2nd Meeting of the CAREC Working Group on Health

Panel: Leveraging Digital Health to strengthen Health Security

11 October 2022, 11:00-12:15 | Tbilisi, Georgia

Scaling Digital Health Solutions for Transformation

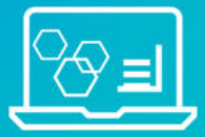
Understanding Evidence in Digital Health

Leveraging Digital Health for Health Security

Investing in Digital Health Foundations

Building Innovation Ecosystems

Scaling Digital Health Solutions for Transformation



Understanding Evidence in Digital Health

Four Major Health IT Investments:
Current State & Key Insights on Evidence

- Enterprise EHRs
  (with interoperability, clinical decision support)
- Telemedicine
- Patient generated data
- Patient-facing APIs & smartphone-based access to records

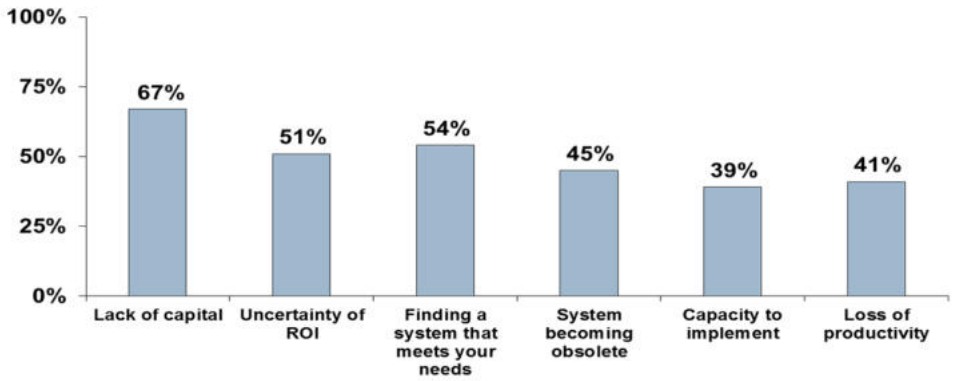
Julia Adler-Milstein,
Tbilisi, Georgia
11 October 2022

1 Enterprise EHRs

Table 1. Survey Items Defining the Use of Electronic Health Records.

Survey Response	Basic System	Fully Functional System
Does your main practice site have a computerized system for any of the following?		
Health information and data		
Patient demographics	X	X
Patient problem lists	X	X
Electronic lists of medications taken by patients	X	X
Clinical notes	X	X
Notes including medical history and follow-up		X
Order-entry management		
Orders for prescriptions	X	X
Orders for laboratory tests		X
Orders for radiology tests		X
Prescriptions sent electronically		X
Orders sent electronically		X
Results management		
Viewing laboratory results	X	X
Viewing imaging results	X	X
Electronic images returned		X
Clinical-decision support		
Warnings of drug interactions or contraindications provided		X
Out-of-range test levels highlighted		X
Reminders regarding guideline-based interventions or screening		X

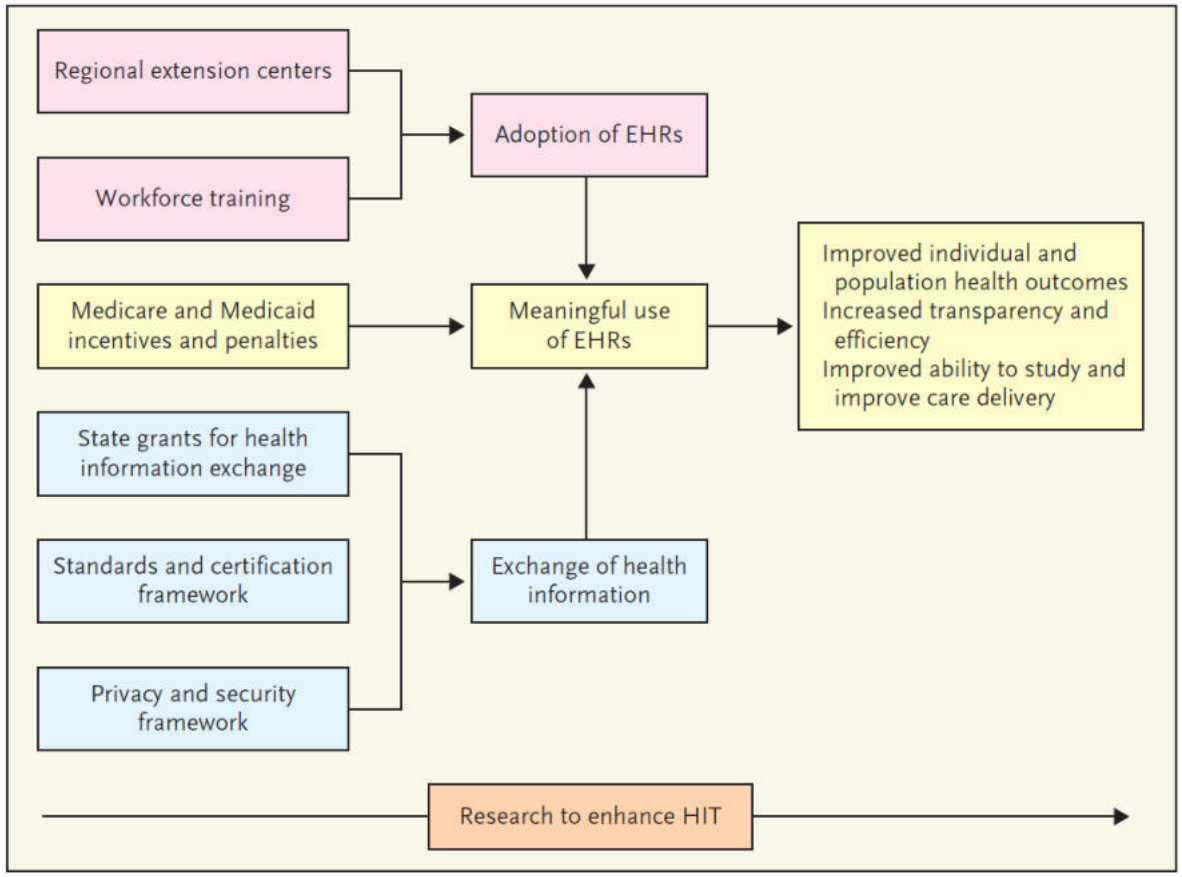
Barriers to EHR Adoption among US MDs



Summary of Evidence on Relationship between EHRs and Quality

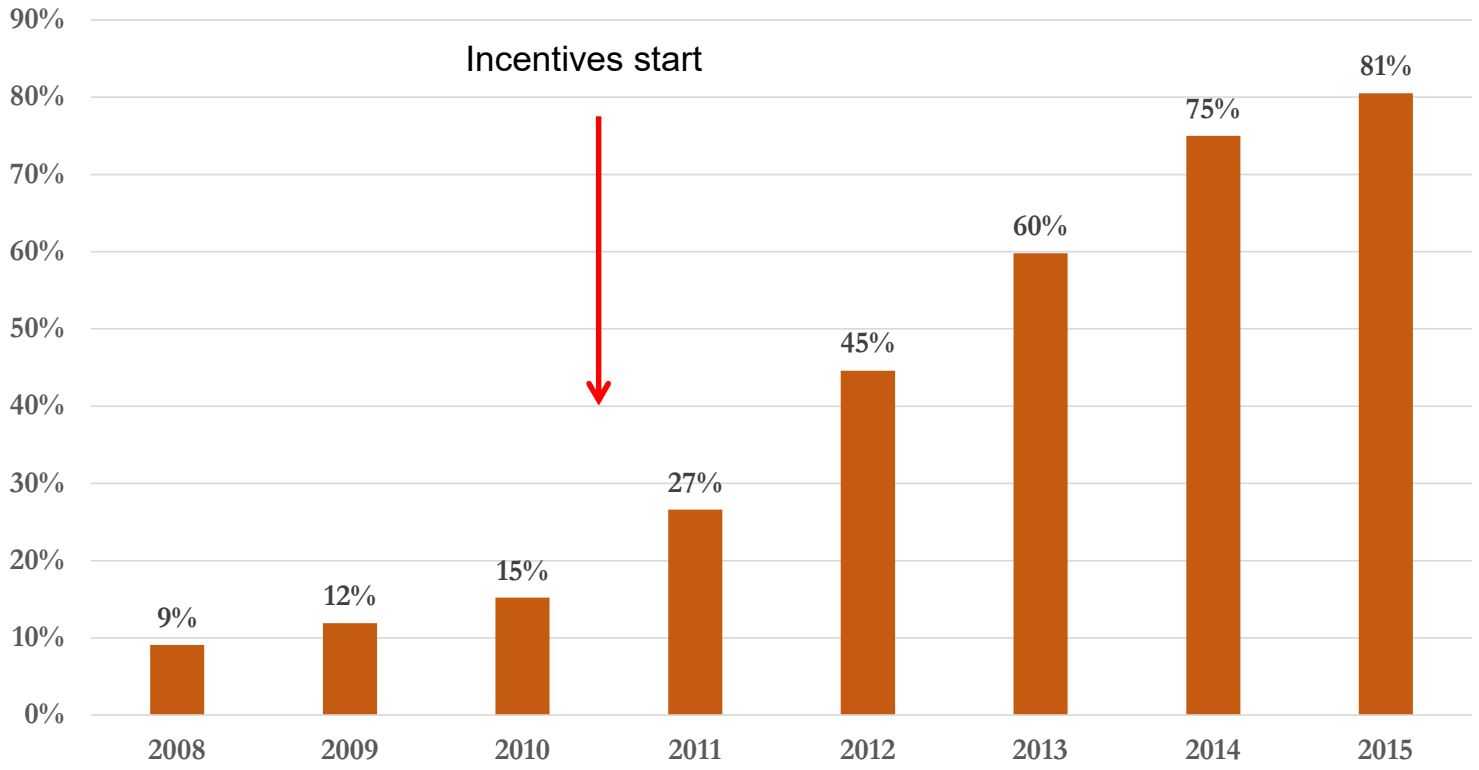
	Impact of EHRs
Safe	**Positive** (with clinical decision support)
Patient-centered	Limited evidence
Timely	Limited evidence; May help with response to results but requiring a LOT of physician time (contributing to burnout)
Effective	Mixed evidence – positive and no impact
Efficient	A lot of "potential" but limited empirical evidence; Efficient from whose perspective?
Equitable	Limited evidence, but early studies are promising; Key is avoiding an adoption digital divide

