

## Dialogue event

# "Next generation public health: Artificial Intelligence (AI) and Big Data for population wellbeing in low- and middle-income countries"

*Summary report*







# Executive Summary

On Friday 12 April 2019, Fondation Botnar, the London School of Hygiene & Tropical Medicine, and the Wellcome Trust united experts in the field for an interactive panel discussion on developments in the use of artificial intelligence (AI) and big data for population health and wellbeing outcomes. This report summarises the key discussions that took place.

The concept of digital health has grown exponentially from a series of disjointed platforms and health orientated technologies, to now include entire health systems. AI and big data are ever more at the centre of conversations on digital health. Evidence shows that new innovations have the opportunity to have the greatest impact in low- and middle-income (LMICs), where infrastructure and processes are currently the least embedded.

The event brought together like-minded individuals for a discussion on the key barriers to progress in ensuring current applications of AI, and uses of big data, lead to accessible, affordable healthcare for all.

Introductory comments were made by Stefan Germann, CEO of Fondation Botnar. Stefan stated that almost 2 in 3 people worldwide will live in cities by 2030, where simultaneously, the world will face a shortfall of 18 million health workers. This is where AI and digital services could be the key to discovering scalable solutions to tackle these issues. He noted that together with a multi sector led approach, we are able to fully leverage the advantages of new technologies to assist changes in LMICs.



**KEYNOTE SPEAKER**  
**PETER PIOT**

Director of the School and a Handa Professor  
of Global Health, London School of Hygiene &  
Tropical Medicine



**MODERATOR**  
**ANDREW JACK**

Global Education Editor,  
Financial Times

## PANELLISTS



**ILONA KICKBUSCH**

Director of the Global Health Centre and  
adjunct professor at the Graduate Institute of  
International and Development Studies in Geneva



**HILA AZADZOY**

Managing Director, Global Health  
Initiative at Ada Health



**SIDDHARTHA JHA**


AI/Digital Health Program Manager,  
Fondation Botnar



**AKALIZA KEZA NTWARI**

Member of the UN High-Level Panel on  
Digital Cooperation



A medium shot of Peter Piot, a middle-aged man with glasses and a beard, wearing a blue blazer over a light blue shirt. He is standing in front of a window with vertical blinds, looking directly at the camera with a serious expression. His hands are clasped in front of him, holding a small object. A small lapel microphone is clipped to his shirt.

*"At the current pace we  
will not achieve the SDGs,  
and I think it's about time  
we wake up."*

Peter Piot  
London School of Hygiene &  
Tropical Medicine





#### KEYNOTE SPEAKER

**PETER PIOT** (KCMG MD PHD DTM FRCP FFPH FMEDS)

Director of the School and a Handa Professor of Global Health, London School of Hygiene & Tropical Medicine.

Peter Piot spoke of the difficult journey to meet the Sustainable Development Goals (SDGs) by 2030. In the last decade, there has been a rise in technology enabled medical products for specific health needs. In the future, such intelligent applications will be able to input differentiated solutions and start to focus on prevention, as well as treatment. He stressed however, that to be effective in how we use these developments in resource-limited contexts, we need to target interventions according to need criteria. Peter's presentation is summarised below.

*"It would be unethical to miss these opportunities. It is not by doing the same thing that we will make a difference, particularly in the lowest income countries."*

Peter Piot

### Addressing the health workforce crisis

In sub-Saharan Africa, due to migration outside of the region, data indicates a critical shortage of doctors in rural public general practice - with only 9% of qualified doctors, compared to 21% in urban areas. African regions currently hold an average of 2.7 doctors per 10,000 of the area's population; this is where digital health can have the most impact.

However, some LMICs do not have the appropriate infrastructure in place to take advantage of this. There is a lack of internet access in the world's poorest nations, where fewer than 1 in 5 can have access to regular electricity.

### Diagnosis and early intervention using scalable tools

Currently, AI is having important outcomes for health with imaging analysis. The Novartis Foundation and Microsoft have recently partnered to develop an AI-enabled digital health tool for early leprosy detection.

### Mapping and identifying the highest risk areas

A lack of disaggregated data often masks important regional variances on specific health issues, which can block the effective allocation of resources. Sharing big data starts to build an important, more detailed picture of potential health risks. In Kenya, mapping is being used at the level of the local population to understand how to distribute HIV resources.

