



A STUDY ON INDIA'S PREPAREDNESS FOR DIGITAL HEALTH AND LEARNING OPPORTUNITIES FROM UK

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Introduction

Digital health applies digital transformation to the healthcare field, incorporating software, hardware and services. “The broad scope of digital health includes categories such as mobile health (mHealth), health information technology (IT), wearable devices, telehealth and telemedicine, and personalized medicine.”

In any country, ensuring healthy lives and encouraging well-being are fundamental and critical demands (United Nations Sustainable Development Goal No. 3).

Advanced and specialized healthcare is still a privilege for rural India, which makes up about two-thirds of our population. Only 13% of the people in rural India have access to a primary health centre, 33% to a sub-center and 9.6% to a hospital.

To address the inadequate healthcare infrastructure—leading to a supply-demand imbalance in India—digital transformation is likely to improve availability, accessibility, affordability, and the quality of healthcare

Preparedness in terms of digital health means the ability to smoothly imbibe the digitalisation of health data in initiative with the least resistance from the stakeholders and associated systems for its effective and sustainable use to achieve the targeted outcomes.

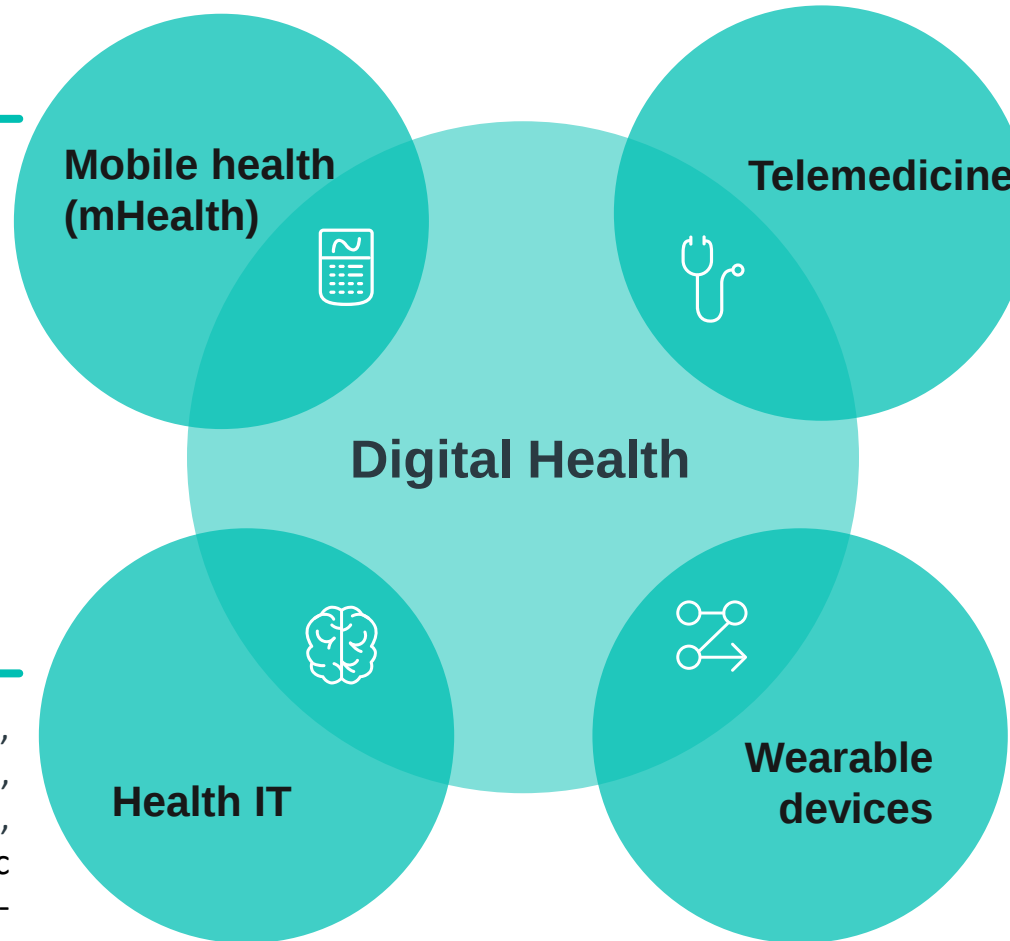
It is important to identify and analyse the various indicators for preparedness of India for digital health as India is at the cusp of digital health transformation and this can propel the country's economic growth and set an example for emerging economies if managed well.

Mobile Health (mHealth)

WHO has defined Mhealth as the "use of mobile and wireless technologies to support the achievement of health objectives." The term is most commonly used in reference to using mobile communication devices, such as mobile phones, tablet computers and personal digital assistants (PDAs) for health services, information, and data collection.

Health IT

Health IT is the use of computer hardware, software, or infrastructure to record, store, protect, and retrieve clinical, administrative, or financial information. It includes electronic health records, electronic medical records, e-prescribing with a secure exchange of health information between consumers, providers, payers, and quality monitors by using artificial intelligence and machine learning.



Telemedicine

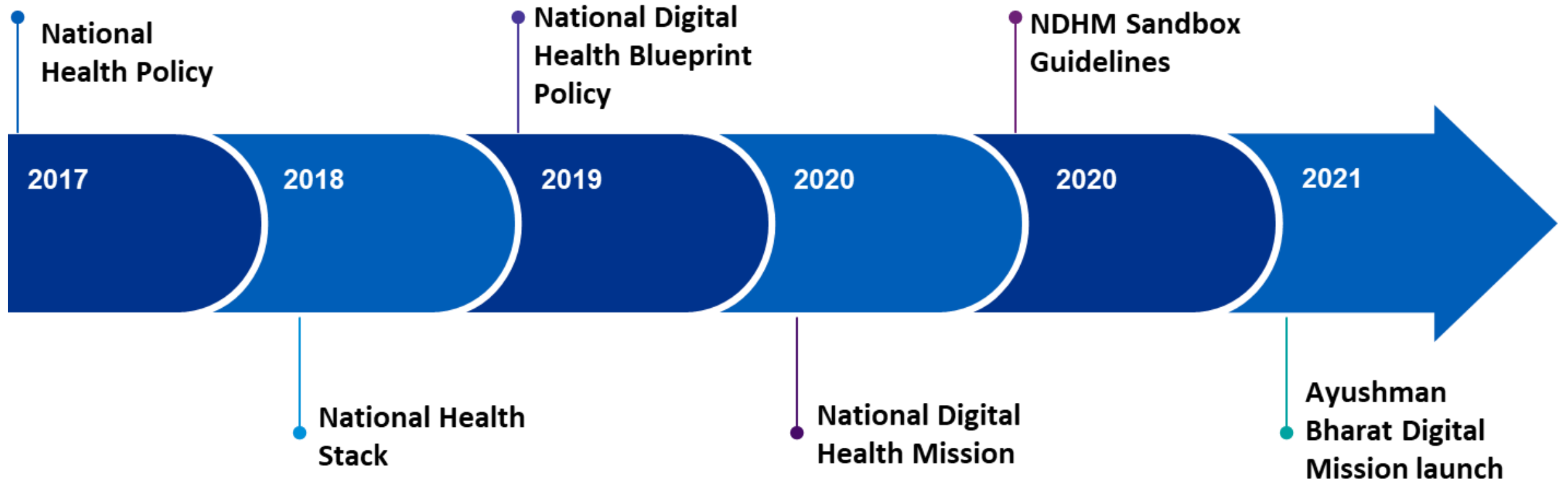
Telehealth broadly refers to electronic and telecommunications technologies and services used to provide care and services at a distance.

Telemedicine is the practice of medicine using technology to deliver care at a distance.

Wearable Devices

Wearable technology comes in many forms including smartwatches and on-body sensors. These technologies are used to gather the data on patients during the day.

DIGITAL HEALTH JOURNEY OF INDIA



Key Levers of Digital Health Transformation in India

National Digital Health Blueprint (NDHB)

National Digital Health Blueprint (NDHB) provides a framework for the evolution of Digital Health Eco-system in the country. It contains a high-level action plan designed as a layered framework, with the Vision and a set of Principles at the core, surrounded by the other layers relating to Digital Health Infrastructure, Digital Health Data Hubs, Building Blocks, Standards & Regulations, and an Institutional Framework for its implementation.

Digital Information Security in Healthcare Act (DISHA)

Digital Information Security in Healthcare Act (DISHA) aims to provide for establishment of National and State eHealth Authorities and Health Information Exchanges; to standardize and regulate the processes related to collection, storing, transmission and use of digital health data; and to ensure reliability, data privacy, confidentiality and security of digital health data and such other matters related and incidental thereto.

Personal Data Protection Bill (PDPB)

Personal Data Protection Bill, 2019 ("PDPB") aims to provide protection of privacy of individuals relating to their Personal Data and to establish a Data Protection Authority of India for said purposes and matters concerning personal data of an individual. Organizations will have to review and update data protection policies and implement appropriate technical and organizational measures to prevent misuse of data.

National Health Stack (NHS)

National Health Stack is designed to provide the foundational components that will be required across health programs in India. NHS is a nationally shared digital infrastructure usable by both public and private sectors, to bring a holistic view across multiple health verticals and enable rapid creation of diverse solutions in health, including digital health: Electronic Registries, Claims & Coverage platforms, Federated PHR, Health Analytics Platform.

National Digital Health Standards (NDHS)

National Accreditation Board for Hospitals and Healthcare Providers (NABH) has setup a drafting committee for NDHS. Digital Health Standards aims to consider all relevant aspects of the application of patient interfacing technologies across the continuum of care applicable for outpatient, inpatient, and remote patient monitoring. Digital Health Standards will also act as a catalyst in the faster adoption of technology

National Program on Artificial Intelligence

National Program on AI has been set up with a view to guide the research and development in new and emerging technologies. The research would focus to encourage Big Data, cybersecurity and Robotics and explore use cases in healthcare in the areas of AI driven diagnostics, personalised treatment, early identification of potential pandemics, and imaging diagnostics, among others.

