GLOBAL RESEARCH MAP OF DIGITAL HEALTH

Research and Development landscaping and National Strategies' benchmarking

2021

I-DAIR

GLOBAL RESEARCH MAP OF DIGITAL HEALTH

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Archimedes is reported to have said “Give me a lever long enough and a fulcrum on which to place it, and I shall move the world." At the International Digital Health and Artificial Intelligence Research Collaborative (I-DAIR), we believe that inclusive R&D is that lever and transdisciplinary collaboration that fulcrum, which can move the world on digitally-enabled health.

Knowledge-making is not a solitary pursuit and builds incrementally on the efforts of many. It is essential to understand the existing knowledge landscape, who the knowledge makers are, and what the direction of investments and policy is. For emerging knowledge domains such as digital health and AI, it is also important to have a truly global picture. This helps to address emerging inequities and gaps, identify opportunities for collaboration and to link research to innovation for addressing urgent public health challenges.

It is for good reason that the Global Research Map (GRM) of digital health and artificial intelligence in health is I-DAIR's very first Pathfinder. Without situational awareness, we would be flying blind. It is also for good reason that of the nine regions that the GRM covers, three are in Africa. Existing digital divides would deepen further if researchers and innovators from the emerging geographies of innovation are left in the shadows. The GRM shines a light on incipient trends and policies, green shoots if you will, which global policy forums must take into account. It also underlines technology development trends that national regulators and international forums such as the World Health Organization (WHO) will find useful.

The I-DAIR team followed a twin track approach to developing the GRM. It used AI to survey publications and patents from 2011, when the term digital health began to trend, right up till 2020. However, we all know that data can mislead and big data can mislead in big ways. In parallel, therefore, we did a qualitative survey of digital health trends across the globe with the help of partners from academia, private sector and digital health experts. A dashboard was developed to present the results and integrated into a microsite. A taxonomy emerged and is in the process of validation.

As the data analysis got underway, we decided to add a national digital health strategy component to the GRM with a first group of 23 countries. This would facilitate peer-to-peer learning and eventually benchmarking with the WHO's Digital Health Strategy. From the R&D perspective, it would permit a longitudinal assessment of how investments and policies are getting reflected in research and innovation. There are other potential applications that we have started to explore with our philanthropic, national and international organization partners.

I would like to felicitate the entire I-DAIR team for their hard work and creativity in producing the 2021 edition of the GRM in twelve months. I would also like to thank our partners from industry, academia and civil society. Last but not least, I would like to acknowledge the generous support of Fondation Botnar that made this work possible.

Amandeep S Gill, PhD
Project Director/CEO, I-DAIR

In data science, and particularly in DataViz, besides explorative and communicative dimensions, we have a complementary rhetorical objective: the persuasion. A consensual and persuasive visualization essentially depends on the quality of the data, their contexts, the bias that is induced and finally, the cultural convention of the chosen visual models.

While developing the current version of the GRM, our main focus was on the intensification of this persuasion dimension: maximising range of data sources, consolidation of the quality of data assets, reduction of the complexity of representations, fluid navigation and finally, increasing exploitation and the utility of the output.

To achieve our goals, we have built our methodology with a final goal in mind: Knowing that there is a growing number of existing mature indexes in the space of Digital Health and AI, we need to move away from the production of a YANDEX (Yet Another Index). Naturally we agreed to reconstruct the geography of the world through a representation of the maturity level of digitalization (present and future) of health services in the selected countries to be included. In fact, maps are a form of rhetoric that uses conventions to guide readers to conclusions based on cultural, political, and religious viewpoints. They are not the actual land structures, but rather illustrations of them. Maps are a sort of visualisation that are naturally used either to discover and comprehend our data, or to communicate the sense of the data.

Once we have got the final visual in our mind, the different steps of the methodology were clear enough, building the taxonomies of Research and Development and the National Digital Health Strategy is essential for our understanding and for covering the domain. The taxonomy serves as the basis of our Natural Languages Processing scripts (NLP) that will search, collect and validate required data and populate the landscape. Finally, the visual should bring this clarity of representation.

I am proud and happy to present to you the GRM, this is the result of team effort, and I hope that you will enjoy reading and using it as much as we have enjoyed working on it.

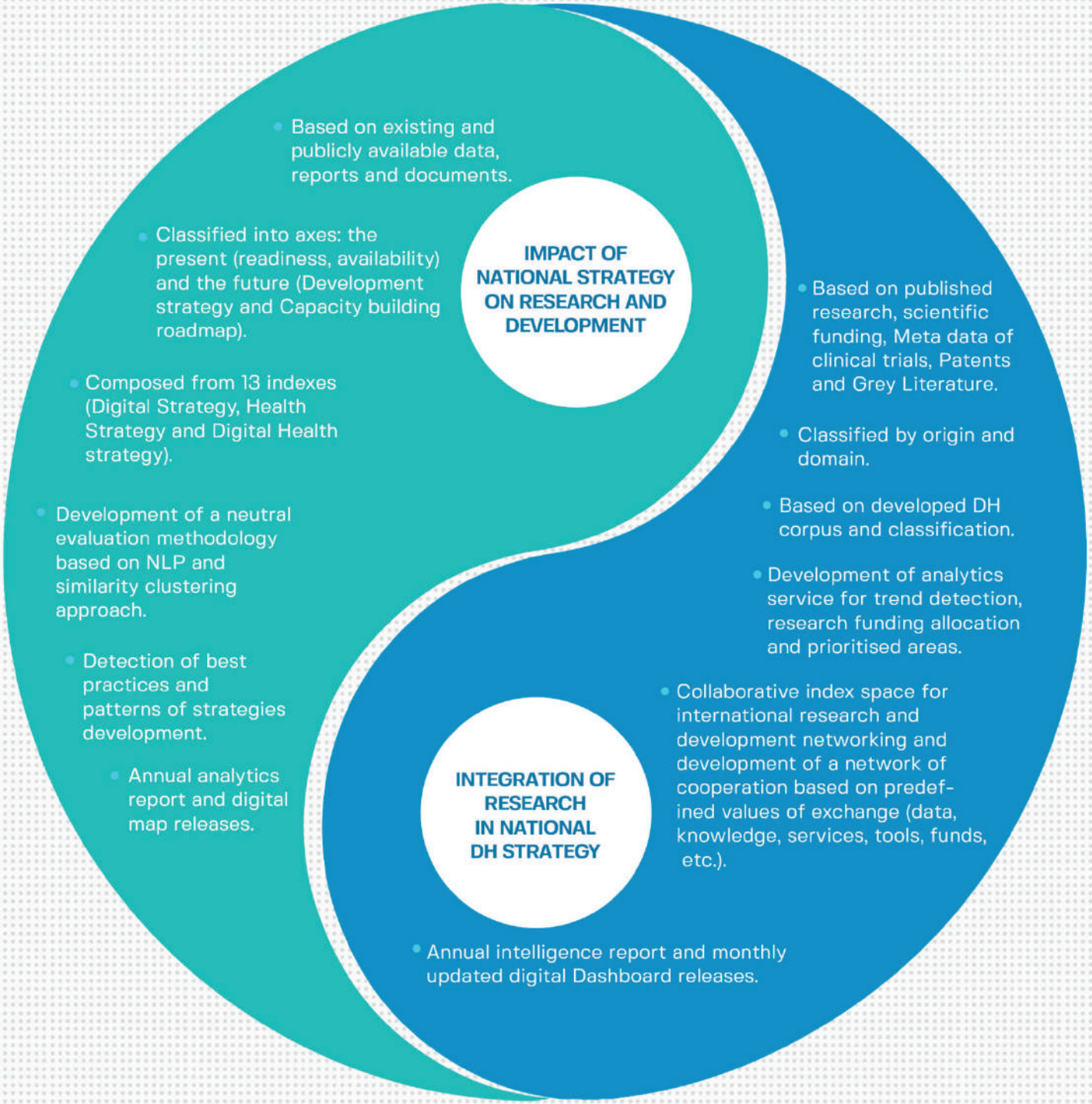
Dr. Mehdi Snène
Research Director
Mehdi Snene

METHODOLOGY & OBJECTIVES

The Global Research Map (GRM) is a comprehensive and multi-faceted map that provides a clear landscape of Research and Development (R&D) activities across different world regions and the state of maturity of various National Digital Health Strategies (NDHS). The GRM is a powerful tool capable of providing a clear situational awareness to countries, regions, funders and multilateral organisations to visualise, analyse and act according to identified gaps and needs in different settings. It will provide an inclusive vision that explicitly underlines the dual link between the integration of the Research and Development landscape in the national digital health strategy and the impact of national digital health strategy on the evolution of the national research and development outputs.

The overall vision of the GRM is to provide a global landscape that can serve for the identification of existing international research and development networks, reinforcement of cooperation and collaboration and the nature and scope of exchanges between developed countries and the LMICs. This will underline the potential of different countries in producing their own research and development and the roadmap to achieve their national vision. It will also help in the establishment of regional joint research capacity and to quickly identify major actors, trends and important investigational subjects at the regional and national level. The GRM will also help in the identification of best practices for the shaping of National Digital Health strategy that can match better with the regional or the country profile. These best practices will constitute a practical and living guide for the development of efficient and up to date national strategies.

This dual benchmarking provides a comprehensive vision that addresses both the strategic and the executive levels. The developed GRM brings a better clarity to address, in a holistic approach, the full spectrum of digital health and AI development from the ground to the policy makers. The GRM could provide a floor to discussions in global policy bodies. Relevant stakeholders can use it in conjunction with the detailed customised report to identify policy and governance gaps in AI and digital health for the achievement of universal health care and the sustainable development goal (SDG.3). It also helps donors, development agencies and other digital health actors to quickly identify areas of interest for investment and development.


Based on existing and publicly available data, reports and documents.
Classified into axes: the present (readiness, availability) and the future (Development strategy and Capacity building roadmap).
Composed from 13 indexes (Digital Strategy, Health Strategy and Digital Health strategy).
Development of a neutral evaluation methodology based on NLP and similarity clustering approach.
Detection of best practices and patterns of strategies development.
Annual analytics report and digital map releases.
IMPACT OF NATIONAL STRATEGY ON RESEARCH AND DEVELOPMENT
Based on published research, scientific funding, Meta data of clinical trials, Patents and Grey Literature.
Classified by origin and domain.
Based on developed DH corpus and classification.
Development of analytics service for trend detection, research funding allocation and prioritised areas.
Collaborative index space for international research and development networking and development of a network of cooperation based on predefined values of exchange (data, knowledge, services, tools, funds, etc.).
INTEGRATION OF RESEARCH IN NATIONAL DH STRATEGY
Annual intelligence report and monthly updated digital Dashboard releases.

R&D in Digital Health Methodology

I-DAIR has developed a taxonomy that is applicable for both publications and patents in the Digital Health field. All attributes and classes of interest are grouped in 5 top level categories - type of medical device/software, purpose of medical device/software, healthcare information technology, healthcare analytics and enabling technologies. Each category has at least 5 sub-categories with several of them branching into smaller individual classes - for example, there are 16 classes in the disease/disorder targeted category within the purpose of medical device/software category. The taxonomy currently has a total of three tiers. Papers and patents both can belong to multiple categories in each tier, making this taxonomy overlapping in nature.

In order to connect the data points to the geographical (9 regions with individual countries), socioeconomic (LMIC or not) and taxonomic categories, I-DAIR has partnered with PatSnap. This company takes the data from the free available databases of patents and publications, structures and cleans it using manual curation and proprietary AI. The added semantic layer is added to select a subset of 142 million data points and connect them to I-DAIR's taxonomy and dashboards.

NDHS maturity benchmarking

I-DAIR structured the digital health strategy as a dual problem - on one side, it is affected by the individual state of IT and Healthcare, and the joint digital health on the other. Further on, by recognizing that the present state should be considered separately from the prospective development, I-DAIR defined a number of indicators in both the present and the future states. Present indicators are evaluated according to availability and readiness, while the future ones are evaluated for development strategy and capacity building. Each of these individual evaluations are performed through a number of yes/no questions translating to different scores and yielding a total score from 0-100 for each indicator aspect. The questions belonging to an indicator aspect are frequently scored with groups of chained value logic - if the first (main) question in a group is negative, no others can be answered. For example, in the Healthcare Governance Availability indicator there is a group of 4 questions concerning Health Insurance for Citizens and offering a maximum of 25 points. Answering “no” to the question “Is there a Federal Health Insurance Fund Available?” gives 0 score for the group, while answering “yes” contributes 6 points and unlocks additional questions like “Is the Health Insurance Available only to low income group/elderly people?” and others.

