Data Science Africa FC

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Welcome to the virtual symposium that's launching the NIH Common funds new programme, harnessing data science for health discovery and innovation in Africa. That's a lot of words. So we're just going to call it DSI Africa. I'm Francis Collins, director of the US National Institutes of Health. At this point, however, speaking to you from my home office about four miles away from NIH, where I've been pretty much continuously for the last 17 weeks managing the NIH is incredibly broad portfolio of research everything from basic science to clinical trials from right here, because that is what we have all been required to do in order to keep ourselves and our staff safe. People still working in hospitals, of course, like the one we run on our campus are busy taking care of patients. People working actively on developing the vaccines for COVID-19 are therapeutics. They're hard at work in the laboratories, but most To the rest of research has had to slow down in order to make it possible for people to be safe by sheltering at home. While we all deal with this unprecedented crisis pandemic that we have not seen the likes of in a century, and of course it is affecting everybody around the world, including those of you listening to this message. So, I hope you were all staying safe where you are. And I hope you're okay with the fact that we are now needing to do things like this virtually, instead of what we had originally hoped for. Our original plan was we were going to meet with all of you in person and Uganda for the kickoff of DSI. But I guess Coronavirus had another plan. And clearly, our plans had to be adjusted. But I'm happy to take part in the launch of this initiative. And maybe even there's a slight silver lining here because having the meeting online allows us to reach many more people across Africa. And across the globe than if we had required everybody to travel to one meeting site. So we have done everything we can to take advantage of that made this platform as open and accessible to anybody who's interested in the topic of data science, to the special effort also to engage organisations outside of universities and academia, because this is a great moment to build those relationships. And I'm happy to say that despite all of the pressures that have fallen down on on us because of the pandemic, I'm happy to see the scientific community has been responding and all sorts of other creative ways. And of course, data science initiatives are in a

certain way, particularly amenable to people doing things in a distributed fashion.

In my own lab, for instance, the people who had to work at the lab bench they've not gotten a lot done in the last three months. The people who are doing data science, hey, they're at home, but they're linked up appropriately over the internet. To get access to their data sets and to be able to do computational approaches, and they've actually been making pretty good progress. Well, let's talk about the opportunity in Africa. I'm particularly excited about DSI Africa, because I think it comes at a particularly incredible time of growth and opportunity. And then Africa is very well situated to play an increasingly significant role in this area of scientific opportunity. My own experience in Africa goes back many years, I've travelled on multiple occasions, to the continent beginning, gosh, nearly 30 years ago, as a volunteer in a rural missionary Hospital in Nigeria, where I took care of patients with a wide variety of problems. I learned a lot about medicine in that circumstance was came quickly to appreciate the creativity and the energy and the determination of people all around me. And thought, if we could tap into this and all kind ways that would be amazing to see. And that has very much been my experience over my 27 years now at NIH, with the last 11 as NIH Director,

I've had the occasion to work with many experts who understand global health in a big way. And many of them are Africans, who have become my friends and my colleagues, as we've sought together ways to try to see how science can bring things forward in remarkable advances that are going to benefit people all over the world, and especially so in Africa. So I've had the privilege of seeing African science on the move, and maybe even tried to help a bit with that building the momentum with some of the price projects that NIH has been able to take part in, sometimes with other partners like the Gates Foundation, or the Wellcome Trust, but all of these have been really wonderful learning experiences. To see how collaboration can move things move forward more quickly. So what about data science? And why is it that we think this is a particularly important moment? Well, rapid advances in data science coming from all over the globe and largely accessible to anybody with internet connection, are expected to be rather transforming and biomedical research.

Data is the currency of the future. Investing now, to develop data science expertise in Africa has the potential to pay really big debit dividends. And it's the kind of science which I believe can be conducted without necessarily access to hundreds of millions of dollars of expensive equipment. But it requires talent and it requires some internet connections and then a great deal of things can happen. It promises to enable scientists to study the vast trove of genomic information that's being generated, but which needs to be generated even more in Africans because we are all Africans. We know this is the cradle of humanity. This is where we all came from. Want to

understand genomics, the best place to do that is in Africa. And it's also means that using that information together with more sophisticated analyses of environmental exposures, which are also creating large datasets that are easily accessible, we could practice this precision medicine approach to try to identify how best to identify the differences between individuals that play out and whether they are able to stay healthy, or whether if they do develop a disease, how best it should be treated. And of course, all of this, the hope is leads to therapeutics and preventive strategies that are not only more effective, but also more low cost because they go right to the heart of the issue. So all of this, I think makes for a really good moment for Africa to invest in this particular area of data science, which is why we felt it was appropriate using some of the dollars from our common fund which is our venture capital space to see what We could do to assist in that by providing some resources and encouraging creative minds to get together to see what could be done. There's several African organisations already leading the way on data science. And that includes the African Academy of Sciences, the African Open Science platform and data science, Africa, amongst others. And African governments, companies, universities and other stakeholders also have a lot, I think, to gain by joining this effort and are interested in doing so building these links between possible collaborators maybe in various regional areas, and making the most of the fact that there's a lot of talent in Africa, but it's not all in one country. And building those links between countries which the internet is particularly appropriate for doing can be a real catalyst for progress. So we've been doing things along this line for the last decade or more in terms of trying to come up with ways that we in a small way can encourage building of this research capacity, have to mention one of those called human health and heredity in Africa, otherwise known as h3 Africa, which began about a decade ago, and has enabled African scientists to develop skills in genomics conducting research into genetic and environmental determinants of health, but also building data science capabilities in that regard, producing really interesting discoveries and holding on untapped potential to go further. Likewise, about the same time and I chopped to support the medical education Partnership Initiative, we did that with PEPFAR, also known as mipi, which catalysed improvements in medical education, including research education, and that has evolved now into the health professional education Partnership Initiative or happy ATP, which continues to strengthen the scientific workforce, most recently in a programme that I'm quite excited about, although we just got started about a little over a year ago. It's a partnership with the Gates Foundation. called the African postdoctoral training initiative, which admits African postdocs to our two year intramural programme for intensive research training, and then supports them when they go back to Africa to build their own research capabilities. And again, a wonderful partnership with the Gates Foundation to make that possible. So we have that track record of doing things along these lines, and then looking across the landscape to say what would now be an area of particular opportunity. We all agreed it was data science, because of the scientific potential, and the way in which this could be incorporated into multiple African institutions, and particularly could build collaborations between sectors and between countries. So that's what DSI Africa aims to do, to develop solutions to the continents most pressing health problems through a robust ecosystem, if you