US Policy Response: HITECH Act of 2009



Blumenthal NEJM 2010

US Hospital EHR Adoption Grew Dramatically in Response to Financial Incentives



A HITECH REPORT CARD

Domain	Grade
Driving **EHR Adoption** in Hospitals	A
Driving **EHR Adoption** in Ambulatory Settings	A-
Driving **EHR Adoption** across the Care Continuum	D
Interoperability: Getting data in/out of EHRs and moving it to where it is needed	B-
Usability: EHRs that are easy to use (w/ safety implications)	D
Data Quality: Ensuring that electronic clinical data is complete, accurate, etc.	B-

2 Telemedicine

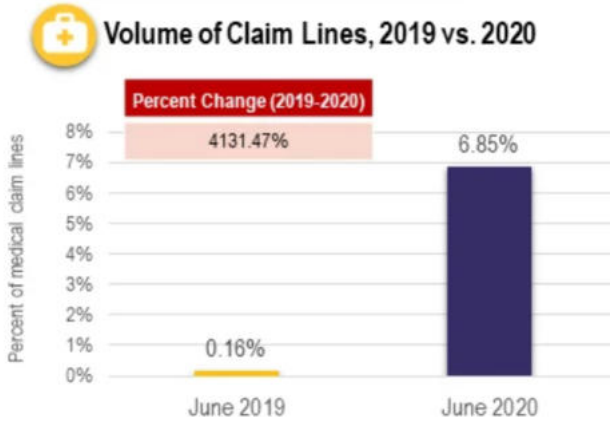
Access

<u>What's changed? What's known?</u>

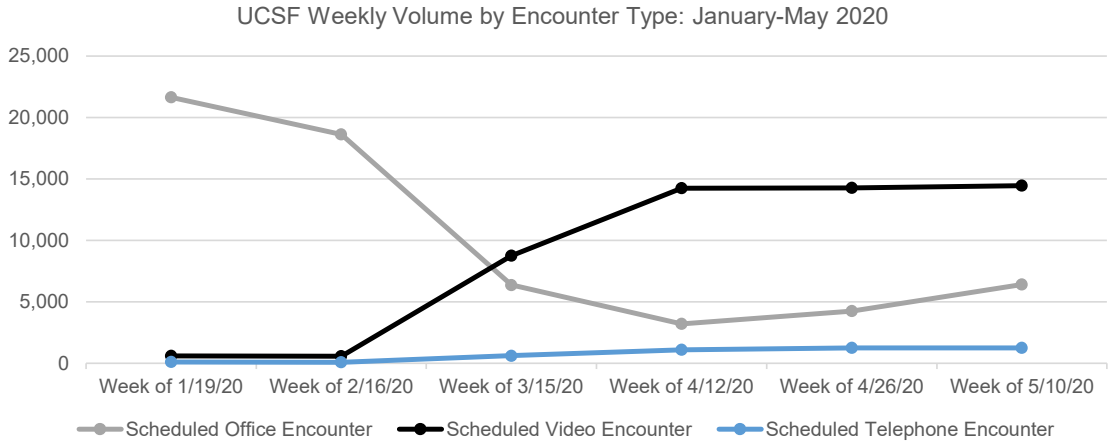
Access to telehealth resources is growing, but additional barriers remain:

- High-speed internet in rural areas
- Costly hardware to use tele services
- Logistical challenge of ancillary services (labs, imaging, consults)
- Regulatory limitations (state lines, clinician licensure)
- Accessibility for disabled persons

(Annaswamy et al., 2020)



Source: FAIR Health (Commercial claims)



The COVID-19 pandemic prompted CMS to expand telehealth coverage. Along with advances in technology, this brings telemedicine within (digital) reach.

Telemedicine

Access

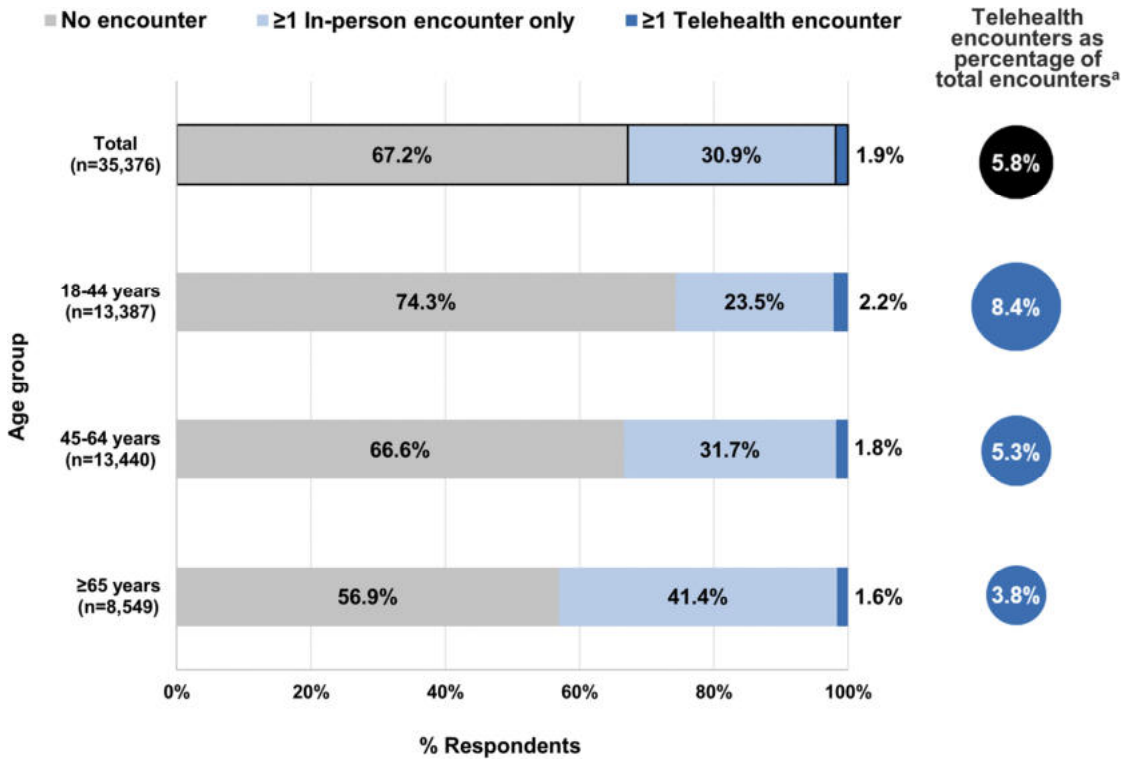
What's changed? What's known?

Variation in telehealth use by key demographics:

- More common in younger populations
- More common for mental health conditions
- Less common in rural areas, especially in Southern states

Telemedicine has potential for both reducing and increasing inequalities in access:

- Fewer physical access barriers (e.g., transportation)
- More digital access barriers



Distribution of health care encounters in March 2020, stratified by age group. Respondents are a random sample of US adult patients.

(Jaffe et al., 2020)

Telemedicine

Impact on outcomes: quality, cost, patient experience, clinician experience

What's changed? What's known?

Telemedicine can lower costs:

- Less travel, less expensive than ED visit (patient)
- Fewer resources and staff involved (provider)

It can improve outcomes:

- Decreased mortality and LOS (tele-ICU)
- Reduced hospital admissions

And it's well-received by patients:

- 75% expressed satisfaction

But it changes the care that is offered:

- Major decline in cholesterol, blood pressure assessment
- More likely to prescribe low-value medications

(Alexander et al., 2020; Uscher-Pines et al., 2016)

3 Patient-generated health data (PGHD)

"Health-related data created and recorded by or from patients outside of the clinical setting to help address a health concern" –ONC 2018

What's changed? What's known?

