm sorry for this kind of intruding in your process, but in fact there is now, as we're going through an electoral campaign in this country I'm not going to speak about that, but I am speaking about the importance of a worldwide capacity for economic development.

With all the consequences that has in every country. Let's put it in this way. Pick up the elements that Dr. Castro put forward in terms of if – and I never like to say this because it's really a human rights problem to a certain extent – but if you put it precisely just on the economic approach and if you relate that with what is approved for aid to develop and if you see what in fact the devastating consequences of all those pandemics added together in terms of the capacity of growing a GDP in every country with whom the United States, with whom the states of the United States, with whom the industrial capacity of the factories in each state of the United States has, then it is a very intractable kind of very pressure issue. Because it's clear that if we don't attack the capacities whether the risk here as it was pointed out, or what is happening around the world in terms of development, you have a serious problem in the meantime.

Because if you examine some countries in Africa for example, but not in Africa, just around Europe have we spoken about the TB and the HIV rates in India for example? In China for example? In Russia for example? But that is where everyone now is trying to have economic relations. So apart from violin considerations which I now say could be a political utopia that everyone is thinking one way or the other, there are realistic issues which in fact recommend that we deal with

this from a political point of view based on added scientific experiments and study, et cetera.

JOHN RENNIE: Thank you, because I think that really goes to the heart of what I was hoping for, as you said, the violin issues. It's very nice to play to people's better natures but…

JORGE SAMPAIO: Because we're not isolated.

JOHN RENNIE: No, exactly.

JORGE SAMPAIO: We're going everywhere and everybody's coming everywhere, so.

JOHN RENNIE: I think what I'd like to do at this point is I'd like to try to just open up the conversation a little more and introduce to you more of the people who are here in our front row standing as they are and then we'll just start to open up too a little more of the questions. First of all just some of the other experts here in our front row, let me point out if I may Dr. Ann Ginsberg who is the Head of Clinical Development of the Global Alliance for TB Drug Development. She's a highly regarded TB expert. She brings to her current position 15 years of experience at the U.S. National Institutes of Health. In 1995 she joined the National Institutes for Allergy and Infectious Diseases as program officer for tuberculosis, leprosy and other mycobacterial diseases. And she was appointed chief of the respiratory diseases branch in

2000. Dr. Ginsberg is the recipient of several prominent awards including the Department of Health and Human Service Secretary's award for distinguished service in 2000. And she's served on multiple global health committees and is currently a member of the board of directors of the Aeras Global TB Vaccine Foundation. Dr. Ginsberg.

ANN GINSBERG, M.D., PH.D.: Thank you very much, John. It's really a pleasure to be here today and to see such an outstanding audience for a World TB Day event. As you've heard that hasn't always been the case for this urgent public health problem. As John mentioned, I'm at the Global Alliance for TB Drug Development. The TB Alliance is one of the public/private partnerships that you've heard mentioned here today. We're an independent not-for-profit organization and our focus is to discover and develop improved treatments for tuberculosis. I also have the honor today to introduce to you our brand new CEO, Dr. Jerome Premmereur who's just joining the TB Alliance from Sanofi Aventis and we're really thrilled to have him leading our team now.

The TB Alliance is focused on developing better drugs for TB because as you've heard the drugs we have today though when properly used and taken by patients are very effective, they're clearly not controlling this epidemic. You've heard that progress is stalling. The drug resistance is spreading.

And at least a significant portion of that is due to the fact that the drugs we have today, discovered back in the 1940s and 1950s have to be taken by patients for a total of six months, a minimum of six months. You all know how hard it is to take even a 10-day course of antibiotics. You begin to feel better after a little while. The drugs often have some side effects. Imagine what it's like to have to keep taking those drugs on a regular basis for six months. Most patients can't do that.

As a result the World Health Organization and others have pushed for directly observed therapy. That means there needs to be a huge infrastructure throughout the world to watch TB patients actually take their drugs by health personnel. That is incredibly labor intensive and again is very difficult for high burden countries to maintain that kind of infrastructure. And the recent WHO report pointed to that as a problem, as a reason for why progress is stalling against the TB epidemic. So we believe that by developing new drugs, new drug combinations, we can shorten and simplify TB treatment. It ought to be two weeks like any other respiratory infection. There's no absolute need for six months of treatment for a disease like TB. And you can imagine the difference that that would make to this epidemic if you could just take pills for two weeks and be cured. I'd be happy to answer any questions about drug development for TB.

