



Digital Systems for One Health

Global health security and health systems strengthening in the digital era

Purpose

This policy brief explores how policy-makers can meet UN Sustainable Development Goal (SDG 3) – 'Ensure Healthy Lives and Well-being for All at All Ages' – via the widespread and strategic use of digital technologies in health system and solutions strengthening.

Key messages

1. **Global security:** Digital health systems will enable real-time detection, response and co-ordination across and between government.
2. **Risk preparedness:** Global support is required for emerging data platforms for global early warning systems and risk preparedness for pandemics via multi-stakeholder research and development, co-ordination and collaboration, with private sector leadership.
3. **National strategy and road map:** National leaders must create political will and set out a definitive roadmap at the highest level of cabinet for a 'one government approach' for national digital and mobile health strategies, and in partnership with business, civil society and multilateral organisations.
4. **Governance:** Mainstreaming potential digital applications across the Commonwealth health systems policy framework to strengthen governance for digital health will deliver faster, better and cheaper health systems.
5. **Sustainability:** Digital health innovation and investment is rapidly increasing but sustainability will entail iterative delineation of low-cost and transformational digital technology interventions to realise the potential of digital health platforms and provide rapid information for planners and practitioners.
6. **Workforce capacity:** Online learning resources and tools as well as smart technology to significantly scale up the health workforce are widely available but demand mainstreaming.
7. **Knowledge management and platform interoperability:** Promote cross-industry standardisation and interoperability, policy, trade, legal and regulatory efforts in advancing innovation in, and access to, essential medicines and digital health technologies in developed and developing countries.
8. **International programme delivery:** Transformational programme delivery is possible through more efficient digital systems, brokering collective and multi-stakeholder partner platforms for digital health.
9. **Empower communities:** Mobile communications and mobile health (m-health) in remote communities provide easily accessible information, decision and treatment tools to empower patient-centred care.
10. **Promote innovation and investment:** A co-ordinated and collaborative Commonwealth approach on research and development (R&D) will markedly increase innovation sharing, policy responses and investment in delivery ensuring scalability and sustainability.

A systems approach to digital health in the Commonwealth

Digital technology has the potential to transform the way health systems are delivered and how communities and individuals engage in self-care and the promotion of their well-being.

The Development an enabling digital health ecosystem can potentially to deliver cost-effective solutions for health system strengthening to achieve the ambitious targets and milestones of SDG3 on health, hence the need for a coherent policy approach.

This policy brief looks at how the Commonwealth systems framework for health policy (SFHP) can be used when seeking to build a resilient health system effectively.

Governance: public health legislation; policy; strategy; financing; organisation; quality assurance; transparency, accountability and audit.

Knowledge: surveillance, monitoring and evaluation; research and evidence; risk and innovation; dissemination and uptake.

Protection: International Health Regulations (IHR) and co-ordination; communicable disease control; emergency preparedness; environmental health; climate change and sustainability.

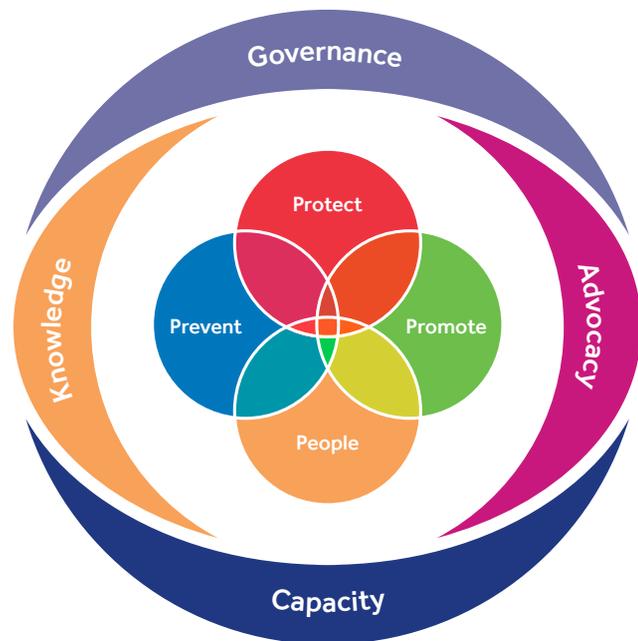
Promotion: inequalities; environmental determinants; social and economic determinants; resilience; behaviour and health literacy; life-course; healthy settings.

