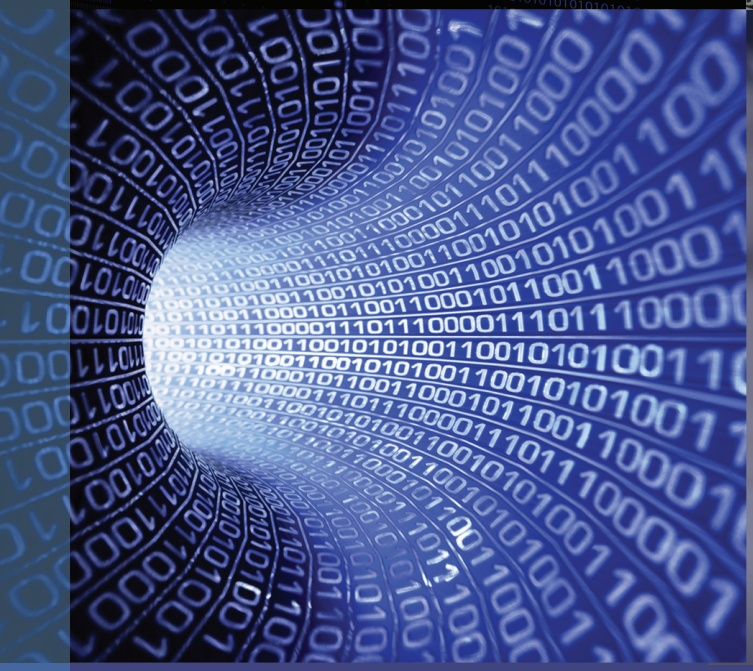


Executive Summary

Digital Health: A Call for Government Leadership and Cooperation between ICT and Health

February 2017

BROADBAND COMMISSION
FOR SUSTAINABLE DEVELOPMENT

Executive Summary

Digital Health: A call for government leadership and cooperation between ICT and health

Digital health, sometimes called electronic health or eHealth, is the use of information and communication technologies (ICTs) for health purposes. Wisely and widely used, digital health can bolster access to healthcare, raise the quality and diminish the costs of providing it and empower patients to take more responsibility for the management of their own health. Figure 1 provides a framework of different categories of digital health solutions. Examples of digital health include:[1]

- connecting remote, rural and underserved communities with referral centers and expert care,
- training healthcare providers (e.g., by eLearning and mLearning),
- improving quality of care through digital solutions for diagnosis, clinical decision support systems, supportive supervision or monitoring patient compliance with treatment,
- optimizing resource allocation and lowering healthcare costs through more efficient care coordination (e.g., with electronic medical records),
- improving data management for surveillance, reporting, accountability and monitoring, and
- facilitating communications between health workers, specialists and patients.

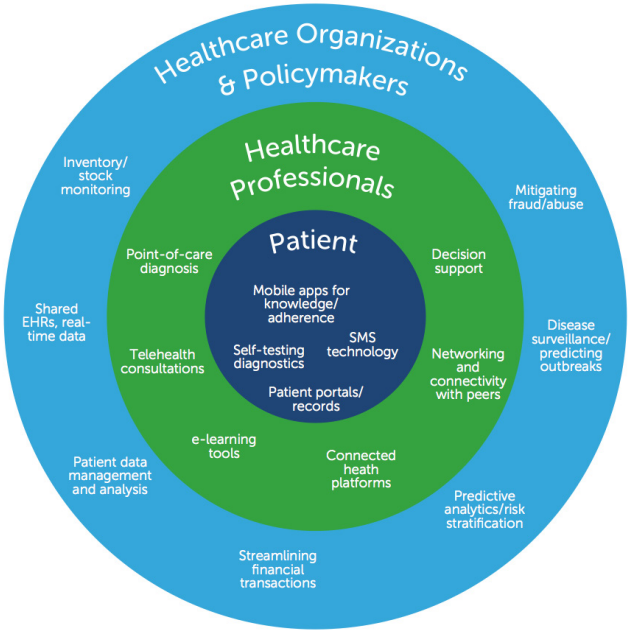
About this report The Broadband Commission Working Group on Digital Health (Working Group) is co-chaired by the Novartis Foundation and Nokia and is composed of leading digital health experts from governments, international and non-governmental organizations (NGOs), academic institutions and the private sector. The Working Group commissioned Vital Wave to conduct

Report value and audience

Digital health, which is the use of information and communication technology (ICT) to provide health services, can advance the goal of universal health coverage (UHC) and improve the quality and efficiency of healthcare services worldwide. Today, many countries are moving to the complex task of implementing national digital health strategies, and effective leadership and cooperation approaches are needed to coordinate the often fragmented ecosystem of digital health solutions and programs. This report provides insights into the importance of government leadership, governance, and intragovernmental cooperation in digital health for government leaders and policy makers at the intersection of the health and ICT sectors. It draws on the experience of countries in a variety of geographic and resource settings and builds on existing digital health literature by shedding light on leadership approaches and on governance mechanisms for engaging health and ICT stakeholders.