The taxonomy classes for each country were populated in a collaboration between I-DAIR and Xlpat. Online sources of information were researched and all the questions were answered with “yes”, “no” or “no data available” if the online search didn't provide results. At this point the latter category is treated as a negative answer regarding the score, but is open to additional research.

All the results are grouped per country into two groups taken as axes for the new digital strategy world map - present and future development, each with its own indicators. An appropriate simple similarity measure is used to quantify the level of agreement between individual countries, and are then clustered according to it into 6 groups (“continents”) which represent countries with similar level of present and future development, thus enabling comparison and systematic review of healthcare systems and possible improvements. Within this perspective, the GRM developed within I-DAIR essentially provides the following features:

- National Digital Health Strategy benchmarking

+ Based on existing and publicly available data, reports and documents.
+ Classified into two axes: the present (readiness, availability) and the future (Development strategy, Capacity building roadmap)
+ Composed from 13 indexes (Digital Strategy, Health Strategy and Digital Health strategy).
+ Development of DH development strategies Taxonomy and classification.
+ Detection of best practices and patterns of strategies development.
+ Annual analytics report and digital map releases.

- Research and development landscape

+Based on published research, scientific funding, Meta data of clinical trials, Patents and Grey Literature.
+Classified by origin and domain
+Based on developed DH corpus and classification.
+Development of analytics service for trends detection, research funding allocation and privileged areas for investment.
+Collaborative index space for international research and development networking and

development of a network of cooperation based on predefined values of exchange (data, knowledge, services, tools, funds, etc.).
+ Annual Intelligence report and monthly updated digital Dashboard releases.

Given the actual disparities in investment, capacity and resources, the GRM has been thought, designed and developed with a similarity clustering approach rather than the classical ranking approaches and methodologies. To achieve our goals, our development of the national strategy map is based on a neutral and automatized approach that makes use of advanced Natural Language Processing techniques for the evaluation and the clustering of different national strategies by making use of a national strategy taxonomy and corpus (See Fig.2). Concretely, we have created a dictionary of keywords and concepts relative to a National Digital Health Strategy. The available national strategies are then compared to the defined dictionary to estimate the level of readiness of a country (present) and the adequacy of its future development (Future) .

For the R&D landscape analysis a similar work has been conducted. Firstly, a global Taxonomy and corpus of the Digital Health and AI space was defined. The taxonomy supplemented corpus was then used to search, collate and display via a web based platform (Fig.1), the findings relevant to Digital Health and AI in Health research, funding and development. Finally, the results and reports generated by the GRM were tested and verified by end users and relevant stakeholders.

At the current state of development, we have a Beta release of the R&D landscape and we have included a first batch of 23 countries in the NHDS database. The validation is a flexible process from which we would like to know more about our potential end users expectations and needs from such tools, specific data and details for the specific regional customisation if any, and their feedback on the actual status of development. We are also in the continuous process of data sources collection and curation and our end users are often our first identifiers of local sources given their knowledge of the regional ecosystem.

Fig.1: The R&D landscape Web tool

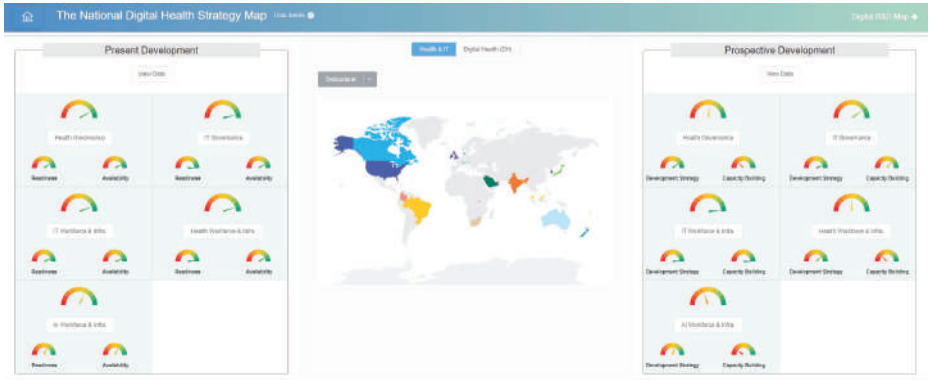


Fig.2: The National digital health Map

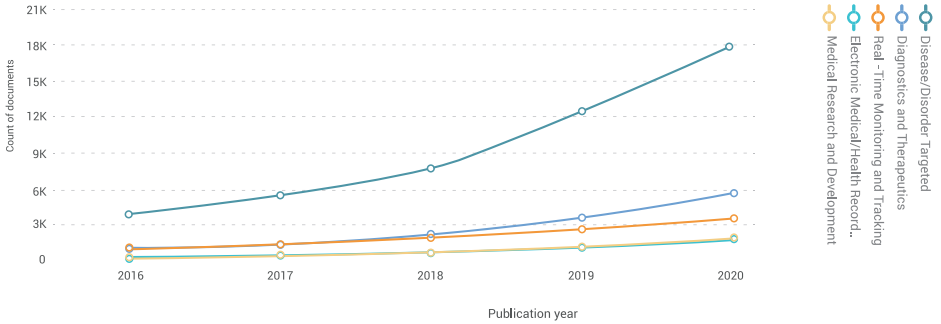
Major Findings

1.Research and Development Findings
2.National Digital Health Strategies

3.1. Research & Development Findings

3.1.1 - Overview

Publications across the world have seen an exponential growth with the predominance of disorder/disease subject. Still, it is interesting to see that the number of patents in this group is a bit smaller than the number of patents in the therapy/diagnostics group which is the second group according to the number of publications. In numbers, diagnostics/therapy has approximately two papers per patent, while the disorder disease has eight papers per patent when summing across all the years. On average, one patent follows every four publications overall. Interestingly enough, LMICs constitute less than one third of research publications but over one half of patents. Both categories are mostly in the EMR/EHR and diagnostics/therapeutics areas. USA and Chinese universities dominate the publication world.



SADC-EA Publications Subject Trends

Region	Top Country	Region(...	Global(...
Africa SADC and East Africa	South Africa	75%	0.02%
Africa Central and West Africa	Sudan	100%	0.01%
MENA	Israel	89.07%	0.98%
Asia Central and East Asia	China	80.03%	47.32%
Asia South East, South, Western...	India	67.31%	2.93%
Americas North America	United Stat...	95.41%	23.48%
Americas Latin America and Car...	Colombia	39%	0.28%
Europe Northern, South and We...	Germany	28.14%	2.46%
Eastern Europe and Russia	Russian Fe...	69.34%	0.54%

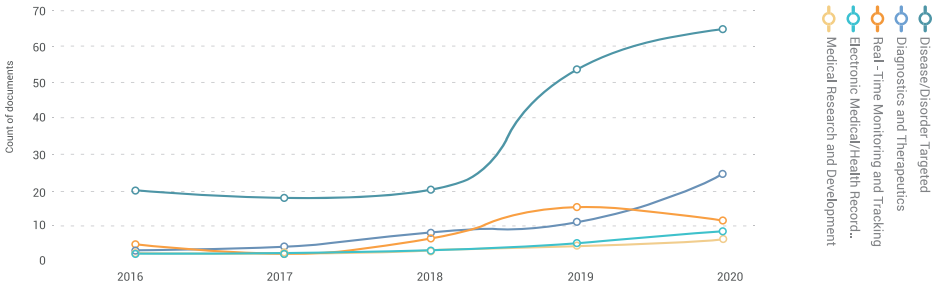
Distribution of Patent by Country and by Region

Region	Top Country	Region(...	Global(...
Africa SADC and East Africa	South Africa	60.49%	0.21%
Africa Central and West Africa	Nigeria	70.3%	0.12%
MENA	Iran	38.23%	1.87%
Asia Central and East Asia	China	66.79%	14.82%
Asia South East, South, Western...	India	48.68%	8.45%
Americas North America	United Stat...	87.73%	24.74%
Americas Latin America and Car...	Brazil	61.93%	1.19%
Europe Northern, South and We...	United Kin...	24.28%	5.42%
Eastern Europe and Russia	Russian Fe...	28.14%	0.72%

Distribution of Patent by Country and by Region

3.1.2 - SADC and East Africa (SADC-EA)

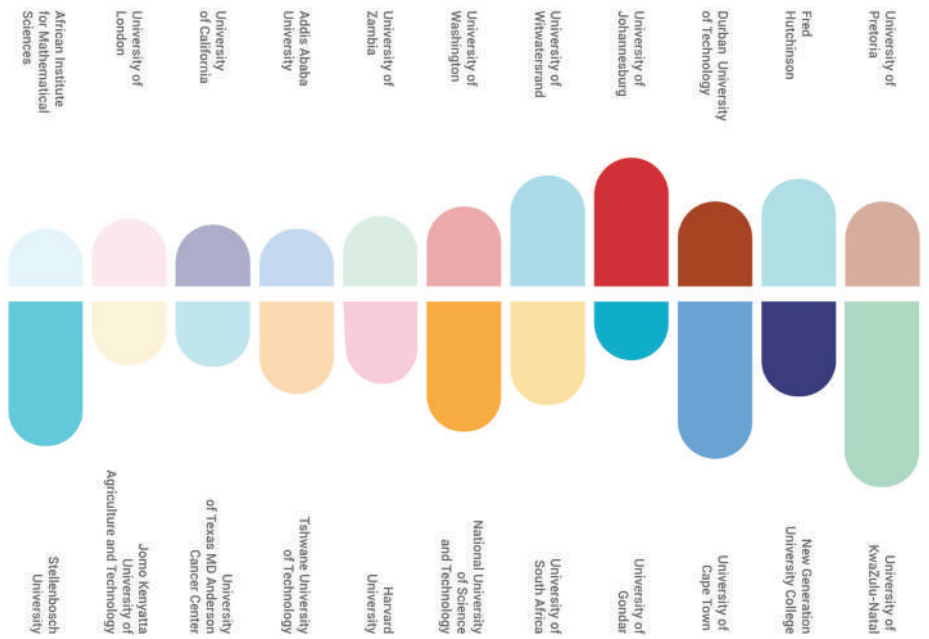
Compared to the global trends, SADC-EA does not have the gradually exponential growth of publications. After a period of stagnation from the beginning of the collection period (2011) until 2018 there is a constant number of publications, and then there is a marked jump consisting mostly of disease/disorder targeted publications.



	2011	2012	2013	2014	2015	2016	2017	2018	2019	20202
Disease/Disorder Targeted	6	10	10	5	10	19	17	21	54	65
Diagnostics and Therapeutics	1	4	3		2	2	3	8	10	24
Real -Time Monitoring and T.	3	1	1	2	2	3	1	5	14	10
Medical Research and Dev...	1	1				1	1	2	4	7
Electronic Medical/Health R...		1		1		1	1	2	3	5
On-Body Medical Devices	3	1				1	3		1	2
Data Governance				1			3		5	4
Healthcare Facility (hospit...			2			1		2	6	2
Big Data Analytics						1		1	2	6
Robotics						1	1	2	2	3

SADC-EA R&D Domain Evolution

South Africa is by far the biggest local contributor to the research and development landscape. Out of 12 largest university contributors, 10 are located in South Africa (the remaining two being in Ethiopia and Zimbabwe) - note that some multi-national organizations have their branches in South Africa.



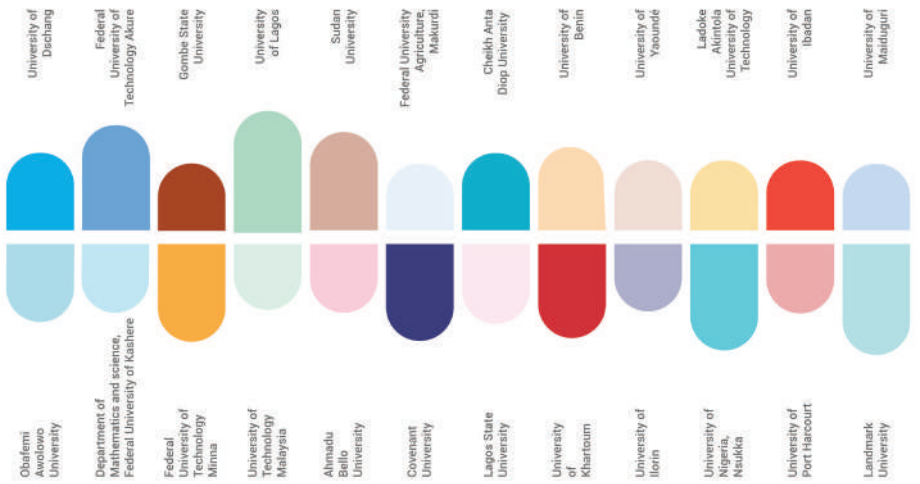
SADC-EA Major Actors

3 out of 4 approved patents are from there, in the areas of disease/disorder and diagnostics/therapeutics. Note that there aren't any patents in EHR and information, contrary to the world trend, but this is likely due to the small number of overall patents.