Prevention: primary prevention: vaccination; secondary prevention: screening; healthcare management and planning.

People-centred care: primary health care; secondary health care; tertiary health care and rehabilitation.

Advocacy: leadership and ethics; community engagement and empowerment; communications; sustainable development.

Capacity: workforce development for public health, health workers and wider workforce; workforce planning: numbers, resources, infrastructure; standards, curriculum, accreditation; capabilities, teaching and training.



The Commonwealth Institute of Digital Health

The first Commonwealth Conference on Digital Health held in Sri Lanka in October 2016 led to the 'Colombo Declaration' and 'The Colombo Declaration plan for collaborative action', with digital health as an integral component. Partners collaborated, with the co-ordination of the secretariat health hub, in developing a Commonwealth Institute of Digital Health (CWIDH) to take forward commitments in the Colombo Declaration plan for collaborative action. These partners included the Commonwealth medical Association, The Commonwealth Institute for Infrastructure Development, The Mobile Action on Pandemics (MAP) 2030 Alliance and the Government of Sri Lanka on a proposed Commonwealth Institute for Digital Health (CWIDH).

Under the current model Sri Lanka acts as the regional Asian spoke of the institute, with the central hub at the Commonwealth Secretariat in London for the purposes of administration, resource mobilisation, co-ordination and governance. The institute will be launched at the annual Commonwealth Ministers of Health Meeting (CHMM) of all 52 member states in Geneva, on 21 May 2017.

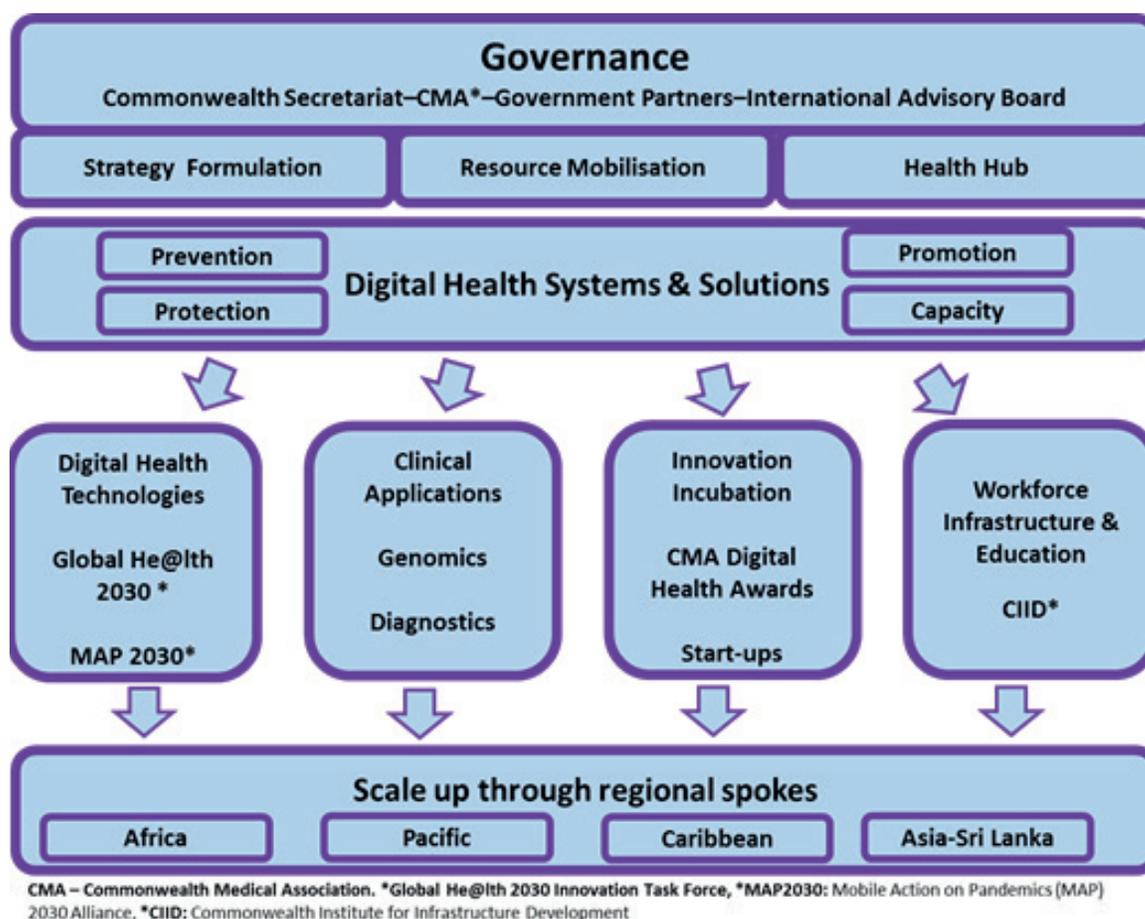
The institute will have regional spokes in Africa, Pacific, Caribbean and Asia, as well as Europe and North America. There may be more than one spoke in any given region depending on the willingness of governments to host them. In-country implementation with innovation incubation will occur nationally in all interested countries where adequate skills and capacity building, including R&D capacity via academic institutions, are available.