PGHD has clinical value, but using it is complicated

Better outcomes:

- Adherence to recommended treatment
- Increased patient engagement
- Better patient experience

(Jayakumar et al., 2020)

- Initially included in Meaningful Use Stage 3, but removed due to concerns about accuracy, completeness, and liability.

Methods of collection and transfer of PGHD continually expand:

- Home blood pressure cuffs, scales
- Wearable mobile tech (Apple Watch, FitBit)
- Smartphone health apps (diet, weight, sleep trackers)
- Patient-reported medical history, symptom severity, treatment side effects

Patient-generated health data (PGHD)

"Health-related data created and recorded by or from patients outside of the clinical setting to help address a health concern"
–ONC 2018

<u>What needs further evidence? What will enable this?</u>

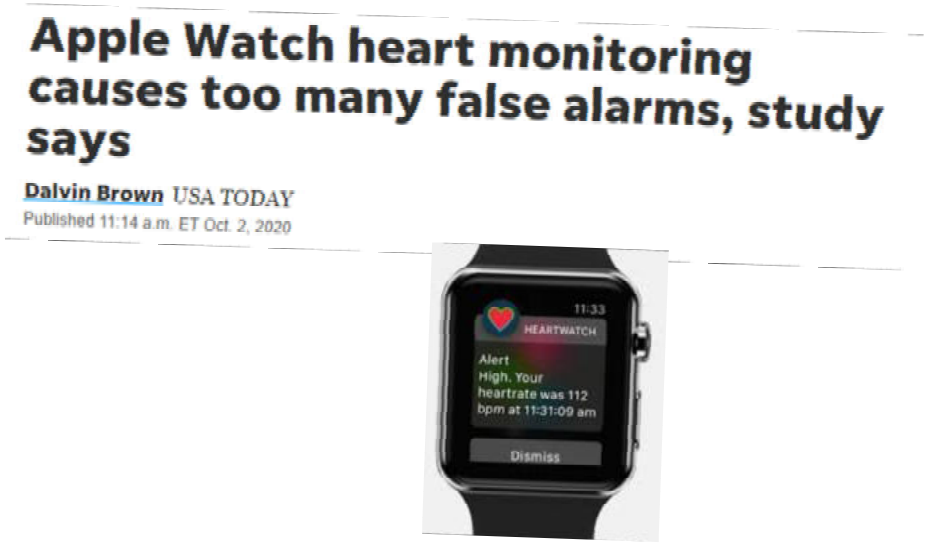
To advance PGHD use, clinicians must receive, trust, and use the data.

- To **receive**, need to develop:
  - Standards for data transfer, use of APIs, implementation within EHR, organizational buy-in

- To **trust,** need to understand:
  - Data validity and how to address inaccuracies, gaps, etc.
  - How to mitigate liability by developing policies and procedures regarding the sharing and use of PGHD

To **use**, need to develop:

- Care models that integrate PGHD



4 Patient Access to Health Data

Via APIs + Smartphones

What's changed? What's known?

Large federal policy push to support patient access, exchange, and use of electronic health information.

- *Extends the sources of data: providers & payers*
- *Requires exposing data via APIs, which allows data to more easily flow to apps and other 3rd parties*
  - Apple's HealthKit includes the functionality to link to health records

Risks from information overload:

- Too many options hinders decision making
- Even when incentivized to do so, very few patients shop for lower cost care
- Behavioral science can help navigate this; information display, phrasing, etc.

Privacy and security risks:

- Apps & 3rd parties are largely *not* covered entities under HIPAA

Initial levels of use low

(Adler-Milstein and Sinaiko, Health Affairs 2019)

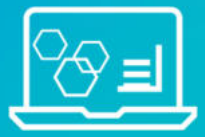
Patient Access to Health Data

Via APIs + Smartphones

<u>What needs further evidence? What will enable this?</u>

- Why is patient uptake of access to their health data so low?
- What “apps” will successfully engage patients?
- How can data security and privacy be protected, particularly given that patients may not realize they are giving their data to non-covered entities?