UK-India Digital Health Partnership visions for revitalized and dynamic connections between both the countries; re-energized trade, investment and technological collaboration that improves the lives and livelihoods of citizens; enhanced defense and security cooperation that brings a more secure Indian Ocean Region and Indo-Pacific and India-UK leadership in climate, clean energy and health that acts as a global force for good. These reforms form the bedrock of the digital transformation in the healthcare sector of the country and have opened multiple avenues for national as well as international businesses working in this domain.





Objectives

Objective 1

To assess the preparedness of India for digital health using various indicators

Objective 2

To analyse the possible learning prospects of India in digital health from UK

Study Design:
**Descriptive Cross-Sectional
Study**



Study Frame:
Healthcare Professionals
Age – 18 years and above
Both males and females



Duration:
21.03.2022-
30.06.2022

Sampling Technique:
Convenience Sampling



Sample Size:
102



Data Collection



- Primary data collection
- A self-administered online survey google form was used as a tool to gather the primary data.
- Social media apps (whatsapp, facebook) were used to reach out to respondents
- Data was analysed in terms of percentages using MS Excel and represented in the form of graphs.



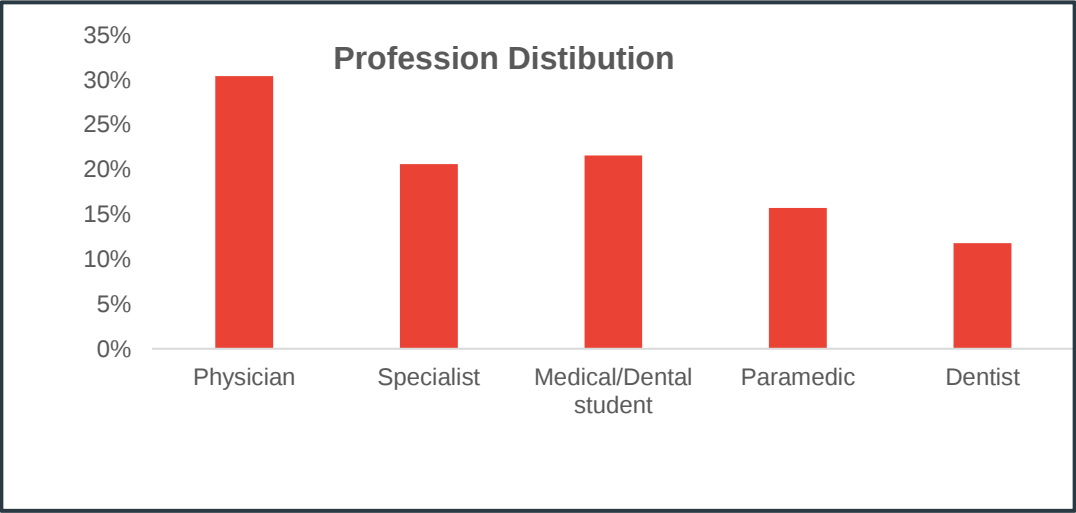
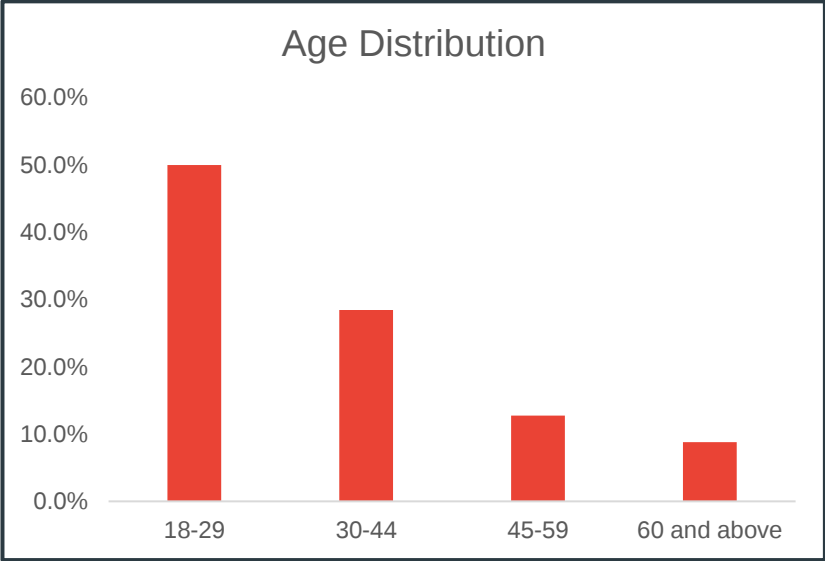
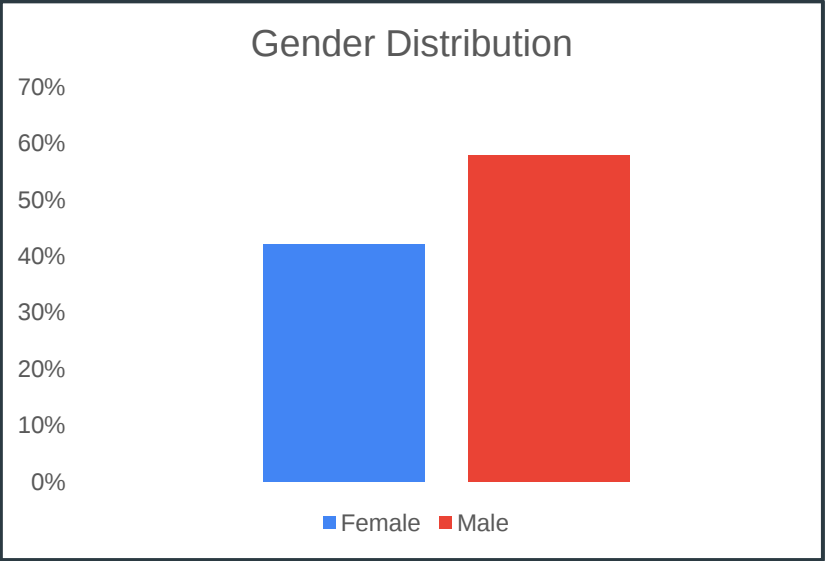
- Secondary data collection
- Search engines like PubMed, Research gate, Google scholar, Direct science were used
- 25+ papers were reviewed
- Official government websites of India and UK and reports from Big4 on digital health were used