SADC-EA Trends in Patents

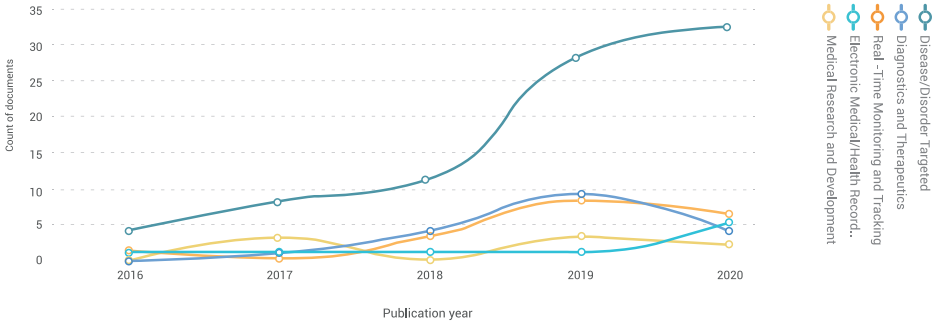
3.1.3 - Central Africa and West Africa

This region has a relatively small number of publications (0.17% of Global) and only 2 patents, both in Sudan. Interestingly enough, the country with over 70% of publications is a different one - Nigeria, originating from many of the country's universities.
Top publishing universities in Sudan are Khartoum and Sudan universities.



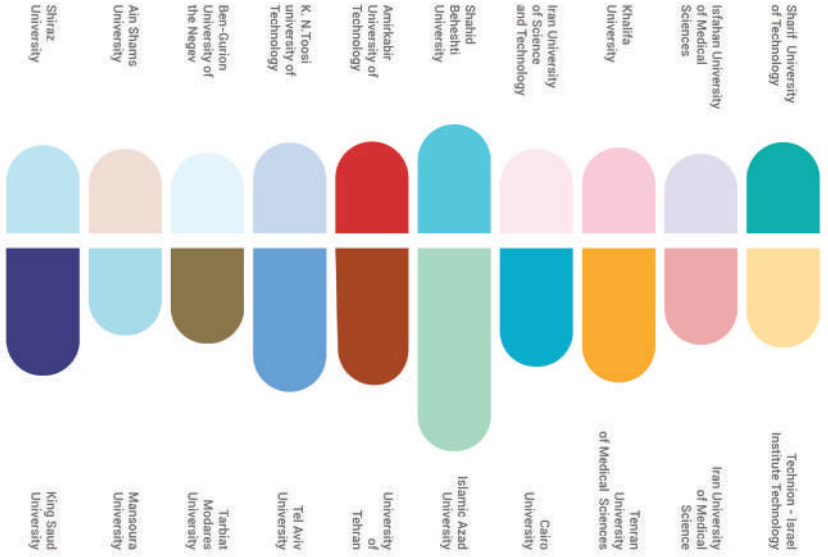
AC-WA Major Actors

Recent increase in the number in the disease/disorder targeted papers started in 2018.



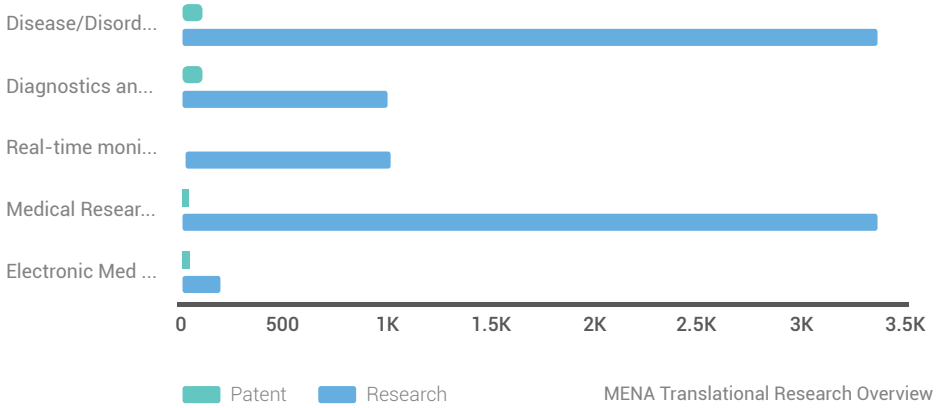
3.1.4 - Middle East and North Africa (MENA)

Looking at publications, the exponential growth seems to mimic the global one. Still, the patents are not following the publications like on a global scale - patent/publication ratio is around 4 times smaller. This is even more prominent for the LMICs, which hold a total of 6 patents and 1304 publications.



MENA Major Actors

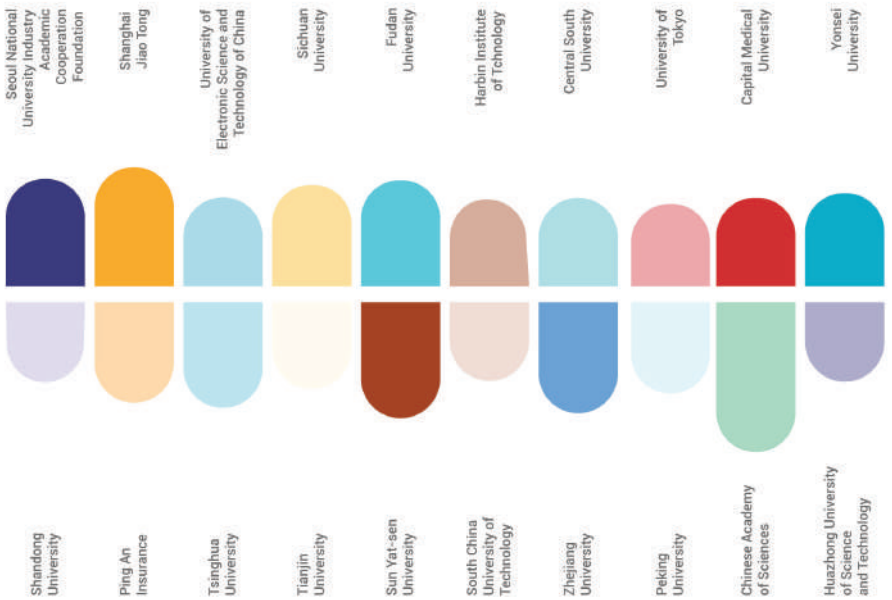
General sparsity of patents across the region leads to a notable majority (89.07%) being held by Israel. A third of all publications come from Iran, with the Islamic Azad University being the most fruitful in the region.



MENA Translational Research Overview

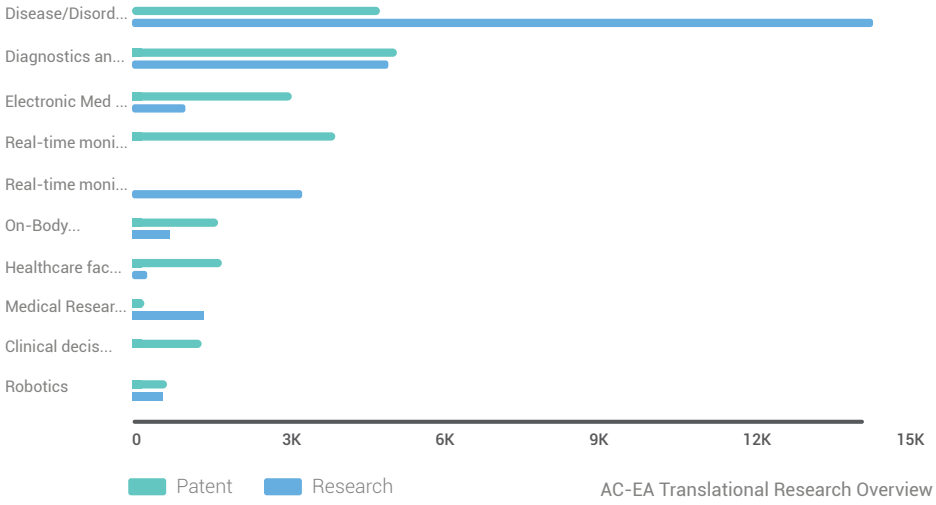
3.1.5 - Central Asia and East Asia

This region excels in translational research, as the number of patents (16,220) nearly reaches the number of publications (20824).



AC-EA Major Actors

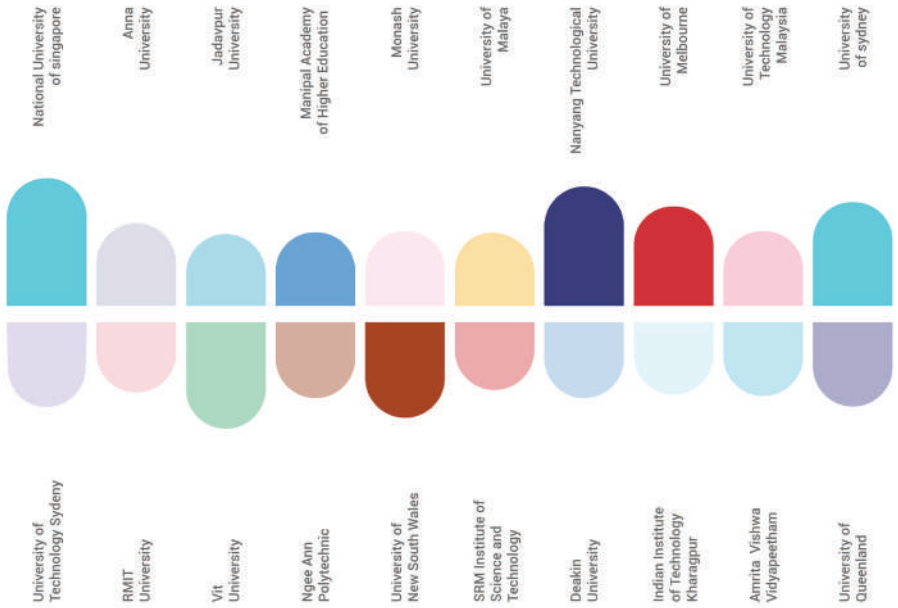
Apart from disease/disorder group, the number of patents in individual groups even exceeds the number of papers. It is of note that in the Electronic Medical/Health Records group there are three times more patents than publications.



AC-EA Translational Research Overview

China is the regional leader in both types of research, the largest source of patents globally (47.32%) and the second largest source of publications (14.82%). Outside of China, one should mention the universities in Tokyo and Seoul.

3.1.6 - Asia Southeast, South, West and Australasia



ASE-SWA Asia Translational Research Overview

In this region the leader of both patents and publications is India, but the translation of research is under the global average - one patent comes for every 14 publications, with no difference in ratio between LMICs and others.

Interestingly, top universities from this region according to the amount of research come from Australia and Singapore, showing that India contributes a large amount with smaller universities.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Disease/Disorder Targeted	102	123	166	171	211	219	283	393	596	880
Diagnostics and Therapeutics	25	40	27	37	57	71	85	125	221	311
Real-Time Monitoring and Tr...	31	34	41	51	51	71	76	108	152	198
Medical Research and Dev...	6	5	8	10	20	16	15	32	52	62
Electronic Medical/Health R...	6	4	19	10	10	9	19	36	56	63
On-Body Medical Devices	2	3	10	8	14	22	19	24	34	36
Internet of Things (IoT)				2			2	21	33	57
Clinical Decisions Support ...	3	5	10	15	6	7	16	11	28	25
Real -Time Monitoring and T...	5	4	6	11	12	17	11	25	16	3
Big Data Analytics				1	2	5	2	12	30	40

MENA Translational Research Overview

3.1.7 -North America

North America Major Actors

This region is dominated by the USA in both types of research - globally, it has the highest number of publications (24.74%) and the second highest number of patents (23.48%). Translational trends follow the global ones.

There is very little contribution from the LMICs, that too solely in publications. Largest amount of research comes from the University of California, followed by some Ivy League schools.