Scaling Digital Health Solutions for Transformation

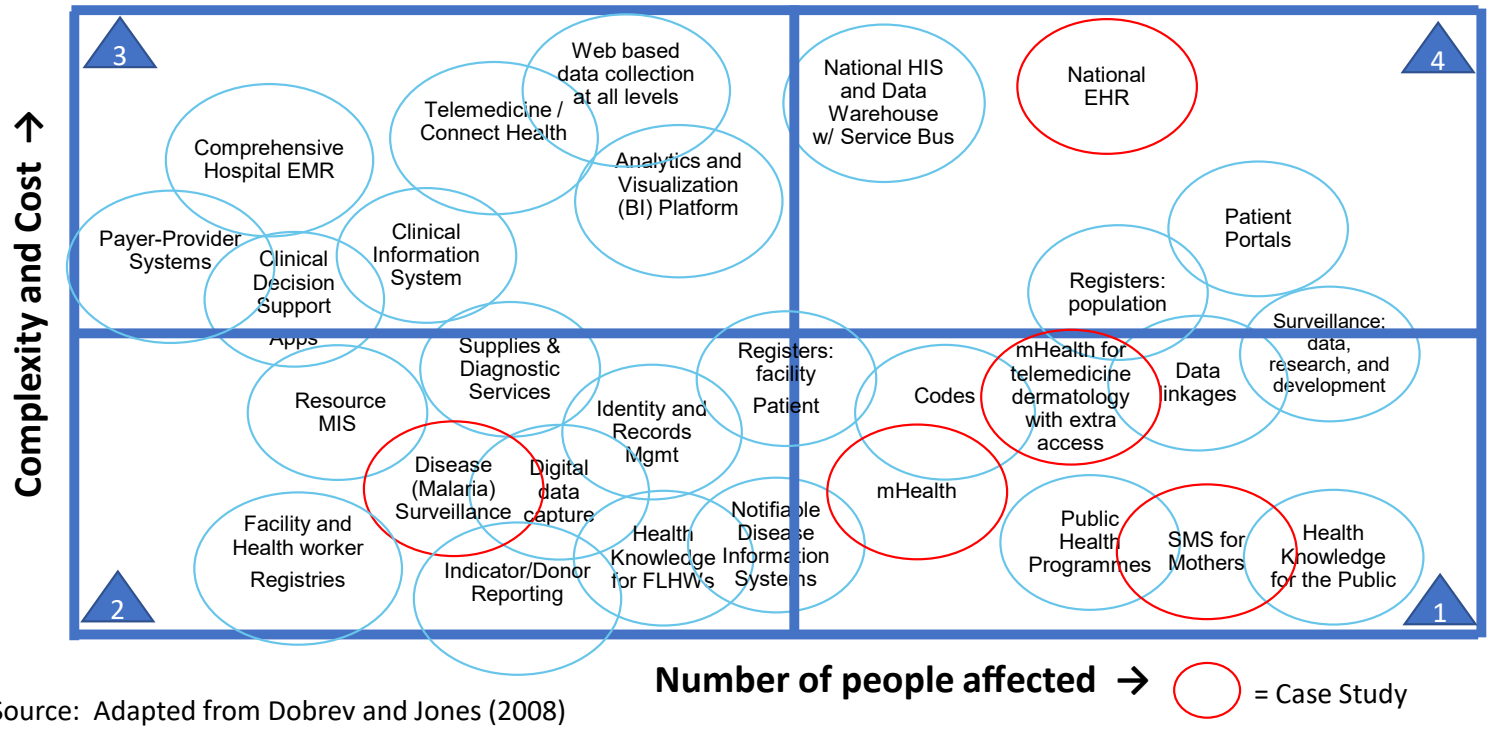


Understanding Evidence in Digital Health

Digital Health Impact Assessment

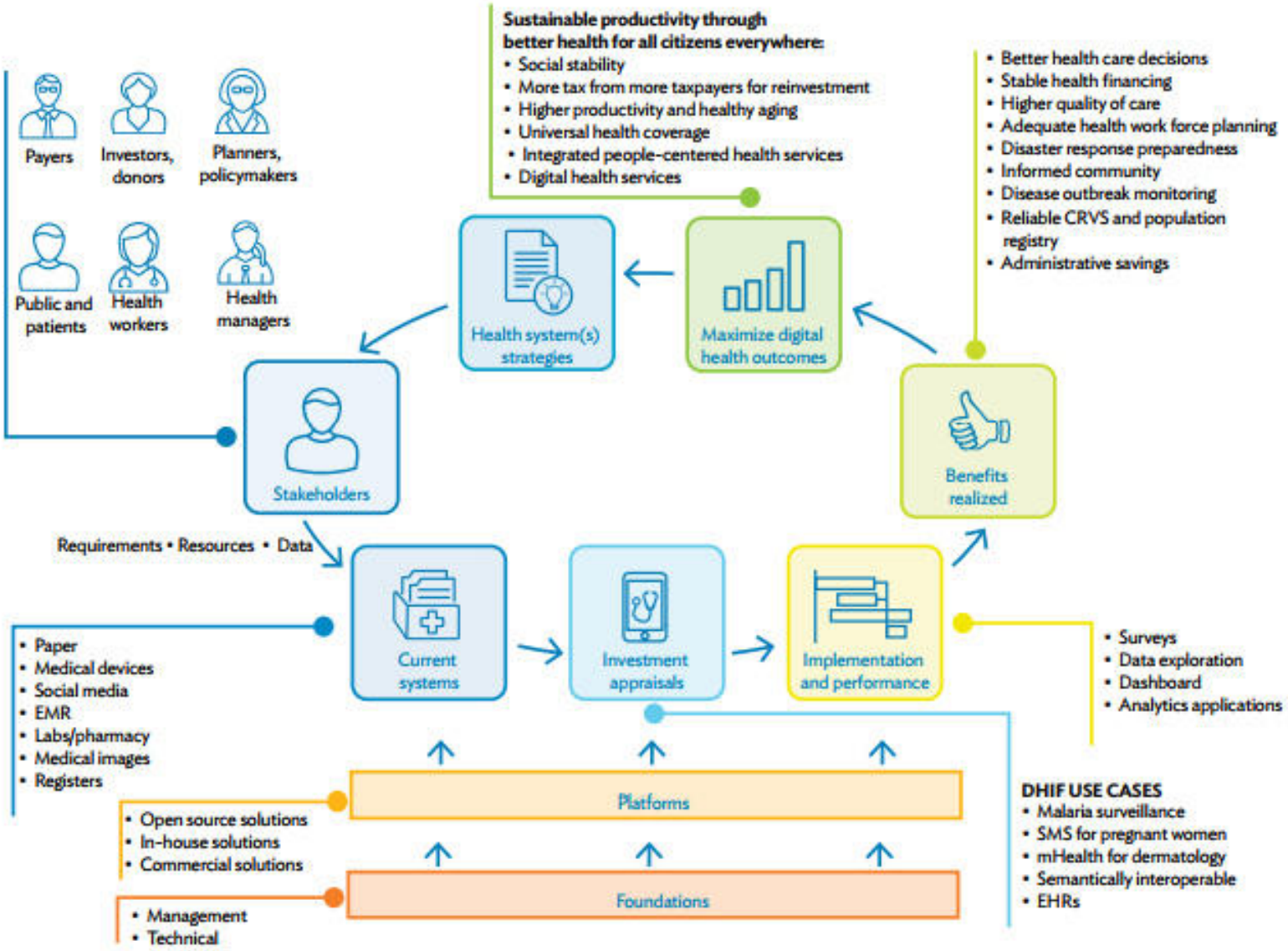
- **Direct impact** of the intervention on the **outcome**
- **Outcome:** governance, legislation, data sharing protocols, eHealth strategies, digital literacy, enhanced interoperability).
- **Includes:** counterfactual, positive and negative, direct and indirect, intended and unintended consequences
  Dimensions: quality, access, cost-effectiveness, efficiency, care, appropriateness, relevance gender equality, education, culture and health.
- Most studies **mixed results** and focused on health behaviour, medication compliance, psychiatric care, care coordination, telehealth and wearable devices.
- **Evidence Gaps**: health system efficiencies, disease impact
- Digital Health Readiness Assessments measure **baseline** to monitor **UHC and SDG3 goals**
- ADB's Digital Health Impact Framework supports evaluation for investment decisions

Digital Health Systems' Investment Profiles: vary with complexity, cost, numbers affected, and over time



Source: Adapted from Dobrev and Jones (2008)

Evidence underpins investment decisions



CRVS = civil registration and vital statistics, DHIF = digital health impact framework, EHR = electronic health record, SMS = short message service.

Source: ADB Guidance for Investing in Digital Health

Global Evidence

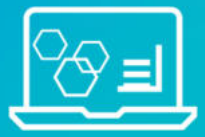
Outcome of interest	Evidence
Quality	**Telemedicine** decreases morbidity and mortality, ALOS, hospital admissions (Armaignac et al., 2018; Sayani et al. 2019) **mHealth** improved compliance and psychiatric care (Alexander et al. 2020 from IQVIA Research Forum) **Mobile apps:** positive changes in BP, diet, physical activities alcohol consumption and mental health (Ibrahim et al. 2022)
Access	**Telemedicine** expands access and continuity of care (Bhaskar et al. 2020) **mHealth** improved access, increase affordability (Godinho et al. 2020)
Cost-effectiveness	**Telehealth** is cost-effective (Armaignac et al. 2018) **Health ICTs** potential to improve care and lower costs (Adler-Milstein et al. 2014).
Efficiency	**Telemedicine** increased workload for health workers.

Global Evidence

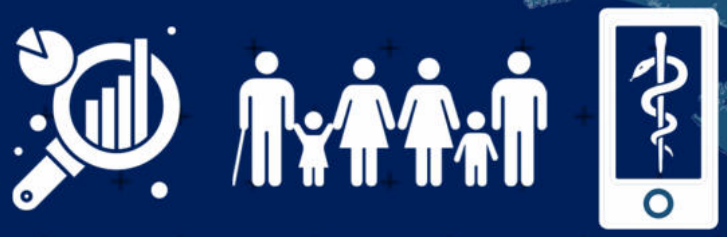
Outcome of interest	Evidence
Patient-centred care	**Telemedicine:** Patients expressed satisfaction; increased treatment adherence Vis-screen **mobile application** enabled access by visually impaired patients, **Personal health records** valuable for patients but low adoption rates; **Smart electronic pill container and personal digital record** improved treatment compliance (Batra et al. 2017); **Patient-generated health data** improved treatment adherence and patient engagement (Jayakumar et al. 2020 from Adler-Milstein, 2020)
Relevance and equity of care	**Telemedicine** implementation in underserved communities resulted in higher rates of stroke treatment (Hess et al. 2006).
Patient Safety	**Telemedicine-guided** treatment is as safe and effective compared to traditional stroke centres and e-prescribing reduced medication errors and ADE (Roumeliotis et al. 2019)

Scaling Digital Health Solutions for Transformation

Leveraging Digital Health for Health Security



Understanding Evidence in Digital Health



2nd Meeting of the CAREC Working Group on Health

Health information systems and lessons learned during the COVID-19 pandemic

Tuesday, 11 October 2022

David Novillo Ortiz
Unit Head, Data and Digital Health
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World Health Organization
European Region

Data in the context of the COVID-19 pandemic

Public health, social and economic measures

- Epidemiological factors
- Health care capacities
- Public health capacities
- Availability of effective pharmaceutical interventions
- Multi-sectoral and non-pharmaceutical measures
- Wider effects on population health

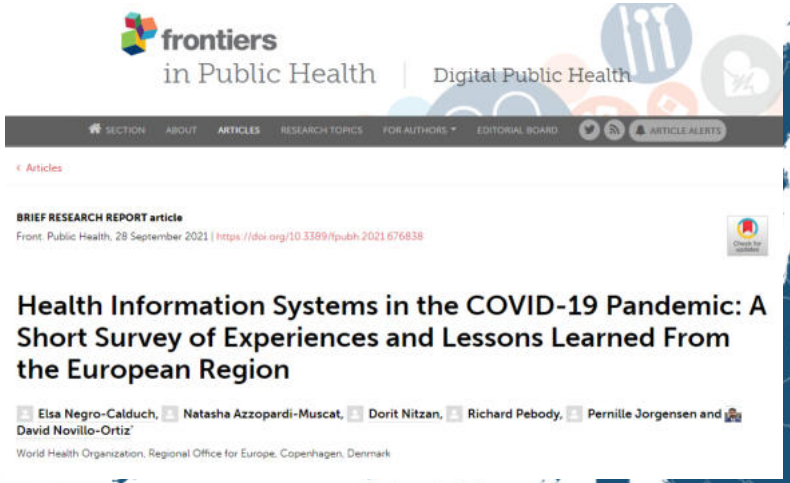
Data in the context of the COVID-19 pandemic

Lessons learned

- Real-time data for decision-making is crucial in guiding an effective, timely and targeted response
- Effective integration of different data and information systems can facilitate data-driven decisions
- Inability to effectively leverage the volume and different types of data available due to:
  - *Lack of health data standards related to the definition, calculation and format of the data*
  - *Delays in receiving data*
  - *Lack of integration and interoperability between the different data and health information systems*
  - *Deficiency of trained people to manage and use these data*

Data in the context of the COVID-19 pandemic

Lessons learned



frontiers in Public Health | Digital Public Health

BRIEF RESEARCH REPORT article

Front. Public Health, 28 September 2021 | https://doi.org/10.3389/fpubh.2021.676838

Health Information Systems in the COVID-19 Pandemic: A Short Survey of Experiences and Lessons Learned From the European Region

Elsa Negro-Calduch, Natasha Azzopardi-Muscat, Dorit Nitzan, Richard Pebody, Pernille Jorgensen and David Novillo-Ortiz*