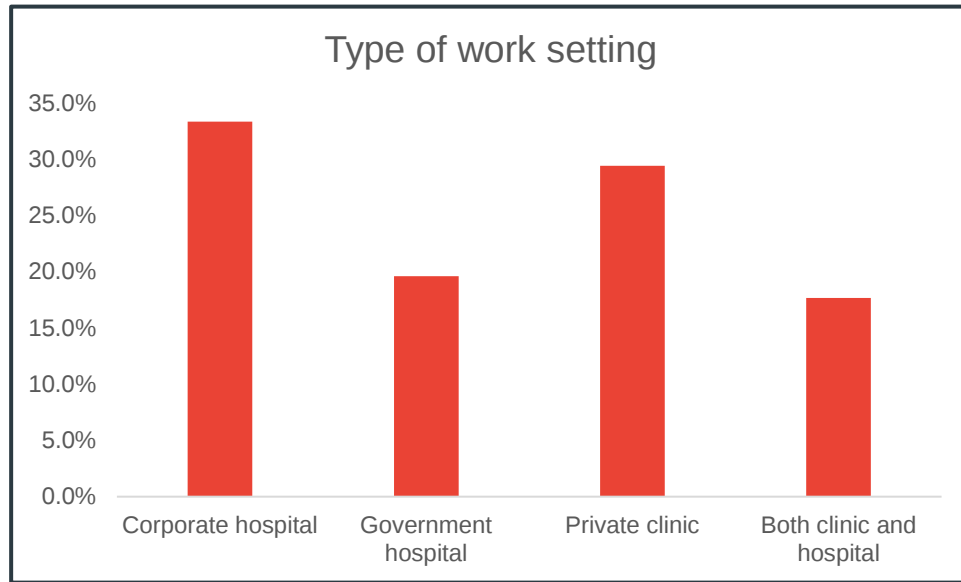


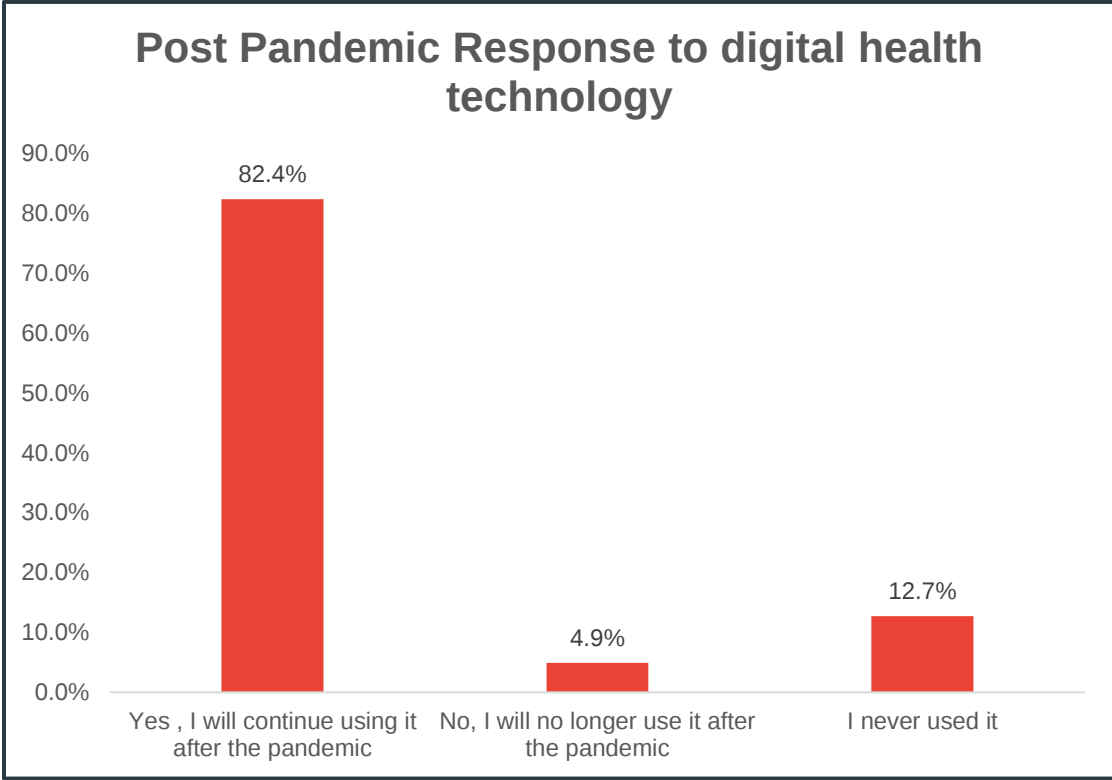
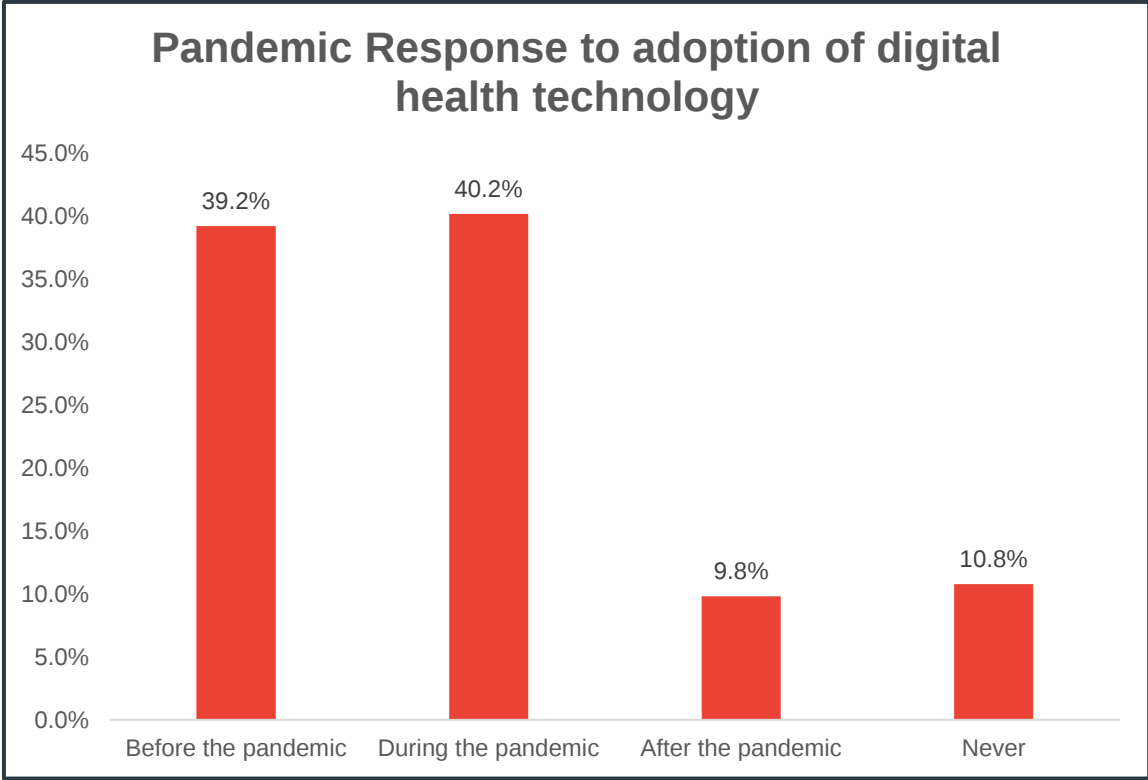
RESULTS AND ANALYSIS

INDICATOR 1 : ADOPTION AND UTILISATION OF DIGITAL HEALTH

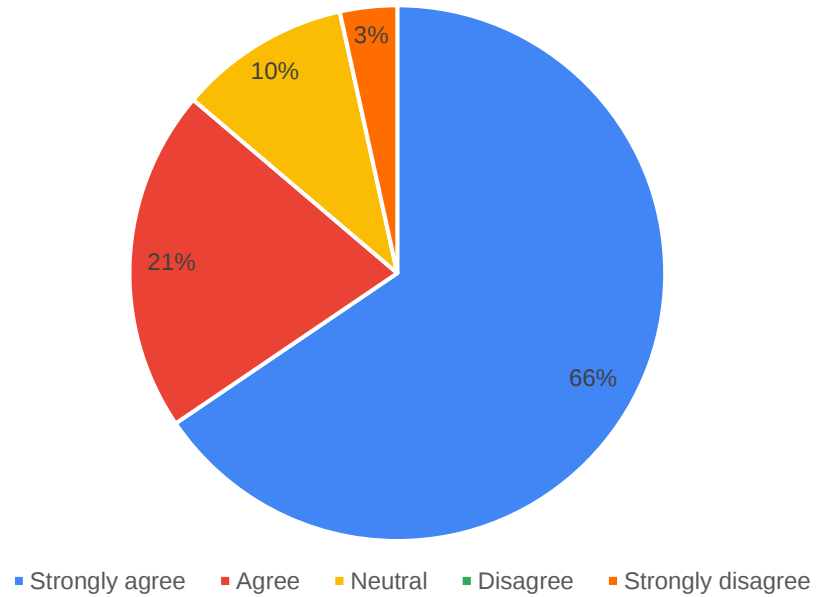
Sociodemographic Characteristics



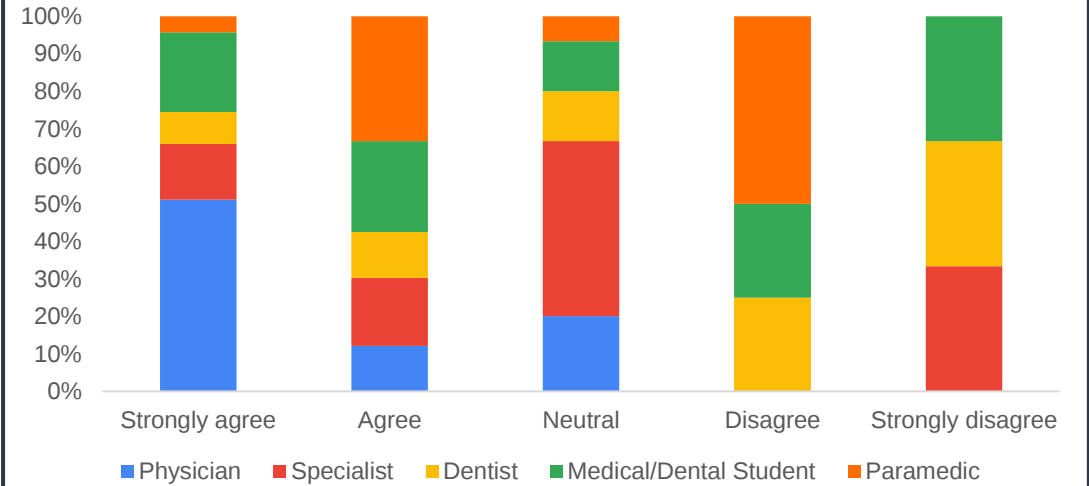




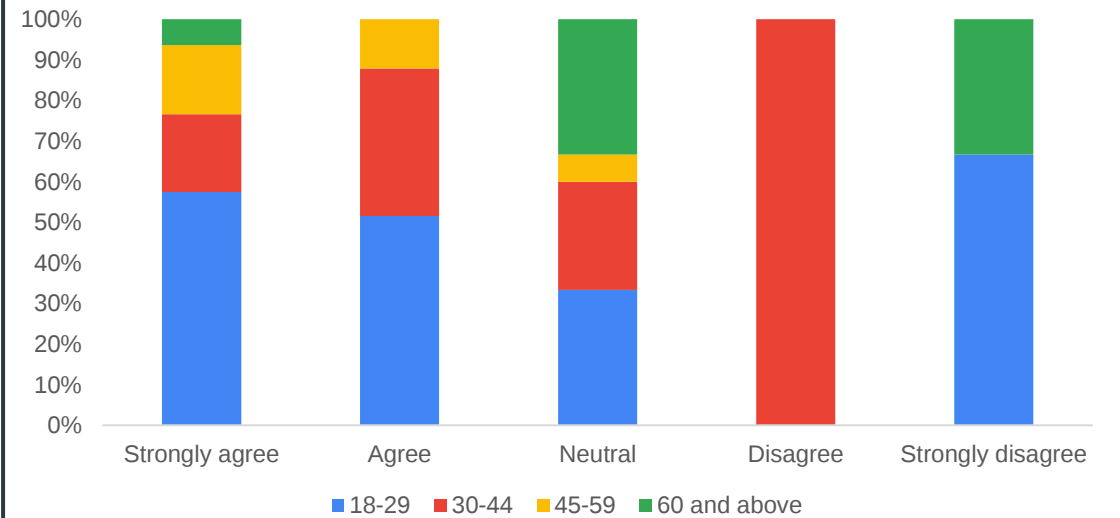
Understanding of digital health



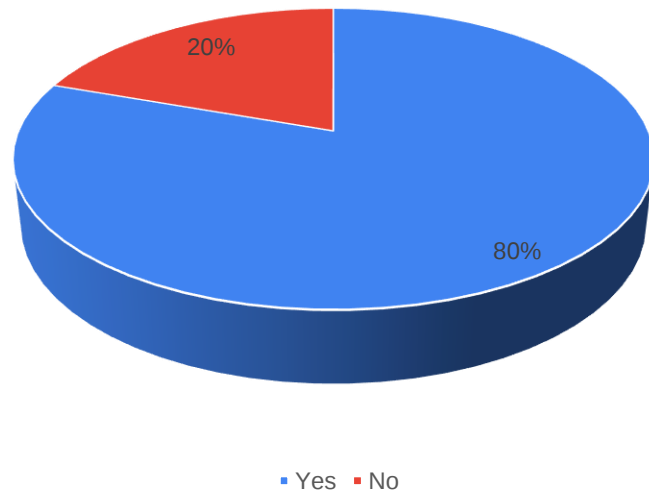
Profession-wise understanding of digital health



