ATUL GAWANDE: That was the best introduction. Hattie is better than all of us. I'll just say that. By the way, how many of you know what Denim Day is? So, some of you do know denim day. Well, I wore denim today. In 1992, an 18-year-old woman was raped by a 45-year-old driving instructor in Italy. And the conviction of the instructor was overturned because of the tight jeans she had worn.

The appeals court had judged that it must have required her cooperation to get them off for the rape. And so today, April 24, is recognized around the world as Denim Day in honor of survivors of sexual violence. And that includes us at USAID.

And so I'm wearing denim today.

I want to thank the EIS team and Mandy for inviting me to give the Langmuir lecture, which is such a great honor. And I want to use it because Alexander Langmuir actually plays an important role in the joint USAID CDC partnership in global health work. And out of that joint work together has come some lessons about health equity and advancing life expectancy everywhere that I think have become, to me, some of the most important lessons that I'm trying to apply in my part of the work in global health.

And it's a story I want to tell of successes that go beyond all expectations. And it's going to take us to Thailand to have a chance to meet this woman on the bottom left, [INAUDIBLE]. But I'm going to save that for a minute because in order to start, I have to go back to November 3, 1961, when John F. Kennedy signed the legislation that created the US Agency for International Development, the first time in the world, a single agency was charged with foreign social and economic development.

His declaration at the time was, "There is no escaping our obligations, our moral obligations as a wise leader and good neighbor in the interdependent community of free nations. Our economic obligations as the wealthiest people in a world of largely poor people, as a nation no longer dependent upon the loans from abroad that once helped us develop our own economy, and our political obligations as the single largest counter to the adversaries of freedom."

For us in health, we have two enduring goals that come from that legacy. And they are knitted together. Those goals are to reduce the glaring gaps in survival between the rich and the poor, and in joining the fight against health threats abroad, protect Americans here at home.

In the 1960s, it meant a focus on child mortality as the most pernicious form of injustice. Half of all deaths on the planet were to children under the age of five. The US had the highest life expectancy, with 7% of deaths under five. Actually, I'm going to flip ahead to this slide, which gives you the breakdown by age.

You'll see that the red is ages 0 to 4. The next lighter red is 5 to 14, and so on. And what you can see here is the US led the world with the highest life expectancy in large part because we had been the first to get deaths down for children under age 5 to 7%. That was an important accomplishment of the health system and the CDC.

CDC had focused as well here at home on addressing the biggest child killers, including malnutrition, vaccine-preventable illnesses, diseases like malaria that established CDC right here in Atlanta. And CDC and USAID upon our formation as an agency of international development worked side by side on translating those learnings abroad.

CDC drove the investigations, the guidance, the scientific know-how. And USAID was charged with trying to drive global scale up. The first CDC sustained international intervention was in 1958. And it was to investigate cholera in East Pakistan in what is now Bangladesh. Cholera was the deadliest of the acute diarrheal illnesses claiming four to six million children's lives every year.

IV fluids were the critical life-saving measure. But we were unable to drive scale because of the complexities of delivering IV fluids in places often without clinical capability. A 1968 paper-- and I realize I'm not moving the slides with my talk as I'm going-- on cholera, 1968 paper in the Lancet, one of the most influential of the century it was called, showed in just 29 patients that oral hydration with a solution of sugar, salt, and water could have a dramatic effect on survival.

USAID then was charged with advancing the learning into how to scale it with guidance on the scientific component coming from CDC on what was required for proper implementation. So first, the focus at USAID was on teaching at large scale, enabling cadres of people who would come to villages and teach people how to make these solutions at home.

That was highly successful, but limited in how much you could get that to scale. And so then the next part of the work became what we nowadays call market shaping in developing organizations, like this company, the Social Marketing Company in Bangladesh, or SMC, which to this day supplies packets of oral rehydration solution while also enabling women often to be able to make some money in communities with the low cost of these sales, but large volumes.