Disease/Disorder Targeted	632	699	767	955	1.2K	1.4K	2K	2.7K	3.9K	4.9K
Diagnostics and Therapeutics	202	234	271	304	373	545	704	1K	1.2K	1.3K
Electronic Medical/Health R...	142	156	216	227	292	398	574	797	972	801
Real-Time Monitoring and Tr...	145	140	140	193	207	242	320	496	625	822
Medical Research and Dev..	72	64	74	98	123	151	235	375	469	562
On-Body Medical Devices	75	81	106	110	149	199	231	328	368	216
Healthcare Facility (hospit...	53	69	77	96	157	165	225	297	367	216
Real -Time Monitoring and T...	54	75	111	118	133	181	252	296	208	14
Clinical Decisions Support ...	20	36	31	45	55	56	70	102	195	245
Data Governance	21	23	32	42	46	57	73	164	198	231

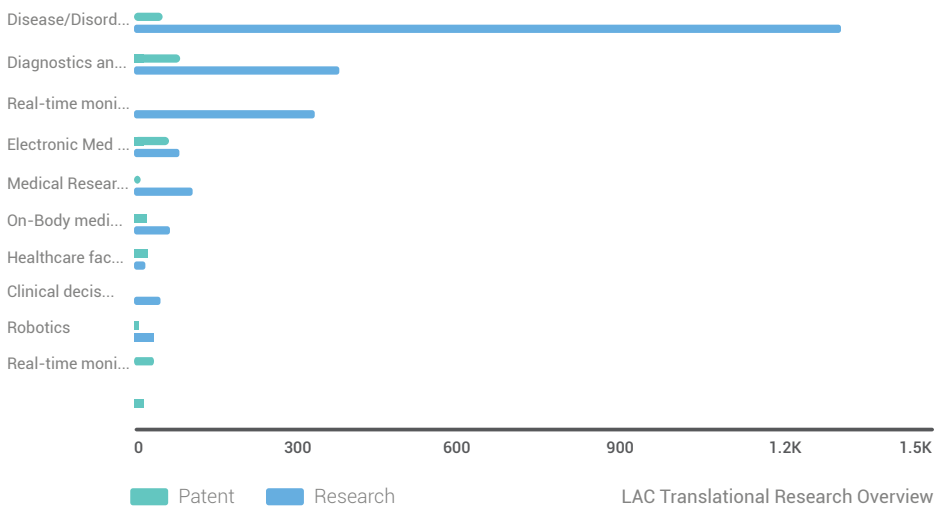
North America R&D Domain Evolution

3.1.8 - Latin America and the Caribbean

LAC Major Actors

This region is dominated by the patents from Colombia (39%) and publications from Brazil (61.93%), but both have relatively small global contributions.

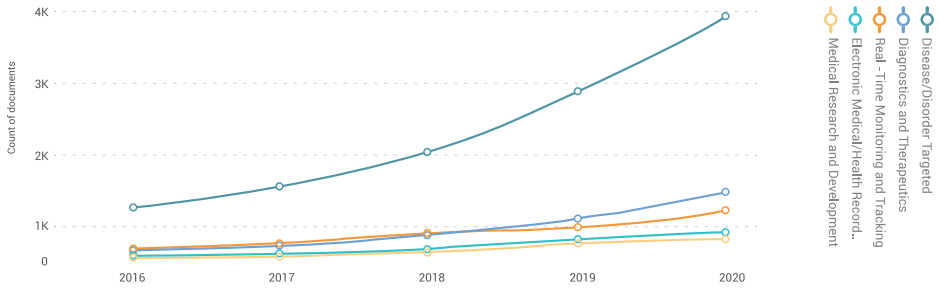
Translation of research is on the low side, one patent for every 9 publications. Proportion of LMICs contributions is very small in both areas of research. Research is mostly generated by the universities in São Paulo.



LAC Translational Research Overview

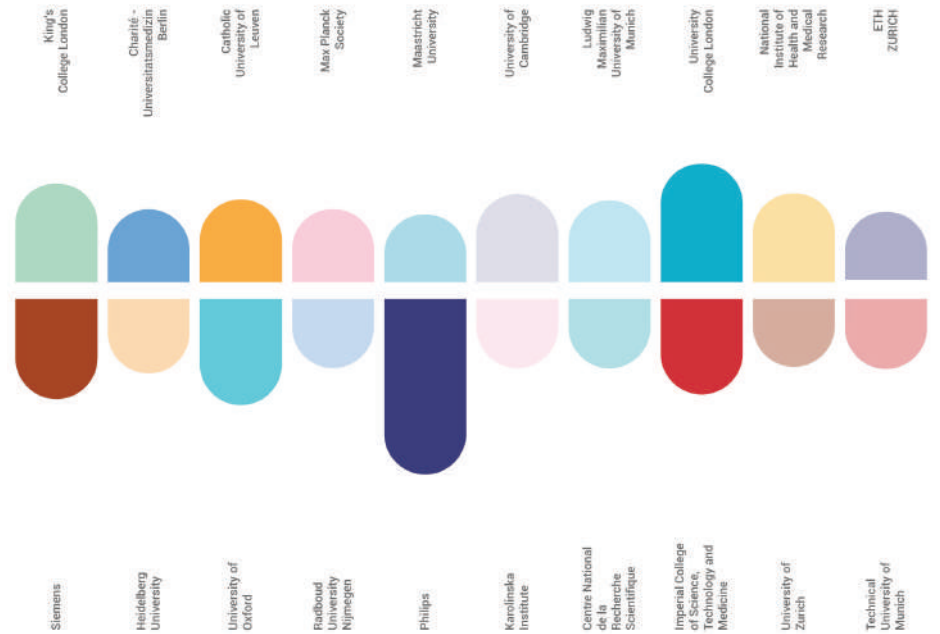
3.1.9 - South, North and West Europe

Publications per year follow the global trend, but translation of research is lower, one patent for every 9 publications.



SNW Europe Publications Trends

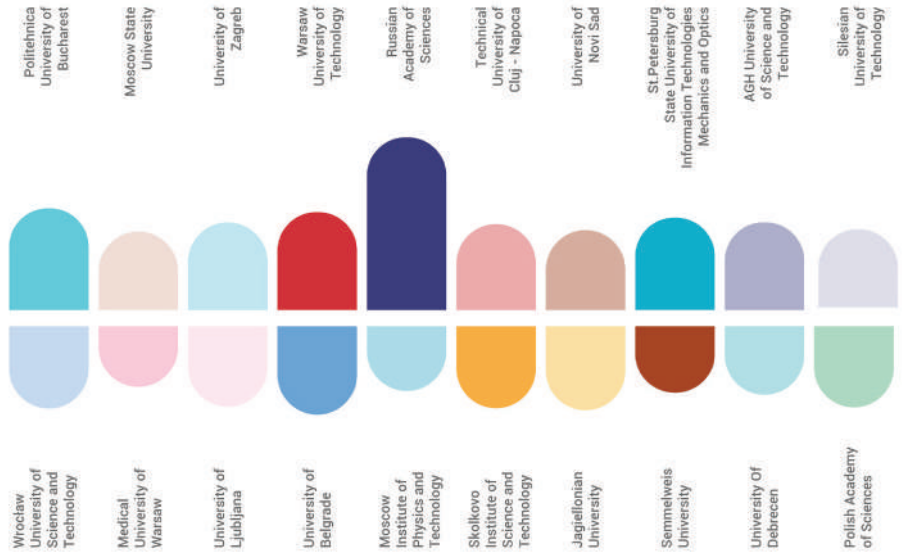
Most publications come from the UK and its leading universities, while most patents come from Germany. There are important contributions from Swiss universities as well. Interestingly enough, the most research from an individual university comes from the Philips university in Cyprus.



3.1.10 - Eastern Europe and Russia

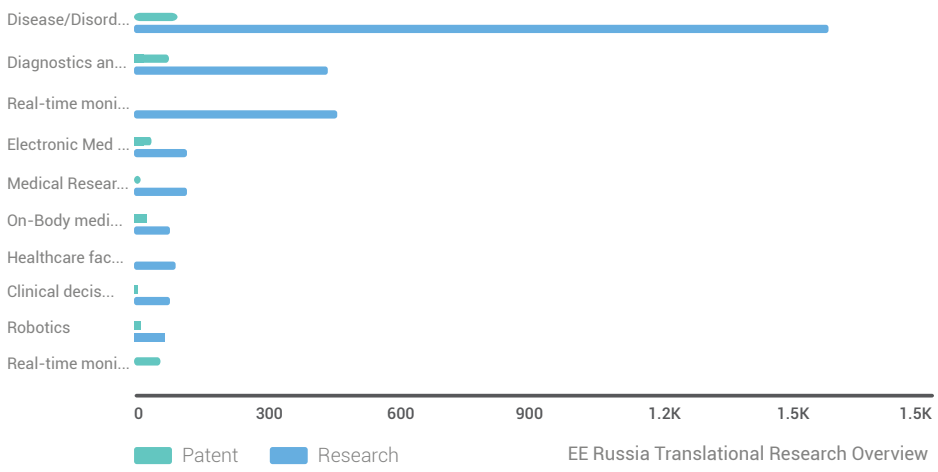
Russian Federation is the clear leader in providing research in both patent (69.34%) and publication (28.14%) areas.

In addition to Russian universities, one can notice Polish and universities from ex-Yugoslav Republics. Still, the global contribution is very small.



EE Russia Major Actors

Translation is on the low side (a patent for 11 publications). LMICs contribution is moderate.



EE Russia Translational Research Overview

3.2 National Digital Health Strategies

GRM uses the original methodology to map the individual country to a 2D-model showing the present and future development. The new national digital health strategy (NDHS) map groups the countries into 6 new continents according to the development distance, and facilitates comparison of policies, metrics and solutions. There is generally a strong positive correlation between current and future development. Four continents essentially lie on the line connecting the same values on both axes, showing an incremental growth of development for both the present and the future. One continent has a higher future readiness compared to their current situation, while another continent has invested more into the current readiness then the future one.

3.2.1 - Low balanced continent

The low balanced continent encompasses two countries which are below 50 percent on both accounts - Bangladesh and Colombia. The present values for these two countries are marked by a very low availability in several categories of digital health (DH) - workforce, Funding & Research and literacy. These values are followed by medium or even high readiness levels, providing a clear action point. In general, other categories in DH and Health & IT present overview are mediocre.

The prospective development values for Bangladesh and Colombia diverge, and Bangladesh has around 20 points more on the scale. The biggest difference is in the DH prospective development where Colombia has very low values in almost all categories, primarily due to the values not being available. Regardless of these internal differences, this example continent faces overall the problem of low data availability for prospective development.

3.2.2 - Medium balanced continent

Both present and future development are marked by overall medium values. Brazil and Saudi Arabia have a very low funding & research availability at present, while Israel is very good in that aspect. Saudi Arabia and Israel the prospective development of rank low on prospective development of digital health literacy. That being said, capacity building seems to lag behind the development strategy for multiple future development categories and for all the countries.

3.2.3 - Medium high balanced continent

The countries in this group have both their present and future development scores close to 70, thus having a balanced present and future development.

The present development is medium or better in all the Health & IT categories. DH is solid but seems to be problematic for all three countries in the Workforce and Literacy categories, with the availability being worse than readiness.

Future development for Health & IT in all three countries is medium or better in all categories. For DH, all three countries lack the capacity for literacy. New Zealand lacks the capacity building for legal rules as well. UAE and New Zealand have exceptionally good IT governance and Funding & Research.