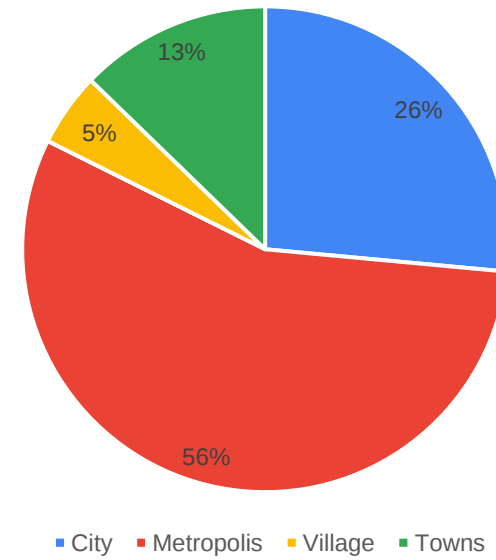
Age-wise understanding of digital health

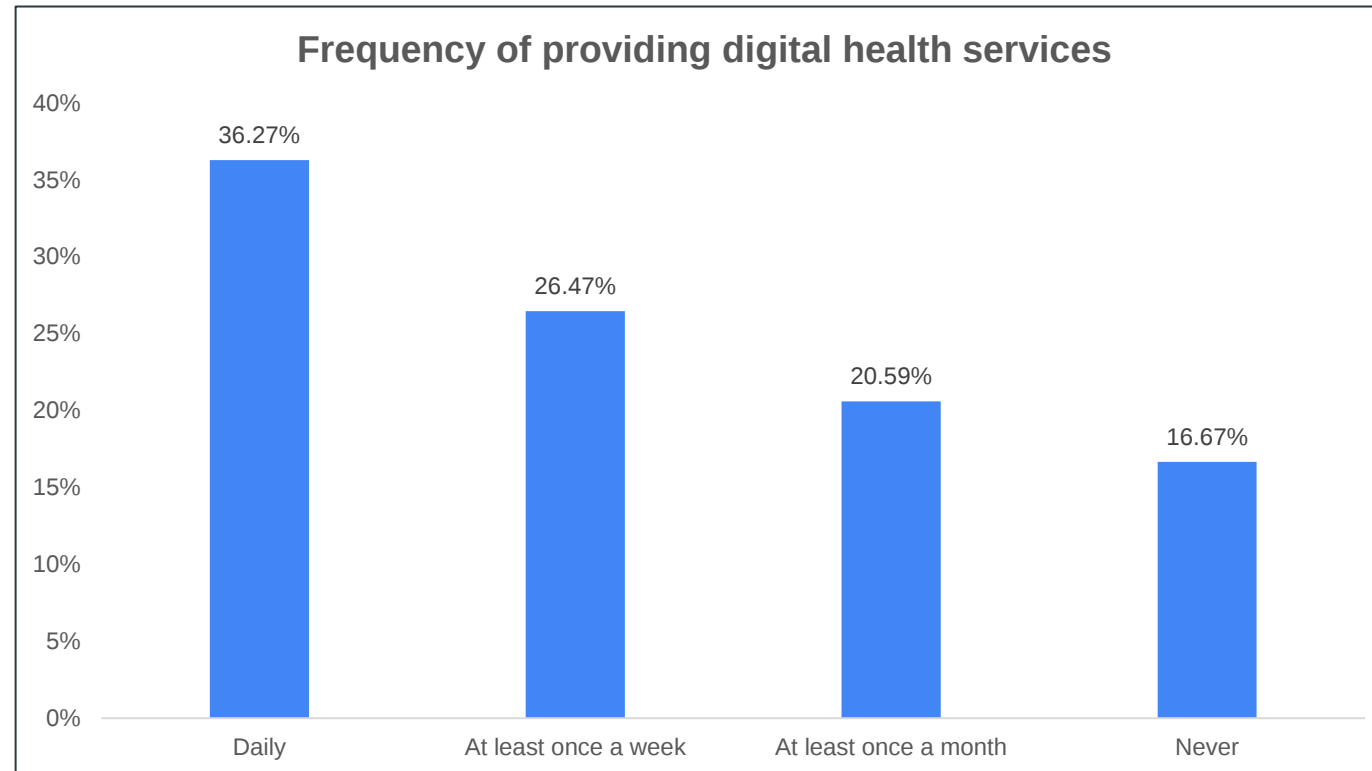


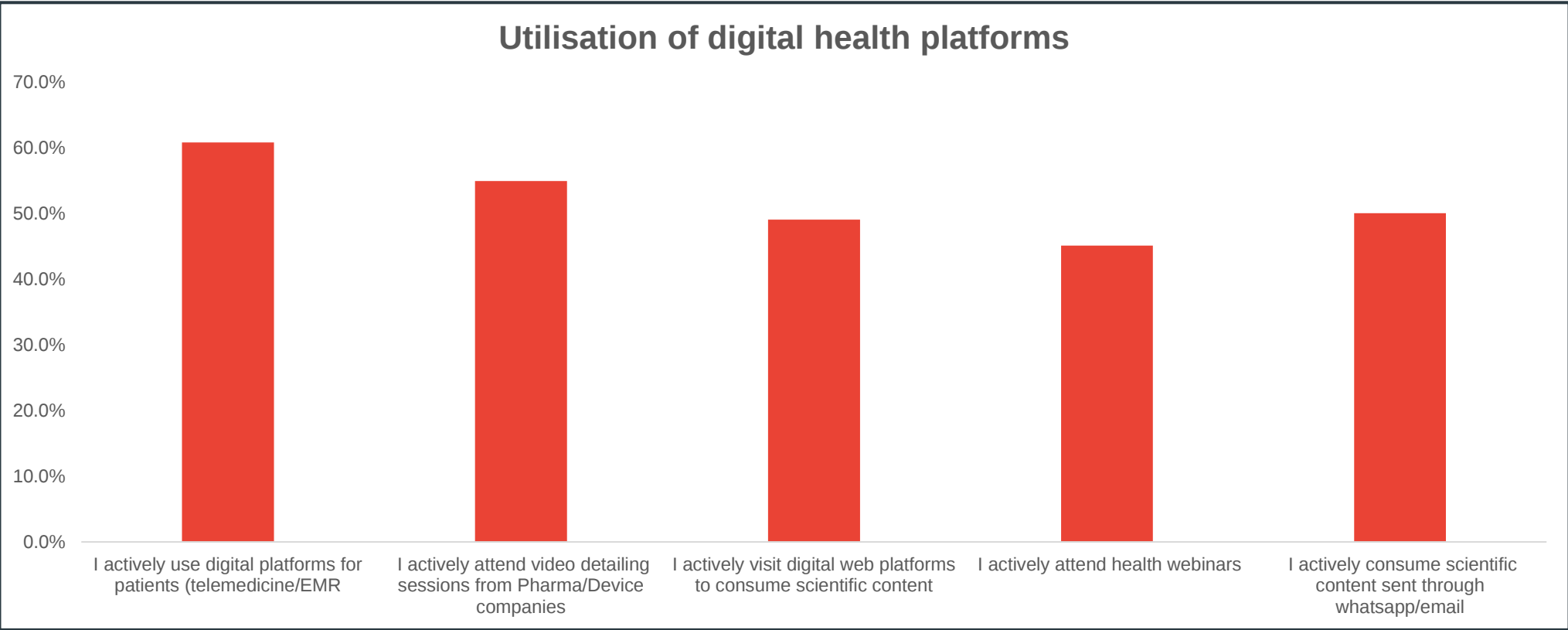
Awareness about NDHM amongst HCP



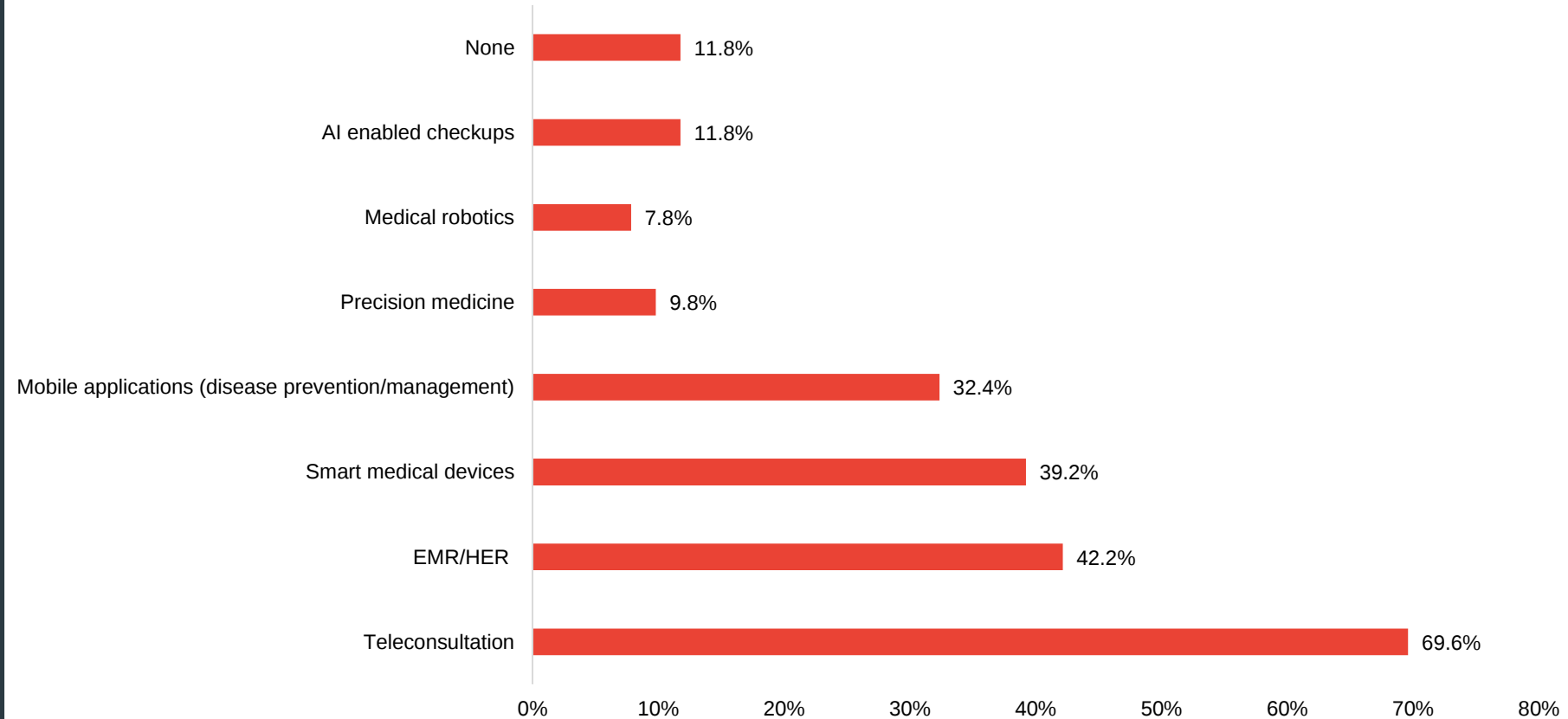
Population catered through digital health



