## Positive Disruption: Health Systems in the Digital Age

Panel Discussion: Digital Trade and Health, Opportunities and Challenges for Developing Countries

WTO Forum, 9 October 2019

Andrea Tartakowsky P. Senior Research and Policy Officer Pathways for Prosperity Commission & Blavatnik School of Government, University of Oxford



## Pathways for Prosperity Commission

• A two-year project based out of Oxford University's Blavatnik School of government





**Melinda Gates** 

Minister Sri Mulyani Indrawati

Strive Masiviwa

Plus 10 other global leaders...

- Gather evidence to reset the conversation around how technology is affecting developing countries
- We have already completed work on economic transformation, digital inclusion, global governance, and health and education.
- Recommendations presented here are part of our report: "Positive Disruption, Health and Education in the Digital Age"



# Positive disruption: improving health systems in the digital age

- Technology has the potential to make health systems more effective, efficient, and equitable in Developing Countries
- BUT this will only happen if introduced with care and caution
- Small-scale examples of success are being sized upon as justification for investing in any shiny bit of tech, in the hope that it will be the one that makes all the difference
- Such investments have not only wasted money in countries on tight budgets but also have created widespread misunderstandings on how to invest in tech solutions



# Positive disruption: improving health systems in the digital age

- In Positive Disruption, we report that the digital solutions that work do two things:
- 1. They do not only focus on hardware, but on content, data sharing and the health system-wide connections:
  - we need to ensure the whole health system is working smoothly
  - A failure in one part of the system can defeat an otherwise-good intervention in another part
- 2. They only deploy technology after careful consideration, and when appropriate to tackle a real identified problem





#### Tech for managing and empowering workers

**Problem** Frontline workers disconnected from policymakers

> Solution Monitoring and direct digital feedback

#### **Result** Empowered, accountable, data-driven staff

#### Evidence

In Mali, direct digital feedback led to better impact, with health workers visiting 40 more houses per month (a 10% increase)





RMACY



**Problem** Weak management and accountability

Solution User-friendly data collection for decision-making

> **Result** More efficient resource management

#### Evidence

In Uganda, mTrac, an SMS-based malaria drug availability tool reduced the number of districts that were reporting stockouts from 79% to 15%



#### Digital learning for skilled workers

**Problem** Staff often lack specialist skills

**Solution** Online and digital training

**Result** Better-quality services delivered by well-trained workers

#### Evidence

An online course effectively provided HIV training to 900 Zambian clinicians, leading to improved health outcomes







#### **Connecting citizens to services**

Problem Low uptake of health and education services

> Solution Targeted digital reminders

**Result** Better-attended services, and healthier and better-educated people

#### Evidence

SMS reminders increased Kenyan HIV-patients' regular use of antiretroviral drugs by over 30%, improving their wellbeing



# Glimpsing the Health Systems of the Future: Our 5 visions

Vision 1: Learning systems	Vision 2: Proactive systems	Vision 3: Personalised systems	Vision 4: Changing roles of workers	Vision 5: Virtua systems
Digital technologies allow data collection at low cost and enable the creation of feedback loops to inform medical practice and decision-making	Algorithms and dashboards will proactively identify at-risk or priority patients for frontline workers to reach and treat effectively	Digital health records and and the use of data analysis will make personalised diagnosis and treatment possible	Automation and new formats of service delivery will redefine but not diminish the roles of health workers, shifting towards offering more patient support	Telehealth and videoconferencir will break down th clinics' walls, bringing the expertise of specialised docto to all



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# Foundations and building blocks for future health delivery systems



### Future building blocks

Infrastructure and human capability

### **Digital foundations**



## Building blocks: Governance and privacy



- Policy makers and health providers need to be aware of the highly sensitive nature of health data
- Data aggregation that makes all other information available (including metadata) may inadvertently reveals a person's identity
- Countries need to advance in developing more sophisticated systems to to protect citizens and give them control of their data (e.g. India, Google)
- Developing countries need policy to determine what decisions can be made by automated systems and what safeguards will prevent errors and misuse



#### Building blocks: Data standards

- Data standards
- The stores of data across health systems are often unstructured and disconnected (ex: Botswana). This obscures system-level outcomes and effects.
- Without structure and consistency, using data for machine-learning and other advanced technologies is difficult
- Meeting accountability and monitoring needs of donors or NGOs may not help to improve outcomes
- Through foundational data specifications, governments can encourage high-quality data collection and storage methods that are machine readable and consistent across services (e.g. Kenia's Clinical Information Network)
- Datasets must be broadly representative: Machine learning algorithms can easily extrapolate and perpetuate bias in data (e.g. on sex and race)
- In some cases data collection will require global coordination (e.g. genetic precision medicine tools largely developed using DNA from people of European descent)



### Building blocks: Digital plumbing



- After collecting standardised and consistent data, this must be aggregated and put to use for decisionmaking, feedback loops and bottom-up accountability.
- Innovative approaches that take into consideration the skills and preferences of the health practitioners are needed (e.g. Kenyan Startup: "PaperEMR")



# Building blocks: Microservices and Interoperability



- To spur innovation on health care a broad ecosystem of of information and microservices is needed.
- Basic fundamentals are: digital identification, digital payments and messaging –developing countries in disadvantage (e.g. East Africa)
- Digital Impact Alliance + ITU recently published a comprehensive digital investment framework containing 23 basic microservices to mobilise governments, entrepreneurs, philanthropies and aid agencies
- Governments should be also encouraging interoperability (e.g. Estonia and India)



## Conclusions

- Before implementing a digital solution: countries need to analyse whether technology will solve their problem
- The focus must be: content, data and connections within the health system and not the hardware for its own sake
- Data is useful only with good digital foundations and building blocks
- Countries need to make deliberate efforts to build digital solutions that include everyone



### New Paper: Digital Diplomacy: Technology Governance for Developing Countries

#### Key principles for a cooperative digital world



Foster digital cooperation: creating incentives for countries to work together



Be part of something bigger: harmonising cross-border digital trade



Tailor technology governance for developing countries: better ensuring implementation in a wider range of national contexts



Unlock data for inclusive development: using data to improve people's lives



Protect against cyber harms: establish data protection, transparency and accountability measures



## Thank you!

Find us:

https://pathwayscommission.bsg.ox.ac.uk

Email us:

pathwayscommission@bsg.ox.ac.uk



Pathways for Prosperity Commission Technology & Inclusive Development