

Transcript of Oral History Interview with Richard Wamai

Interviewee: Richard Wamai

Interviewer: Christina Lefebvre

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Abstract: Richard Wamai is an associate professor in the Department of Cultural Societies and Global Studies and Northeastern University where his focus is global health. In this interview, he answers questions about the global COVID-19 response in comparison to past epidemics. He also talks about the response to COVID-19 in Africa compared to the response in the United States. Additionally, he also talks about what he hopes society learns from this pandemic that could be helpful in the future.

Richard Wamai 00:00

My name is Richard Wamai. I am an associate professor in the Department of Cultural Societies and Global Studies here at Northeastern. My area of work is global health. It's a large field, but I have specific projects that I focus on, and specific methodologies that I use in my work. So I work on infectious diseases, primarily HIV, neglected tropical diseases, primarily, visceral leishmaniasis. I also work on modeling, including new work now modeling for COVID-19 pandemic. We have a team of colleagues from the African region, and also do work on economic evaluation and health systems, evaluations. I also work on non-communicable diseases. And there my specific disease of interest is modeling the epidemiology of some of the NCDs [non-communicable diseases] like diabetes and hypertension, in context of HIV and AIDS. So looking where the global pandemics might be heading towards in the African region, specifically in the next decade. Yeah, and my project on visceral leishmaniasis is much specific and unique because I last year opened up our center for research and treatment for visceral leishmaniasis, a highly neglected disease in the North, Northern Africa, Northern Kenya region. And so we have a center there and the center is used to conduct research to conduct clinical interventions, as well as other other operations in, in population health. And the COVID-19, has had specific impact on specifically that work, because my team, for example, have a team in Nairobi and the team has regularly been going to the Research Center, which is about seven hours away, a road trip. But they haven't been able to go back since February, because there are restrictions on on travel movement from outside Nairobi, to outside Nairobi, to any part of the country. And so for this reason, my team has not been able to go to the research field, some activities like training of clinicians, the health workers, conducting surveillance, and also, field screenings through integrated mobile clinics have not been able to be to be conducted. The clinic of course, the hospital is running because you have a clinical team there, but having my team not able to travel has had substantive impact on delaying

completion of specific projects within the timeline that we have had. And so that means extending grants timelines for certain grants to support this project, working with the grant managers to allow for these extended time. And, of course, it has also, COVID has also impacted the global supply chain for treatment for leishmaniasis as well as test kits. We use rapid diagnostic tests, which cost about \$9 a piece to diagnose, unless it's a rapid test that detects antibodies within 10 minutes. But for several months, now, there's a shortage, the global supply chain is delayed. We've been told by the WHO in Geneva that some donated supplies on the way but there is a delay. So, my clinic were the conditions and are able to use the to use these test kits. So they are using a new, rather, a different approach, which is in the algorithm for testing for visceral leishmaniasis will be the last thing you do, which is to do a splenic aspirate, essentially taking tissue of the spleen from suspected cases. And then using a microscope to diagnose the disease. Normally you do a clinical symptoms assessment to triage patients and then you do the rapid test. And now without the rapid test, then you move on directly to the splenic aspirate. It is more invasive, few people who are trained to do that. Albeit, it's one way we have had to adjust with the impact of COVID-19.

Christina Lefebvre 04:55

Right. And I think you've touched on this a little bit in the Northeastern News, the issue that health systems are having to focus less on other diseases. And you talked a little bit about the immunization effect in Africa. Could you talk a little bit more about the impact that COVID is having on public health measures and initiatives in Africa, or Kenya specifically?

Richard Wamai 05:22

Yeah, I think it's a big question. And it's a big, big topic and subject of conversation. So, I as I observed in that video, the WHO [World Health Organization] had estimated over 100 million children missing out on immunizations, childhood immunization, because COVID-19 when it hit the WHO committee that advises on global vaccine programs, agreed to effectively postpone or halt these immunization programs, which are mostly mostly allowed to catch up with children who are born outside the health facilities, then I usually reach through mass immunization campaigns. So, you mobilize a clinical team or community team to go from house to house or to go through to schools or to go to other community sites, and then they will immunize children there and these diseases like polio, and many others, measles, yellow fever and meningitis, and so on, so forth. And so, because of these global decisions to halt these mass immunization campaigns, then you have, no doubt, an effect where many children they're not reached with, with current vaccines. Specifically, for example, in my research site, we know that in our community, which is a community of about 150,000 people. And so, the only way that these children are reached is through these mass immunization campaigns. And so, without these programs happening, in meeting or reaching children with immunization, then that means that some of the timeline for when you should, you know, children should be immunized, then all I have completed past

and there is no way to catch up with with those missed opportunities. The decline in in vaccine delivery, even in health facilities, such as happens mostly in the US has been observed. So, we have seen a reduction in in the childhood immunization for many, many vaccines, even in the US, so called routine pediatric vaccines have dropped precipitously over time in the month of April, particularly in March and April. And so, I mean, that is happening in in routine immunization in hospitals here in the US is happening, obviously, across Sub Saharan Africa and that is one specific impact of COVID. Regarding childhood vaccines, infectious diseases, and so on, so forth. So, clearly COVID-19 has had an effect and be the outcome of this effect will remain to be seen in time. But we do know that when we have had these types of outbreaks and pandemic diseases that demand concentrated focus on that specific disease, then you have increased mortality from other diseases. The primary example we can give would be the West Africa Ebola outbreak in 2014-15. Where you had increased mortality due to malaria, TB, HIV, compared to Ebola deaths, in all the three countries that are affected by Ebola, that's Guinea, Liberia, and Sierra Leone. They had more people who died from these other diseases than died from Ebola. And so that's really attributable to a failure of these health systems. You know, so, and that is, you know, that's, that's a big scenario where, you know, sort of parents don't want to take their children to the hospitals, for whatever reason for immunization or even as we have had in this country where there has been a dramatic reduction in emergency hospital visits, and so on so forth. People have avoided to go to hospitals because of fear of contamination, we export it to COVID. And so we expect that that happens across across the board.