JOHN RENNIE: We'll have an opportunity to take some questions there. If I could introduce a few of the other members, oh, let me also bring back up Dr. Lewellys Barker who's a senior medical advisor at Aeras Global TB Vaccine Foundation. Happy to reintroduce you. Dr. Barker's major professional interest is in the prevention, treatment and control of infectious diseases through better vaccines, drugs and diagnostics. He served as a senior manager with the NIH and the NIAID's Division of Aids and the NIH's Division of Biologic Standards, the FDA's Bureau of Biologics and the American Red Cross and well as Cary Pharmaceuticals. He's published extensively on his work in pre-clinical and clinical research on disease detection, epidemiology, risk assessment, treatment and prevention of infectious diseases. And he's a past President of the National Health Council and the International Society of Blood Transfusion. Dr. Barker.

LEWELLYS BARKER: Thank you. Well I already commented on why we need better TB vaccines, so I probably ought not to say much more but to listen to questions about that. I did mention that we are a product development partnership. We have many partners throughout the world including major field site development partners currently in South Africa and India. South Africa is where some of the new vaccines are being tested as we speak. And so our effort is a truly global effort and

we're optimistic although I have to be totally honest and say we also need more basic science in this field in order to understand how best to make new and better TB vaccines. Thank you.

JOHN RENNIE: I'd also like to introduce now Dr. Lee Reichman. He's a professor of medicine and preventive medicine and community health, and the founding Executive Director at the New Jersey Medical School Global Tuberculosis Institute. Between 1971 and '74 he served as director of the Bureau of Tuberculosis Control and Assistant Commissioner of Health at the New York City Health Department. He then joined the faculty of the New Jersey Medical School as the director of the Pulmonary Division and became a full professor there in 1977. In 1993 he founded what is now the Global Tuberculosis Institute. Dr. Reichman serves on several national and international committees, advisory board and professional organizations including the national coalition to eliminate tuberculosis, the U.S. Advisory Council for the elimination of tuberculosis, the International Union Against Tuberculosis and Lung Disease. He's past vice-chair of the Executive Committee for that organization. And the World Health Organization Stop TB Partnership and of course the American Lung Association of which he's a past President and the recipient of the Will Ross Medal, their highest award. Dr. Reichman.

LEE REICHMAN, M.D., M.P.H.: Thank you very much. Thank you for the distinct honor of being on a podium with so many distinguished icons in tuberculosis and yet people who are currently making a difference in this disease. I wrote down a couple of points while this was going on because there's really not a whole lot more to say. These people expressed it so well.

First of all I'm here representing the American Thoracic Society and you can see up there the American Thoracic Society; we help the world breathe. It was formed in 1905 and it was formed as the American Sanatorium Association. Remember in those days TB patients were taken care of in sanatoria. So I would say of all the sponsors we probably have the longest interest and involvement in tuberculosis. But that leads us to the sobering thought that in 1882 Robert Koch discovered the tubercle bacillus which was a monumental achievement at the time. It was tantamount to saying that the world was round and not flat for the people a little earlier than that, that this was now caused by a microbe. It wasn't caused by heredity or something like that. But TB will kill more people in 2008 than died in 1882 when Koch discovered the bacillus. So I think that we're not seeing so much in the dialect any more when you get a former president of a country, when you get these distinguished people and you get these brilliant sponsors

taking care of TB and being involved in TB. But we just have to recognize that there's still a long way to go.

The second point that I want to make is that TB is pretty easy to diagnose and cure even with the tools we have. You don't have to be a brain surgeon to take care of TB. That's perhaps why I chose to do it. [laughter] But diagnosis and treatment of tuberculosis with the current tools is frequently missed. Several of our panelists mentioned multiple-drug resistant tuberculosis and extensively-drug resistant tuberculosis, which I think is a little better sounding if you say Extreme drug resistant tuberculosis, but the point that was not mentioned is those conditions are entirely man-made. They don't occur in nature.