want to call it that of new partners, from academia, from government and from the private sector. You will probably By now, but I'll tell you one more time there are four main components of DSI. First developing African hubs devoted to research on key health problems. What are the areas where this could be most useful for him? Second, creating data science training programmes to build capacity and expertise in data science, third, supporting research to examine the ethical, legal and social implications because there are certainly those implications, particularly when it comes to the applications of artificial intelligence and machine learning to human medical issues. And then fourth, to pull this all together, establishing an open data science platform and a coordinating centre as a source of support for what we hope will be a trans African network. So this is not your traditional NIH grant programme, where you have a single investigator coming forward with the grant and getting it peer reviewed. And then if all goes well getting funded, we love that, but that's not really quite the right format for them. We have different priorities here. We want to see partnerships that go beyond the traditional academic research Amina partnerships that connect up with government with private sector with NGO partners. And we want to be sure that this is focused in a way that solves health challenges in Africa in a sustainable way. And that probably can't be done by any single institution, we want to try to bring the components together in more effective ways. And we do want to see buy in and investments by African governments and other sources of support from Africa. We want to move the way in which research is funded from what you might have called donorship, to something

I would now call ownership,

where it is seen that this is one of the best ways that countries can invest in their own future and their own economy and their own workforce. That kind of technical know how and the ability to scale is going to be critical if this is going to lead to economic growth and development of the private sector as well. So DSI Africa wants to do that, bringing together different sectors but also different disciplines, data specialists, computer scientists, engineers, together with biomedical researchers, clinicians, health experts. That's where the real excitement happens. I've watched this in my own scientific career. And right now my own research lab at NIH has a lot of people who are doing data science as well as people working at the bench. And the most exciting advances happen when they are working together, learning from each other, if you have data science off in a corner by itself isn't always clear that the most important problems are the ones that get tackled. Maybe problems get solved, but they weren't the ones that really mattered. Whereas if you have biomedical researchers working off by themselves, they may miss the chance to get insights from the data they're generating, because it is more complicated than you can work out with pencil and paper or with your own mind trying to sort through the complexities of human biology which are substantial as we all know So bringing these disciplines together is going to be really important. programme also hopes to be open and have the discoverability and accessibility

of data in Africa, very much part of the plan. And as I said earlier, to focus on ethical, legal and social implications, making sure that the conduct of data science is done in a fashion that respects individuals and makes it clear that what we're trying to do here is to assist everybody and not to contribute in any way to a discriminatory outcome. So this is what we're aiming to try to accomplish with the OSI. And whether you're interested in applying for one of the new funding opportunities are looking for potential collaborators, or just interested in the topic. I hope you will participate in this virtual symposium platform where you'll be learning a lot about what we aim to accomplish in this and we hope to get a lot of feedback from people who are taking part in this, about how to make this even better. It is a trans NIH programme in our common fund but we have Have lots of help from other parts of NIH, the Fogarty International Centre, particularly our global health experts, the National Institute of Biomedical Imaging and bioengineering a lot of the technology geeks there, the National Institute of Mental Health, the National Library of Medicine, all engaged in DSI. And I want to thank the directors of those Institute's for their leadership, and you'll be hearing from them during some of the interactive section sessions that are scheduled for this meeting. So I guess I observed earlier, that the discoveries made possible by DSI Africa, will serve to benefit all of humanity because of our shared inheritance and because of the fact that Africa is the cradle of humanity for all of us. In that regard, I'm thinking back to a time. Nine years ago, it was the 10th anniversary of the first publication of the human genome sequence. And Archbishop Desmond Tutu. I've had the privilege of getting to know and it's one of the people I most admire on this Planet, he reflected on the meaning that this new knowledge might have for our understanding of ourselves. And he said, and this is a quote, My dream is that by including all peoples and understanding and reading the genetic code, we will realise that all of us belong in one global family, that we are all brothers and sisters. And then in classic Desmond Tutu fashion, he finished his sentence with one single word. Wow. That is the kind of guy he is. Well, I'd like to encourage you also not to look at the opportunities here and say, Wow, because I think this dream, bringing science together amongst sectors across Africa could be a really significant one for the future, and could take the opportunities that are in front of us and turn them into advances that are going to benefit humanity. So thank you all for your willingness to contribute to this thinking process. And we NIH want to be your partners. We want to be just not the National Institutes of Health, but also the National Institutes of hope. And that's hope for the whole world. Thank you all very much for listening and I hope the symposium is

wonderfully successful.