Christina Lefebvre 10:11

Right. You also spoke about consequences for neglected diseases in Time Magazine, when you were talking about Trump's defunding of the WHO. Could you talk more about that decision and the impacts that it will have globally?

Richard Wamai 10:32

Yeah. So the the article that and that specific discussion we had in Time was that there is this is this point, which is that with the US removing or withholding funding from the WHO, what is the consequence for that. While clearly a primary consequences are then the funds WHO has available is then reduced. And so then you can look at so what, what funding level has the US been providing to the WHO. It's significant proportion of the WHO budget come from the US. So the overall annual budget of the WHO is about \$4 billion, it's not a lot of money, but even \$500 million withheld from the US, that's a huge, a huge hole that hopefully could be filled by others. And I know there's a conversation going on about that, but we can use [inaudible]. So in the WHO, the WHO has a primary responsibility for the Global Polio Eradication plan then goes into Somalia, and then goes into into the rest of the Horn of Africa, which is Kenya and Ethiopia. So because these WHO funds that I use for polio eradication, the US contribution to that fund, and so withholding the availability of these funds for polio programming,

means that we will have increased cases of polio will have increased large numbers of people, of children, who will not be reached with these polio vaccines. Another point is that, the WHO was 60% of the WHO fund, funding and programming is in Sub-Saharan Africa. That's a that's a huge proportion of WHO programming and work within one region. And so, with a growing fund. US is withdrawing funds from WHO means that the effectiveness of these WHO programs in the rest of the world will be affected. And that is worrying because for a long time the African region has been dealing with outbreaks of diseases, outbreak of infectious diseases, and we need to be strengthening health systems, we need to be strengthening surveillance for diseases in the African region, not weakening it. So, having a WHO that is not well resourced means that we have a weaker health system surveillance that is heavily supported by the WHO in the African region and so, that means, almost taking a step back with infectious disease achievement that we have made. There is already an estimate of what the effect of HIV is regarding COVID-19. So, you know, we estimate the increased number of of mortality for HIV will arise from a way increasing even, you know, with a stoppage and, you know, the slowness of these programs for HIV and AIDS, where you have, you know, people unable to access the treatment, as frequently as they as they did, then you can have all kinds of things happen, including non-adherence, you know, drug resistance can result when these are reasonable to use properly, and so on, so forth. So there are many consequential effects of the COVID pandemic, to HIV program, as well as consequential effects of US withholding funding from the WHO, for infectious diseases in the African region. The magnitude of this effect will obviously, you know, be seen in the future, you know, which is a lagged progress of, you know, tackling infectious diseases. Yeah.

Christina Lefebvre 14:50

During the Contact-a-Thon, you mentioned that while the US's healthcare system is largely focused on responding to non-communicable diseases, African countries are constantly facing infectious disease. Are there any ways in which that experience with infectious disease has assisted in response to COVID?

Richard Wamai 15:16

For the African region? Most certainly, yes. You know, I think we could say that the, the lessons in fighting with infectious diseases in the African region can be drawn for the continent, regarding how the continent is responding, or has been successful in mitigating, you know, huge consequential mortality or health effects from COVID. Specifically, you can take this content, which is currently we have the WHO Africa region, which is based in in Congo Brazzaville. And they track disease outbreaks on the continent. So you know, as we speak, in the week of April, for example, the end of May, we had in the African region, 48 disease outbreaks or disease events from all kinds of diseases, whether it's visceral leishmaniasis, whether it's cholera, whether it's polio, whether it's measles, and so on, so forth, and so on, so forth. So I'm saying that to try and get the point, which is that for a very long time, the African region has been dealing with infectious diseases. The continent has learned and has created an

infrastructure for responding to, to these outbreaks. You know, what lessons could we draw, for example, from Sierra Leone, or Liberia, or Guinea, they may they may tackle their Ebola outbreak. So we created lots of networks. Imagine, for example, contact tracing networks, or even social distancing measures that one learned in the Ebola outbreak in, in West Africa. You know, social distancing is not a new thing in the continent has been practiced for, for hundreds of years, even in pre colonial Africa, communities knew how to deal with, with conditions that they did not understand by isolating villages or isolating themselves or isolating households, and so on, so forth. So this build up a whole army of community health workers in many countries who are the primary frontline health workers who have been trained to conduct, you know, regular population health health measures, whether it's distributing mosquito net, whether it's distributing vaccines like smallpox, not smallpox, obviously in the olden times, but polio vaccine today, whether it's responding to programs for water, sanitation and hygiene, you have a huge army of community health workers, who have been trained and equipped to be able to respond to, to the building of the primary health care infrastructure on the continent. That I think explains an existing capacity to deal with infectious diseases to deal with diseases that require community mobilization, diseases that require that you have a large, a large pool of people who can be quickly mobilized as well as rapid response teams. So we have that infrastructure. Overall. I think another another thing that is very helpful for the, you know, that has been very helpful for the African region, which is a lesson that can be drawn. Here is the point that, you know, nations, countries, do not need to be wealthy, to stay healthy. You know, policies matter a lot. Policies matter a lot. Smart policies, like early action. I mean, consider, for example, the Africa CDC, which is based in Addis Ababa, had already created a strategic team in response to COVID. Before there was a single case, a whole one week before there was a single case on the entire continent of Africa. There was already a response team created in the Africa CDC in Addis Ababa. Many countries shut down before you had a single case. Uganda shut down it's schools before you had any single case reported in the country. And so these policies, early policies, and early action was very instrumental in, in stemming the epidemic in the African continent. And I just mean that, you know, it's not about the, you know, the economies or health system that can deal with the, with a pandemic, in terms of clinical care patients. But that even these, these vast network of community health workers, engage communities matter a whole lot in responding to a pandemic like this. And these are the lessons that the rest of the world can learn from the from the African countries, certainly, as far as policies are concerned. As far as having a unified policy, the US has not had a very robust, unified, federal policy regarding whether it's, you know, closure of institutions, whether it's wear a mask, or whether it's social distancing, whether it is an effort to structure for testing and so on, so forth. And and then, of course, as I mentioned, and you mentioned that in your question, which is that, for many decades, since the 1930s, in this country, when infectious diseases ceased to be the leading cause of death in the US, and then you had infectious diseases become the leading cause of death from the 1930s, then the whole system has been basically built towards responding to non-communicable diseases. And so that means large infrastructure, as large, expensive hospitals, and very little, even non existent