3.2.4 - High balanced continent

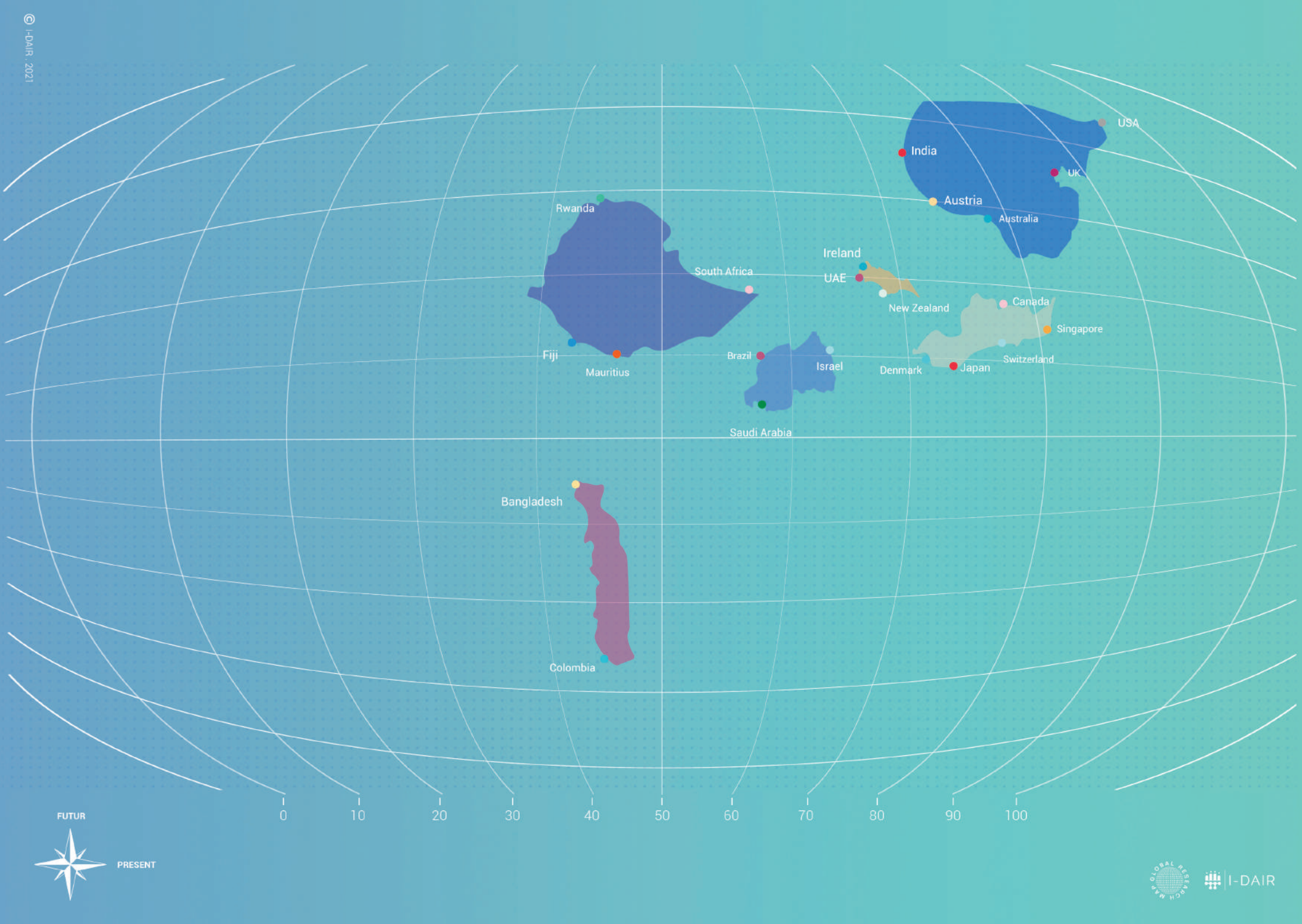
5 countries in this group (India, Austria, Australia, UK, USA) score very well in all the Health & IT categories, and mostly well in all the DH categories in both the present and the future. Most of them have missing data in literacy causing occasional bad scores.

3.2.5 - Present high balanced continent

Diverging from the line of balanced present and future development scores, these 5 countries (Denmark, Canada, Singapore, Japan, Switzerland) showcase a present development score better than the future one. Most present categories are exceptionally good, apart from the workforce which is ranging from poor to moderate. Conversely, future development scores range from medium to good, with some cases of bad scores e.g. literacy for all, workforce for Japan and Denmark etc.

3.2.6 - Future high balanced continent

Rwanda, Fiji, Mauritius and South Africa have a prospective development above the current development level. Most indicators for the present development are medium or better, with the workforce in DH being below average and problematic literacy. On the other hand, the future development looks bright - medium to good scores in most categories, and an overall tendency of improvement from the current scores.



Analysis

1. Data sources

For this first study, we decided to limit our ontological field of research and development of digital health. Based on existing definitions of Digital health, we have carefully chosen subdomains strongly associated with these definitions, namely: Health Informatics, Health Information Management, AI in health, medical devices, Electronic Health Records, Big data in health and Bioengineering for a total of approximately 1,480,000 publications and 180,000 patents. the second set of subdomains included is essentially composed of: General medicine, Public Health, Environmental and Occupational Health, Communicable disease, Radiology, Nuclear Medicine and imaging, Pulmonary and Respiratory Medicine and Oncology for a total of 22,000,000 scientific publications and 640,000 patents. The goal of this selection was to produce a draft version of our taxonomy which will serve as a basis for the future development of the ontological foundation of digital health as well as for the construction of a classifier. A total of 93,000 publications and 27,000 patents corresponded to our research and were included in this landscaping.

1.1 Translational Research

At first glance, the distribution of patents between LMIC countries and HIC countries seems to be a fair distribution with respectively 13,843 patents and 13,591 patents. However, almost all of the LMIC countries' patents are filed by Central and East Asian countries: 12,984, and mainly filed by China: 10,387. In comparison, the total number of patents filled in Africa and MENA region is 14 which represent 0.21 patent/country while the total number of patents in Europe (North, South Western and Eastern) and Russia is 2607.

Moreover, translational research and the number of patents filed by China over the past 5 years has experienced a record development, exceeding in 2020 the total of all patents filed by the rest of the HIC and LMIC countries combined. This development was also distinguished by an acceleration in the number of scientific publications reaching 14% of the total world publications, whereas it represented less than 4% of total of publications 10 years earlier (Fig.1).

Fig.1. The evolution of number of patents/number of published research from 2015 to 2019.

This development shows a recent desire for the transformation of the production sector of medical devices, biotechnology and medical AI, from a manufacturing sector to an innovation sector. An examination of trends in this region confirms this finding. In fact, since 2015, there is an almost annual doubling of scientific production and patents in the previous fields, namely disease / Disorder targeted and Diagnostics and Therapeutics (Fig.2). Despite of a growth of interest in scientific production in these sub-fields in other sub-regions, this exponential growth is only visible in Central and East Asia.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Disease/disorder			523	538	654	850	1.5	2.7K	4.2K	5.7K
Diagnostics and Therapeutics	126	142	180	206	277	421	837	1.8K	2.5K	3.1K
Electronic Medical/Health R...	25	41	53	56	91	178	400	799	1.1K	1.3K
Real-Time Monitoring and Tracking	54	56	61	105	201	332	496	820	975	811
Real-Time Monitoring and Tr...	109	102	130	148	200	189	290	426	630	795
On-Body Medical Devices	42	55	61	79	129	153	247	419	582	551
Healthcare Facility (Hospit...	24	33	39	25	66	101	207	457	505	574
Medical Research and develo...	46	29	48	48	59	81	130	238	354	491
Clinical Decisions Support Systems	5	9	8	13	23	50	133	313	405	386
Robotics	19	32	43	29	50	64	130	209	273	331

Fig.2. Concentration of patent and publications in Central and Est Asia

1.2 Preliminary Taxonomy

As explained above, the resulting taxonomy is a draft taxonomy which was used for a quick investigation of the definition of the domain on the basis of a reduced scope. This Taxonomy follows our discovery spaces and our landscaping environment (Fig.3). It is essentially made up of a vision of the use of digital in health rather than a cross-disciplinary vision where digital and health merge. Through this taxonomic draft, we hope to be able to lay the foundations for the future development of an ontological and dynamic definition of the field of Digital health. This clarity is from our point of view an urgent need in order to be able to better structure this space, to define a multi-user vision and above all to avoid redundancies and duplication of efforts.

Type of Medical Devices/Software (Using AI)	On-Body Medical Devices	Wearables; Implants & Prosthetics
	Hand-Held Medical Devices	
	Portable Medical Devices	
	Heavy/Stationary Medical Devices	
	Medical Software	mHealth Apps; Virtual Assistants
	Medical Kiosks	
Purpose of Medical Devices/Software (Using AI)	Real-Time Monitoring and Tracking	Blood Glucose; Blood Oxygen; Blood Pressure; Boby Temperature; EEG Signals; Fœtal/Neonatal Monitoring; Heartbeat/Pulse Rate; Respiration Rate; Sleep/Meditation; Weight
	Diagnostics and Therapeutics	Disease Diagnosis; Disease Management; Disease Prevention; Disease Treatment
	Disease/Disorder Targeted	Cardiology; Dental; Dermatological; Gastroenterological; Gynaecological; Haematology; Infection; Metabolic/Endocrine; Nephrology/Urological; Neurological; Oncology; Ophthalmology; Psychological; Pulmonary; Rheumatology; Toxicological
	Remote (Patient) Surgery	
	Remote (Patient) Consultation	
Healthcare Information Technology	Electronic Medical/Health Records (EMR/EHR)	
	Pharmacy Information Systems	
	e-Prescription	
	Patient Portals	
	Healthcare Facility (Hospital) Information System	Administrative Data Management System; Clinical Data Management System
	eLearning for Doctors/Clinicians/Patients	
	Interoperability	
Healthcare Analytics	Medical Research and Development	Drug Discovery; Patient Selection and Cohort Composition for Clinical Trials; Predicting Patient Dropout in Clinical Trials; «Personalized/Precision Medicine»
	Clinical Decisions Support Systems	
	Customer (Patient) Relationship Management (CRM)	
	Predicting Cybersecurity Threats	
	Data Governance	

Fig.3. Draft Taxonomy of the select subdomains of Digital Health

With this result in mind, we have developed a more detailed evolutionary vision of the subdomains that appear to be the most important. This approach aims to more precisely determine current trends and to allow us to better understand the evolution of digital health in the years to come. For example, we can clearly see that oncology as a field of application and digital study has grown by more than 25% in one year (Fig.4). At the same time, we can see an equivalent growth in the medical diagnosis. This can be attributed to the increased research and development of diagnostic tools and expert systems in oncology or diagnostic radiology.

Fig.4. Example of detailed evolution of Sub domains components from 2019 to 2020.

2. Future Trends

Overall, there is a common trend in terms of development and research across the different regions. In translational research it is generally Diagnostics and Therapeutics and in basic research it is Disease/ Disorder Targeted. This trend should continue over the next few years, driven by a need for reliable and rapid diagnostics while having fewer human resources. However, there is a growing interest in analytical tools and clinical decision support systems. In fact, with the increasing number of deployed EHR through healthcare institutions, the interest in decision support systems coupled with predictive systems could significantly increase the proportion of research and development in these fields. If their growth continues at this rate, we could see them in the next 5 years among the top three areas.

Finally, and despite the important role played by non-clinical monitoring tools and devices for the popularization of real time monitoring, it is clear that we are moving quickly towards the use of «medical grade» type devices rather than the existing ones. in order to be able to use the data at the clinical level(Fig.5.). This trend should be seen in conjunction with the growing interest in Digital biomarkers as well as distributed clinical trials. We can therefore clearly distinguish two major trends for the next few years: the use of medical data by predictive systems within health institutions and the transformation of the passive patient into a point of care.

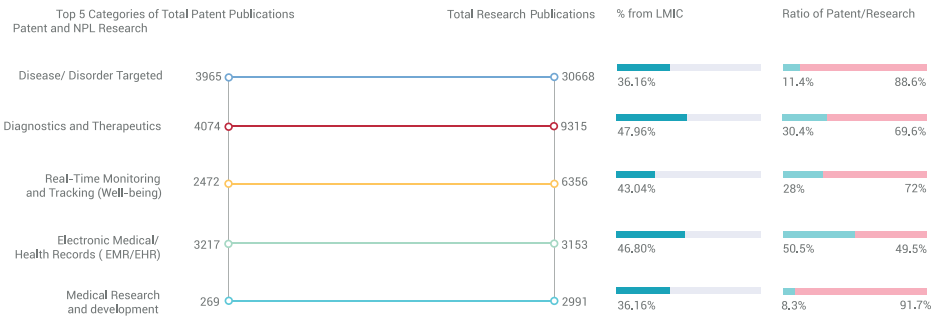


Fig.5. General trends in research and development

Country landscape

(By Alphabetic order)

AUSTRALIA
AUSTRIA
BANGLADESH
BRAZIL
CANADA
COLOMBIA
DENMARK
FIJI
INDIA
IRELAND
ISRAEL
JAPAN
MAURITIUS
NEW ZEALAND
RWANDA
SAUDI ARABIA
SINGAPORE
SOUTH AFRICA
SWITZERLAND
UAE
UK
USA

Australia

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	86,5%
Readiness	82%
Availability	95%

HEALTH GOVERNANCE

	97.5%
Development Strategy	95%
Capacity building	100%

IT GOVERNANCE

	97.5%
Readiness	100%
Availability	95%

IT GOVERNANCE

	97.5%
Development Strategy	95%
Capacity building	100%

IT WORKFORCE & INFRA

	67.5%
Readiness	60%
Availability	71%

IT WORKFORCE & INFRA

	87.5%
Development Strategy	100%
Capacity building	75%

HEALTH WORKFORCE & INFRA

	93.5%
Readiness	100%
Availability	87%

HEALTH WORKFORCE & INFRA

	71%
Development Strategy	92%
Capacity building	50%

AI WORKFORCE & INFRA

	86%
Readiness	87%
Availability	85%

AI WORKFORCE & INFRA

	70%
Development Strategy	90%
Capacity building	80%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DIGITAL HEALTH (DH)

DH GOVERNANCE

	97.5%
Readiness	100%
Availability	95%

DH INFRA.