1. World Health Organization, *Atlas of eHealth Country Profiles*, 2015, http://www.who.int/goe/publications/atlas_2015/en/

Figure 1: Digital Health Categories and Solutions



Source: 2017 Ernst & Young AG

"The use of eHealth to improve the delivery of health care continues to increase around the world. In line with the principles of universal health coverage, eHealth can potentially make health systems more efficient and more responsive to the needs and expectations of the people they serve."

Dr. Margaret Chan, Director-General, World Health Organization (WHO)

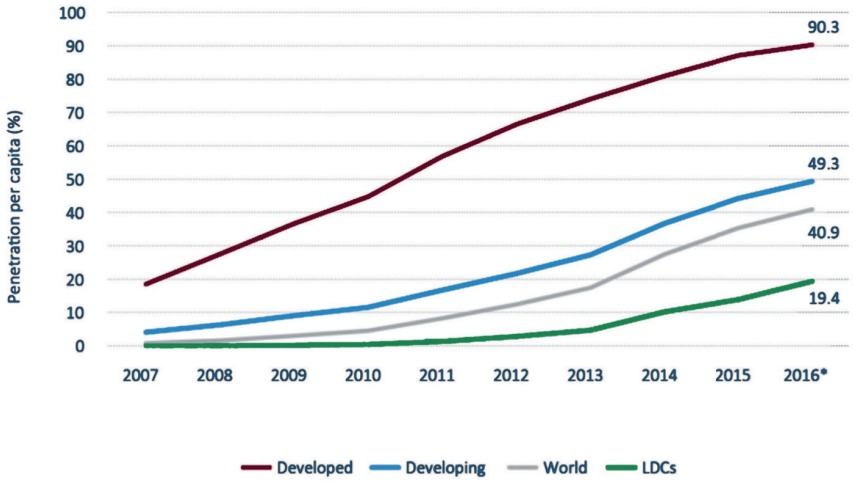
research and to interview digital health leaders from twenty countries to explore the role governments play in developing and implementing digital health. This report documents the results of the exploration with a view to providing practical guidance on leadership, governance and intragovernmental cooperation to leaders in health and ICT who wish to adopt a digital health strategy. The work conducted in consultation with the Working Group produced eight case studies of countries that have achieved success in developing and implementing digital health strategies.

The promise of digital health As WHO points out in a recent report, "It has become increasingly clear that universal health coverage (UHC) cannot be achieved without the support of eHealth."[2] As leaders confront the Sustainable Development Goals (SDGs) and the quest for UHC, digital health has an evident potential to facilitate the achievement of these goals.

Mobile connections globally now stand at 7.6 billion, and mobile broadband penetration has risen sharply in the last ten years (Figure 2). Smartphone penetration is already at 48%, and predictions are that there will be 5.6 billion smartphones by 2020, with 90% of users in low- and middle-income countries (LMICs).[3] The number of mobile health (mHealth) products and services has doubled in the past five years in LMICs,[4]

2. World Health Organization, Global Observatory for eHealth, *Global Diffusion of eHealth: Making Universal Health Coverage Achievable*, 2016
3. GSMA, *The Mobile Economy 2016*, http://www.gsma.com/mobileeconomy/
4. GSMA, *The Mobile Economy 2015*, http://www.gsma.com/mobileeconomy/archive/GSMA_ME_2015.pdf

Figure 2: Mobile Broadband Penetration Growth, 2007-2016



Source: ITU

and there are now over 165,000 mobile applications for health services.[5] More recent advances in technology in domains such as network speed and efficiency, cloud computing, device connectivity and data analytics are accelerating the conversations and dynamics around the promise of digital health.