primary health, or even public health measures. I mean, this country, spends about 2.4% of the entire health expenditure is on public health. And so we have very little in terms of any kind of infrastructure, or, you know, population health or public health measures that are in place. So that's one way to say, well, if you look at where the money is being spent in the healthcare system here, and what kind of infrastructure we have built, there is no memory of dealing with infectious diseases, there is no infrastructure on dealing with pandemic outbreaks in this country.

Christina Lefebvre 22:13

Right. I'm shifting gears a little bit, I wanted to ask about your work with the COVID and Africa Data Science Initiative. And kind of the process for developing some of those models and any of the challenges you faced in doing so.

Richard Wamai 22:31

Yeah. So yeah, thank you. Thank you Hope. So, early on in the pandemic, we closed down the university in, I think it was like March 18 or thereabout. I haven't, you know, since I left the office didn't get to go back there. But, and then we all went into online mode, online teaching, online learning, and colleagues that I have been engaged with previously on, you know, modeling work or technical, technical efficiency studies, for health systems. You then had a conversation about what can we do, we are seeing that in the African region, the space for modeling is limited. And so, you know, we got together to my colleague, Yohannes Kinfu, is in a he's an, he's an economic health, economics professor in Australia, in Canberra, together with others, Lawrence Were, who was formerly a PhD. I was in his dissertation committee at Brown University and, and others, you know, from Botswana, to Nairobi, to Rwanda to Ethiopia, and here in the US, the three of us are here based in the US. Tom Achoki is also health econ-economist and then we have others two others in in Australia. So, we build this model as a fast modeling to predict the epidemic in the African region. And our, our modelling predicted that the by the end of June, this month, which is tomorrow, June 30, we would have in the African region 16.2 million cases of COVID and the number of deaths would be 34,000 by the end of this month, by the end of this month in June. So, so of course in modeling, you use a lot of parameters to create models like this. So between two approaches one which is agent based modeling, where you know, precisely the Reproductive Rate Factor, or RRF factor, that we've heard about quite often. And then that disease agent, that specific agent, then themselves becomes the person who then transmits and spread the disease. And that's an agent based model, but good to use when you have very good data when they are not as well known, well defined by, so we use the set covariates based model, which is, you know, taking into account variables. We took a whole group of variables like place locations, you take the African continent in all countries and ask yourself, Where do people live? Do people live in urban areas? Do people live in rural areas, what's the proportion of people in these regions, and then we take another set of variables like livelihood, so the social demographic index, which means, you know, income levels, education levels, all of those type of

factors, household, we take population factors like density, how close to one another do people live the age of age distribution of the population. And then household size, those are population parameters. You might have heard that, regarding the, the, this this age distribution dimension, in the in the US the average age, about 35 years, in the African region about 18 years. So the US average age is not that different from Europe, it's probably high in Europe, compared to the US, I would think. But that means that you have a much younger population in the African, in the African region. And you have, you know, among all the things that are being discussed regarding why or how Africa has been able to avoid high cases of mortality, this age factor is a very important one. But we think household size also plays a role. There's even other variables you can add there regarding, for example, the frequency of contact at the household level, or a typical person in the African region, what's the frequent kinds of contact they have, like whether it's skin to skin contact, or close proximity, contact, and so on. So that's why you understand, you know, sort of including household size matters a lot. Another set of variables include there, the burden of disease, so that means comorbidities, right, we look at other diseases in the population. So I know for example, in the US, about 60% of the American population has one condition. One other condition like diabetes, hypertension. So the comorbidity is extremely high in population, about 60%. We don't know what that is in the African region, but we know based on population studies, for example, the distribution of non communicable diseases for some countries that have done the surveys or even observational surveys, we have an observational survey about, let's say, diabetes in Nairobi, or in Johannesburg. And you know, another type of a survey like that in a rural village, we can always compare based on the totality of the available information, and understand this issue of the comorbidity or burden of disease. And of course, HIV, malaria, malnutrition, all of those are components of the burden of disease. And then another set of variables are health systems, or systems in general. So part of the systems is health system. The other one is connectivity. You can think of connectivity in terms of infrastructure, let's say roads, or even airport. In all of those parameters, for example, the connectivity with the African region is higher in let's say, Egypt has a high connectivity within the Middle East. And then South Africa has a higher air traffic travel in South Africa, and then you take East Africa, Kenya will be one, but then you go to Central Africa like Central African Republic or Chad, and much less air travel, so that the element of connectivity. So what I mean, right? So, we have our fair connectivity in those regions. And therefore, you can be able to predict if an area has high connectivity, then the likelihood of the spread will be more right and then you know, connectivity also factors into you know, the where do people live? People, most people in, like, Kenya, 75% live in rural areas. And in rural areas, the density is less compared to let's say, Nairobi, we take a big city like Nairobi and Kibera, Kibera is a slum area, Kibera, you have a much higher density of the population so the degree of probable spread with exposure in high density areas will be higher compared to rural areas. One last pillar in this sort of covariance model is the governance question. And here, you know, so particularly regarding here, we can say maybe they say the, the policies, right, so some countries, like I was speaking to earlier, adopted their policies much earlier. And they're much more, you know, they're much more