ORS and this deployment effort that has now spanned the world has since cut deaths 90% worldwide from acute diarrheal illnesses. A second example is our partnership in smallpox. In the early 1960s, DA Henderson, the CDC Viral Disease Chief, and Alexander Langmuir, a CDC epidemiologist at the time, put forward a proposal for USAID to build a program to eliminate smallpox and control measles in 18 West and Central African countries.

That then was accepted in 1966. And that very year, that led WHO to develop a proposal for a 10-year campaign to eradicate smallpox. By then, smallpox had claimed 300 to 500 million deaths in the 20th century.

Henderson then was seconded by CDC to Geneva in 1966 to lead the campaign. And the last case would be found in Somalia in 1977. That prompted the polio eradication initiative, which we continue to collaborate on to this day. And what you see from the impact of this work focusing on survival in children are dramatic increases in overall lifespan resulting from these gains in children.

You see that the world average had risen 50%. And if you go back to the beginning of the 20th century, you'll see that it was already now double the early average of just living into one's

thirties, and now finding that the world average was 65. But you see still some major gaps that persisted, not least for African children. And the child gaps not only persisted.

But we were now struggling by the year 2000 with a massive amount of deaths that had not been addressed from a new disease, HIV. You can see here it had been flattening the curve of survival in Africa. And in fact, as much as there might have been gains in child deaths, now it was young adult deaths that was claiming people's lives.

It led to some new tools of driving scale and speeding access to cures in the world, pooled procurement, as well as large-scale financing to enable the affording of drugs. You saw a series of incredibly important and transformative global health initiatives; Gavi, the vaccine alliance that now supplies and procures the majority of vaccines for the low and middle income world; the Global TB Drug Facility that continues to dramatically lower the cost of accessing TB drugs for the world; The Global Fund to Fight AIDS, Tuberculosis, and Malaria; the President's Emergency Plan for AIDS Relief, PEPFAR; and then the President's Malaria Initiative.

These were commitments like never before. A billion had been proposed for global health in around the year 2001. And it had seemed like an utter fantasy. Then George W. Bush came along and made a commitment with PEPFAR, and then PMI. And US leadership brought the entire world along to make contributions and commitments on health like never before.

And we've seen extraordinary gains then pick up from that point, driving significant reductions in mortality and continuing closure in gaps in the lifespan gains, where Africa accelerated substantially towards where other countries were advancing. This was the legacy I'd inherited when I got the opportunity when I was confirmed to lead global health at USAID in 2021.

At that time, you see at the end there that dip in 2021 represented the first global reduction in life expectancy in a century that resulted from the COVID pandemic. That was the singular focus for most of us here and our lives for the next couple of years. We finally are in a place where we're seeing evidence of recovery to return to the gains that we've made in 2019 and start to now actually exceed them again.

And the key question that we then have to ask ourselves is, what are the goals now in order to achieve health equity? What does that even mean on an international scale? The concept of health equity is that we would actually, at least at the country level, be able to deliver the same prospect of average life expectancy that high income countries can achieve.

And that has seemed a far off prospect. The countries that we see that have reached that high income life expectancy had done it by achieving a high income status. That was countries like Japan, which now has the highest life expectancy in the world of 85, and South Korea, which is very close behind them, or China, which is now arriving at high income status and only now achieving a 78-year life expectancy, nearly matching our US life expectancy.

And it is understandable that we would find it hard to figure how to drive life expectancy given the complexity of what health now is expected to deliver. In the last century, we have discovered 70,000 different conditions, 70,000 different ways that the human body can fail. How do I know?

If you look at your ICD-10 billing codes in EPIC, there are 70,000 different codes and conditions. For these we now have 19,000 FDA approved drugs. We have 4,000 medical and surgical procedures. We have not by any official count, but we know there are hundreds of public health interventions of significant value.

And our job has become to deploy this capability town by town to every person alive. I've argued that this is the most ambitious endeavor human beings have ever attempted. We are seeking to bring the capability that has already doubled the entire species lifespan and make sure that it reaches every corner of the Earth.