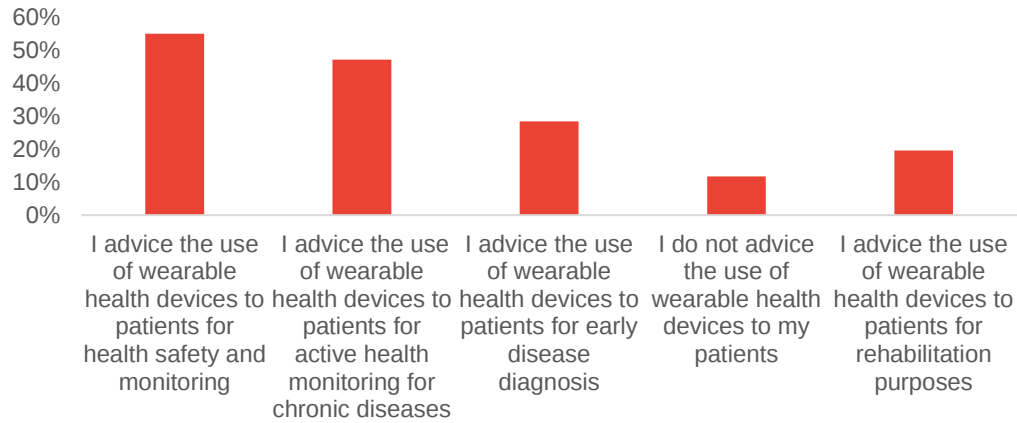




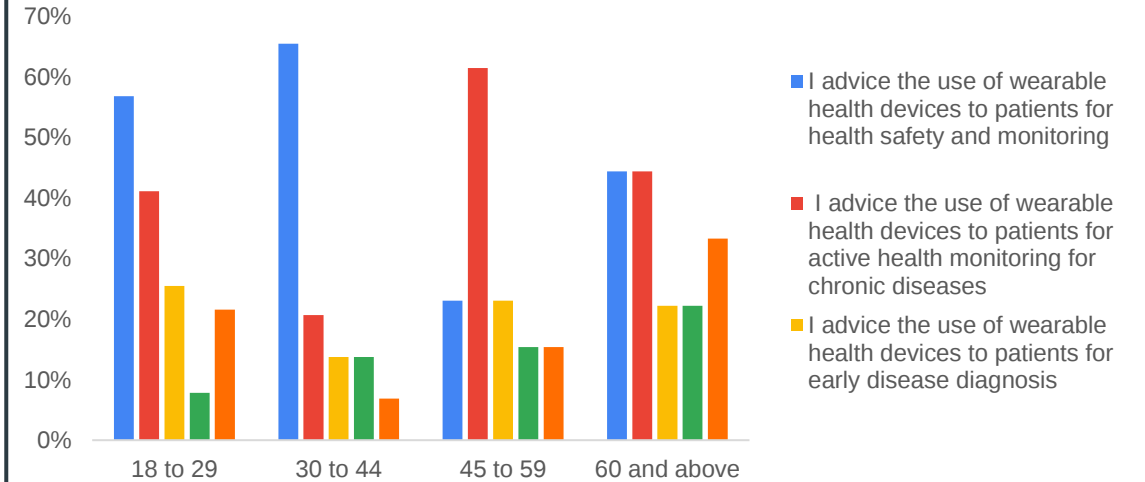
Type of digital health technology used in clinical practice