policy oriented, like, you know, national policy, this is what we are going to do all their specific policies about, you know, you know, whether it's social distancing, or whether it is wearing masks, and then combining that in legislation, to speak to that point a bit. For example, in my country, Kenya, it is mandatory as a national policy, to wear a mask whenever it goes out. And that is enshrined in law. Compared to that here in the US, the application on our policy is by no means there is no national application of a policy like that, right. It's very fragmented in states or even in cities within states, and so on and so forth. And so, I mean, policy regarding restriction of travel, right? So we've had, in Nairobi, a restriction of movement from Nairobi, and into Nairobi, almost going to the third month. Now, can you imagine having a policy that restricts travel to New York for three months? Anybody from there should not leave anybody from others should not come into - that type of an adoption of policy? And when you have community support with that, right, so there are many, many variables you include in this in this idea of modeling, right?

Christina Lefebvre 31:46

Yeah.

Richard Wamai 31:47

So when we it's a long way to, you know, to explain the methodological approach, you explain how you came up with these numbers that I mentioned earlier? Right? The other thing is, of course, as so far, if you look at the the African continent, the number of cases, as reported, you know, today, for example, and it varies a lot, but it's pretty much our model is, is is reflective of the current statistics. So from current cases, as of June, June, last, yesterday, about 380,000 cases in the African region, the deaths are about 9000. So, if you take the measurement, the number of deaths in the African continent is about 1.5%, or maybe less than 2% of all the global deaths, right. And the number of cases is probably 3% of all the global death. Right. And then you have a higher higher caseload overall, in southern Africa, meaning South Africa, specifically, and then the North African region, so very much commensurate to the model that we had established whereby you'd have higher cases in the African North, including Egypt, including areas like Morocco, VA ins Southern Africa, South Africa overall. And then you have pockets in between which have fewer cases, right. So in view of that, we say, well, we haven't yet reached there is no record or report. In current case, cases which are detected, we don't have 16 million cases detected, tomorrow is June 30, we will have probably 400,000 cases detected who knows maybe by tomorrow, so, but that will mean that based on our model, we have only been able to test this much. So, if our model was accurate, it just means this is how much we have been able to test. And this is the number of days we've been able to ascertain. Okay? However, what we know is that modeling, modeling is a prediction, is based on hypotheticals, so no model will be accurate. But we know also that most persons infected with the disease and exposed to the disease will not have been tested. So far, the testing levels where we are is very low in Africa. But that means we are not reaching everybody who is

infected. Not everybody who is infected has been tested. So that's why we look at model prediction and the current cases, okay? Not that we would have in fact 60 million cases tested by tomorrow, or that it will be positive by tomorrow, but there is a difference between the number of cases tested to date. and the predicted number. You might have heard that in the US CDC released a report last week, I think the end of last week where the writer was saying that the, the estimated number of infected persons in the US is about 20 million compared to as a 2.5 million today that are tested positive. And so you will always have that difference between the predicted cases and the number of actual cases which are detected. Our primary concern if you were to ask me the primary concern that we have, me as the modeler, and my team, and we have had a conversation with the Africa CDC director, we have even had a side by side model comparison, you might have heard of the, of the model from Imperial College London, and the HIV model, University of Washington, and other models. So we had my colleague Johannes Kinfu, had a presentation at the Africa CDC scientific working group, where these three models were presented that is our model and the three other models and then discuss by the, you know, the scientific committee and community there. And so, because of the different approaches that are used in modeling, and also the nuances that the modelers have, you will have these differences in estimation. So, what is of interest is that as as a group, Africans have advantages, nuances of understanding the continent, then other people who have no that nuance, were not not been raised there or grown there, they have not spent substantive time, or they work there, or have families there - this breadth of knowledge, which cannot be gained by looking from outside. So those nuances have helped us to have a superior prediction model that was more widely received and acceptable within the African CDC as a probable question wondered. And so having that type of insight is very, very helpful. The concern for me and my group and all the people that we know and are working with is the mortality. Okay, so the concern that: A) we don't have an increase, or vastly increased cases, case detection, that then you have an increased hospitalization. And then you have an increased mortality because of the poor or weak health system that have no that don't have as extensive capacity to cope with increased number of hospitalization, or demand, for example, for ventilators and so on, so forth. So, so far, it's already been hammered for three months. So I think we're going into the fourth month of the epidemic of the pandemic. And we have not seen, we have not seen hospitals being overwhelmed or hospital being, you know, heavy, heavily overused, by COVID patients, or even other patients. I was speaking on Friday, just last Friday with my colleague, Carol Karatu. She was my PhD student at BU, and she's running a program, a large \$65 million program of the USAID in eastern Uganda. It's a health system program to build and strengthen health system in eastern Uganda. So she's responsible, she's in charge of a vast number of health facilities, from low level facilities, community level facilities to tertiary hospitals, and she was telling me that she has not seen, they have not seen any any concerning increases of hospitalization or any kind of demand or increased mortality from any cause. So that is very reassuring and and then I also spoke with a lab technician and her name is Ruth Momo, who is working with the Ministry of Health. Ministry of Health in in Kenya has two mobile laboratories to screen for COVID.

One is situated in the border area with Tanzania, and the other one is in the Rift Valley, on a route use by truck drivers, long distance truck drivers. And she said that the majority, by far the majority of people are these truck drivers who are turning positive have no symptoms, no or very mild symptoms. So all we have to say that, as predicted by our model, we will have a large number of people who are infected and even exposed, but many people are not developing symptoms, and they may very well go on and infect others. But the, the sort of the funnel that is, you know, funneling upward of you know, severe cases for hospitalization or even critical care patient is very, very small, that funnel is very, very narrow. So, we know seeing these, these numbers of increases, okay?