And the prospect of imagining that we could get the whole world there, it seems at times dubious. It's equal health truly scalable. And that's where I come back to Mrs. Poomkaew at the bottom left in Thailand. When I arrived at USAID, I realized that I had arrived in what has been for 70 years, 60 years-- I should count-- a living experiment, an experiment in investing in health and development.

And we now have worked as a global health bureau with more than 60 countries on advancing their health system development. And what we've seen is that we've had a few that have actually matched our US life expectancy, or even exceeded it, prior to arriving at a high income level.

At middle income levels, we're seeing countries that are matching US life expectancy or exceeding it with a fraction of our income and a fraction of our health spending. Countries like Chile, Costa Rica, Thailand have all in fact exceeded US life expectancy. Sri Lanka barely making it to become a low middle income country has enduring an economic disaster. The LKA there is the three letter code for Sri Lanka.

And there it's 77 years. And those two major dips that you see, that first one is a tsunami that wiped out 30,000 people in a population of 20 million. And the second was a civil war that claimed 20,000 people in a single year. And yet they still have managed to deliver a 77, now predicted to be 78 here in 2023 life expectancy. And the question is, how?

How have they done it? One of the striking things to me is that they're doing it with so little money. In the case of Thailand, on $300 per person per year. On the case of Sri Lanka, $158 per person per year for health. We spend $12,000 per person per year to achieve our results.

One of the critical measures-- first of all, I wanted to have a simpler way for people to understand what is life expectancy. But it also gave me an easier way to understand what programming, and public health, and health systems were delivering. And the way we started measuring in the USAID is by saying, what is the percentage of deaths in any given year that occur before the age of 50?

And what you see in countries like-- well, in the United States, we are at 8.8%, so about 9% of our population, 9% of our deaths in any given year is to people under the age of 50. In Europe, it's even down to 5% of deaths. Japan is at 2% of deaths are occurring before the age of 50.

Well, the countries where we're working in, you can see here they are starting in the 1970s, 1980s about 50% of deaths occurring before the age of 50. And these countries have dramatically reduced these numbers, particularly over the last couple of decades. The question is, how?

There's still wide disparities in the likelihood of death before 50. In Africa as a continent, it is still an average of 60% of deaths are occurring before the age of 50. And the case I want to make for you is that the way the outliers are doing it, what they're showing us is possible, is done by prioritizing primary healthcare.

And there are some very specific things I think primary healthcare means when we're describing it this way. And the way we think about it, I think, can be guided by what we've seen from some strong evidence about what PHC can produce. In the Navrongo trial, which USAID was an investor in in the 1990s, there was a very specific primary healthcare design in Ghana in northern districts where villages were randomized to receive an intervention that involved a nurse-level community caregiver, a community health nurse in a clinic which had integrated services that encompassed family planning, malaria, birth services, and others, plus having a community health outreach capability.

That is to say community health workers who would go door to door and visit homes at least once every quarter, if not more frequently. They would provide some education. And they would capture and understand-- they would recognize when people were ill or had needs and were not having those met, and be able to connect them to that community health clinic for services.

It had a component of also what people have come to call empanelment. Every home, every household in a community belonged to a PHC and to a community health worker who would make the visit. So no one would be left behind. The results were a 50% reduction in child mortality in three years, a 70% reduction in seven years.

And these were sustained, plus a reduction on average of one birth per woman in a family as they began to be able to control the spacing and the number of births from family planning. Ethiopia achieved similar results as they implemented their health extension program, which had the same features.

And that makes a lot of sense in countries where life expectancy is very low and the gains might be very high. But the other interesting thing is that the data has indicated that the gains continue as countries climb the life expectancy curve. In Costa Rica, there was a recent paper published in the Journal of Health Economics that demonstrated their World Bank supported-- so Costa Rica, once they reached about 75 years life expectancy, graduated from most of USAID support.

They had received programs for malaria, for malnutrition, all the things that I just went through. But once they had reached past that 72, 73-year life expectancy, they had graduated from our support, and then had applied for and received World Bank loans to continue to build out their health system.