### Technological platforms for rapid sharing of data

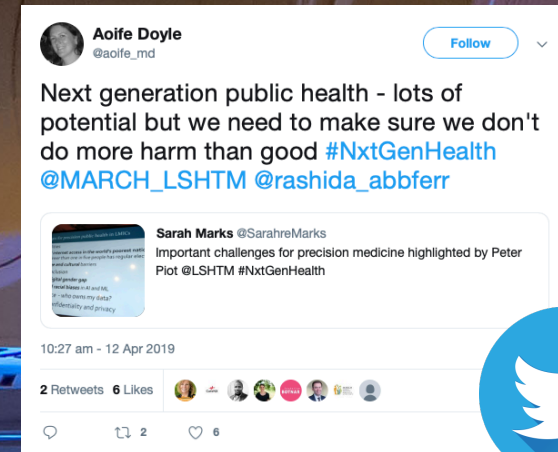
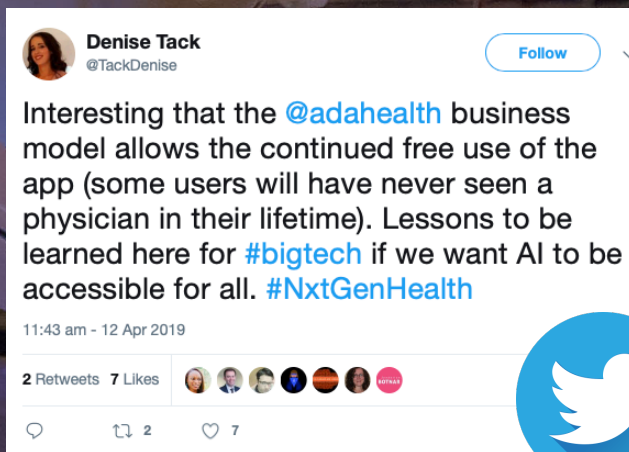
Tackling the West African Ebola outbreak was problematic because the platforms to share data did not exist. Simultaneously, through blockchain, it is now possible to track the movement of donations, supplies, and funds, increasing transparency and helping mitigate corruption.

### The benefits of health data can sometimes be overpromised

Lastly, Peter discussed how we have an abundance of data, but not all of it is useful. In particular, the jury is still out on the impact of the 'genomics' revolution on the general public's health. Innovation is more likely to lie with social determinants, such as city development, and early child development.

Including local stakeholders is of the utmost importance to ensuring qualitative difference to how we utilise big data. Peter Piot ultimately stressed that we need innovation, but also the innovation of delivery and implementation to ensure that effective solutions are scaled up.







# Discussion:

The panel discussion was facilitated by Andrew Jack, Global Education Editor at the Financial Times. Questions raised centred around the dangers of the ‘big tech’ business model in building digital health platforms, and around the ethics of data collection.

Though a wide variety of topics were covered, there were three distinguishable themes and related questions that emerged.

## Young People as Stakeholders

Young people are key stakeholders in the application of digital health and ensuring it is leveraged meaningfully for their own wellbeing. Not only that, but they are key local players, and changemakers, in determining the future role that data will play in global health policy and programmes.

## Democracy and Equity in Big Data

AI and big data have enormous potential to democratise the field of public health, but only if equity is woven into the fabric of how these technologies are applied. How do we successfully integrate digital health into the current public health sphere, rather than building two powerful but noncommunicative systems?

## The Future of Data Ethics

There are a multitude of questions surrounding data ethics that still need to be answered. How ethical is data collection and precision targeting at an individual level? Are we fully aware of algorithmic bias?

Throughout the discussions, suggestions were also made as to what ‘best practices’ of leveraging digital health to accelerate progress in LMICs would look like:

**1. Successful integration of the digital healthcare system into the current mainframe of offline healthcare systems. Innovators must not be afraid to create and build new healthcare systems with digital tools at their centre, especially in LMICs.**

*“Many of the countries we are speaking about are in the process of adopting universal health coverage. Western countries can actually be bad examples. There is now a willingness to ‘invent’ health systems that fit LMICs. It is much more difficult to re-organise our dinosaurs. A democratic system built on digital takes away power. Building a system, rather than having to destroy one first, is a real opportunity, with all stakeholders: users, patients, health workers, citizens, involved from the start.”*

Ilona Kickbusch

*“Rwanda has universal health coverage... and apps are part of that healthcare system. Babylon Health works with insurers.”*

Akaliza Keza Ntwari

**2. Ensuring that AI and big data systems are able to innovate for the future of inclusive and accessible health without losing their ability to improve the health quality of those in LMICs. For example, with support from Fondation Botnar, Ada Health has recently integrated the Swahili language to reach 100 million more users.**



*“Pain is described differently in every language, so it takes local adaptation and working with local partners to make digital health more equitable.”*