Christina Lefebvre 40:32

That's really interesting, that the number of asymptomatic cases is that high.

Richard Wamai 40:38

Uh huh. Yeah, that is where we are on the continent, we know that the cases will continue to increase, most certainly will will have increase you know, case detection, we'll also have increase a number of death, but it is very slow and very low low lagging on the continent. What what is ahead of us, I hope, if I can speculate on the fact that many countries in the African continent have implemented as, as other countries have implemented all these, which are called non pharmaceutical interventions, so, social distancing, you know, advises, obviously, that is very hard to implement in the in certain urban areas with high population concentrations, wearing masks certainly, or even, you know, sanitation, washing hands, and so on, so forth. So some areas in some cities have been able to implement very robust systems such as those like, you know, hand washing, and so on and so forth. For example, in Ethiopia, in Addis Ababa, where my my in-laws are, when they go to the bank, for example, outside the building the bank hall, there is a water tank with soap, and everybody washes their hands before they go in. And or even a hospital they do that. I mean, we here hear of that, you know, you should wash your hands. But if those systems are not provided, when people can't have them, then you can't. It's a useless policy to say right. And so that is really good. So where we are headed to is the fact that soon enough government in the continent in Africa will begin to relax these restrictions. We we we expect that in Kenya, for example, President Uhuru will remove the restriction of movement of travel from Nairobi and from Mombasa, to cities in which these restrictions have been in place. Next week, I think, is a July 4 or thereabout, or mid month, he will be making an announcement about whether indeed he's going to remove this restrictions. We think that ,you know, is going to read in the month of July will be a critical mind for these these leaders to make these determinations and decisions. There is a very high and convincing argument for removing these restrictions. And those arguments are economic argument. Okay.

Christina Lefebvre 43:18

Yes.

Richard Wamai 43:19

But we can also make them you know, you know, population health argument. Here is here's a way to connect the two taking the example of a country of Malawi. So Malawi has, and just yesterday they they have a new president, and this is the first opposition president to win an election in the African continent, by the way. Most opposition candidates handily win this election.

Christina Lefebvre 43:47

Yeah, yeah. [laugh]

Richard Wamai 43:50

But but but Malawi has about 22,000 people die of HIV in Malawi. If we take the Imperial College, College London model of prediction of mortality for COVID in Malawi, there was about 7000 deaths that will be realized in Malawi. Okay? For due to COVID. Okay, but now compare 7000 deaths of COVID and 22,000 deaths of HIV, right? There's a huge difference. So what is more merited? Is it merited to save 7000 lives? Or 22,000 lives? The argument is simple, I mean, for any policy, any person in their sensible mind will say no, no, we will save more people. Plus, you can save 22,000 lives of HIV at a much cheaper cost compared to the cost that is being implemented to save 7000 lives for COVID in Malawi. About a billion or one year of GDP of GDP in Malawi will be lost in these measures, these restrictions, and, you know, lockdown measures due to COVID in, in, in Malawi. And then you save another lives, but the economic costs is stratospheric right? Compared to compared to these, you know, saving the lives of over 22,000 people. So they can only make argument does not? In no way, in no way is there an economic argument that can be made that these closures make sense, okay. And even in the predicted mortality estimates due to COVID, and due to other diseases, they really don't come close. And so if I was a policy adviser to the government in Kenya, these are the discussions we will be having, we'll be having predictive models of economic impact, what is the effect of children missing schooling for half a year, and missing schooling for half a year in a time that they will never be able to recover or cannot be recovered? Because in terms of age, I mean, I guess it's also like students, like you know, you, if you were to lose half a year of education or a year of education, that means, you know, the years are going by so you kind of delaying things you could do later on. But it's also having these large baggage of uneducated or kids who missed out on education on people who missed out on being reached by antiretroviral drugs, and or other other demands of the healthcare system that I was speaking to earlier. So I think this is where the debate is now going to move towards the argument, economic argument. And there is this institute in Copenhagen, Denmark, the Copenhagen Consensus, and they, they did some estimate, for Malawi and for Ghana. So the specific figures giving is from the Copenhagen Consensus regarding the priorities that governments need to implement.

Christina Lefebvre 47:00

Got it. I do have a few more questions. Are you okay, on time?

Richard Wamai 47:06

Sure. That we can we can we can do another? I don't know, maybe half an hour, 15 minutes or so.

Christina Lefebvre 47:12

That'll be great. Thank you so much. Um, so in the United States, COVID, clearly further exposed the health disparities in our system.

Richard Wamai 47:23

Right.

Christina Lefebvre 47:24

Have there been any similar experiences in Kenya or Africa? Because I know you talked about some of the marginalized communities in your paper.

Richard Wamai 47:34

Right. Yeah. So I think what we see here, I will take us back to, you know, a comment. I guess this is anecdotal. My former PhD student I mentioned her name is Carol Karutu was in Uganda. Her husband is, is called Charles, who is South Sudanese, and he's an economist. He's a development economist. And he mentioned in the conversation on Friday that what he's hearing in South Sudan is that is that people are saying that the COVID has become an equalizer. I think I think there was something some new ones like that earlier here in this country, maybe, maybe in the beginning, or there was in the beginning of the of the pandemic, there was these things we used, I had heard about people saying that, Oh, Africans are being spared, you know, African Americans are being spared of COVID. And, and, you know, soon enough, it was clearly not the case.

Christina Lefebvre 48:38

Yeah, I remember that.