And they focused their investment on building community-based primary care and having universal primary care coverage, which meant, again, having a structure that would establish

empanelment, preventative, curative, and chronic care services with teams of clinicians, including community health outreach workers that didn't have people just waiting in their clinics for people to show up, but instead reaching out, as you know in public health is the only way you can get to getting better outcomes and ensuring that people get the services that they should have.

And the results in Costa Rica they ensure that workers visit every home at least yearly. And it's more typically at least once every quarter. And for those at high risk it maybe as often as once a week. And the result of this was a natural experiment because that program rolled out community by community over the course of nine years.

So they had a chance to see what happened over time by comparing the communities that had earlier receipt of the system. And the result was even though they were starting at a 75-year life expectancy was a continued reduction with a 13% reduction in all cause mortality related to receiving this primary healthcare intervention. And what it was combining health delivery with public health because when you have a community health outreach capability, that outreach capability is tuned to-- they'll basically go with a set of checklists around the education they provide.

They might be focused on addressing prenatal needs, and malnutrition, and identifying height and weight issues, and actions in those realms when child survival is the main issue. But in Costa Rica then it began to be around non-communicable diseases and getting people their COVID shots and the other priorities that now happen to be the most actionable.

And the result was the biggest reductions were in non-communicable diseases and in elderly mortality, outreach workers to make sure people were getting blood pressure checks, to getting diabetes checks, getting COVID shots, and being brought into primary care for the receipt of more complex services than a community health worker could provide.

The striking example to me is what Thailand has been able to do with $300 per person per year. They had a notable departure starting after 2000 in their percentage of deaths that occurred before the age of 50. In the year 2000, they were right where their peers were, with about 35% of deaths occurring before the age of 50.

Like their peers, Indonesia, Philippines, Vietnam, as they rose to lower middle income status, they began to implement universal health coverage provisions. Unlike Indonesia, Philippines which followed an American model of focusing first on protection against catastrophic hospital costs, Thailand instead prioritized building community-based primary healthcare.

They had since the 1990s a village health worker capacity with what were called village health volunteers. But they hadn't built out the community primary health system. But now in 2024, in Bonito, a community of 34,000 semi-urban, here I got to visit their health center financed by their universal health coverage system, prioritizing community-based based primary care first.

This is the outpatient clinic here. They had primary health services with family physicians, a nurse, a dentist, and a pharmacist for every about 10,000 population. One team for each of that

size. And the cost of getting those services, imaging, chronic illness services, hypertension, diabetes, as well as dentistry was free under the universal health coverage scheme, almost free.

An assistant actually apologized to me. She said, well, some services are not free. They do offer Invisalign. It's $800. If you got an Invisalign, you know it's a lot more than that here. And they do Thai massage for free, but only if a physician prescribes it. It's an amazing thing to walk into a primary healthcare clinic in Thailand.

People belong to a primary healthcare clinic. They do have private clinics. But you know you have a home for your primary healthcare services, regardless of whether you want to take advantage, to use a private health center. And it's not enough. The key on my visit with Mrs. Poomkaew, the woman on the right who is the supervisor of the village health workers, the village health volunteers, she, I think, was the key to some of the success of the outcomes that they've achieved.

She is the bridge between a primary healthcare medical model of delivery and a community model of achieving public health aims by putting this together. So they have in Thailand one million village health volunteers for every 70 million people, for 70 million people. So that means for basically me, one volunteer for around 20 households.

And that volunteer has been trained 50 hours. There's not a lot can train and have them do in 50 hours. They can do blood pressures. They can do height and weight of kids. They can recognize how to look at your pill bottles and make sure you're on the right prescriptions for what you have. They can recognize if you are a pregnant woman and you haven't had your medical visit.

They can recognize if you have high blood pressure and that you haven't had a follow up for it. And that is what's critical. She is the glue because she's paid. She is full time, where the other volunteers work on average a few hours a week. It might be five going on their rounds. She supervises about 50 to 100 of these volunteers. And when they have a problem, she's the one they call.