The universal goal of the institute is to create a more equitable market across the Commonwealth and incubate digital health innovation and venture capital in the best places possible. Initially, the Global He@th 2030 Innovation Task Force and Mobile Action on Pandemics (MAP) 2030 Alliance have been earmarked to lead the application digital health technologies activities of the institute to strengthen health security responses.

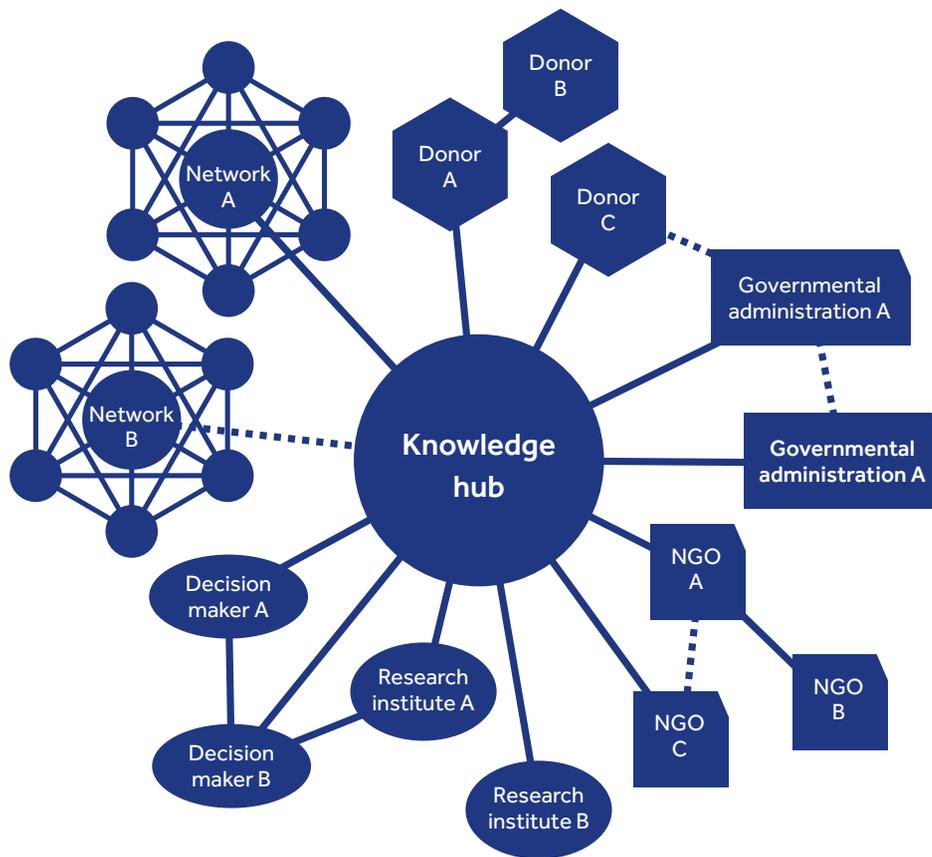
In order to implement SDG3, CIDH will focus on:

- Delivering innovative digital health technologies, infrastructure and services appropriate for low resource settings;
- Setting up partnerships to implement the new sustainable development agenda, to achieve scale, improve efficiency and develop education and training; and
- putting in place new financing mechanisms and business models based on the Commonwealth’s value-based investment guidelines.