	87%
Readiness	74%
Availability	100%

WORKFORCE (TECH & HEALTH)

	65%
Readiness	55%
Availability	75%

FUNDING & RESOURCES

	75%
Readiness	50%
Availability	100%

LEGAL RULES

	92.5%
Readiness	100%
Availability	85%

DH GOVERNANCE

	58.5%
Development Strategy	67%
Capacity building	50%

DH INFRA.

	95%
Development Strategy	90%
Capacity building	100%

WORKFORCE (TECH & HEALTH)

	80%
Development Strategy	60%
Capacity building	100%

FUNDING & RESOURCES

	87.5%
Development Strategy	75%
Capacity building	100%

LEGAL RULES

	42.5%
Development Strategy	85%
Capacity building	0%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DIGITAL HEALTH (DH)

FUNDING & RESEARCH

	75%
Readiness	100%
Availability	50%

LITERACY (PATIENT & WORKFORCE)

	17.5%
Readiness	35%
Availability	0%

FUNDING & RESEARCH

	90%
Development Strategy	80%
Capacity building	100%

LITERACY (PATIENT & WORKFORCE)

	No data
Development Strategy	No data
Capacity building	No data

Austria

HEALTH & IT

PRESENT DEVELOPMENT

PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	84%
Readiness	77%
Availability	91%

HEALTH GOVERNANCE

	93.5%
Development Strategy	87%
Capacity building	100%

IT GOVERNANCE

	97.5%
Readiness	100%
Availability	95%

IT GOVERNANCE

	80%
Development Strategy	90%
Capacity building	70%

IT WORKFORCE & INFRA

	69%
Readiness	58%
Availability	80%

IT WORKFORCE & INFRA

	87.5%
Development Strategy	100%
Capacity building	75%

HEALTH WORKFORCE & INFRA

	85%
Readiness	90%
Availability	80%

HEALTH WORKFORCE & INFRA

	96%
Development Strategy	92%
Capacity building	100%

AI WORKFORCE & INFRA

	79.5%
Readiness	84%
Availability	75%

AI WORKFORCE & INFRA

	72%
Development Strategy	64%
Capacity building	80%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DH GOVERNANCE

	Present	Prospective
	85%	50%
Readiness	100%	
Development Strategy		50%
Availability	70%	
Capacity building		50%

DH INFRA.

	Present	Prospective
	69,5%	65%
Readiness	60%	
Development Strategy		90%
Availability	79%	
Capacity building		40%

WORKFORCE (TECH & HEALTH)

	Present	Prospective
	32.5%	70%
Readiness	55%	
Development Strategy		40%
Availability	10%	
Capacity building		100%

FUNDING & RESOURCES

	Present	Prospective
	90%	55%
Readiness	80%	
Development Strategy		50%
Availability	100%	
Capacity building		60%

LEGAL RULES

	Present	Prospective
	75%	100%
Readiness	95%	
Development Strategy		100%
Availability	55%	
Capacity building		100%

DIGITAL HEALTH (DH)

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

FUNDING & RESEARCH

	Present	Prospective
	75%	80%
Readiness	100%	
Development Strategy		80%
Availability	50%	
Capacity building		80%

LITERACY (PATIENT & WORKFORCE)

	Present	Prospective
	50%	50%
Readiness	100%	
Development Strategy		100%
Availability	0%	
Capacity building		0%

Bangladesh

HEALTH & IT

PRESENT DEVELOPMENT

PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

64,5%

Readiness 69%

Availability 60%

HEALTH GOVERNANCE

85%

Development Strategy 95%

Capacity building 75%

IT GOVERNANCE

75%

Readiness 80%

Availability 70%

IT GOVERNANCE

30%

Development Strategy 60%

Capacity building 0%

IT WORKFORCE & INFRA

29%

Readiness 25%

Availability 33%

IT WORKFORCE & INFRA

62,5%

Development Strategy 100%

Capacity building 25%

HEALTH WORKFORCE & INFRA

52,5%

Readiness 80%

Availability 25%

HEALTH WORKFORCE & INFRA

72,5%

Development Strategy 95%

Capacity building 50%

AI WORKFORCE & INFRA

56%

Readiness 67%

Availability 45%

AI WORKFORCE & INFRA

35%

Development Strategy 30%

Capacity building 40%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DH GOVERNANCE

	65%
Readiness	55%
Availability	75%

DH GOVERNANCE

	27,5%
Development Strategy	55%
Capacity building	0%

DH INFRA.

	35,5%
Readiness	24%
Availability	47%

DH INFRA.

	50%
Development Strategy	80%
Capacity building	20%

WORKFORCE (TECH & HEALTH)

	12,5%
Readiness	20%
Availability	5%

WORKFORCE (TECH & HEALTH)

	30%
Development Strategy	60%
Capacity building	0%

FUNDING & RESOURCES

	60%
Readiness	55%
Availability	65%

FUNDING & RESOURCES

	25%
Development Strategy	50%
Capacity building	0%

LEGAL RULES

	70%
Readiness	70%
Availability	70%

LEGAL RULES

	47,5%
Development Strategy	45%
Capacity building	50%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

FUNDING & RESEARCH

	30%
Readiness	60%
Availability	0%

FUNDING & RESEARCH

	No data
Development Strategy	No data
Capacity building	No data

LITERACY (PATIENT & WORKFORCE)

	15%
Readiness	30%
Availability	0%

LITERACY (PATIENT & WORKFORCE)

	57,5%
Development Strategy	80%
Capacity building	35 %

Brazil

HEALTH & IT

PRESENT DEVELOPMENT

PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	66%
Readiness	46%
Availability	86%

HEALTH GOVERNANCE

	30.5%
Development Strategy	61%
Capacity building	0%

IT GOVERNANCE

	92.5%
Readiness	100%
Availability	85%

IT GOVERNANCE

	87.5%
Development Strategy	75%
Capacity building	100%

IT WORKFORCE & INFRA

	39%
Readiness	25%
Availability	53%

IT WORKFORCE & INFRA

	90%
Development Strategy	80%
Capacity building	100%

HEALTH WORKFORCE & INFRA

	66%
Readiness	95%
Availability	37%

HEALTH WORKFORCE & INFRA

	17.5%
Development Strategy	35%
Capacity building	0%

AI WORKFORCE & INFRA

	47%
Readiness	59%
Availability	35%

AI WORKFORCE & INFRA

	40%
Development Strategy	20%
Capacity building	60%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DIGITAL HEALTH (DH)

DH GOVERNANCE

	77.5%
Readiness	100%
Availability	55%

DH INFRA.

	66.5%
Readiness	43%
Availability	90%

WORKFORCE (TECH & HEALTH)

	47.5%
Readiness	35%
Availability	60%

FUNDING & RESOURCES

	67,5%
Readiness	70%
Availability	65%

LEGAL RULES

	75%
Readiness	95 %
Availability	55%

DH GOVERNANCE

	83.5%
Development Strategy	67%
Capacity building	100%

DH INFRA.

	35%
Development Strategy	50%
Capacity building	20%

WORKFORCE (TECH & HEALTH)

	70%
Development Strategy	40%
Capacity building	100%

FUNDING & RESOURCES

	75%
Development Strategy	50%
Capacity building	100%

LEGAL RULES

	100%
Development Strategy	100%
Capacity building	100%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DIGITAL HEALTH (DH)

FUNDING & RESEARCH

	37.5%
Readiness	75 %
Availability	0%

LITERACY (PATIENT & WORKFORCE)

	52.5%
Readiness	70%
Availability	35%

FUNDING & RESEARCH

	27.5%
Development Strategy	25%
Capacity building	30%

LITERACY (PATIENT & WORKFORCE)

	40%
Development Strategy	80%
Capacity building	0%

Canada

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	88%
Readiness	85%
Availability	91%

HEALTH GOVERNANCE

	75%
Development Strategy	100%
Capacity building	50%

IT GOVERNANCE

	92.5%
Readiness	100%
Availability	85%

IT GOVERNANCE

	90%
Development Strategy	80%
Capacity building	100%

IT WORKFORCE & INFRA

	66.5%
Readiness	53%
Availability	80%

IT WORKFORCE & INFRA

	100%
Development Strategy	100%
Capacity building	100%

HEALTH WORKFORCE & INFRA

	81.5%
Readiness	100%
Availability	63%

HEALTH WORKFORCE & INFRA

	42.5%
Development Strategy	85%
Capacity building	0%

AI WORKFORCE & INFRA

	88.5%
Readiness	92%
Availability	85%

AI WORKFORCE & INFRA

	42%
Development Strategy	24%
Capacity building	60%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DH GOVERNANCE

	Present	Prospective
	97.5%	75%
Readiness	100%	75%
Availability / Development Strategy	95%	75%
Capacity building		75%

DH INFRA.

	Present	Prospective
	87%	80%
Readiness	74%	80%
Availability / Development Strategy	100%	80%
Capacity building		80%

WORKFORCE (TECH & HEALTH)

	Present	Prospective
	62.5%	90%
Readiness	75%	80%
Availability / Development Strategy	50%	100%
Capacity building		

FUNDING & RESOURCES

	Present	Prospective
	85%	72.5%
Readiness	70%	80%
Availability / Development Strategy	100%	100%
Capacity building		

LEGAL RULES

	Present	Prospective
	90%	32%
Readiness	95 %	64%
Availability / Development Strategy	85%	0%
Capacity building		

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

FUNDING & RESEARCH

	Present	Prospective
	82.5%	65%
Readiness	85 %	50%
Availability / Development Strategy	80%	80%
Capacity building		

LITERACY (PATIENT & WORKFORCE)

	Present	Prospective
	35%	No data
Readiness	70%	No data
Availability / Development Strategy	0%	No data
Capacity building		

Colombia

HEALTH & IT

PRESENT DEVELOPMENT

HEALTH GOVERNANCE

66.5%

- Readiness 67%
- Availability 66%

IT GOVERNANCE

50%

- Readiness 50%
- Availability 50%

IT WORKFORCE & INFRA

34%

- Readiness 28%
- Availability 40%

HEALTH WORKFORCE & INFRA

54.5%

- Readiness 85%
- Availability 24%

AI WORKFORCE & INFRA

46%

- Readiness 62%
- Availability 30%

PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

35.5%

- Development Strategy 46%
- Capacity building 25%

IT GOVERNANCE

77.5%

- Development Strategy 75%
- Capacity building 80%

IT WORKFORCE & INFRA

80%

- Development Strategy 85%
- Capacity building 75%

HEALTH WORKFORCE & INFRA

15%

- Development Strategy 30%
- Capacity building 0%

AI WORKFORCE & INFRA

18%

- Development Strategy 36 %
- Capacity building 0%

DH GOVERNANCE

	45%
Readiness	56%
Availability	35%

DH GOVERNANCE

	7.5%
Development Strategy	15%
Capacity building	0%

DH INFRA.

	54.5%
Readiness	39%
Availability	70%

DH INFRA.