The only way you get XDR-TB is if somebody treats you wrong or you take your medicine wrong or you're infected by someone who was treated wrongly or didn't take his medicine wrongly. And that means that we have all the new diagnostics that Giorgio is going to get for us and the new drugs that Jerome and Ann are going to get for us. We need to build capacity to use those because when we get those new drugs after all that hard work and all of those trials and stuff like that, and you take them and put them in the health care delivery system that made all these people extensively-drug resistant tuberculosis what's going to happen to the new drug? They're

going to become resistant to them. So while this is going on we need to build the capacity to do these things.

And finally what I'd like to say is the World Health Organization said last week, and I didn't write down the number but 1.5 million or so people die of TB every year. And yet if you look and see the diseases that interest our Congress in the United States, how much money is spent on anthrax? And how many people died of anthrax? Five in 2001 due to bio-carrierism. How many people died of bird flu? A lot of money's being spent on bird flu. Last time I looked it was about 200 or 300. And how many people died of smallpox last year or the year before or the year before or the year before? A lot of research done there but no one. So the point I'm saying is where the people need the help, where the people are doing the work and bang for the buck we need to support all these things in TB. Thank you very much.

JOHN RENNIE: Thank you very much. I'd also like to introduce John Tedstrom. He's the Executive Director of the Global Business Coalition on HIV/AIDS, Tuberculosis, and Malaria. He's the founder of the Transatlantic Partners Against AIDS and served as its President and CEO before founding TPAA in 2003 Dr. Tedstrom served as vice president for policy studies and vice president for global security at the East West Institute where he co-founded the U.S. Russia working

group against HIV/AIDS. For nearly a decade he worked at the Rand Corporation where he focused on the intersection between economics, development and international security, and led the policy analytic work for the first presidential-mandated National Defense Panel. And he now also serves on the board of the International Center for Policy Studies.

JOHN TEDSTROM, PH.D.: Thank you very much. Lots of national security work in my background and as the leader of the Global Business Coalition on HIV, TB and Malaria, I certainly do approach this set of problems, all three big pandemics, with a clear understanding that these are international security issues. As President Sampaio also mentioned they are major economic challenges and major challenges for our businesses around the world. The GBC is a coalition of over 220 businesses based in almost every country in the world. And each one of them in its own way fights HIV, TB, and malaria and we've very happy to associate ourselves with this event. Becton Dickinson, BD, is one of our super star members and we're very fortunate to have the leadership of Ed and Gary and Rinuke [misspelled?] and other BD colleagues here. Also very happy to support and endorse the work of President Sampaio as a previous speaker said, when we as a community have the opportunity to work with a person of this

stature and to take advantage of his leadership, I think that's a big step forward.

Having said all that one thing that I don't want this group to go away with is the misperception that we're getting a handle on tuberculosis either in this country or any place else. This is an emergency. And we as a community of scientists, business leaders, politicians need to approach this with a sense of urgency. Right now the thing that concerns me the most is the near empty pipeline of new treatments that will be available in the next 5, 10, 15 years for tuberculosis. And the lack of resources that are being funneled as Lee mentioned earlier, lack of resources that are being funneled into new drug development. This is something we need a new business model for infectious disease around the world.

When you think of it prices for antiretrovirals for HIV are coming down, sometimes by as much as 95-percent. Nobody's making money on ARVs any more. The same thing is going to happen to malarial treatments. The same thing is going to happen with TB. Where is the economic incentive for companies, major research companies, to invest the hundreds of millions of dollars necessary to develop these new treatments? They're not going to be there.

So one of the things that we have done at the Global Business Coalition is to put as one of our top agenda items,

innovative financing for these three diseases and to work with our partners in government, in civil society, and the business community to find ways that will on a sustainable basis provide the resources necessary to develop the treatments, to develop the new diagnostics that are so desperately needed. And as we roll this out we would welcome absolutely the participation of everybody in this room, all the organizations, Columbia University, et cetera, to join with us as we search this.