**Hila Azadzoy**  
**Ada Health**





*"The value of the Ada Health app is not in it being standalone but as a new front door to the health system."*

Hila Azadzoy

*"Most of the technology is being created in the global north. Digital health technologies have exponential potential, but actually could increase the gap between the 'haves' and 'have-nots'. Healthcare is primarily a market-driven sphere. Fondation Botnar sees its role as bringing these technologies to countries without that purchasing power."*

Siddhartha Jha

**3. Including young people as legitimate actors in policy and programme implementation, for the future sustainability of digital health. There is a need to ensure that they have the right tools, support and platforms to be heard.**

*"Young people are the early adopters of technology."*

Peter Piot

*"Listening to, and including young people in policy and implementation decisions is the key to discovering sustainable and scalable solutions."*

Stefan Germann

#### **On the subject of 'validation' and 'pre-qualification' of new technologies ...**

The panel agreed that despite the troubles that accepting pre-qualification by consensus could bring in terms of stifling entrepreneurship, the digital health market, with an abundance of data and products being created, needed to be subject to the same hardline peer review as other health practices.

*"We prequalify medicines, so therefore we should prequalify algorithms."*

Ilona Kickbusch




*"I read completely contradictory information online about the best choices I should make for my child."*

Akaliza Keza Ntwari

#### **On the subject of the current business model of health technology, true health equity, and risks of a parallel system ...**

Because there is a justified focus on the potential uses of digital health, AI, and big data, it is entirely possible that without scrutiny, a digital health system will be built that does not work with the health systems on the ground. Equity means equal access, and equal access means an effectively integrated health system, with all stakeholders involved in its discussion and implementation. Young people who will be inheriting these systems, must be part of the process.





*"New technologies can make a difference in some cultures where issues are siloed by gender, e.g. discussing menstrual cycles with male doctors, or men hiding the level of their pain."*

Akaliza Keza Ntwari  
Member of the UN High-Level Panel on  
Digital Cooperation

*f o n d a t i o n*  
**BOTNAR**





### On how AI and big data could impact the social determinants of health issues ...

The present healthcare system is built reactively, relying on visible symptoms, patient history, and effective communication. AI and big data have the capacity to disrupt that by creating social maps, focussing on wellbeing and prevention, rather than care.

*"Do I own all my data, or do I donate some to the state for effective digital health?"*

Ilona Kickbusch

### On the current situation in data governance, and the overabundance of data ...

We are entering an unprecedented time in history, in which data has become the norm, but we are still 'naive' about its collection, potential applications, and it's relative usefulness. We must put extensive effort into designing lean models for data capturing. These should allow for the inclusion of social aspects, with open communication and better informed citizen stakeholders to achieve equitable health. It is our ethical responsibility to educate young people on good data practice, to strengthen data governance in the future.



### On the ethics of AI and machine learning, and what interacting with AI will mean in the future ...


There are emerging issues around the interactions humans will have with AI and machine learning, both now and in the future. On the one hand, the neutral, anonymous face of AI medical assistants has allowed individuals to interact with digital health more honestly than they do with human doctors.

However, we are already aware of machine learning bias, and we must strive to make sure that future systems are built to mitigate human biases in programming, not reflect them.

*"In China, the average consultation with a physical doctor is only 6 minutes. In that respect, AI can be human. It has the time to listen, and people felt heard."*

Hila Azadzoy



A photograph of Ilona Kickbusch, a woman with short blonde hair and red-rimmed glasses, wearing a blue blazer and a colorful patterned scarf. She is seated and gesturing with her hands while speaking. The background is a plain, light-colored wall.

*“There is a danger that a parallel digital system will be built, partly privatised, instead of a system of truly UHC. This is a true governance challenge. Are we moving, with digital, into a vertical system, driven by different forces, whilst still not building health systems in LMICs?”*

**Ilona Kickbusch**  
Director of the Global Health Centre



# *foundation* **BOTNAR**

Fondation Botnar is a philanthropic foundation established in 2003 with the core purpose of improving the health and wellbeing of children and young people in growing urban environments around the world. Fondation Botnar acts as a catalyst, connecting diverse partners and investing in scaleable AI and digital innovation.

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SCHOOL *of*  
HYGIENE  
& TROPICAL  
MEDICINE



The London School of Hygiene & Tropical Medicine was founded in 1899 at the London Docks. It's mission is to improve health and health equity in the UK and worldwide; working to achieve excellence in public and global health research, education and translation of knowledge into policy and practice.



Wellcome directly funds thousands of scientists and researchers around the world at every step of the way from discovery to impact, works with policymakers to ensure that good research is well supported, and raises public awareness about the importance of science and health research.