Digital Technology: A Determinant of Population Health and Health Equity Gains

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State of the World: Connectivity (1)

• At dawn of the 21st Century, only 7% of the world’s population had access to the Internet

• 2017: over 3.8 billion people connected to Internet = >57% of world’s population

• 50% of people in remote areas in Africa have a mobile phone

• Mobile phone penetration will soon reach 100% in India and China

• 2020: 77% of world’s people, including those in the poorest countries, are expected to have access to a smartphone

Source: International Telecommunications Union (ITU)
Internet Users in the World by Region (June 2017)

- Asia: 49.7%
- Europe: 17.0%
- Latin America/Caribbean: 10.4%
- Africa: 10.0%
- Middle East: 3.8%
- North America: 8.2%
- Oceania / Australia: 0.7%

Basis: 3,885,567,619 Internet users in June 2017 (ITU)
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Low- and middle-income countries are witnessing substantial increases in mobile-broadband penetration, household access to digital technologies, and international Internet bandwidth. Presently over 12 billion digital devices are connected to the Internet. Expected to increase to an estimated 20 to 100 billion devices by the year 2020.

Source: International Telecommunications Union (ITU)
Digital Tech in Health Care

Focus on:

1. Individual health and personalized medicine
2. Patients, once they are in need of a medical intervention or health care service
3. Delivery of diagnostic and treatment services
4. Helping practitioners make better clinical and cost-effective decisions
Digital Tech in Public Health (1)

Most significant application of digital technology within the field of public health:

1. Disease surveillance
2. Population health surveillance
3. Emergency and pandemic response
Other applications of digital technology within the field of public health:

1. Mobile phones to transmit health service utilization data
2. Crowdsourcing to propagate health messages
3. Phone apps for promoting health and well-being
4. Social media for training purposes
5. Dropbox and YouTube to share information and videos/presentations
6. Webinars to train a new generation of public health professionals
7. Adapting interventions for text messaging and mobile apps, as well as gamification
Digital Tech in Public Health (3)

More recent: use of drone technology to ship blood supplies to remote/rural hospitals in Rwanda

WHA Resolution 58.28: eHealth (2005)

… to establish national centres and networks of excellence for eHealth …

WHO Global Observatory for eHealth (GOe) launched to ‘monitor the development of eHealth worldwide…’
WHO urging Member States to develop/implement mhealth/eHealth strategic plans

By end 2016: over \( \frac{1}{2} \) of WHO Member States had prepared strategic plans

Over 80% of those reporting to have prepared a strategic plan reported as well to have launched at least one m/eHealth-related initiative, primarily related to telemedicine
Mobile health market is growing

- **2013**: $2B
- **2018**: $21B

DT is BIG BUSINESS!

By 2018, Europe expected to replace the US as largest mHealth market in the world, worth upwards of $7.1 billion

Low- and middle-income countries provide huge business opportunity for what is called ‘technology-enabled care’:

- LMICs comprise large, rural, remote and disconnected communities with limited access to healthcare professionals and low per capita spending on health care
- LMICs exhibit high prevalence rates for communicable disease and an increasing prevalence of non-communicable diseases
- LMICs lack what are called legacy technologies, opening the door to the introduction of innovative technologies.
Critical questions to be asked

- Who’s pushing DT development and its introduction?
- How and are these technologies benefiting the public?
- What role can and should ‘public health’ and public health associations play in addressing and helping to resolve some of the important issues raised about the use of digital technologies in the health sector and the assessment of their impact on population health and health equity?
- What constitutes a ‘public health approach’ to digital technology for health and health equity?
Purpose of the WFPHA DT initiative

1. Increase knowledge among front-line health workers and the global public health community about
   - use of digital technology (DT) within the public health domain
   - its impact on population health and health equity gains.

2. Encourage use of DT by public health workers and associations (PHAs)
   - contribute to an improvement in population health (disease & injury prevention, health promotion, health protection, population health assessment, surveillance, emergency response)
   - address issues of health equity.
Component 1

Knowledge/skills-building session during the 14th World Congress on Public Health (Kolkata, India: 13 February 2015)
Series of articles published in special e-supplement of *Journal of Public Health Policy* (November 2016)

doi: http://link.springer.com/journal/41271/37/2/suppl/page/1
Component 3

WFPHA discussion paper as basis for future action & advocacy on the issue (September 2016)
Issues regarding use of DT

- Scalability, reproducibility, transferability, sustainability
- Technology hype / Industry-push
- Personalized medicine/health
- Local resource constraints
- Digital divide & DT literacy
- Ethics, security and privacy
Focal issue

Lack of evidence about the impact of DT on population health and health equity
DT impact assessment

Indicators within clinical medicine:

- patient adherence to a medical treatment
- reducing the number of redundant examinations and medical tests,
- increasing knowledge and awareness about health promotion and health protection ‘good practice’
- improved health worker productivity, and reducing labour and health care facility operating costs.
DT impact assessment

Different story for public health:

- Very limited evidence of effectiveness
- The word ‘health’ in the DT intervention assessment literature usually refers to health care as a process, rather than to health as an outcome
- Greatest challenges: generating valid, reliable and useful evidence that demonstrates DT’s capacity to improve health systems performance, help build human capital for health, improve access to knowledge, support decision-making and lead to better health outcomes
DT impact assessment

Uganda experience:

- 2012: declares moratorium on mHealth projects
- Over 120 mHealth projects implemented in country
- Problems related to type of DT used, no coordination with Ministry of Health, tech operability issues, sustainability
- Result: elimination of the tracking of health-based indicators that served only as metrics of overseas development aid success, instead of benefiting the country’s national HIS
DT impact assessment:

“A significant gap in the literature is the lack of studies measuring health outcomes and prevention programs implemented as a result of the data using mobile technology. Acknowledging this step is far more challenging than feasibility and pilot studies. It is a natural next step to advance the field. There is little evidence of the health value of mHealth (and eHealth for that matter).”

Despite the rapid growth, however, very few WHO Member States reported evaluations of government-sponsored mHealth programmes, thereby limiting knowledge of what works well and what mistakes to avoid.

DT impact assessment: Gaps

Lancet: 9 RCT trials for mHealth in LMIC

World Bank: 500 pilot DT initiatives – no health outcome assessment

Cochrane Review: metrics/methods inconsistencies
DT impact assessment: promising approaches

- John Hopkins Global mHealth Initiative/WHO Department of Reproductive Health and Research/WHO mHealth Technical Evidence Review Group: mHealth Evaluation, Reporting and Assessment (mERA) checklist
- Researchers in Australia: Mobile App Rating Scale (MARS)
- World Bank, USAID and WHO: The Roadmap for Health Measurement and Accountability (MA4Health) initiative
DT impact assessment: equity

“Effectiveness is only half the story; the other half is equity.”

Richard Horton, in Offline: The error of our health technology assessment ways [Comments]. *The Lancet* 2013; 382: 1318
Primary take-home message

There is an urgent need for credible, transparent and comprehensive assessments of the impact of digital technologies on population health and health equity.
2nd take-home message

How does DT being used in other sectors affects health and health equity?
My ‘ask’

- National public health associations and other health organizations/institutes join WFPHA to advocate for credible, transparent and comprehensive assessments of the impact of digital technologies on population health and health equity.

- Advocate for effective country ownership, good digital governance, political will and strong institutional and human capacity as core components of e-health planning, implementation and assessment.
Thank you / Merci / Dankeschön

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