I myself just came back from Ukraine about three weeks ago with a terrible cough which my doctor says is just a lingering case of bronchitis, but not tuberculosis, and I apologize, but nevertheless we very much celebrate the fact that you've been able to bring us here today. This is a good sign. Let's hope that in 2009 there's even more attention brought to this and with the leadership of companies like BD and President Sampaio, The Earth Institute and others, I am very hopeful. Thank you.

JOHN RENNIE: Good. Thank you. Finally, I'd like to introduce Dr. Yanis Ben Amor. He's an associate research scientist at The Earth Institute at Columbia University and Tuberculosis Coordinator for the Millennium Villages Project. The TB Initiative for the Millennium Villages Project focuses on delivering a comprehensive package of TB interventions at remote health centers in rural settings across 10 African

nations with the aim of improving case detection and treatment. Dr. Ben Amor's related research and partnership with the Foundation of Innovative New Diagnostics focuses on ways to improve TB diagnosis in developing countries where electricity and clean water are commonly limiting factors.

YANIS BEN AMOR, PH.D.: Thank you very much. And since I have the shortest bio of all of the speakers that you heard, I'm just going to make a brief, brief statement. I very personally believe that developing new diagnostics is critical, developing new drugs is critical, but given the current conditions on the ground in Africa, in India, it may not be enough to fight tuberculosis. And I think it's time in 2008 to start tackling other aspects which are access to the health care.

A lot of the patients don't even make it to the health care system that will provide them with a diagnosis that will provide them with a treatment. Once they're there, Dr. Sampaio made that comment earlier; they may not find the nurses. The nurses are not available. The doctors have left the country. Or if they are available they have not heard about the TB initiatives. You go into countries and you discuss with the national TB programs and they introduce you to their guideline which is a beautiful reproduction of what WHO wants and then you travel locally and you go to the health care system that

actually sees the patient and you realize that most of the nurses haven't even read the guidelines and haven't heard about what's going on. And that's something that needs to be focused on.

Besides that, looking at reasons why patients are defaulting. It's extremely important because we don't right now the new drugs that are currently coming out of the pipeline, is it going to be two weeks? Is it going to be two months? Is it going to be three months? So if the patients are defaulting on average after two months, coming up with a four-month regimen, even if it's two months better than the current one may not be enough.

So that's the type of work that The Earth Institute and the Millennium Villages Project is currently doing. We are putting in place all the basic infrastructure. We're making sure that our patients in the villages that we coordinate actually get access to the nearest health system. And then once they're there they have access to qualified personnel, nurses, doctors. And we monitor all the TB intervention. Why are they defaulting if they're defaulting and et cetera, et cetera? And I just wanted to make that point that all the new tools are very critical, but it is important to look beyond that and see from the patient's perspective, what are the problems that they are encountering? Thank you.

JOHN RENNIE: Thank you very much. I'm hopeful we have time to be able to take at least a couple of questions from the crowd that you can put to our audience. As you can see we have microphones set up to either side. If you'd like to ask a question please do step up to one of those and just state your name and organization and please do feel free to direct a question to any of our panelists or members of the team here in our front row. Yes?

BRAD TYTEL: Hi, my name is Brad Tytel a senior associate with Global Health Strategies. We've consulted with a number of organizations in the room and partnered with others. I had a question about a project that we actually just received some funding for which involves TB patient advocacy. When you look at sort of the parallel of the way the 20 years ago, the U.S. government was really sort of convinced to galvanize its response to HIV/AIDS, a lot of it, I feel like, had to do with the way people who were infected with HIV/AIDS really came out and created a movement to convince the American people that it was an issue that was worth paying attention to.

And in terms of this general question of how to convince Mr. and Mrs. American how to really care about TB, it sort of seems like a piece that's often been missing in terms of TB. There really hasn't been particularly in this country, any visible TB patients, except maybe on the front page of

newspapers when they take ill-advised international airline flights.

So I was just hoping to open it up to any of the panelists or experts just to hear what they sort of see as the role currently of TB patients in convincing people around the world that this is an issue worth paying attention to. And also what they feel like should be the role of TB patients in helping to galvanize that response?

JOHN RENNIE: That's an interesting question. Should the TB patients themselves be – are they the best advocates for this cause?