World Health Organization, Regional Office for Europe, Copenhagen, Denmark

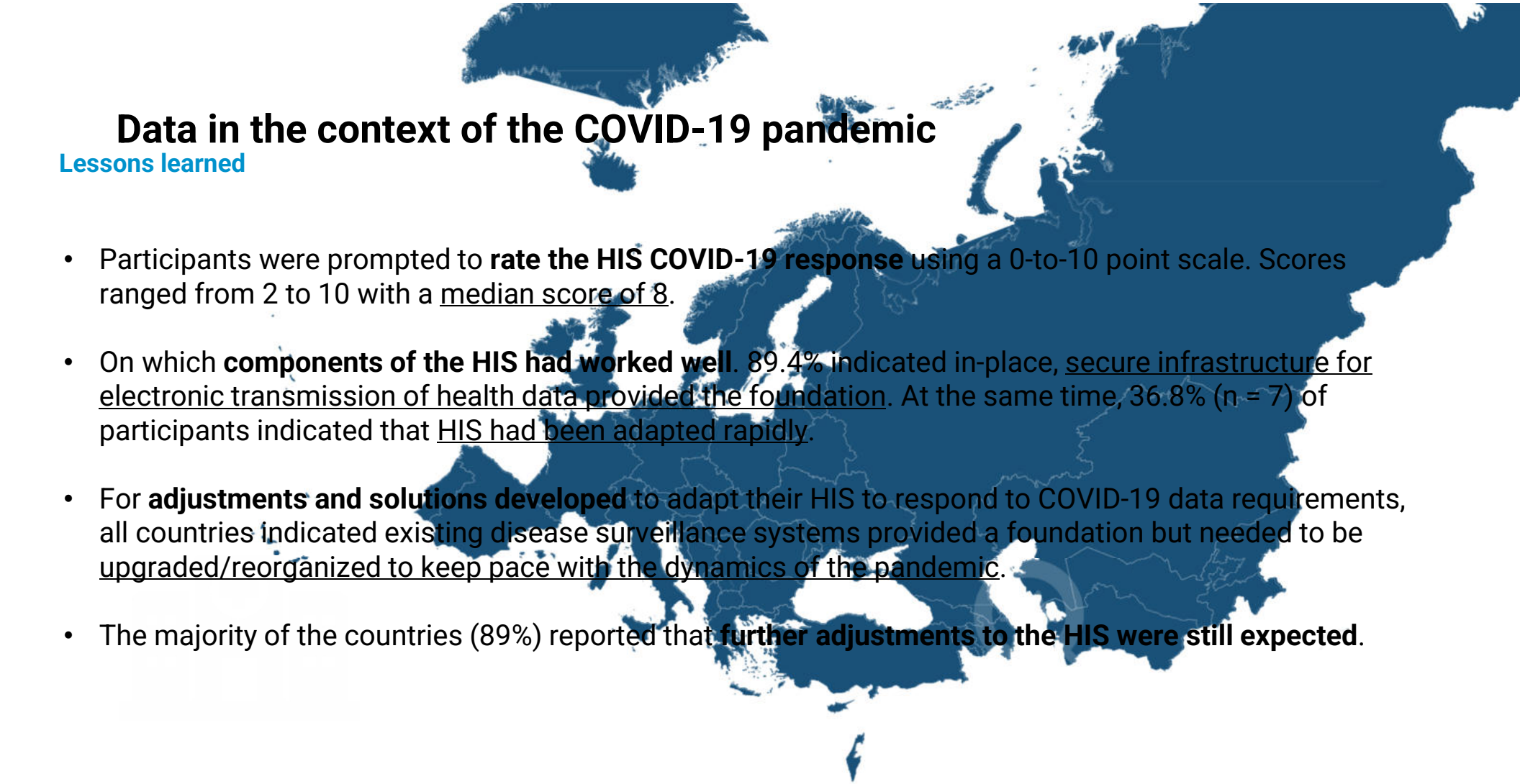
Date: November 2020

N = 19 countries

Source: Negro-Calduch E, Azzopardi-Muscat N, Nitzan D, Pebody R, Jorgensen P, Novillo-Ortiz D. **Health Information Systems in the COVID-19 Pandemic: A Short Survey of Experiences and Lessons Learned From the European Region**. Front Public Health. 2021 Sep 28;9:676838. doi: 10.3389/fpubh.2021.676838

Data in the context of the COVID-19 pandemic

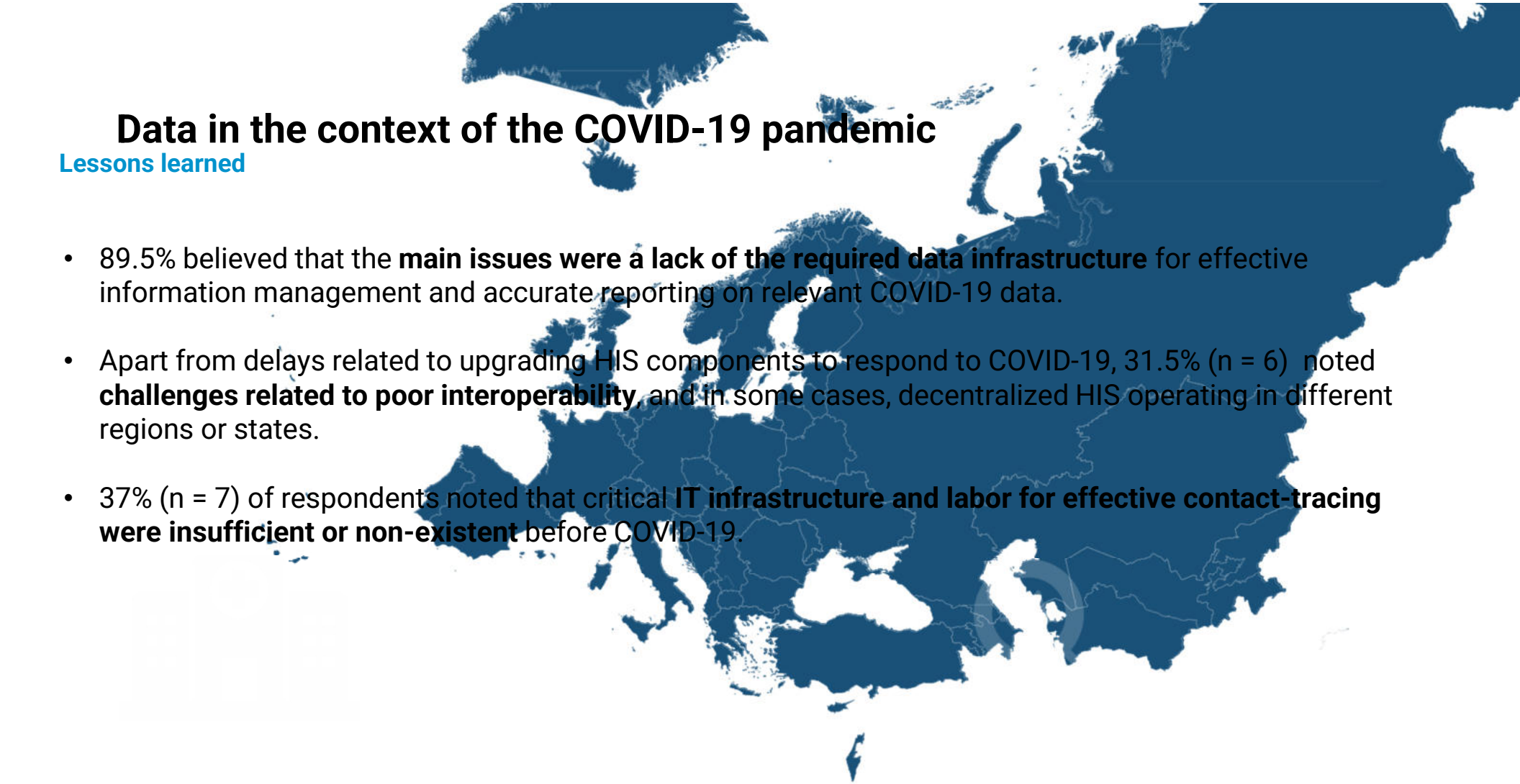
Lessons learned



- Participants were prompted to **rate the HIS COVID-19 response** using a 0-to-10 point scale. Scores ranged from 2 to 10 with a median score of 8.
- On which **components of the HIS had worked well**. 89.4% indicated in-place, secure infrastructure for electronic transmission of health data provided the foundation. At the same time, 36.8% (n = 7) of participants indicated that HIS had been adapted rapidly.
- For **adjustments and solutions developed** to adapt their HIS to respond to COVID-19 data requirements, all countries indicated existing disease surveillance systems provided a foundation but needed to be upgraded/reorganized to keep pace with the dynamics of the pandemic.
- The majority of the countries (89%) reported that **further adjustments to the HIS were still expected**.

Data in the context of the COVID-19 pandemic

Lessons learned



- 89.5% believed that the **main issues were a lack of the required data infrastructure** for effective information management and accurate reporting on relevant COVID-19 data.
- Apart from delays related to upgrading HIS components to respond to COVID-19, 31.5% (n = 6) noted **challenges related to poor interoperability**, and in some cases, decentralized HIS operating in different regions or states.
- 37% (n = 7) of respondents noted that critical **IT infrastructure and labor for effective contact-tracing were insufficient or non-existent** before COVID-19.