Richard Wamai 48:39

Yeah, but the, the idea of COVID becoming an equalizer is this. And his observation is that in South Sudan, for example, the Vice President Riek Machar was tested positive for for COVID, and his wife. Okay. And, and then. And then. So there's the elite class and the ruling class, so that he represents with Riek Machar represents the elite and the ruling class in South Sudan. So for the vast majority of people

in South Sudan, whom over 80, or probably even 90% of them live in rural areas, we are basically observing what's happening in the capital Juba, seeing who is being affected, which people are being exposed. Because for now, as the restrictions are in place, by far the majority of people who are infected, tested positive in the African region, are in urban areas. And who lives in urban areas, who live in these wealthy areas. And I think we also saw that even here in the US early on, um, you had celebrities, you had people who are infected, so there was no, there was almost this pattern, which which made it seem as though the African Americans are not exposed, which is that I mean, the only people we have in the beginning were exposed to these sort of people who are connected in urban areas and cities and so on so forth. So the same type of nuance in economy so so the thinking is that you have the disease affecting the wealthy, and the elite ruling class in the masses of people in the rural rural areas are not affected by COVID. That clearly the epidemiology says as much in fact, for for most of the sub Saharan African region, the disease hasn't really spread out into the villages. My mother lives in a farm, there is no there is no case in that whole region. And so and so, however, then you take back, we take back the the conversation we're having earlier, which is that the effect of the pandemic on the health system, on the availability of drugs on the availability of vaccines, right, then will be greatly greatly fairheld by, you know, rural health facilities, okay. Or in the case of these communities, we were women give birth in rural home, right. And the kids are never immunized or at least aren't reached by these mass immunization campaigns. But that's to say that in the in the case where these rural populations are reached, the kids are reached by immunization programs, or other integrated interventions like distribution of mosquito nets, or distribution of antiretroviral drugs in communities, then they'll be affected because the supply chain is not working as efficiently. I gave you the example of my work with visceral leishmaniasis. So that can mean that when these remote areas such as where I work with my leishmaniasis program, is then the population is left farther behind, okay, it's left farther behind, where kids didn't get immunized, where schools are closed, and so on, so forth, and so on, so forth. The other element is this, which is that we see a pattern regarding, let's say, teen pregnancies, okay, teenage pregnancies. And, you know, I can point to two sites where I work in Kenya, one is Western Kenya, we would have visited the site is called McGorry is a community health program there. And then Kitai is a region in Kenya. So those areas have have been in the news recently, regarding increased number of teen pregnancies. Now, we've always seen that teen pregnancies typically happen during school closures. during the school holidays, we have three school holidays. In a country like Kenya, we have a holiday in April, we have a holiday in August, and then there's a holiday in November and December. Now, these periods, we always know that it is time to ramp up these programs, family planning program, or programs to expand coverage of educational programs, to prevent teen pregnancy and so forth. So we already seeing these aspects happening. We also see, so these pregnancies are largely happening in these communities, these marginalized communities, these remote populations. So you can imagine then, the effect and the consequential effect it would have on the education of these girls, as far as, you know, some communities being left behind as a result of COVID, COVID pandemic. So there are those kinds

of ways we can look at how the pandemic is affecting certain communities and because of a failure of the health system or stoppage of immunization campaigns, or because you have large, you know, teenage population, who are then being exposed to these phenomenon, or long periods of time where schools are closed, and then high teen pregnancies, and so on so forth, One, probably positive thing that we think pandemic will cause, you know, in terms of preparing the health system is that probably at the governance level leaders and the wealthy, particularly the leaders, because they're the ones you can make these policy decisions, who are not able to as to freely travel to Asia to India or South Africa or Europe, or London for medical procedures. And are now stuck in their region. We have the governor, Kenya's governor as for example, you know, wherever they are, they cannot, they cannot now travel to, to India or for medical medical reasons. That may mean this is a moment now and an opportunity for them to begin to build their regional health system and capacities in their hospitals to equip those hospitals to create [inaudible] that ill with chronic care conditions. I know, for example, many areas have many areas that didn't have, for example, ventilators or oxygen or, you know, capacity for ICU beds, that has happened in even in eventually a small in small measure, but there are areas that didn't have those infrastructure that have now have those, you know, put into place.

Christina Lefebvre 55:52

That's a really interesting, positive impact. I didn't even think about that.

Richard Wamai 55:59

Yep. Yeah, absolutely. And I think also, too, I mean, you can imagine the infrastructure that is being put into place, here's another way to look at the positive effect of COVID, which is, we've, you know, we think with regard to wash programs, these are water sanitation and hygiene programs, we think that a highly increased consciousness of sanitation, of the importance and value of washing hands, for example, or even sanitizing surfaces and places, whether they are you know, public transportation vehicles, or even these public spaces, and so on, so forth, I think that that will have an effect down the line. I mean, we can take diarrheal diseases, for example, or cholera or others that are, you know, primary contribution is lack of these watch programs that could have in fact, positive effect of, you know, increase awareness, and increase infrastructure and, you know, development, as well as these policies. So, yeah, I think that there will be an increase, increase, you know, benefit in those areas. And also you can imagine, with the, with the insistence of wearing a mask, and the effect, you know, that can have on other respiratory diseases, whether it's tuberculosis, you know, and so on, so forth. So, in a context where respiratory diseases are transmitted, and you know, people wear masks to prevent, you know, COVID, then you have also the prevention of the other respiratory diseases, right.

Christina Lefebvre 57:39

Definitely.

Richard Wamai 57:41

Yeah.

Christina Lefebvre 57:43

What are some of your thoughts on timing for COVID vaccine development, and also accessibility and population acceptance once it is developed?