KEN CASTRO: Well, having spent my first 10 years at CDC working on HIV/AIDS and having been at meetings that were disrupted by AIDS activists and fortunately giving rise to the resources that made a significant difference. I'm very much convinced that we need more of that in the TB community. I think there are different key roles that persons either directly affected by tuberculosis or relatives of persons with tuberculosis could really fulfill. First and foremost as we hear there's a dearth of the warm bodies that are going to be needed for outreach work. There was a very novel program right here at Harlem Hospital.

I remember Wafel Asada [misspelled?] and others where they basically took people who successfully completed TB

treatment and turned them into peer directly observed therapy educators and observers and employed them in that capacity with some training. We have underutilized that capacity.

I also think we need the activists to stand up and say I'm dissatisfied with what you who've been elected as our government representatives are doing about this in every part of the world. And more recently I've been pleased to see some of that. We just need to see that movement grow. The treatment action group has been playing a key role. I know that there's a person I know that's leading the TB Photo Voice Project which he started when his wife tragically died of TB meningitis just about three years ago. So there are multiple roles. One is advocacy.

Also as you see the international standards for treatment of tuberculosis have been developed there's a patient charter. I think we need to create, for lack of a better term, I would call an educated consumer. Patients throughout the world should know that just like you know with TB, why is it that you're only giving me two drugs when what I've read says that you should be giving me four drugs? And by the way, how did you diagnose my TB? Did you get culture results for that? Why are you not getting culture? So I think that's another really key role that they ought to be playing in this effort.

And in fact you heard from Lee Reichman talk about the genesis of the American Lung Association.

That started as a grassroots movement to provide support to people who had to go to sanatoria and didn't have income at a time when no drugs were available. I think we need to return to those very roots and have the communities involved. The Stop TB Partnership has one of its working groups, one called Advocacy and Social Mobilization – Advocacy Communication and Social Mobilization or ACSM. And I think that that will be very much necessary. Thank you for bringing that up because in the earlier discussion we failed to mention that.

JOHN RENNIE: Okay. There's a world of conversation we could continue on this entire subject, but I think in the interest of time I think if I might, at this point I'd like to turn things over for some sort of closing summary remarks to Dr. Nils Daulaire. He's the President and CEO of the Global Health Council which is the world's largest membership alliance of health professionals and organizations dedicated to advancing policies and programs that improve health internationally.

Before assuming leadership of the Council Dr. Daulaire served as Deputy Assistant Administrator for Policy and well as Senior International Health Advisor for the U.S. Agency for

International Development, he was the lead negotiator on health at the Cairo International Conference on Population and Development in 1994, the Beijing World Conference on Women in 1995, and the Rome World Food Summit in 1996. He's represented the U.S. at five World Health Organization annual assemblies. Prior to his time in Washington Dr. Daulaire conducted two decades of field work in maternal and child health and he's provided technical assistance to more than 20 countries. Among his other honors he's a member of the National Academy of Sciences prestigious Institute of Medicine. Dr. Daulaire.

NILS DAULAIRE: That's a really dangerous thing to be the only person standing between an audience and their lunch, so I will be brief in wrapping up. We've heard a distinguished group today and I want to thank Becton Dickinson for bringing us all together here. It's quite remarkable to see a group like this at a leading university, global university. It's wonderful to see Dean Allan Rosenfield from the School of Public Health here with us as well.

And it's particularly notable because I remember on World TB Day nine years ago, 1999, we had a small press conference in Washington, D.C. with some senior officials of WHO to talk about TB. And there were probably five people there, one of whom was an NPR reporter who after the event came up to me and said, "You don't really think anyone's ever going

to pay attention to this, do you?" And I said, "Yes, I do because it is a compelling issue and with time people will come to recognize what this means."

Now what we've heard today is that compelling argument. What does it take to move the world? And we heard from our various panelists and respondents from the audience that we have something, TB, which is widespread and which is dangerous. That's the first step in terms of getting policy makers and the public's attention. We have not only got a dangerous disease that kills 1.5 million people and sickens more than nine million a year, but we have a disease which is piggybacked onto something which has caught the worlds' attention, HIV/AIDS.