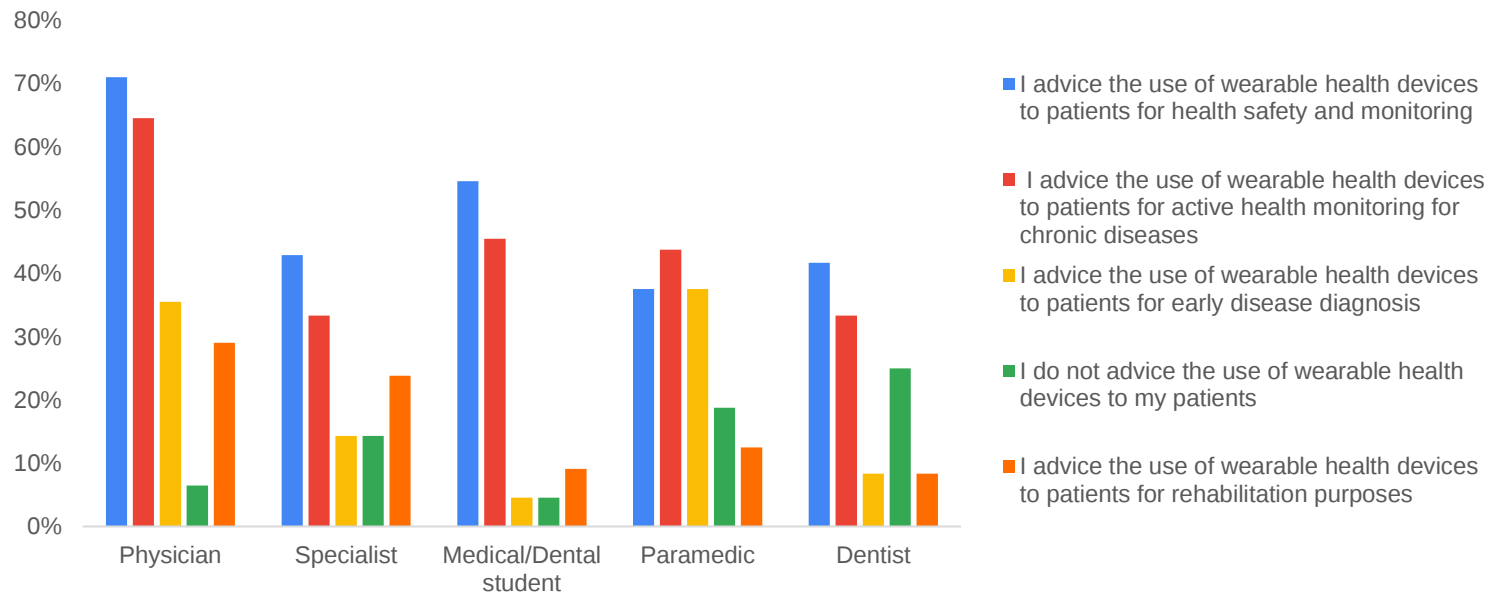
Advice on the use of wearable devices

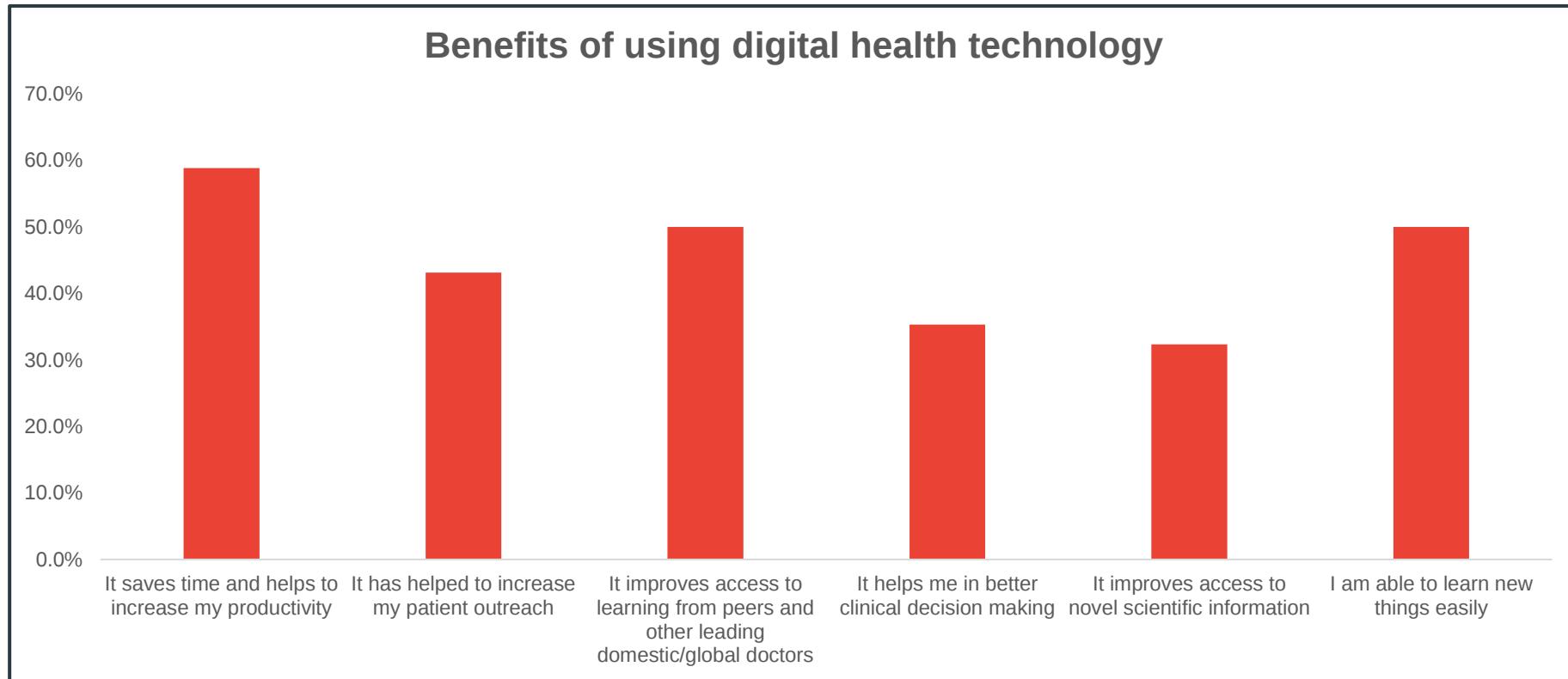


Advice on wearable devices w.r.t age

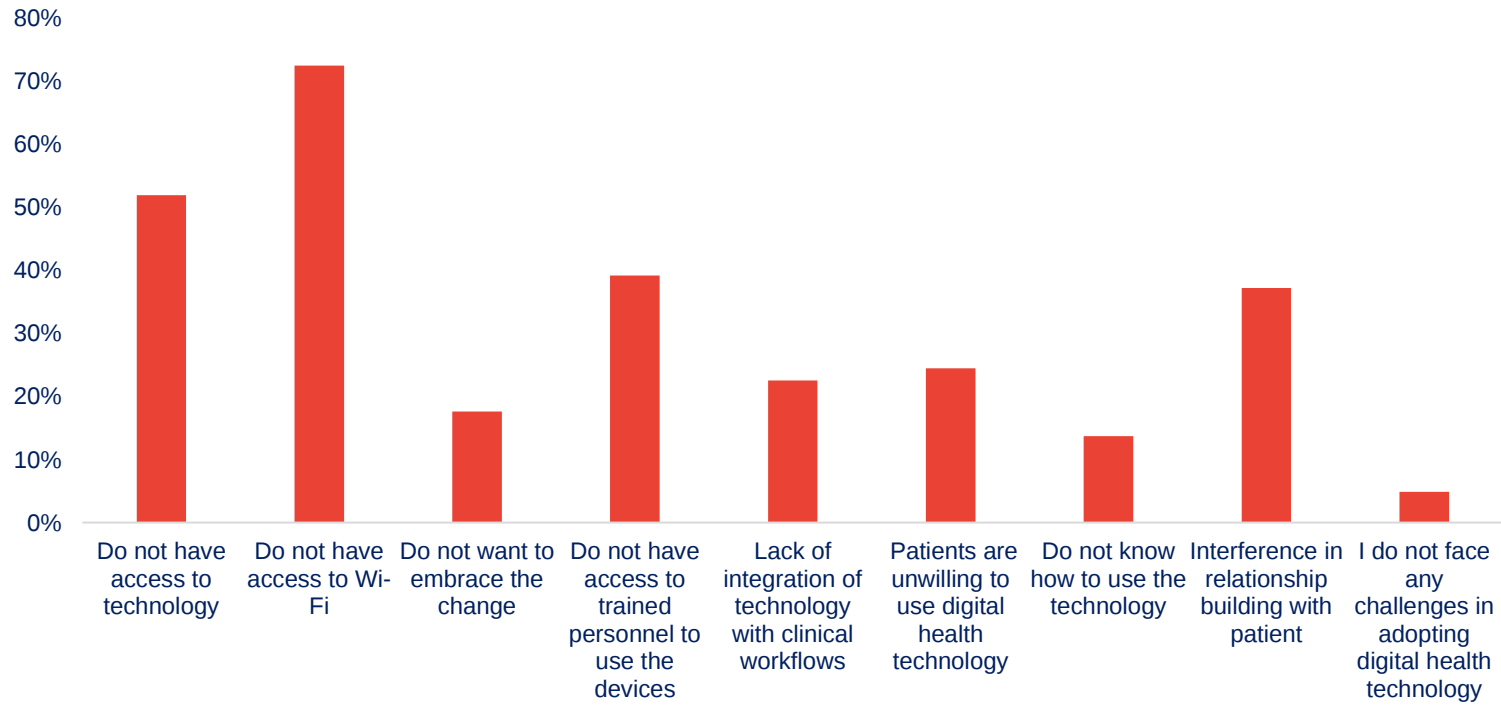


Advice on the use of wearables w.r.t profession

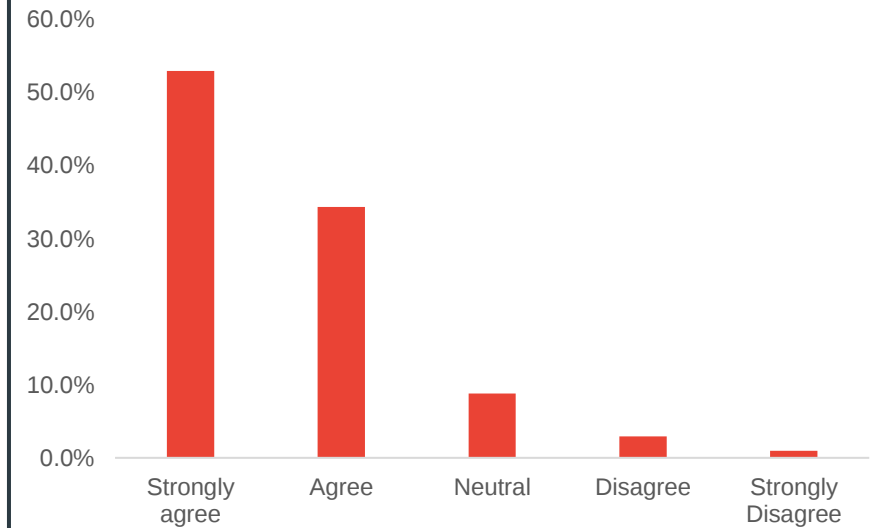




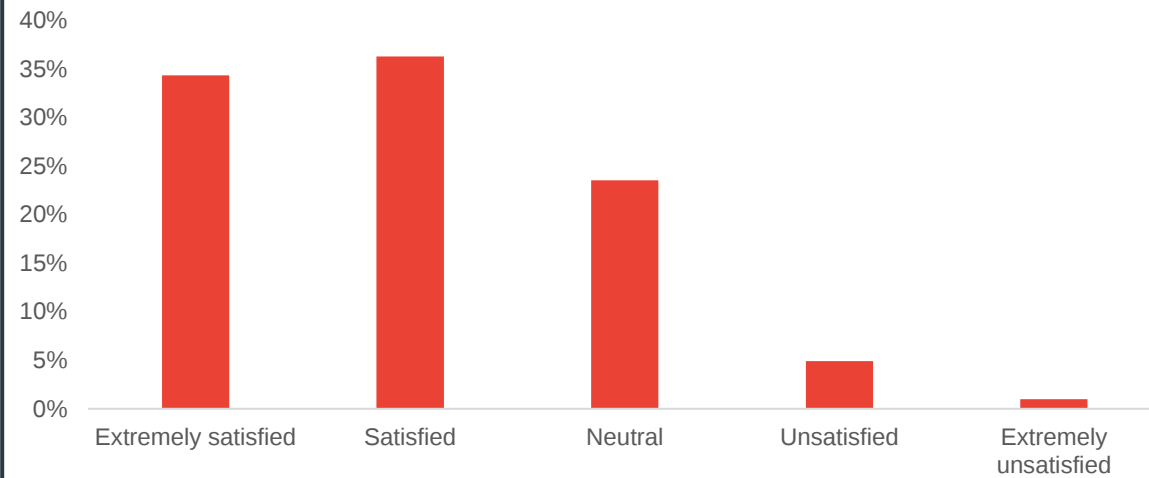
Barriers in adoption of digital health



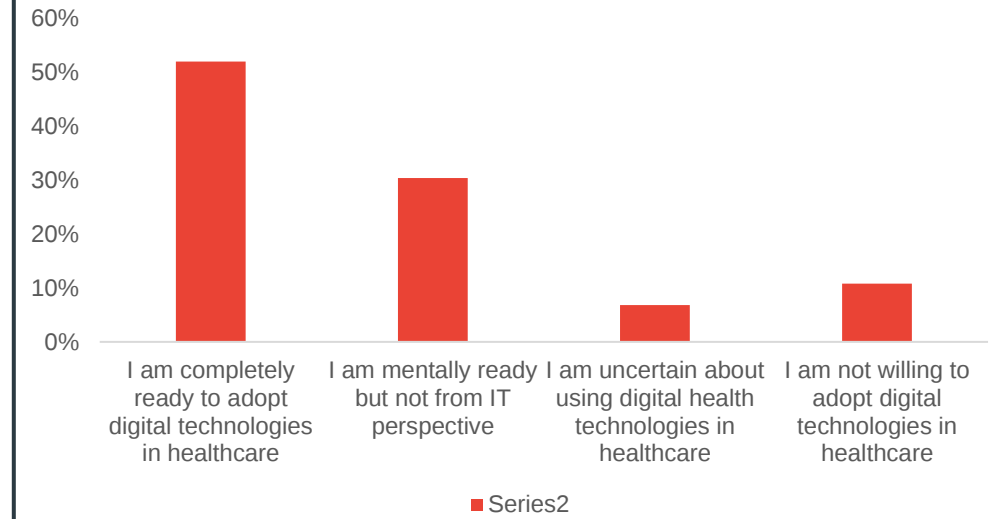
Requirement of official training of digital health technology