	25%
Development Strategy	50%
Capacity building	0%

WORKFORCE (TECH & HEALTH)

	17.5%
Readiness	35%
Availability	0%

WORKFORCE (TECH & HEALTH)

	10%
Development Strategy	20%
Capacity building	0%

FUNDING & RESOURCES

	50%
Readiness	35%
Availability	65%

FUNDING & RESOURCES

	No data
Development Strategy	No data
Capacity building	No data

LEGAL RULES

	77,5%
Readiness	100 %
Availability	55%

LEGAL RULES

	No data
Development Strategy	No data
Capacity building	No data

FUNDING & RESEARCH

	45%
Readiness	90 %
Availability	0%

FUNDING & RESEARCH

	No data
Development Strategy	No data
Capacity building	No data

LITERACY (PATIENT & WORKFORCE)

	50%
Readiness	100%
Availability	0%

LITERACY (PATIENT & WORKFORCE)

	25%
Development Strategy	50%
Capacity building	0%

Denmark

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	85.5%
Readiness	80%
Availability	91%

HEALTH GOVERNANCE

	41%
Development Strategy	82%
Capacity building	0%

IT GOVERNANCE

	100%
Readiness	100%
Availability	100%

IT GOVERNANCE

	100%
Development Strategy	100%
Capacity building	100%

IT WORKFORCE & INFRA

	94%
Readiness	98%
Availability	90%

IT WORKFORCE & INFRA

	100%
Development Strategy	100%
Capacity building	100%

HEALTH WORKFORCE & INFRA

	81%
Readiness	100%
Availability	62%

HEALTH WORKFORCE & INFRA

	38.5%
Development Strategy	77%
Capacity building	0%

AI WORKFORCE & INFRA

	84.5%
Readiness	84%
Availability	85%

AI WORKFORCE & INFRA

	92.5%
Development Strategy	85%
Capacity building	100%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DH GOVERNANCE

	96%
Readiness	97%
Availability	95%

DH GOVERNANCE

	83%
Development Strategy	75%
Capacity building	92%

DH INFRA.

	83.5%
Readiness	87%
Availability	80%

DH INFRA.

	80%
Development Strategy	80%
Capacity building	80%

WORKFORCE (TECH & HEALTH)

	30%
Readiness	50%
Availability	10%

WORKFORCE (TECH & HEALTH)

	20%
Development Strategy	40%
Capacity building	0%

FUNDING & RESOURCES

	90%
Readiness	80%
Availability	100%

FUNDING & RESOURCES

	55%
Development Strategy	50%
Capacity building	60%

LEGAL RULES

	77.5%
Readiness	100%
Availability	55%

LEGAL RULES

	40%
Development Strategy	80%
Capacity building	0%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

FUNDING & RESEARCH

	62,5%
Readiness	85%
Availability	40%

FUNDING & RESEARCH

	40%
Development Strategy	50%
Capacity building	30%

LITERACY (PATIENT & WORKFORCE)

	No data
Readiness	No data
Availability	No data

LITERACY (PATIENT & WORKFORCE)

	No data
Development Strategy	No data
Capacity building	No data

Fiji

HEALTH & IT

PRESENT DEVELOPMENT	PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	67.5%
Readiness	69%
Availability	66%

HEALTH GOVERNANCE

	97.5%
Development Strategy	95%
Capacity building	100%

IT GOVERNANCE

	82.5%
Readiness	95%
Availability	70%

IT GOVERNANCE

	87.5%
Development Strategy	75%
Capacity building	100%

IT WORKFORCE & INFRA

	22%
Readiness	15%
Availability	29%

IT WORKFORCE & INFRA

	95%
Development Strategy	90%
Capacity building	100%

HEALTH WORKFORCE & INFRA

	51%
Readiness	80%
Availability	22%

HEALTH WORKFORCE & INFRA

	72.5%
Development Strategy	95%
Capacity building	50%

AI WORKFORCE & INFRA

	33.5%
Readiness	42%
Availability	22%

AI WORKFORCE & INFRA

	7%
Development Strategy	14%
Capacity building	0%

DIGITAL HEALTH (DH)

DH GOVERNANCE

78.5%
Readiness 87%
Availability 70%

DH INFRA.

25.5%
Readiness 19%
Availability 32%

WORKFORCE (TECH & HEALTH)

2.5%
Readiness 0%
Availability 5%

FUNDING & RESOURCES

72,5%
Readiness 45%
Availability 100%

LEGAL RULES

50%
Readiness 55%
Availability 60%

DH GOVERNANCE

85%
Development Strategy 70%
Capacity building 100%

DH INFRA.

50%
Development Strategy 60%
Capacity building 40%

WORKFORCE (TECH & HEALTH)

70%
Development Strategy 40%
Capacity building 100%

FUNDING & RESOURCES

27.5%
Development Strategy 25%
Capacity building 30%

LEGAL RULES

72.5%
Development Strategy 45%
Capacity building 100%

DIGITAL HEALTH (DH)

FUNDING & RESEARCH

40%
Readiness 60%
Availability 20%

LITERACY (PATIENT & WORKFORCE)

32.5%
Readiness 65%
Availability 0%

FUNDING & RESEARCH

50%
Development Strategy 50%
Capacity building 50%

LITERACY (PATIENT & WORKFORCE)

No data
Development Strategy No data
Capacity building No data

India

HEALTH & IT

PRESENT DEVELOPMENT

HEALTH GOVERNANCE

77%

Readiness 84%

Availability 70%

IT GOVERNANCE

87,5%

Readiness 90%

Availability 85%

IT WORKFORCE & INFRA

31,5%

Readiness 30%

Availability 33%

HEALTH WORKFORCE & INFRA

62%

Readiness 85%

Availability 39%

AI WORKFORCE & INFRA

71%

Readiness 77%

Availability 65%

PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

100%

Development Strategy 100%

Capacity building 100%

IT GOVERNANCE

90%

Development Strategy 80%

Capacity building 100%

IT WORKFORCE & INFRA

100%

Development Strategy 100%

Capacity building 100%

HEALTH WORKFORCE & INFRA

100%

Development Strategy 100%

Capacity building 100%

AI WORKFORCE & INFRA

95%

Development Strategy 90%

Capacity building 100%

PRESENT DEVELOPMENT

PROSPECTIVE DEVELOPMENT

DIGITAL HEALTH (DH)

DH GOVERNANCE

	95%
Readiness	94%
Availability	95%

DH INFRA.

	64,5%
Readiness	29%
Availability	100%

WORKFORCE (TECH & HEALTH)

	75%
Readiness	50%
Availability	100%

FUNDING & RESOURCES

	90%
Readiness	80%
Availability	100%

LEGAL RULES

	62,5%
Readiness	70%
Availability	55%

DH GOVERNANCE

	95%
Development Strategy	100%
Capacity building	90%

DH INFRA.

	55%
Development Strategy	60%
Capacity building	50%

WORKFORCE (TECH & HEALTH)

	40%
Development Strategy	50%
Capacity building	30%

FUNDING & RESOURCES

	100%
Development Strategy	100%
Capacity building	1000%

LEGAL RULES

	100%
Development Strategy	100%
Capacity building	100%

PRESENT DEVELOPMENT

PROSPECTIVE DEVELOPMENT

DIGITAL HEALTH (DH)

FUNDING & RESEARCH

	90%
Readiness	100%
Availability	80%

LITERACY (PATIENT & WORKFORCE)

	57,5%
Readiness	65%
Availability	50%

FUNDING & RESEARCH

	65%
Development Strategy	100%
Capacity building	30%

LITERACY (PATIENT & WORKFORCE)

	25%
Development Strategy	0%
Capacity building	50%

Ireland

HEALTH & IT

PRESENT DEVELOPMENT

PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	78%
Readiness	75%
Availability	81%

HEALTH GOVERNANCE

	85%
Development Strategy	95%
Capacity building	75%

IT GOVERNANCE

	87.5%
Readiness	100%
Availability	75%

IT GOVERNANCE

	80%
Development Strategy	90%
Capacity building	70%

IT WORKFORCE & INFRA

	66.5%
Readiness	58%
Availability	75%

IT WORKFORCE & INFRA

	85%
Development Strategy	95%
Capacity building	75%

HEALTH WORKFORCE & INFRA

	81%
Readiness	90%
Availability	72%

HEALTH WORKFORCE & INFRA

	71%
Development Strategy	92%
Capacity building	50%

AI WORKFORCE & INFRA

	72%
Readiness	69%
Availability	75%

AI WORKFORCE & INFRA

	59;5%
Development Strategy	79%
Capacity building	40%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DH GOVERNANCE

	80%
Readiness	90%
Availability	70%

DH GOVERNANCE

	82.5%
Development Strategy	65%
Capacity building	100%

DH INFRA.

	65.5%
Readiness	71%
Availability	60%

DH INFRA.

	70%
Development Strategy	80%
Capacity building	60%

WORKFORCE (TECH & HEALTH)

	25%
Readiness	40%
Availability	10%

WORKFORCE (TECH & HEALTH)

	70%
Development Strategy	40%
Capacity building	100%

FUNDING & RESOURCES

	85%
Readiness	70%
Availability	100%

FUNDING & RESOURCES

	67.5%
Development Strategy	75%
Capacity building	60%

LEGAL RULES

	75%
Readiness	95%
Availability	55%

LEGAL RULES

	47.5%
Development Strategy	40%
Capacity building	50%

DIGITAL HEALTH (DH)

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

FUNDING & RESEARCH

	52.5%
Readiness	85%
Availability	20%

FUNDING & RESEARCH

	55%
Development Strategy	80%
Capacity building	30%

LITERACY (PATIENT & WORKFORCE)

	60%
Readiness	70%
Availability	50%

LITERACY (PATIENT & WORKFORCE)

	40
Development Strategy	80%
Capacity building	0%

Israel

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	71.5%
Readiness	82%
Availability	61%

HEALTH GOVERNANCE

	47.5%
Development Strategy	90%
Capacity building	0%

IT GOVERNANCE

	87.5%
Readiness	100%
Availability	75%

IT GOVERNANCE

	95%
Development Strategy	90%
Capacity building	100%

IT WORKFORCE & INFRA

	70%
Readiness	60%
Availability	80%

IT WORKFORCE & INFRA

	85%
Development Strategy	95%
Capacity building	75%

HEALTH WORKFORCE & INFRA

	76%
Readiness	85%
Availability	67%

HEALTH WORKFORCE & INFRA

	56%
Development Strategy	81%
Capacity building	25%

AI WORKFORCE & INFRA

	62%
Readiness	59%
Availability	65%

AI WORKFORCE & INFRA

	57%
Development Strategy	54%
Capacity building	60%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DH GOVERNANCE

	Present	Prospective
	76%	56%
Readiness	97%	
Development Strategy		62%
Availability	55%	
Capacity building		50%

DH INFRA.

	Present	Prospective
	67.5%	65%
Readiness	75%	
Development Strategy		70%
Availability	60%	
Capacity building		60%

WORKFORCE (TECH & HEALTH)

	Present	Prospective
	37.5%	45%
Readiness	40%	
Development Strategy		40%
Availability	35%	
Capacity building		50%

FUNDING & RESOURCES

	Present	Prospective
	80%	72.5%
Readiness	100%	
Development Strategy		75%
Availability	60%	
Capacity building		70%

LEGAL RULES

	Present	Prospective
	82.5%	32.5%
Readiness	95%	
Development Strategy		65%
Availability	70%	
Capacity building		0%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

FUNDING & RESEARCH

	Present	Prospective
	72.5%	90%
Readiness	85%	
Development Strategy		100%
Availability	60%	
Capacity building		80%

LITERACY (PATIENT & WORKFORCE)

	Present	Prospective
	15%	No data
Readiness	30%	
Development Strategy		No data
Availability	0%	
Capacity building		No data

Japan

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	89%
Readiness	87%
Availability	91%

HEALTH GOVERNANCE

	47,5%
Development Strategy	95%
Capacity building	0%

IT GOVERNANCE

	97,5%
Readiness	100%
Availability	95%

IT GOVERNANCE

	72,5%
Development Strategy	85%
Capacity building	60%

IT WORKFORCE & INFRA

	77,5%
Readiness	65%
Availability	90%

IT WORKFORCE & INFRA

	75%
Development Strategy	100%
Capacity building	50%

HEALTH WORKFORCE & INFRA

	92,5%
Readiness	95%
Availability	90%

HEALTH WORKFORCE & INFRA

	70%
Development Strategy	65%
Capacity building	75%

AI WORKFORCE & INFRA

	88,5%
Readiness	97%
Availability	80%

AI WORKFORCE & INFRA

	90%
Development Strategy	80%
Capacity building	100%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DH GOVERNANCE

	65%
Readiness	70%
Availability	60%

DH GOVERNANCE

	62,5%
Development Strategy	75%
Capacity building	50%

DH INFRA.

	80%
Readiness	90%
Availability	70%

DH INFRA.