And AIDS with TB is something like pouring gasoline on a fire. That's a strong argument when you recognize the synergy of HIV and TB and the attention that HIV is receiving today for really doing more about it. And we heard form John that this is not just a matter of the humanitarian impulse but a matter of national and international security and one of urgency. So that's the first point of the argument.

The second point is that we can do something about it. And we've heard about the tools and the opportunities that we've got and I'll come back to some of those in just a moment, but it's critical not just to say this is an awful problem out there. It's critical to say it's an awful problem and. And

that is very much the case and the advances that have been made in the nine years since that NPR conversation have given us great hope for even far better tools in the future.

Third, doing it right, dealing with TB in the field where people are experiencing it will not only make a difference in terms of this global epidemic, it will help a host of other things. When you do things right in terms of the infrastructure, the human resources, the systems development, the manpower, then you can do more things about maternal and child health, about family planning, about HIV/AIDS treatment, about malaria, about neglected tropical diseases because they always get built on the backs of the same kinds of systems.

And fourthly, while much of the discourse that takes place in Washington, D.C. and often at the U.N. down the road is about enlightened self-interest and about national and international security, there is a profound argument here which we've heard from our panelists today and particularly from President Sampaio about the fact that this is a matter of human rights. One of the most inequitable of all diseases is tuberculosis. It affects the poor, the marginalized, those without access to health care systems, the new immigrants to the United States as we heard from Ken Castro. It is exactly those with the least opportunities for health and health care who are the most deeply affected. So by dealing with

tuberculosis you're not only dealing with a global scourge, you're dealing with one of the great inequities of global health.

And remarkably, sort of to close the loop on this, by doing this you can actually save money. Now nothing trumps an economist's view of what will save money and we recognize that ultimately decision makers will look at that and they'll say, "Gee whiz, we can get all this and save money too." So I believe profoundly as I have for many years that this is the beginning of a major revolution in human health.

Let me just go back to one element though before I wrap up. This isn't simple as we've heard. The tools, the capacities, the infrastructure, the access are all highly limiting factors. To think that the best drug treatment regimen we've got takes six months, to think that we're celebrating a new technology, the liquid culture media, that only takes three to four weeks, it shows how far we've got to go.

And what we heard today was that in order to really make things happen, to get to the take-off point in terms of TB control, we need first of all to do better than we've been able to do in prevention. And the development of new vaccine and other technologies to prevent the infection to begin with and

to prevent having patients go from latent to active cases of TB is critically important in terms of long-term success.

Secondly we need to be able to identify much more rapidly and much more efficiently at the field level where the patients are who are suffering from this. Both TB broadly, I'm wearing my red snapper tie in honor of Dr. Koch, not only the diagnosis but also make the differential as to whether this is multi-drug resistant or extensively-drug resistant tuberculosis.

Third, we need better treatments. And we've heard about some of the opportunities and things that are in the pipeline and I think the idea of a two-week treatment course like we use for pneumonia and a host of other diseases makes TB – takes it from being a very difficult but manageable illness to being one that could be transformative. And we look very much forward to those changes.

And fourthly we need to be able to follow up because clearly one of the great failings of TB control over the past century has been lost to follow-up, which has led to multi-drug and extensively-drug resistant TB as people stop taking their drugs, as people stop being motivated and mobilized. Ultimately this virtuous circle of prevention, identification, treatment, follow-up, and community mobilization feeds into the larger global virtuous circle which takes TB from being the

greatest of the neglected diseases of the Twentieth Century into what we hope will be one of the greatest successes of the Twenty-first Century.

JOHN RENNIE: Thank you, Dr. Daulaire. I'd really like to thank all of the participants today, most especially President Sampaio, Dr. Siddiqi, Dr. Castro, Dr. Roscigno for all of your wonderful presentations today and of course the esteemed front row that we are lucky enough to have here and also for all of you for your wonderful attention. Thank you very much for this. I hope it has been stimulating for you and I hope that we all leave here with a better sense of what is possible to do in trying to strike back against this terrible disease.

And just in closing I should just say that some of you have made arrangements to have a private luncheon following this discussion. For those of you who are attending this lunch it's going to take place on this floor

[END RECORDING]