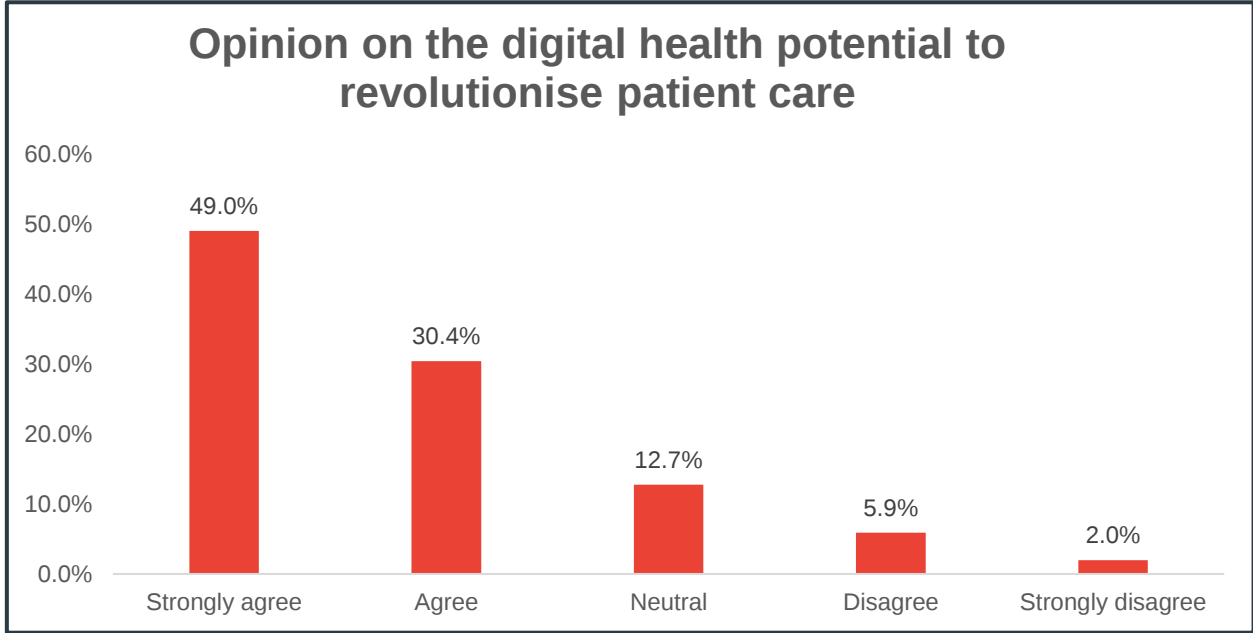
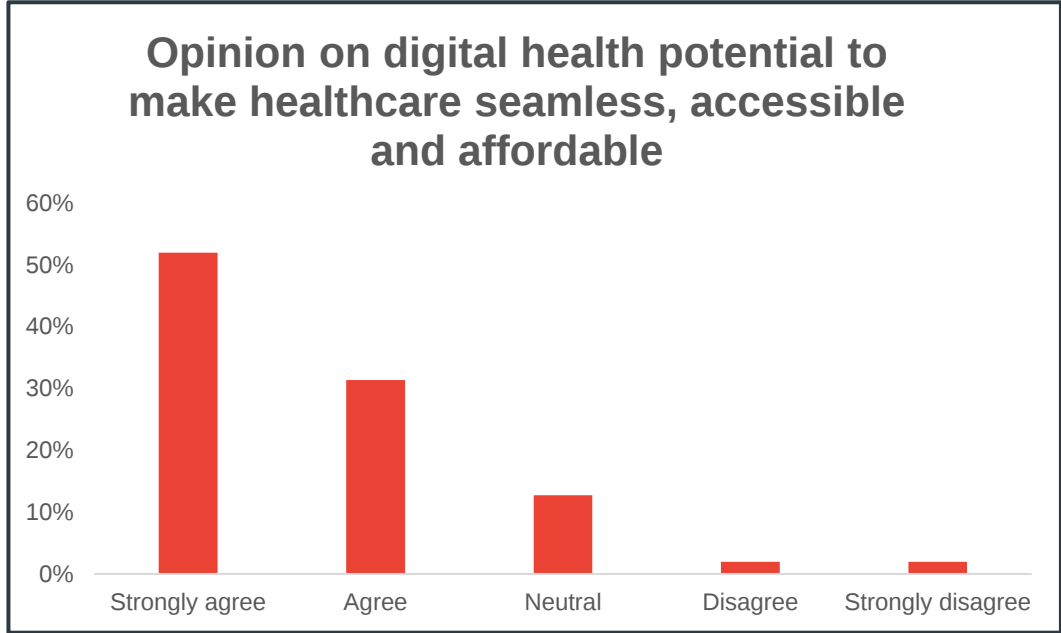


Satisfaction of health professional in using digital health technology

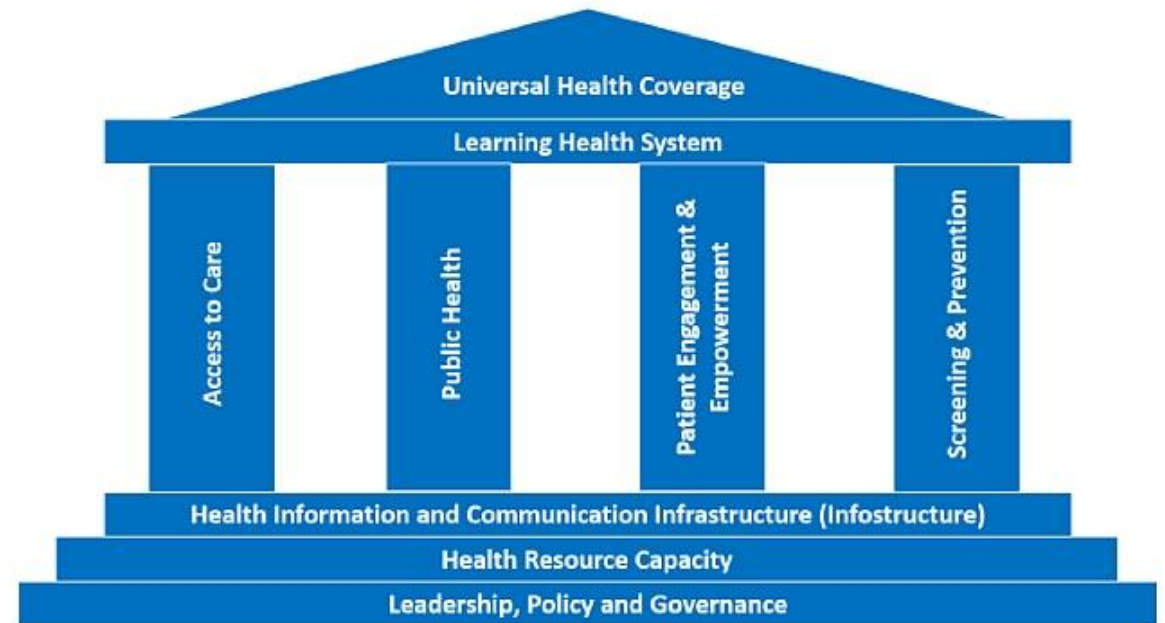


Readiness to adopt digital technology





INDICATOR 2 : INFRASTRUCTURE READINESS FOR DIGITAL HEALTH

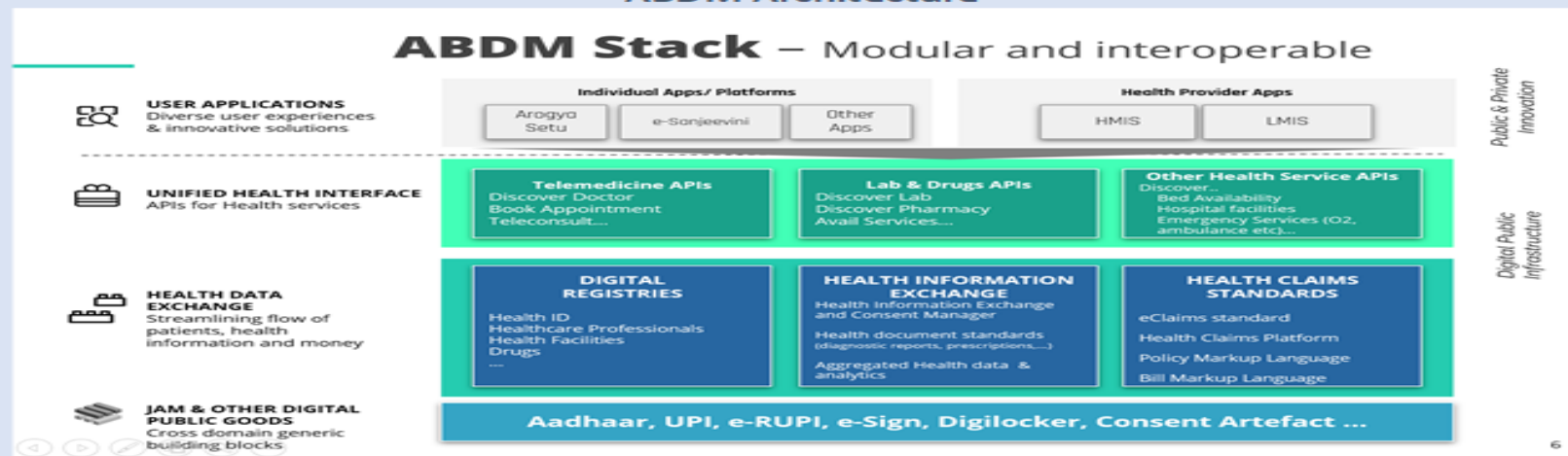


ABDM Building Blocks

The design of the building blocks of ABDM will adopt and conform to India Enterprise Architecture Framework (IndEA) by default.