When there is complexity or problems ranging from people with TB who aren't going in and getting their services to someone who's just sick, and they don't know why and what needs to be done. And I think lots of evidence has accumulated about delays in care being a major barrier around the world. And being able to have access to appropriate services is not enough.

You need people to initiate and prompt early connection to those services. And that's what they do. And you can see the difference in the traditional numbers that we follow for what we're supposed to be delivering. So the UHC index is an index of 14 indicators, universal health coverage index, a WHO marker that has a measure for TB diagnosis. It has a measure for malaria bed net provision.

It has a measure for smoking cessation and hypertension. It has a measure for 13 different indicators, plus one for health worker density. And the transformation from 2000 for Thailand was to leave the trajectory of their neighbors and to rise to a US trajectory in delivering that capacity of services.

And that translates into-- and this is a little hard for me even to read. But it translates into specific ability to have 90% antenatal care coverage of at least four visits for prenatal care to have reached not perfect, but two thirds effective coverage of their tuberculosis treatment as a country that had been one of the highest tuberculosis rate countries in the world, as a place where they had eliminated malaria in 87% of their districts and had a total of just six malaria deaths in a peninsula, where malaria is rife.

You can't contain malaria across borders in the Mekong Delta. But they have got it down so that it is six deaths total. It's extraordinary. Well, it is, I think, a measure of what PHC can contribute. And there's still a lot for us to unpack and understand.

Here you can see, for example, that men continue to die at significantly higher rates before the age of 50 and that primary healthcare has clearly benefited them. But the benefit is still higher for women than men and understanding exactly why we still have to understand. Men do die more often from injury, from alcohol, from drug use, have higher rates of tobacco.

But they also have higher rates of prematurity for reasons that are still not fully unpacked. And so there's something still to understand. But what's clear is that the population as a whole is benefiting substantially when we're able to deliver on these services and have this level of outreach at the community level. At USAID we have launched what we call the primary impact initiative.

We, like CDC-- well, actually for us, 100% of our funding is earmarked. And it's earmarked typically to disease areas, malaria, TB, HIV, family planning, maternal child health indicators, and pandemic prevention and response. And so we wanted to make sure as we're investing, we're committed to backing what WHO has named as a priority the radical reorientation of health systems towards primary health care.

And so we are working with 12 countries around the world that have made a commitment that is registering as either they've made a domestic financial investment or obtained a World Bank loan or international development assistance towards that goal. For example, in Indonesia, they started out with less than 20% of their healthcare spending in primary care.

And in a space of two years, their ministry has increased it to 34% of their budget going to primary healthcare. And so we have joined them to help make sure with technical assistance that their universal healthcare benefit design, their delivery and training of teams is integrated. There's a range of things we've done in these countries to help them close gaps in PHC.

We get funded in these red and blue zones, tuberculosis, HIV, AIDS, those things that I talked about. And now that gray, which is everything else, non-communicable diseases mostly, is what they have to be able to deliver on. And we're finding that it's possible to support that capability while adhering to delivering on the goals we're measured by.

Are we delivering fewer TB deaths? Are we delivering fewer HIV deaths? And an example of this-- well, in all of the countries they have identified action plans that we find fall into five areas. One is around effective primary healthcare delivery, which means building, training, and

curricula for integrated primary healthcare services, so that it isn't HIV here, and malaria there, and family planning over there, but workers being trained and clinical capacities that are more integrated.

It requires planning around subnational level management, just like in the United States. It's cities, counties, states that are where the local services are most affected. It's system integration, interoperability, all of the work around having stronger information systems that enable flow of information to and from the community level, community engagement and partnership, including outreach.

And that also is partly euphemism for domestic financing and that we work closely with governments around how they are driving and increasing everything from revenue collection to design of their universal health care programs. And then finally making sure that our investments in local primary care being climate ready and epidemic ready is an important part of it.