Richard Wamai 57:55

I think that's a very good question, especially the acceptance of the other vaccines, right. Yeah. I think, on the one point about accept acceptance of vaccines, I think it's fair to say that we have a higher vaccine acceptance in, in mostly low income settings or low income countries, compared to let's say, the United States as a unique example, US is in a different level altogether. The anti science movement, anti vaccine movement is so strong here that some areas have a much lower level of coverage of vaccines compared to most countries in the African region. You know, so, so there is already this sort of his huge, vast network of conspiracy theories. And there was a paper that I read, I wish I could get it quickly now, but maybe not. But it's a very interesting article that was published in the journal Science very recently, that says that looking at, you know, vaccine acceptance, and these anti vaxxers and their networks, so, you know, is used as an algorithm to estimate where on social media, messaging for vaccines, and, and then, you know, messaging for anti vaxxers. And apparently, you know, overall on social media, you have fewer people who are anti vaccines, then you have those who are for vaccines. However, the anti vaccine, anti vaccinators, I guess we can call them that have a much vaster network within networks of vaccine promoters. And the article id'd that in fact, in about a decade, you will have much more wider presence in the social media of anti vaxxers than you have for those who support vaccines. And I think that's a really scary, scary, you know, aspect because I mean, we have a much wider acceptance of anti of these anti vaccine ideas, then you have all those pro vaccines, that has huge consequences in the future, not just for this pandemic, but for future pandemic. So quite clearly, even now, as we're seeing in the political debate, particularly in the US, there are those who don't wear masks. So, once a vaccine is is produced, there are those who will not want to have the vaccine, right. But see, acceptance is very, very important and there has to be approach, you know, very carefully, very methodically, with proper communication channels. We always say I mean, in the in the African continent, you, you approach a topic that involves the community, through the community leaders, trusted sources in the community, those that community trusts and listens to, it could be anybody, whether it's the local Imam, or the local traditional herbalist, or today, or local teacher, or community organizer, or the head of the village, or the chief or whomever, or the local priest, you know, those are the ones that people listen to. So you approach all the ways in any intervention, as you know, the Global Health Committee has learned, you know, for example, in the context of, you know, responding to Ebola is that you cannot just go to the

village and say, Yeah, we brought you this, and this is what you will say, No. It is through the community trusted voices, who can communicate local information. And those are the ones those are the channels to be used. You might remember, yeah, you might remember in our class, Intro to Global Health, you had this case study of Malawi, you remember that?

Christina Lefebvre 1:02:01

Yes, I do remember.

Richard Wamai 1:02:03

Yeah, and you know, tackling, you know, maternal and child mortality. And so, the area chiefs, Chief Cortana, in our case in a video was very instrumental. Yes, you have the political leadership at the top, and then you have the whole information, everybody, all the entire leadership is on board. But if you have a dissenting voices, or if you have these kinds of freedoms or exemptions that are there in a very individualistic society, like the United States, then you cannot have a universal coverage, it cannot, it cannot be achieved. And so, you know, having a vaccine is one, but then having acceptance is another one. And then of course, the whole issue of distribution and supply is very important. A point about current vaccine development in the, in the continent, I think South Africa is, is in the clinical trial network, as you may have heard of the solidarity trial by the WHO for, for convenience. So you have a few, a few areas in South Africa, Egypt, Kenya, I think is also coming on board. And the thing about this is that with vaccine trials, cannot be exempt from being included or cannot exempt the African continent from being included in the trial. There are some vaccines that in fact, exists for the global population that have been tested or rather have even been originated in the African region. For example, one of the meningococcal vaccines, a meningitis vaccine is originated from the African continent. And so having, you know, these trials take part take place in in these countries is important because one of the, one of the policy considerations when a vaccine is developed is the country or the population in which it is it was, it was trying must be in the priority group of our population to receive it as the first group of people to receive the vaccine. So, if we didn't have any vaccine trial, and then going on in the African region for covenanting, that means they'll be back of the line. And so, including these trials in those regions is very important. For that reason and also for the fact that biologically, human populations are biologically or have specific genetic particularities or minor differences in these particularities that, you know, a vaccine tried in one population may not necessarily be as good as in another population, because of these differences. So, therefore, having a vaccine trial that, you know, encompasses the you know, the entire population, or the whole distribution of the population, mean across the globe, is the ideal scenario.

Christina Lefebvre 1:05:00

Right. And in another Northeastern News, you talked about the 10 to 90 gap in disease research and drug development. Could you explain the significance of that gap in the evolution and spreading of pandemics?

Richard Wamai 1:05:18

Well, yeah, I mean, the the idea is a very old idea that 10-90 gap is an old idea, you know, where, you know, research, for drugs, for vaccine development, and so on and so forth, generally is driven by demand of health conditions that affect a small proportion of the population. You know, so 90% of the funds in this case with a 10-90 idea is that 90% of the funds are going to a disease that affects only 10% of the world's population. So there are many ways we can look at this, we can look at, for example, the global research budget, that would be well over \$140 billion that is spent in global health research, it's a huge amount of money, right. So which type of research is conducted or which type of diseases are conducted in this, with this kind of money? One example, in the article that you mentioned here, the article is, was was speaking with my colleague, Professor Pulaski at Northeastern College of Science, which is that, you know, him and I work on neglected diseases and that they are neglected. And these diseases are called neglected tropical diseases, is a whole group of an open ended list of, you know, 20 diseases, or more, and they are neglected, that means there's very little research going into this very limited research going into those diseases, if we are to look, for example, where they are clinical trials, maybe less than 1% of all clinical trials go into this into this field. And so, that's the whole point about the fact that we have been the max we have large pandemic diseases, for which we are not committing as much funds as we ought to, given the population affected, given the burden to the globe to global health, right. So, you know, we could we can say, in context, which is that I mean, if we don't eliminate COVID-19 in low income settings, whether it's in Africa or or Honduras, or you know, I don't know Vietnam or any of those countries, we will then not eliminate it globally. So, there has to be a global approach. And you know, we will call for a you know, rebalancing of how global funding for research for for health development is, is currently organized, so that we can remove the neglect from these group of diseases for example, so that means we should put more money into targeting infectious diseases, and neglected diseases like, you know, visceral leishmaniasis or schistosomiasis, or even yellow fever, and even malaria and so on, so forth, and so on so forth. You know, we are seeing an increase, you know, growth, for example, early on, I was speaking to the African region having 48 disease outbreaks, you know, variety of diseases. But how much money are we actually putting into these programs, whether it's yellow fever program, eradication program, or even polio, polio is very close to be eradicated. But clearly now, with with, with COVID, we undoubtedly will have to be playing catch up in immunizing for these diseases, whether it's seen as polio, or yellow fever or meningitis or measles, and so on, so forth. So we are currently putting a lot of money into one basket for COVID. It makes sense from this sort of panic and fear consequence. But it doesn't make sense from a rational point to then avoid or ignore all of these other diseases that we we could be targeting.