#	Building Block	Details	Current Status
1	Health ID	Creation of a Digital Health ID for all citizens through which store, access and share their health data. This Health ID may be linked to the Aadhar and/or the mobile number of the individual	Now known as Ayushman Bharat Health Account Link: https://healthid.abdm.gov.in/ Open for voluntary registration
2	Healthcare Professionals Registry (HPR)	Both public and private health facilities, such as hospitals, clinics, diagnostic laboratories and imaging centres, pharmacies can register under the ABDM. Upon registration, the policies under the ABDM shall be binding and the Health Facility shall digitise their systems accordingly	Link: https://facility.ndhm.gov.in/ Open for voluntary registration
3	Health Facility Registry (HFR)	Individual healthcare providers may register themselves under the ABDM. Professionals involved in healthcare services, both modern and traditional, can get online presence and visibility	Link: https://hpr.ndhm.gov.in/en Open for voluntary registration
4	ABHA Mobile App(PHR)	A PHR is an electronic record of health-related information on an individual The most salient feature of the PHR, and the one that distinguishes it from the EMR and EHR, is that the information it contains is under the control of the individual	Available on play store to download

ABDM Architecture



INDICATOR 3: EXISTING REGULATIONS AND POLICIES FOR DIGITAL HEALTH IN INDIA



Name of the Policy/Act	Policy/Act Brief	Remarks
A. General Acts and Guidelines		
Drugs and Cosmetics Act (DCA)1940 read with Drugs and Cosmetics Rules 1945 and Draft E-Pharmacy Rules, 2018	Administered by: Central Drugs Standard Control Organization (“CDSCO”), headed by the Drug Controller General of India (“DCGI”) Act: DCA requires that all drugs must be sold under a license. The drugs can be sold only on the production of a prescription issued by a registered doctor, which implies that there is a distinction between prescription and non-prescription drugs	E-pharmacies are regulated on the basis of this principle in India. In March 2020, in the light of the COVID-19 pandemic, the Health Ministry issued a notification permitting doorstep delivery of drugs. It is currently unclear how long this notification would be in effect and whether similar home delivery models would be permitted once the COVID-19 pandemic subsides.
The National Medical Commission Act, 2019 and The Indian Medical Council (Professional conduct, Etiquette and Ethics) Regulations, 2002	Administered by: National Medical Commission Act: Only those persons who have a recognized degree in medicine and having passed the National Exit Test will be eligible to enrol with the State or National Registers to obtain a license for practising medicine in India	The provisions of the NMC Act and the MCI Code are applicable to digital health applications to the extent that the services involve the delivery of healthcare by a physician to Indian patients.
Telemedicine Practice Guidelines, 2020	Issued by: Board of Governors instituted by the Central Government for regulating medical education and the medical profession in India in partnership with NITI Aayog Enable medical practitioners to practice telemedicine in any part of the country.	Part of the MCI Code and are therefore binding on medical practitioners practicing allopathic medicine. Only a stop gap measure put in place due to the exigencies of the COVID-19 pandemic until a more comprehensive regulation can be put in place*

A. Under ABDM		
The Health Data Management Policy, 2020 (“HDM”)	As per the HDM, three separate Health IDs- for patients (Health ID), medical practitioners (Health Practitioner ID) and clinical establishments (Health Facility ID) will be created. The HDM Policy also gives the patient complete ownership over the health data and lays down a framework for how this data may be utilized	The ABDM will link all patient data with a single Health ID making it easier for both patients and healthcare practitioners to access their medical history when making clinical decisions. The data may also be utilized in an anonymized form to better understand trends in public health and assist the government in making data-driven policy decisions in the healthcare space
Sandbox	ABDM Sandbox is a framework that will allow technologies or products to be tested in the contained environment in compliance with NDHM standards and judge the consumer and market reactions to the same before introducing it on a larger scale. The benefit of enrolling in the Sandbox is to test the product without a large-scale roll out and allows for experimentation of products on a wider range of consumers.	Only firms or entities incorporated or registered in India or licensed to operate in India can enter the sandbox after demonstrating compliance with applicable laws on data protection and privacy including the proposed laws. However, it must be noted that the Sandbox is not a legal waiver and the entity will still be liable to consumers and for any violation of applicable regulations.
Proposed Health Data Retention Policy	It proposes the health data retention framework for the ABDM architecture. . The passage of a health data retention policy would create uniform principles for the retention, use, storage and accessibility of health data in line with international best practices	The National Health Authority invited comments from the public on its Consultation Paper on proposed Health Data Retention Policy (“Consultation Paper”) released on November 23, 2021. The Consultation Paper also considers the applicability of the proposed health data retention policy to the entire healthcare system

A. Data Protection			
i	The Information Technology Act, 2000, The Information Technology (Reasonable security practices and procedures and sensitive personal data or information) Rules, 2011 and the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021	The patient's personal information, such as medical history and physiological conditions, are considered Sensitive Personal Data or Information ("SPDI") under the Information Technology (Reasonable security practices and procedures and sensitive personal data or information) Rules, 2011 ("Data Protection Rules") issued under the Information Technology Act, 2000 ("IT Act").	
ii	The Clinical Establishments (Registration and Regulation) Act, 2010, Clinical Establishments Rules, 2012, and Electronic Health Record Standards, 2016	Issued under the CE Act requires clinical establishments to maintain Electronic Health Records ("EHRs") in accordance with standards determined by the Central Government. The Electronic Health Record Standards, 2016 ("EHR Standards") has been formulated for the creation of a uniform standard-based system for EHRs in India.	The EHR standards will be applicable to Digital Health Entities which fall under the ambit of the CE Act.
iii	Data Protection Bill, 2021	The DPB is intended to be an exhaustive data protection law. It proposes to regulate the collection and processing of both personal data and non-personal data (including anonymized and de-identified data).	The Joint Parliamentary Committee has tabled its report on the data protection on the Personal Data Protection Bill, 2019 ("PDP Bill") in Parliament in December 2021. The report recommends several changes to the PDP Bill including renaming the draft to Data Protection Bill, 2021 ("DPB")

INDICATOR 4: FINANCIAL INVESTMENTS OVER SUCCESSIVE YEARS



Financial investments over successive years

The budget allocation in 2019-2020 fiscal, for healthcare sector is Rs 62,659.12 crore which has been the highest in the last two financial years with an increase of around 19 per cent from the last year. Out of the total budget, Rs 6,400 crore have been earmarked for the centre's flagship health insurance scheme Ayushman Bharat- Pradhan Mantri Jan Arogya Yojna (AB-PMJAY). Rs 249.96 crore has been allocated for setting up Ayushman Bharat Health and Wellness Centres under the National Urban Health Mission to provide comprehensive primary care close to the community. Under the programme, nearly 1.5 lakh sub-centres and primary health centres will be transformed as health and wellness centres by 2022. HWC mark a step forward towards digitalisation of healthcare for the government as it includes provision of teleconsultation services and require a robust Health IT infrastructure.

In 2020-2021 fiscal, the health sector was allocated a budget of Rs 67,112 crores which marks an increase of only 3.9% from 2019-2020

The year 2020 marked the launch of National Digital Health Mission (NDHM). As of July 2020, the budget disbursed by the Ministry of Health and Family Welfare, for the implementation of the National Digital Health Mission in India, amounted to approximately 1.4 billion Indian rupees.

Digital ICT system along with application development accounted for the highest values with 660 and 220 million Indian rupees respectively.

While under NDHM, the budget allocated for Health IDs for 2020-21 was ₹1.06 crores, only 50% of it i.e., ₹52.02 lakhs were utilised by the end of the year.

Financial investments over successive years

Post pandemic, in the year 2021, health and well-being have been given top priority by the government in the union budget with an impressive increase of 137% over the previous year's health sector budget. A massive outlay of US\$ 31,030 million¹ was allocated to this sector. In **Budget 2021**, India's public expenditure on **healthcare stood at 1.2% as a percentage of the GDP.**

In terms of **revenue**, the **digital healthcare market in India was valued at INR 116.61 Bn in 2018 and is estimated to reach INR 485.43 Bn by 2024**, expanding at a compound annual growth rate (CAGR) of ~27.41% during the 2019-2024 period. An **investment of Rs 64,000 crore** will be made in improving health infrastructure in the country.

Overall, health budget estimates for 2022-2023 stand at over Rs 86,600 crore, up merely 0.8% over the current fiscal's revised estimates of Rs 85,915 crore and 16% over the budgetary estimates.

The union budget of 2022-2023 has given healthcare a much-needed digital push. The budget focuses on rolling out an open platform for the National Digital health Ecosystem (NDHE), setting up of National Telehealth Mental Scheme, incentivising health-tech start-ups, unique health identities and digital health registries.

Financial investments over successive years

The increasing importance of digital health and technologies has fuelled capital investments. In 2019, 53% of angel investments were made in healthcare. In the first quarter of 2020, the healthcare sector witnessed a 50% increase in terms of volume (21 deals versus 14 deals in 2019) and 14% in terms of value (US\$ 452 million versus US\$ 398 million in the first quarter of 2019). Some of the notable deals were Curefit (US\$ 111.5 million), Iora Health Inc. (US\$ 126 million) and HealthCare Global Enterprise Ltd. (\$119.7 million).

India

S

- Govt. willingness and focus on Digital Health
- ABDM launch
- Focus on core principals of interoperability and data privacy at the very starting
- Govt. is focusing on public private partnership and system integration
- Using IT to improve delivery of healthcare services – as private sector has already pioneered and new digital innovations in India
- Govt. support to private sector for innovation through Make in India movement
- India improving external tie ups like India UK PM PM partnership

O

- Maturity of private healthcare sector for digital health
- Advancement of health technology companies in India
- Use of data to derive meaningful insights – Population based Healthcare
- Research in Digital solutions for healthcare sector
- FHIR compliance
- International best practice recommendations – like development of accreditations/ certifications for digital health
- Financing/ collaboration opportunities
- Skilled workforce on AI and Technology

W

- Lack of Universal Health coverage in country
- Lack of physical infrastructure like facilities, smaller health coverage in rural areas and larger coverage by private sector in urban areas only
- Lack of integrated systems
- People's perception to digital healthcare
- No Quality policies or accreditation on Digital Healthcare
- Lack of Skilled workforce
- Lack of standardized care (ICD coding/ SNOMED CT)
- % coverage of internet in India
- Affordability of digital health services

T

- Federal Structure – Health is state subject
- Cyber attacks
- Economic shift
- Rural and Urban divide
- Ethical concerns

UK

S

O

- Early adoption of digital health technology
- Integrated digital health system (NHS spine)
- EHR, home consultation, MHealth and telehealth coverage
- Recognizing the need to move from curative health to preventive health – Population Health management
- Strong operational policies for digital health and Quality structure
- Strong Health and social network which manages the connectivity issues across NHS England
- Universal Health coverage
- Integration of Health and Social sector as done in Northern Ireland and Scotland
- UK govt. is promoting international collaborations in the area of digital health through UK Trade and Investment International
- Further strengthening of Cybersecurity
- Integration of wearable devices data with NHS data

W

- Even with early adoption of digital healthcare in UK still the uptake of Digital technologies is slow
- Lack Skilled workforce on AI and Technology
- Legacy data
- Difficulties in adopting Cloud computing with existing data in NHS spine

T

- Federal System not allowing the systems of 4 countries to collaborate
- Political environment since the healthcare

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