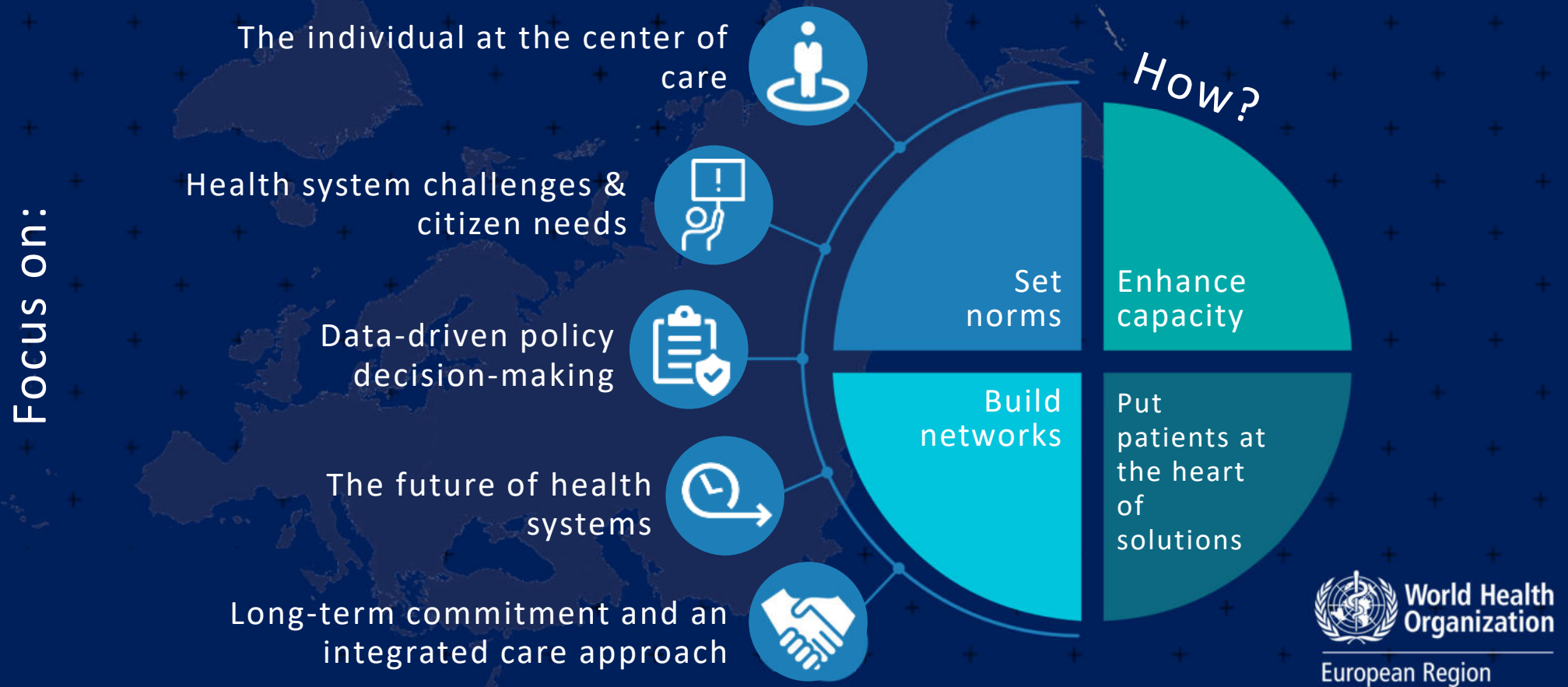
Leveraging Digital Transformation for Better Health in Europe

Better Data for Better Health

- To establish a national **data coordination** mechanism and **implement a data governance framework**
- To **invest in data and digital technology** that can be useful for policymaking
- To **empower citizens** to control the data they produce and develop their data skillsets

Source: Azzopardi-Muscat N, Kluge HHP, Asma S, Novillo-Ortiz D. **A call to strengthen data in response to COVID-19 and beyond**. J Am Med Inform Assoc. 2021 Mar 1;28(3):638-639. doi: 10.1093/jamia/ocaa308.

Leveraging Digital Transformation for Better Health in Europe



World Health Organization
European Region

References

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- Negro-Calduch E, Azzopardi-Muscat N, Nitzan D, Pebody R, Jorgensen P, Novillo-Ortiz D. **Health Information Systems in the COVID-19 Pandemic: A Short Survey of Experiences and Lessons Learned From the European Region**. Front Public Health. 2021 Sep 28;9:676838. https://pubmed.ncbi.nlm.nih.gov/34650946/

- Action plan – Regional Committee for Europe, 72nd session. (2022). Seventy-second Regional Committee for Europe: Tel Aviv, 12–14 September 2022: **Regional digital health action plan for the WHO European Region 2023–2030**. World Health Organization. Regional Office for Europe. https://apps.who.int/iris/handle/10665/360950

- Resolution – Regional Committee for Europe, 72nd session. (2022). Seventy-second Regional Committee for Europe: Tel Aviv, 12–14 September 2022: **resolution: leveraging digital transformation for better health in Europe**: Regional digital health action plan for the WHO European Region 2023–2030. World Health Organization. Regional Office for Europe. https://apps.who.int/iris/handle/10665/362959

- Digital Health at WHO/Euro. https://www.who.int/europe/health-topics/digital-health#tab=tab_1

Thank you

For more information, please contact:

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World Health Organization
European Region

Scaling Digital Health Solutions for Transformation

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Leveraging Digital Health for Health Security

Investing in Digital Health Foundations

Summary of issues if foundations are not right

Weak digital health literacy, no specific university course

Lack of data exchange
Standards not in place and adopted

Lack of care continuity
Not always unique patient identification available

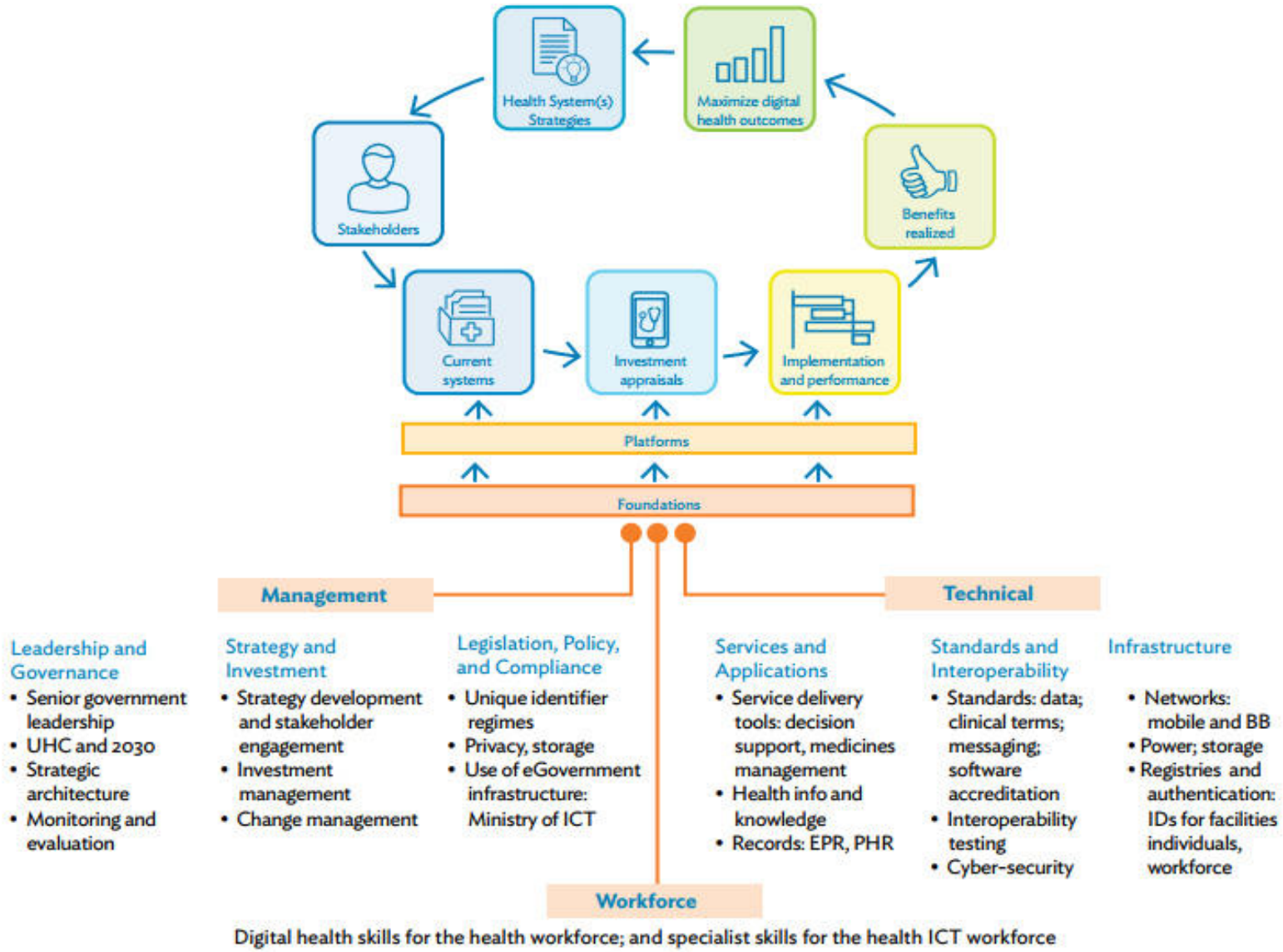
Lack of partnerships
Weak collaboration between private and public sector

Weak inter-agency collaboration
Especially between ICT Ministry and MoH

Fragmented health data
due to fragmented Information Systems

Lack of regulation
Mixed care providers with weak coordination

Strengthening foundations to scale digital health investments



BB = broadband, EPR = electronic patient/(medical) record, ICT = information and communication technology, ID = identity, PHR = personal heath record, UHC = universal health coverage. .