Christina Lefebvre 1:09:32

Are there any important lessons that you hope we I guess, as a global society, take away from the pandemic?

Richard Wamai 1:09:39

Um, yeah, I mean, I think I think yes, you know, absolutely. The reason why we have got to we have reached this point of a pandemic declaration is for one, you know, there are many failures, there is a lot of failures in the across the board in the so called global health infrastructure. You have heard repeatedly, about, you know, the call by President Bush in the first place. This was like a one that was a 2003. And then 2005. And then you had Obama make a call in 2010. And then, and then you have Bill Gates, who made a call in 2014. For what? For these, you know, President Bush and President Obama and Bill Gates made a call at different times. I mean, in 2003, it was it was this SARS disease, pandemic, and then which also originated from Asia, South Asia. And then you had Obama make a call after the H1N1 influenza pandemic that also killed a large number of people with CDC estimates, hundreds of 1000s. And then you had Gates make a call in 2014, after 2014 15, after the West Africa Ebola pandemic, for what? For surveillance, for increased surveillance for strengthening surveillance systems, right? Strengthening disease surveillance. So that was so by that we mean being able to create an infrastructure where you have, you know, system that conduct assessments of disease outbreaks. I mentioned in the article that you mentioned earlier, by Northeastern, I talked about the 10-90 gap, about the USAID predict program, a program that that was, you know, was funded during the time of Bush, or Obama, or other Bush, in fact, at the time, that was created to identify new viruses and new outbreaks, tha our program that was supported, and then, you know, infrastructure was was put into place, all the way until, you know, the current President Donald Trump decided to shut it down. So, and our program had established, over a short period of time of about a decade, 1000 new viruses. So, if we can, if we can, you know, strengthen these surveillance systems, absolutely necessary. I think, well, we have these calls for a surveillance system from 03, you know, or 2010, 2015, I am convinced that this pandemic have made it abundantly clear to the to leaders of countries to global health infrastructure, WHO level and other regions that it is important and it is time to heed the call and set up the surveillance system. You know, the estimate there was there was a commissioned set up the Global Health Security Commission that you know, found out that you know, we can create a robust surveillance system for a very small modest amount of money, you know, if you put \$10 billion to a global surveillance system, how will it help us to be able to predict, to be able to to spot early, any type of an unusual or new disease that comes comes up. So, I think the lesson to be drawn is that we cannot afford to not be prepared anymore. It is absolutely critical that the global community has to be prepared. I think another thing lesson in tandem with that is that infectious disease is very much of a global concern, we cannot be lax in in the developed world, where non communicable diseases have become, you know, the leading cause of

death, I mean, even globally, the global death. Just about, you know, 73% of global deaths are from non communicable diseases. Yes, we know that the burden of disease is tilted towards these non communicable disease. However, we can see now that the impact of a global pandemic global infectious disease pandemic is so huge that we cannot afford the economic effect is so huge. We're talking about trillions of dollars, that we absolutely cannot afford to ignore infectious diseases and we need to be building preparedness. So I mentioned surveillance. Yeah, we need to build surveillance programs. Then we need to build preparedness programs and the country like the US has to be prepared. It has been known all the way from the SARS influenza to H1N1, that there will be there is a predictable probability of having an infectious respiratory disease, far worse than has been seen before. But what happened? Nothing? I mean, if we know that, you know, they it's an influenza, it's a respiratory disease. So then what do you do in terms of preparedness, you know, hospital systems are up put up, isolation sites are put up in you know, PPE is, as you know, putting stock and there is a whole preparedness structure that can be in place. Right? So that I think is a very, very critical lesson that we have to learn. Another lesson, I think, that is very poignant, in the moment where we are, is that no country can afford to work by themselves or to be to be driven by pride or that we can't accept test kits from Country X, because we need to develop our own or we can't accept, you know, these materials from country because we need to develop our own. That is disastrous kind of thinking, no country is alone. No country can, by itself, prevent global pandemic from spreading, no wealth can prevent a country from being overwhelmed by an infectious disease. And we have without question, we have seen what the what has happened has happened in the US in that regard. So, as the saying goes, we are in this together and there is no [laughs] there is no in fact, this is probably the best moment people can say. In fact, in this together, it cannot be said so well, so poignantly, so pointedly, as we can say now, because no country literally is spared. And we are in this together. So we have to act together. And that's the lesson which is global health is one health of one world. And of course, you know, as you may recall, in our class, we talked about global health. And then we talked about planetary health. And so it is very important to be conscious of these developments in global health, that global health of the human population but but we also are conscious of how our human population interacts with our environment, because that's where the diseases, a lot of these new infectious pandemics and this is coming from our contact with the environment, with ecological systems, the animal world, and so on, so forth. So so we're really learning lessons in that we have to work together as a global human society.