Clinical evidence that ICTs have an impact on health outcomes is only starting to surface but is eagerly awaited by many members of the ICT and health communities. The impact of ICTs on expenditures, however, is starting to emerge. **Canada**, for example, measured the cost savings generated by its digital health investments and reported an aggregate saving of CAN$16 billion since 2007.[6] A myriad of studies have forecasted the cost savings that digital health might generate, such as a 2013 GSMA study which estimated that mHealth technology could result in a US$400 billion cost savings over a five-year period in high-income countries.[7]

Challenges Despite these benefits, implementing digital health is not without its challenges. They include unsustainable funding, high capital expenditures, limited workforce capacity and poor collaboration between the health and ICT sectors. Moreover, countries continue to face a proliferation of uncoordinated digital health projects, resulting in fragmentation, unnecessary duplication and data silos which hamper the promise of large-scale health data

"The big challenge is to ensure the sustainability and continuity of digital health initiatives whose benefits can sometimes only become apparent after ten to fifteen years. And to accomplish this, it is fundamental to promote the production of scientific evidence to raise awareness among decision-makers about the importance of investing in eHealth."

David Novillo-Ortiz, Coordinator of PAHO/WHO's Regional eHealth Program

5. IMS Institute for Healthcare Informatics, *Patient Adoption of mHealth: Use, Evidence and Remaining Barriers to Mainstream Acceptance*, 2015, http://www.imshealth.com/files/web/IMSH%20Institute/Reports/Patient%20Adoption%20of%20mHealth/IIHI_Patient_Adoption_of_mHealth.pdf
6. Canada Health Infoway, *Benefits Evidence—Pan¬–Canadian Studies*, Accessed January 2017, https://www.infoway-inforoute.ca/en/what-we-do/progress-in-canada/benefits-evidence-pan-canadian-studies
7. PricewaterhouseCoopers *Strategy&, Connected Life: The Impact of the Connected Life Over the Next Five Years*, 2014, http://www.strategyand.pwc.com/media/file/Strategyand_Connected-Life.pdf

"Fragmentation in digital health is driven by perverse incentives in the ecosystem. Until donors collaborate on shared funding to support interoperability and countries set and publish e-governance standards to guide implementations, we will not solve the problem of fragmentation. However, multiple point-of-service applications should be continued—they just need something to plug into."

Kate Wilson, CEO, Digital Impact Alliance at United Nations Foundation

analytics. This fragmentation is often compounded in donor-dependent countries by a lack of coordination among external funders, which strains the healthcare system as healthcare workers have to spend time on multiple systems that are often not able to communicate with each other.

Digital health systems and solutions are never designed in a vacuum but are introduced within existing complex legacy systems built around static or historical paper-based records and images. Although digital health offers the prospect of long-term cost savings, it usually requires significant investments upfront, as well as regular expenditure on training, maintenance and upkeep.

With the marriage of the ICT and health worlds, digital health systems have to navigate through two very different policy and regulatory worlds. Issues surrounding information sharing and privacy must be considered.

It may be essential for medical staff to communicate within and between different clinics and hospitals to avoid potentially life-threatening situations for their patients. But this asset of digital health raises concerns about the security of the data being exchanged and the rights of patients to privacy where individual records are concerned.

The role of governments Government leaders can play a fundamental role in fostering an enabling environment for digital health and in resolving some of the above-cited challenges. They can help in preventing duplication of effort, in harmonizing standards to promote interoperability and in coordinating stakeholders across both the public and the private sectors. Governments also have a role in developing appropriate legislation to ensure, among other needs, data protection and privacy, medical device regulation, reimbursement policies and security for the exchange of sensitive health data.

WHO reports that 73 of 116 (63%) of its member states have defined national digital health strategies and corresponding plans to implement them.[8] Many governments are now coming to grips with the task of implementing these strategies, but as the WHO data imply, close to 40% of countries have yet to develop a digital health strategy.

The WHO-ITU National eHealth Strategy Toolkit[9] provides a comprehensive roadmap for governments to develop a digital health strategy. The WHO-ITU Toolkit identifies seven essential components that are needed to build a strategy. This report focuses on the first component, namely leadership and governance (Figure 3). Many stakeholders see this component as the first brick needed to build a robust digital strategy, however challenging the task might be.

As a first step toward national digital health implementation, a national

8. World Health Organization, Global Observatory for eHealth, *Third Global Survey on eHealth*, 2015, http://www.who.int/goe/survey/2015survey/en/ Survey responses are the subject of rigorous attempts at standardization, but nevertheless, countries respond according to their own criteria and view of the policy situation. This means that survey responses should be similar, but may not be fully consistent at the international scale.
9. World Health Organization and International Telecommunication Union, *National eHealth Strategy Toolkit*, 2012, https://www.itu.int/pub/D-STR-E_HEALTH.05-2012

"The Government of India has launched the Digital India Programme in order to transform the entire ecosystem of public services through the use of information technology. We need to transform healthcare by empowering people to become active healthcare citizens with choice but most powerfully with information and to take more responsibility over their own health and life choices."