Source: ADB Guidance Investing in Digital Health

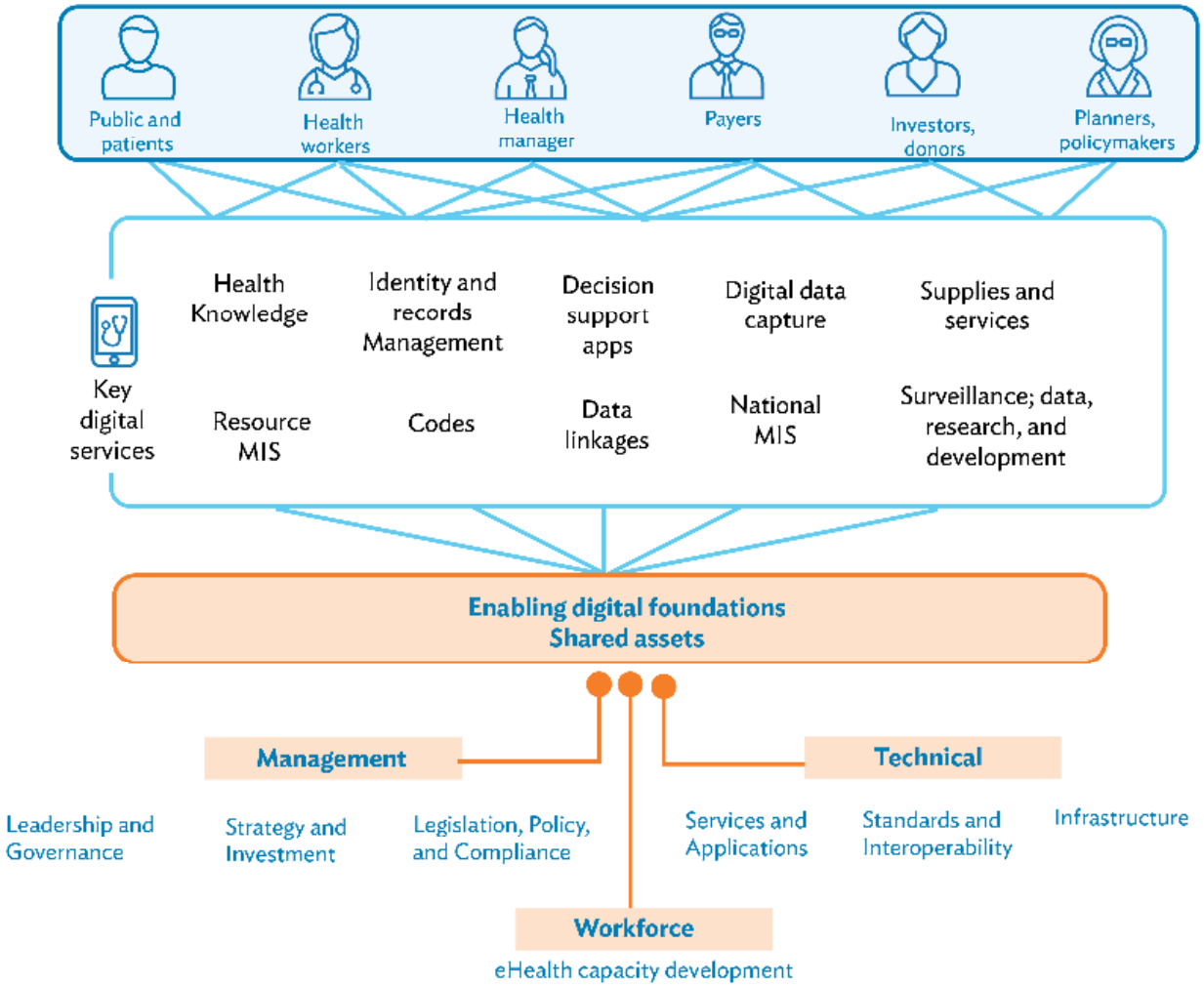
Laying governance and policy foundations

Legislation, Policy and Compliance
Privacy protection, electronic transmission and storage of data

Strategy and Investment
Digital Health Strategy, costing, investment case

Leadership and Governance
Governance structure, stakeholder engagement, monitoring

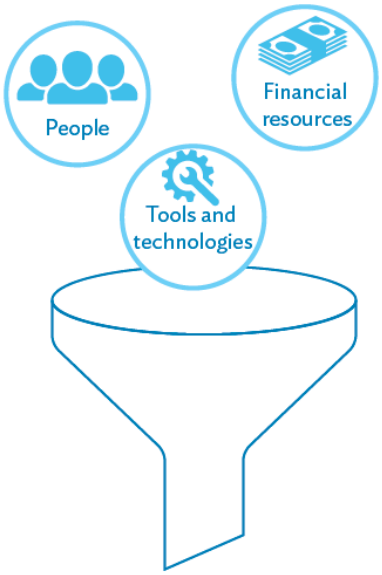
Stakeholders have some shared requirements, and these require shared assets to be well managed