As an example, in Kenya, President Ruto has made a commitment to pay their formerly volunteer 108,000 community health workers and hire 4,000 more physicians to work at the community level. They have committed that they are constructing their community, their levels of their system, into primary health networks with level one through level four, with appropriate levels of moving people through the system and flow of information and electronic information.

And so our programming with our earmarked funds has been able to work in these spaces so that we are supporting, for example, just to pick one here, in more than half of the counties, thanks to partnership with CDC, with state department, PEPFAR program, the President's Malaria Initiative, and USAID's programming, we are enabling assistance for them to move to electronic health systems, including down to the community health worker level and being able to have the technical assistance and training for being able to deliver quality of care, have appropriate management at that subnational, in that case.

So they call it their county level to make it happen. It all is a sign that it can be done. It can be delivered everywhere. And we're seeing that movement happen. And there's a chance for reverse innovation here because I'm sure all of you who work in the US are saying, we don't have this. But there are interesting things we learned out of COVID.

We couldn't reach enough elderly to get to 95% vaccination until the American Rescue Plan that President Biden signed into law dispersed enough funds that at the city and county level you could hire what turned out to be more than 150,000 community health workers who could go door to door in the highest risk communities, come from the community and offer vaccines. We got to 95% vaccination.

It's the space where there is no Republican or Democrat difference in vaccination. We went to the community with people from their own community with the messages about prevention and education. And we got to 95%. And then that money went away. And we laid them off.

I know because I helped build some of the community health workforce capabilities on the East Coast. And we had to let 3,000 people go who could be checking whether people had their blood

pressure managed, the biggest killer in the United States, who could be eliminating four million people a year who have hepatitis. And we have the cure with hepatitis B vaccine and hepatitis C treatments.

That is what the formula is. And the interesting thing is one of the most unwritten stories is we are building some of this framework now. There are two Medicare and Medicaid reforms that happened in November that I think are some of the most important capabilities that have gotten no attention.

First is that Medicare and Medicaid now can pay for outreach and other non-visit-based primary healthcare services, and the new 2023 rule allowing payment directly to community health workers in a way that we've never had before. That is a massive infusion of resource at a community level that if it's done without organization, will not produce the benefits that we can have.

But if it is done in concert with you as people in the community who have the epidemiology and that public health understanding of priorities that can be activated by tackling problems with this capacity. It could make a huge difference. The one missing element is we don't have geographical empanelment. We don't say you belong to this set of community health workers or this primary clinic.

Though I think there's a pathway with FQHCs and other health centers to begin to accomplish that. We have for the first time the ingredients developing here at home as well as all over the world. I'll finish just by taking us back to Thailand.

We have now transitioned much of our aid from Thailand as well. I went on a walk with Mrs. Poonsub Poomkaew, as she went with one of her teams on their walk arounds through a community. And one of the homes we stopped at was this home. And she was contacted because this couple. The woman is 74 years old. And she already was known to have had a stroke.

She has dementia. She has heart disease. Her husband has been caring for her. Because of this community and the support of the health volunteers, they've been able to stay at home and make sure they had services. She was found down and barely responsive. They were able to access services. She revived just with speaking to her and giving her a sip of water.

Gradually, they connected her into a primary healthcare to get diagnosed. Turned out to be what seems to be an infection, got treated with medication. But this was the team that could make sure she could still manage all of that at home, receive the services locally, not have her dementia make matters worse, find herself having to be institutionalized in a place without the same levels of funding that we would struggle to deal with these issues.

And the results were extraordinary. Her village health worker, Raenu Kreunkumnoi, is the woman on the left who alerted the supervisor. The supervisor was the one who made the connection to the primary health system, the follow up to make sure the plan was being delivered by the team at home, and that this family was able to continue with their care, that the daughter who worked days, but came at night got the messages on what was needed to take care of her.

And the result is that they were there. She's happy. And when I asked her was she likes to do, it's to sit right there where we are on her porch watching the neighborhood and being part of that community. I thank you. And I look forward to more interaction with you here at CDC. This is such a special thing to get to be here. I really appreciate it.