The vision of the CIDH will be to digitalise the health system across the Commonwealth SFHP components strategically, to build sustainable health systems that act as a common good for all. The diagram below demonstrates how the institute will be organised.



The Commonwealth Innovation Health Hub



The Commonwealth’s Innovation Health Hub is a pilot initiative of the Commonwealth Secretariat. It provides an integrated and user-friendly space to support health policy-makers and professionals across the Commonwealth to connect, consult and collaborate more effectively, and to share and access relevant knowledge.

The hub’s focus is on emerging and ongoing issues of critical significance to its health community. These vary and adapt to the needs of policy-makers, but the role of health in delivering the SDGs underpins all activities.

Membership of the hub is free and open to all Commonwealth health stakeholders. To date over 900 health policy-makers and planners are members of the hub’s community of practice. It serves as a space to keep participants of the annual CHMM connected between meetings and to strengthen collective action. Additionally, the hub provides and signposts to a range of policy resources and partners pages.

The hub will form a key part of the CWDIH structure, ensuring co-ordination and coherence with wider Commonwealth governance mechanisms and linking the innovation generated at the institute to

high level policy-makers and others across the Commonwealth. It can be accessed at <https://www.thecommonwealth-healthhub.net/>

The Mobile Action on Pandemics (MAP) 2030 Alliance

The Mobile Action on Pandemics (MAP) 2030 Alliance is a multi-stakeholder initiative designed to act as a bridge between the healthcare and information and communications technology (ICT) sectors in rethinking pandemic risk, resilience, response and recovery by employing the rising ubiquity and global access afforded by mobile and digital communications.

First proposed at the CHMM in May 2016, the need for the MAP 2030 Alliance was realised as a consequence of the outbreaks of the West African Ebola Virus and the Caribbean and American Zika Virus.¹

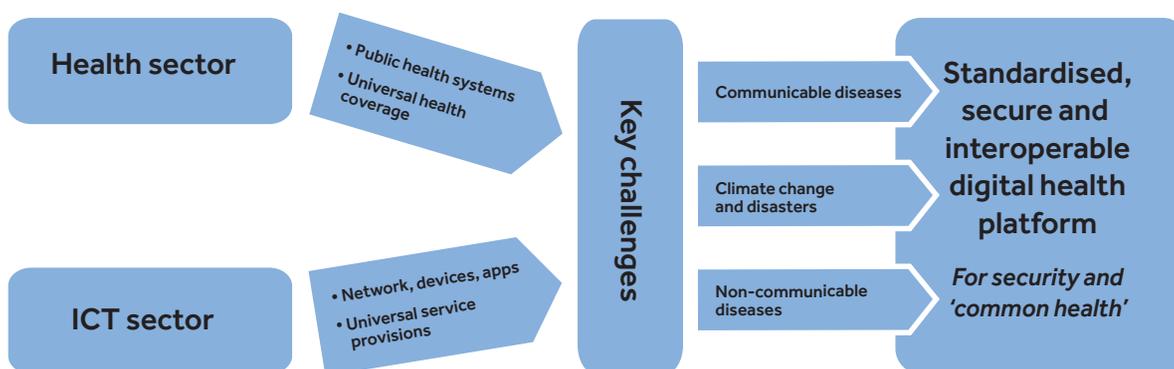
The MAP 2030 Alliance provides a road map and series of business models to align the health and ICT sectors into scalable and sustainable digital health systems and solutions employing the following R&D logic:



- **Big data analytics** lend themselves to large communicable disease outbreaks and pandemics as well as climate-change-related health impacts, but are difficult to fund or monetise for government and industry.
- **Embedding mobility data** for risk planning, preparedness and response must therefore be a function of national digital health systems in order to achieve innovative, scalable and sustainable impact.
- **Non-communicable diseases (NCDs)** are more pervasive than communicable diseases promising greater cost savings and monetisation from digital health, lending this field to personal and preventative medicine and wellness using remote care and diagnostics.
- **Alignment between big data and digital health** would allow health intelligence to be harnessed more systematically to address communicable disease, NCDs and wider health determinants, climate change, and wellness.
- **A planned Commonwealth approach** to emerging digital health systems across the globe will achieve a better transition for scaling-up and sustainability, with the Commonwealth uniquely suited to regional approaches whether in Africa, Asia, the Caribbean or the Pacific.
- **Digital systems create holistic solutions** such as the prevention of data silos between diseases and networks.