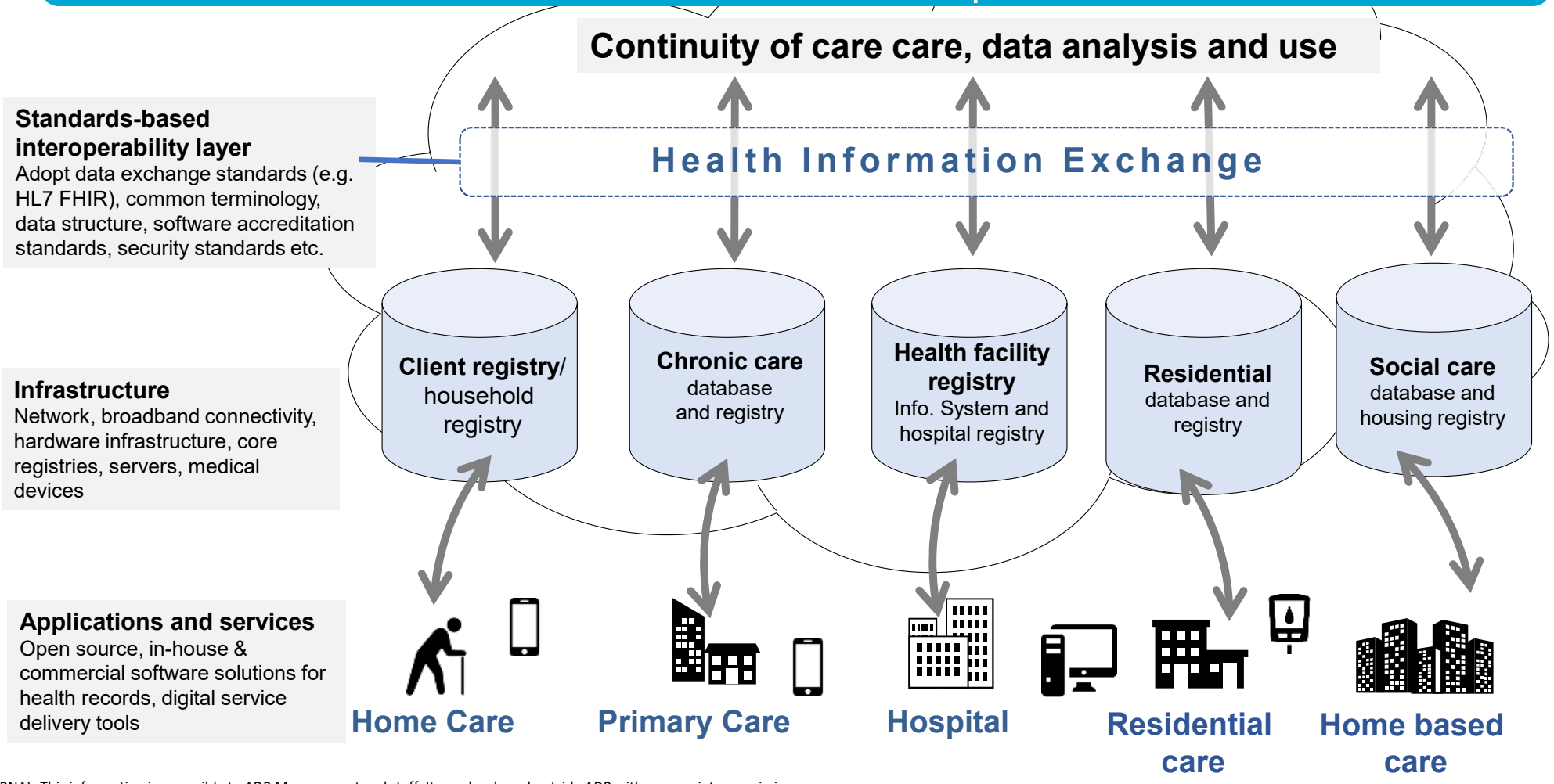
Bringing stakeholders together

Convergence meetings

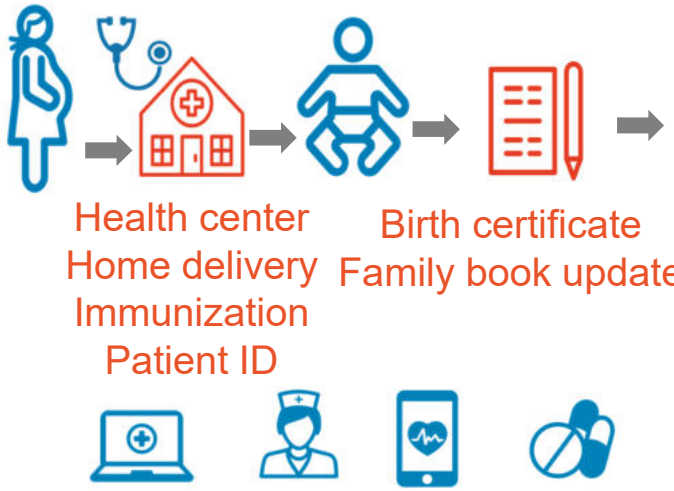
- Bringing different stakeholders together to support create a digital health vision.
- Digital Health solutions are often uncoordinated and fragmented, which can affect data quality.
- Objective is a comprehensive HIS, which improves health care quality, and decision making for health sector planning.
- The convergence workshop to identify mechanisms to strengthen HIS in the country.
- Carried out in several countries in Southeast Asia



Standards-based and interoperable governance framework and blueprint



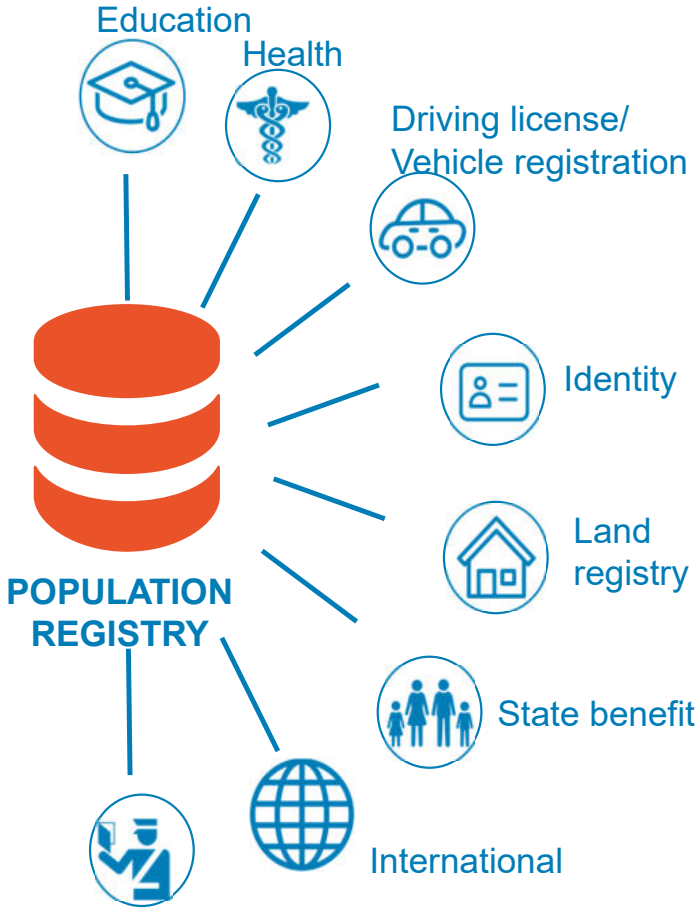
Health sector links with eGovernance



Health center
Home delivery
Immunization
Patient ID

Birth certificate
Family book update

CRVS



eHealth

eGovernment

Scaling Digital Health Solutions for Transformation

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Building Innovation Ecosystems

MRANTI
Malaysian Research Accelerator for Technology & Innovation

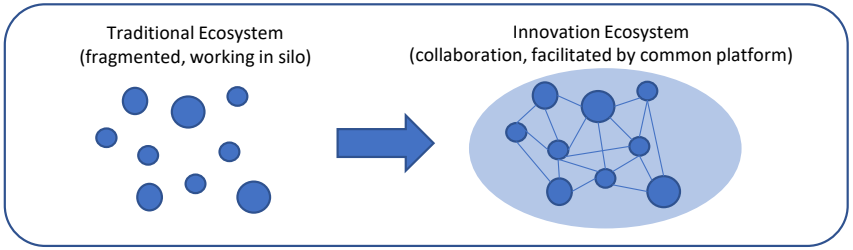
Digital Health Innovation Ecosystem in Malaysia

11th October 2022

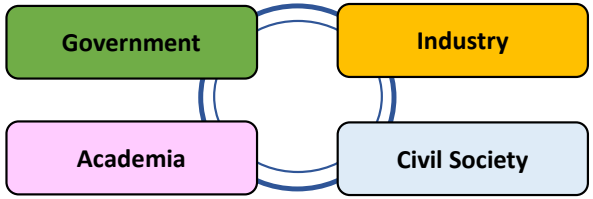
Hazwan Daut, Ph.D.
Head of Healthtech Hub,
Ecosystem Development Division

Enhancing Innovation Ecosystem for Digital Health in Malaysia – Our Journey

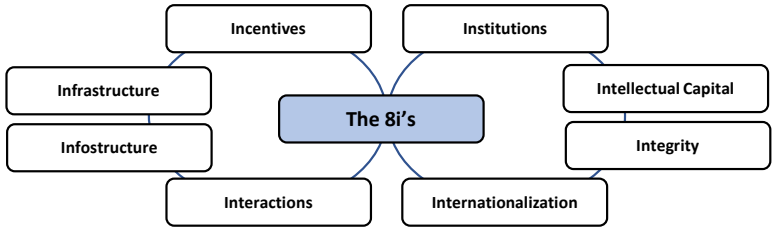
Step #1
Promote **Effective Collaboration** by Becoming a Neutral **Platform**



Step #2
Bring **Together** Relevant **Stakeholders** (Quadruple Helix Model) into the Ecosystem



Step #3
Continuously **Strengthening** the Ecosystem via **8i's** Ecosystem Analysis



Step #4
Run Innovation Acceleration and Capacity Building **Programs** to **Facilitate Innovation**

Enabling Innovation to See the Light at the End of the Tunnel – Sharing on Programs

Sharing on Some Government-Led Programs in Malaysia Run by Various Entities to Promote Acceleration in Digital Health Innovation

NTIS by MOSTI (MRANTI as Secretariat)

NATIONAL TECHNOLOGY & INNOVATION SANDBOX

Facilitate selected healthtech prototype to be tested in actual but controlled environment. Funding to conduct testing and validation is offered as part of the facilitation in this program.

i-Connect by Academy of Sciences Malaysia (ASM)

iConnect
Malaysian Collaborative Network for Innovation

Commercialization grant to enable quadruple helix collaboration in the area of health & wellness to develop and market any disruptive product within 18-month duration.

OHS RegLab by MOH (Futurise as Secretariat)

OHS RegLab
DIGITALISING HEALTHCARE FOR A BETTER FUTURE

Facilitate selected OHS companies to operate in a live and controlled environment, within specified parameters and time frame under close monitoring by MOH and regulators.

Various R&D Grant Schemes by MOSTI

Various grant scheme offered by the Ministry across all innovation stages (TRL1-9) to academia and industry (start-up & SME) with focus based on 10-10 MySTIE framework

Lessons in Overcoming Obstacles in Facilitating Digital Health Innovation

- Always get the right stakeholders to be involved

- Work with partners! Working alone will get you nowhere

- Have patience! The journey in digital health innovation is commonly longer than other areas

- Manage the expectations and be empathetic of healthcare professionals and patients!

- Regulatory is one of the biggest matters to be addressed.

- You won't fully know until you test it!

- Always assess the preparedness of ecosystem to adopt your tech

- There are right ingredients for effective collaboration, but not a single right recipe!

Thank You

Ideas to Impact

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Scaling Digital Health Solutions for Transformation

Understanding Evidence in Digital Health

Leveraging Digital Health for Health Security

Investing in Digital Health Foundations

Building Innovation Ecosystems