Shri J.P. Nadda, Union Minister of Health and Family Welfare, India

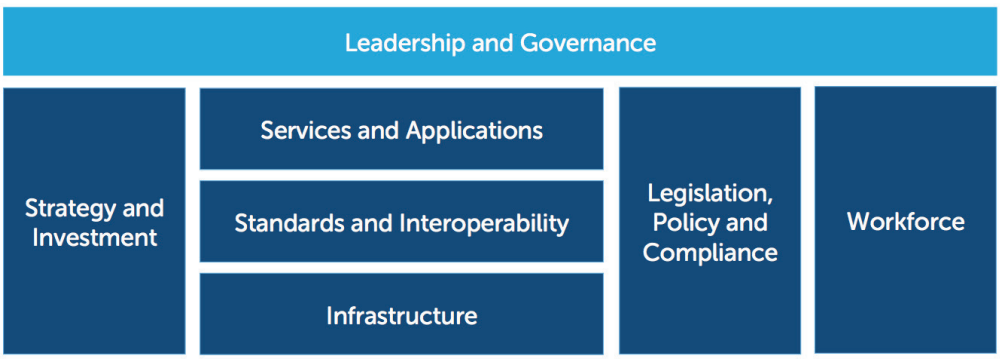
vision for digital health should align with the country's health priorities, as well as with the existing capacity of the country's ICT infrastructure and systems. A detailed action plan and a monitoring and evaluation framework can then address fundamental issues such as regulation, governance, standards and interoperability, workforce and financing. Bringing together multiple stakeholders from both the ICT and health sectors is a complex and time-consuming undertaking and yet essential if the national digital health strategy is to be effective. Stakeholders can be academics, donors, health professionals, patients, professional associations, multilateral organizations, NGOs, partner countries and private-sector organizations.

The case studies demonstrate that a national ICT framework or plan, if built in coordination between health and ICT authorities (e.g., Ministry of Health, Ministry of Communication, eGovernment agency), enables common policies and ICT standards and thereby supports data interoperability across systems and programs. Cooperation between ICT and health ministries also rationalizes investments and allows for shared responsibility in their respective domains and areas of expertise. Clearly defined governance mechanisms not only help anchor cooperation between the ministries but also organize and guide the complex stakeholder management aspect of a strategy. Figure 4 summarizes three critical elements needed to realize

"The world is changing, and we cannot afford to lag behind. Let us take a giant step forward to transform our health sector and use ICT to advance medicine. We have the will and all it takes to achieve this."

Hon. Isaac F. Adewole, Minister of Health, Federal Republic of Nigeria

Figure 3: WHO-ITU National eHealth Strategy Toolkit Components



Source: World Health Organization. (2012). National eHealth Strategy Toolkit. https://www.itu.int/pub/D-STR-E_HEALTH.05-2012

"The complexity and number of eHealth stakeholders can be overwhelming and is yet fundamental in bringing coherence in the ecosystem. It has been a pleasure to see different sectors of society, often with competing agendas, coming together to make eHealth work for the people."

Dr. Alvin Marcelo, Executive Director, Asian eHealth Information Network (AeHIN)

implementation of a national digital health strategy.

The report identifies three potential governance mechanisms that can guide the implementation of a national digital health strategy (Figure 5), each presenting advantages and drawbacks. These governance mechanisms may change over time and are not intended to be prescriptive. The country case studies give examples of governance mechanisms and describe the elements needed to implement national digital health strategies across a variety of geographical and resource settings. Each case study tries to answer questions such as: What elements trigger the political leadership and commitment to digital health? How do governance mechanisms develop frameworks that facilitate stakeholder management and ensure that the health and ICT government entities work in close collaboration? How do governments address financing and funding? What are the lessons and insights that can be shared with other countries?

The following points exemplify how the eight countries analyzed for this report have used leadership and governance to develop and implement digital health strategies.