Mobile Action on Pandemics (MAP) 2030 Alliance

Digital health new deal for catalytic and collaborative impact



The telecommunications Open Systems Interconnection seven-layer model and Health Level Seven (HL7) model are already examples of early bridges between the healthcare and ICT communities. The MAP 2030 Alliance begins a one-year digital health landscape study working with government, business and civil society exploring approaches to integration on standardised digital and mobile health platform architectures.

The global mobile industry has embraced and endorsed the 2030 Sustainable Development Agenda, opening a unique policy and technology window for developing digital health systems and solutions for government, business and civil society collaboratively.²

By using digital health technologies, it is feasible to meet SDG3 and provide universal health coverage; without these technologies it will be a much greater challenge to do this.

Glossary of terms

API (application programme interface)	A set of functions and procedures that allows the creation of applications which access the features or data of an operating system, application or other service
CWIDH	Commonwealth Institute for Digital Health
Digital health	An encompassing term that includes m-health, e-health and the wider application of ICTs to advance health and wellbeing; said to be the convergence of the digital and genomic revolution with health
E-health (electronic health)	The use of modern ICTs to meet health needs across health systems
Interoperability	The ability of different health information systems and software applications within and across organisational boundaries to 'talk to each other' and share information
M-health (mobile health)	The use of mobile and other wireless technology in health
MAP 2030 Alliance	Mobile Action on Pandemics 2030 Alliance

Key emerging technologies that can be applied to health systems

A number of emerging technologies promise to transform the way technology shapes our lives and health systems. Some of these effects may be positive, some could be negative. Strong governance mechanisms will be key.

Technology	Description
3D printing	Advances in additive manufacturing using a widening range of materials and methods; innovations include 3D bioprinting of organic tissues
Advanced materials and nanomaterials	The creation of new materials and nanostructures to develop beneficial material properties such as thermoelectric efficiency, shape retention and new functionality
Artificial intelligence and robotics	Development of machines that can substitute for humans, increasingly in tasks associated with thinking, multitasking and fine motor skills
Biotechnologies	Innovations in genetic engineering, sequencing, therapeutics, biological computational interfaces and synthetic biology
Blockchain and distributed ledger	Distributed ledger technology based on cryptographic systems that manage, verify and publicly record transaction data; the basis of 'cryptocurrencies' such as bitcoin
Energy capture, storage and transmission	Breakthroughs in battery and fuel cell efficiency; renewable energy through solar, wind and tidal technologies; and energy distribution through smart grid systems, wireless energy transfer and more

Technology	Description
Geoengineering	Technological intervention in planetary systems, typically to mitigate effects of climate change by removing carbon dioxide or managing solar radiation
Neurotechnologies	Innovations such as smart drugs, neuroimaging and bioelectronic interfaces that allow for reading, communicating and influencing human brain activity
New computing technologies	New architectures for computing hardware, such as quantum computing, biological computing or neural network processing, and innovative expansion of current computing technologies
Space technologies	Developments allowing for greater access to and exploration of space, including microsattellites, advanced telescopes, reusable rockets and integrated rocket-jet engines
Ubiquitous linked sensors, also known as the internet of things	The use of networked sensors to remotely connect, track and manage products, systems and grids
Virtual and augmented realities	Next-step interfaces between humans and computers, involving immersive environments, holographic readouts and digitally produced overlays for mixed-reality experiences

Table reproduced from World Economic Forum, The Global Risks Report 2017, <http://reports.weforum.org/global-risks-2017/>.

Endnotes

1. Global Ebola Response, 'Ebola Innovation for Impact 2015: Game Change in Global Health Crisis Management', United Nations Secretary-General's International Ebola Recovery Conference, http://ebolaresponse.un.org/sites/default/files/ebola_innovation_for_impact_2015_july_10.pdf; 2016.Digital Health for Catalytic & Collaborative Impact -Zika: A Case Study & Framework Model for the Mobile Action on Pandemics (MAP) 2030 Alliance
2. GSMA, 2016 Mobile Industry Impact Report: Sustainable Development Goals, 2016, http://www.gsma.com/betterfuture/wp-content/uploads/2016/09/_UN_SDG_Report_FULL_R1_WEB_Singles_LOW.pdf.



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