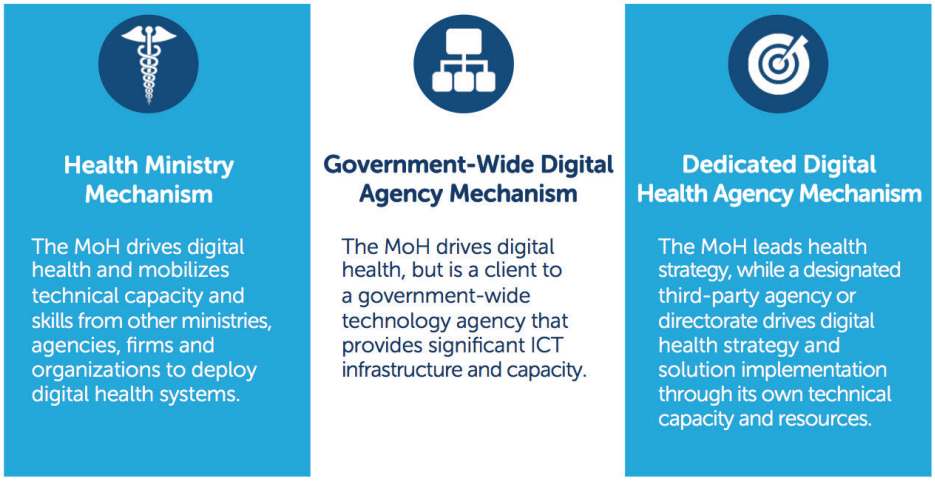
- **Rwanda** provides an example of how the long-term commitment of national political leaders to a broad societal vision for using broadband

"The development of a comprehensive national digital health strategy and its implementation has to be co-created and co-owned by the ICT and health ministries. Digital health is at the intersection of the two sectors and as a result requires leadership, expertise and investments from both."

Hon. Jean Philbert Nsengimana, Minister of Youth and ICT, Government of Rwanda

Figure 4: A Recipe for Success

Figure 5: Three Governance Mechanisms



"Our plan is to operationalize the eHealth strategy, with leadership from the Federal Ministry of Health and with a specific focus on governance. We have come to the conclusion that the lack of appropriate governance is possibly the greatest challenge to the application of technology in health."

Olasupo Oyedepo, Project Director, ICT4HEALTH Project (Health Strategy and Delivery Foundation), Nigeria

and ICTs translates into catalyzing digital health progress at the national level, based on accountability at all levels of the health system.

- **Nigeria's** national digital health strategy development process, which unfolded over several years, exemplifies successful stakeholder involvement and management in a highly complex cultural and political context.
- **The Philippines'** experience demonstrates how close cooperation between health and ICT ministries, materialized in a joint memorandum of understanding and governance mechanisms with clear roles and responsibilities, provides a solid basis for effective cooperation in implementing a digital health strategy.
- **Malaysia** illustrates how the development of project management capacity in the Ministry of Health, aligned with the country's comprehensive ICT and eGovernment framework, can deliver steady progress in the deployment and institutionalization of digital health solutions.
- **Estonia** highlights the benefits of a digital health approach based on a comprehensive eGovernment framework with basic structural elements, such as a national electronic ID and a system architecture, designed for interoperability.
- **Norway's** experience exemplifies how a country's digital health governance structure can evolve as the result of an ambitious national-scale electronic medical record design and deployment process. The complexity of stakeholder management is reflected in the many boards and coordination bodies involved in digital health and the active involvement of healthcare providers,

"Technological advances bring opportunities to enhance patients' lives. At Novartis, we want to harness the power of digital health to create innovative solutions that complement our medicines."

Joe Jimenez, Chief Executive Officer, Novartis

professional associations, regional health authorities and municipalities.

- **Canada** provides an objective lesson in how pathways to national digital health implementation can be used in politically decentralized countries by creating a separate agency for digital health. The Infoway agency works with the country's provinces and territories to implement solutions in line with its national digital health architecture.
- **Mali** illustrates both the advantages and disadvantages of an independent agency model and how more effective donor coordination could play a role in addressing the fragmentation and interoperability issues common to so many donor-dependent LMICs.

"Health and telecommunications should be united and spread new knowledge on how to leverage technology for healthcare. Without a strong drive and vision, nothing can happen."

Rajeev Suri, President and Chief Executive of Nokia

"The single greatest success factor is having a strong regional or country champion. Leadership is one element that can make or break electronic health information systems."

Dykki Settle, Director of the Digital Health Solutions Program at PATH

Moving Ahead

These countries show that success in implementing a national digital health strategy depends on the presence of committed senior government leaders, on effective governance mechanisms to facilitate coordination among stake-holders, and on a national ICT framework promoting alignment between stakeholders in both the health sector and the ICT sector. The findings and insights contained in the report provide leaders with an understanding of the steps and elements needed to achieve these three conditions, illustrated by real-world experiences and lessons learned. Progress is happening in digital health, and with that progress comes the real prospect of realizing the potential of ICTs to achieve global health goals through the SDGs and beyond.

Full report available at:http://broadbandcommission.org/workinggroups/Pages/digitalhealth.aspx

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