	85%
Development Strategy	90%
Capacity building	80%

WORKFORCE (TECH & HEALTH)

	12,5%
Readiness	5%
Availability	20%

WORKFORCE (TECH & HEALTH)

	10%
Development Strategy	20%
Capacity building	0%

FUNDING & RESOURCES

	90%
Readiness	80%
Availability	100%

FUNDING & RESOURCES

	27,5%
Development Strategy	25%
Capacity building	30%

LEGAL RULES

	82,5%
Readiness	95%
Availability	70%

LEGAL RULES

	67,5%
Development Strategy	85%
Capacity building	50%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

FUNDING & RESEARCH

	85%
Readiness	100%
Availability	70%

FUNDING & RESEARCH

	75%
Development Strategy	70%
Capacity building	80%

LITERACY (PATIENT & WORKFORCE)

	50%
Readiness	100%
Availability	0%

LITERACY (PATIENT & WORKFORCE)

	No data
Development Strategy	No data
Capacity building	No data

Mauritius

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	77.5%
Readiness	84%
Availability	71%

HEALTH GOVERNANCE

	100%
Development Strategy	100%
Capacity building	100%

IT GOVERNANCE

	70%
Readiness	70%
Availability	70%

IT GOVERNANCE

	92.5%
Development Strategy	85%
Capacity building	100%

IT WORKFORCE & INFRA

	49%
Readiness	28%
Availability	70%

IT WORKFORCE & INFRA

	100%
Development Strategy	100%
Capacity building	100%

HEALTH WORKFORCE & INFRA

	55%
Readiness	80%
Availability	50%

HEALTH WORKFORCE & INFRA

	96%
Development Strategy	92%
Capacity building	100%

AI WORKFORCE & INFRA

	59.5%
Readiness	74%
Availability	45%

AI WORKFORCE & INFRA

	47.5%
Development Strategy	35%
Capacity building	60%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DH GOVERNANCE

	57.5%
Readiness	80%
Availability	35%

DH GOVERNANCE

	32.5%
Development Strategy	40%
Capacity building	25%

DH INFRA.

	61%
Readiness	62%
Availability	60%

DH INFRA.

	70%
Development Strategy	80%
Capacity building	60%

WORKFORCE (TECH & HEALTH)

	17.5%
Readiness	35%
Availability	0%

WORKFORCE (TECH & HEALTH)

	60%
Development Strategy	20%
Capacity building	100%

FUNDING & RESOURCES

	52.5%
Readiness	70%
Availability	35%

FUNDING & RESOURCES

	27.5%
Development Strategy	25%
Capacity building	30%

LEGAL RULES

	50%
Readiness	55%
Availability	45%

LEGAL RULES

	57.5%
Development Strategy	65%
Capacity building	50%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

FUNDING & RESEARCH

	45%
Readiness	50%
Availability	40%

FUNDING & RESEARCH

	No data
Development Strategy	No data
Capacity building	No data

LITERACY (PATIENT & WORKFORCE)

	15%
Readiness	30%
Availability	0%

LITERACY (PATIENT & WORKFORCE)

	17.5%
Development Strategy	0%
Capacity building	35%

New Zealand

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	89%
Readiness	87%
Availability	91%

IT GOVERNANCE

	97.5%
Readiness	100%
Availability	95%

IT WORKFORCE & INFRA

	79%
Readiness	73%
Availability	85%

HEALTH WORKFORCE & INFRA

	78.5%
Readiness	90%
Availability	67%

AI WORKFORCE & INFRA

	59.5%
Readiness	64%
Availability	55%

HEALTH GOVERNANCE

	85%
Development Strategy	95%
Capacity building	75%

IT GOVERNANCE

	97.5%
Development Strategy	95%
Capacity building	100%

IT WORKFORCE & INFRA

	82.5%
Development Strategy	90%
Capacity building	75%

HEALTH WORKFORCE & INFRA

	51%
Development Strategy	77%
Capacity building	25%

AI WORKFORCE & INFRA

	74.5%
Development Strategy	69%
Capacity building	80%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DIGITAL HEALTH (DH)

DH GOVERNANCE

	75%
Readiness	80%
Availability	70%

DH GOVERNANCE

	70%
Development Strategy	65%
Capacity building	75%

DH INFRA.

	81%
Readiness	82%
Availability	80%

DH INFRA.

	60%
Development Strategy	80%
Capacity building	40%

WORKFORCE (TECH & HEALTH)

	32.5%
Readiness	55%
Availability	10%

WORKFORCE (TECH & HEALTH)

	70%
Development Strategy	40%
Capacity building	100%

FUNDING & RESOURCES

	80%
Readiness	60%
Availability	100%

FUNDING & RESOURCES

	27.5%
Development Strategy	25%
Capacity building	30%

LEGAL RULES

	77.5%
Readiness	100%
Availability	55%

LEGAL RULES

	42.5%
Development Strategy	85%
Capacity building	0%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DIGITAL HEALTH (DH)

FUNDING & RESEARCH

	80%
Readiness	100%
Availability	60%

FUNDING & RESEARCH

	100%
Development Strategy	100%
Capacity building	100%

LITERACY (PATIENT & WORKFORCE)

	15%
Readiness	30%
Availability	0%

LITERACY (PATIENT & WORKFORCE)

	15%
Development Strategy	30%
Capacity building	0%

Rwanda

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	79,5%
Readiness	84%
Availability	75%

IT GOVERNANCE

	70%
Readiness	70%
Availability	70%

IT WORKFORCE & INFRA

	29%
Readiness	25%
Availability	33%

HEALTH WORKFORCE & INFRA

	40%
Readiness	60%
Availability	20%

AI WORKFORCE & INFRA

	41%
Readiness	47%
Availability	35%

HEALTH GOVERNANCE

	85%
Development Strategy	95%
Capacity building	75%

IT GOVERNANCE

	90%
Development Strategy	80%
Capacity building	100%

IT WORKFORCE & INFRA

	85%
Development Strategy	95%
Capacity building	75%

HEALTH WORKFORCE & INFRA

	96%
Development Strategy	92%
Capacity building	100%

AI WORKFORCE & INFRA

	10%
Development Strategy	20%
Capacity building	0%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DH GOVERNANCE

	Present	Prospective
	73,5%	85%
Readiness	67%	70%
Availability / Development Strategy	80%	100%
Capacity building		

DH INFRA.

	Present	Prospective
	51%	90%
Readiness	22%	100%
Availability / Development Strategy	80%	80%
Capacity building		

WORKFORCE (TECH & HEALTH)

	Present	Prospective
	17,5%	70%
Readiness	35%	40%
Availability / Development Strategy	0%	100%
Capacity building		

FUNDING & RESOURCES

	Present	Prospective
	72,5%	75%
Readiness	80%	50%
Availability / Development Strategy	65%	100%
Capacity building		

LEGAL RULES

	Present	Prospective
	55%	92,5%
Readiness	55%	85%
Availability / Development Strategy	55%	100%
Capacity building		

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

FUNDING & RESEARCH

	Present	Prospective
	57,5%	65%
Readiness	75%	80%
Availability / Development Strategy	40%	50%
Capacity building		

LITERACY (PATIENT & WORKFORCE)

	Present	Prospective
	No data	60%
Readiness	No data	50%
Availability / Development Strategy	No data	70%
Capacity building		

Saudi Arabia

HEALTH & IT

PRESENT DEVELOPMENT

PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	74%
Readiness	67%
Availability	81%

IT GOVERNANCE

	67.5%
Readiness	70%
Availability	65%

IT WORKFORCE & INFRA

	67%
Readiness	63%
Availability	71%

HEALTH WORKFORCE & INFRA

	50%
Readiness	65%
Availability	35%

AI WORKFORCE & INFRA

	56%
Readiness	47%
Availability	65%

HEALTH GOVERNANCE

	60%
Development Strategy	95%
Capacity building	25%

IT GOVERNANCE

	95%
Development Strategy	90%
Capacity building	100%

IT WORKFORCE & INFRA

	85%
Development Strategy	95%
Capacity building	75%

HEALTH WORKFORCE & INFRA

	54.5%
Development Strategy	59%
Capacity building	50%

AI WORKFORCE & INFRA

	59.5%
Development Strategy	39%
Capacity building	80%

DH GOVERNANCE

	80%
Readiness	80%
Availability	80%

DH INFRA.

	60%
Readiness	65%
Availability	55%

WORKFORCE (TECH & HEALTH)

	50%
Readiness	45%
Availability	55%

FUNDING & RESOURCES

	85%
Readiness	70%
Availability	100%

LEGAL RULES

	52,5%
Readiness	50%
Availability	55%

DH GOVERNANCE

	41%
Development Strategy	57%
Capacity building	25%

DH INFRA.

	45%
Development Strategy	90%
Capacity building	0%

WORKFORCE (TECH & HEALTH)

	55%
Development Strategy	60%
Capacity building	50%

FUNDING & RESOURCES

	67.5%
Development Strategy	75%
Capacity building	60%

LEGAL RULES

	22.5%
Development Strategy	45%
Capacity building	0%

FUNDING & RESEARCH

	42.5%
Readiness	85%
Availability	0%

LITERACY (PATIENT & WORKFORCE)

	50%
Readiness	100%
Availability	0%

FUNDING & RESEARCH

	37.5%
Development Strategy	25%
Capacity building	50%

LITERACY (PATIENT & WORKFORCE)

	No data
Development Strategy	No data
Capacity building	No data

Singapore

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	79%
Readiness	87%
Availability	71%

HEALTH GOVERNANCE

	85,5%
Development Strategy	71%
Capacity building	100%

IT GOVERNANCE

	100%
Readiness	100%
Availability	100%

IT GOVERNANCE

	77,5%
Development Strategy	95%
Capacity building	60%

IT WORKFORCE & INFRA

	84%
Readiness	85%
Availability	83%

IT WORKFORCE & INFRA

	85%
Development Strategy	95%
Capacity building	75%

HEALTH WORKFORCE & INFRA

	75%
Readiness	90%
Availability	60%

HEALTH WORKFORCE & INFRA

	83,5%
Development Strategy	92%
Capacity building	75%

AI WORKFORCE & INFRA

	84,5%
Readiness	94%
Availability	75%

AI WORKFORCE & INFRA

	84,5%
Development Strategy	69%
Capacity building	100%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

DH GOVERNANCE

	Present	Prospective
	97,5%	48,5%
Readiness / Development Strategy	100%	72%
Availability / Capacity building	95%	25%

DH INFRA.

	Present	Prospective
	92%	55%
Readiness / Development Strategy	85%	70%
Availability / Capacity building	100%	40%

WORKFORCE (TECH & HEALTH)

	Present	Prospective
	82,5%	45%
Readiness / Development Strategy	80%	40%
Availability / Capacity building	85%	50%

FUNDING & RESOURCES

	Present	Prospective
	95%	65%
Readiness / Development Strategy	90%	100%
Availability / Capacity building	100%	30%

LEGAL RULES

	Present	Prospective
	92,5%	50%
Readiness / Development Strategy	100%	100%
Availability / Capacity building	85%	0%

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

FUNDING & RESEARCH

	Present	Prospective
	95%	50%
Readiness / Development Strategy	100%	100%
Availability / Capacity building	90%	0%

LITERACY (PATIENT & WORKFORCE)

	Present	Prospective
	17,5%	No data
Readiness / Development Strategy	35%	No data
Availability / Capacity building	0%	No data

South Africa

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	84,5%
Readiness	84%
Availability	85%

IT GOVERNANCE

	82,5%
Readiness	90%
Availability	75%

IT WORKFORCE & INFRA

	38%
Readiness	25%
Availability	51%

HEALTH WORKFORCE & INFRA

	48,5%
Readiness	70%
Availability	27%

AI WORKFORCE & INFRA

	48%
Readiness	51%
Availability	45%

HEALTH GOVERNANCE

	100%
Development Strategy	100%
Capacity building	100%

IT GOVERNANCE

	92,5%
Development Strategy	85%
Capacity building	100%

IT WORKFORCE & INFRA

	85%
Development Strategy	70%
Capacity building	100%

HEALTH WORKFORCE & INFRA

	67,5%
Development Strategy	85%
Capacity building	50%

AI WORKFORCE & INFRA

	7%
Development Strategy	14%
Capacity building	0%

DH GOVERNANCE

	82,5%
Readiness	90%
Availability	75%

DH GOVERNANCE

	96%
Development Strategy	92%
Capacity building	100%

DH INFRA.

	49,5%
Readiness	42%
Availability	57%

DH INFRA.

	80%
Development Strategy	80%
Capacity building	80%

WORKFORCE (TECH & HEALTH)

	27,5%
Readiness	25%
Availability	30%

WORKFORCE (TECH & HEALTH)

	80%
Development Strategy	60%
Capacity building	100%

FUNDING & RESOURCES

	85%
Readiness	70%
Availability	100%

FUNDING & RESOURCES

	52,5%
Development Strategy	75%
Capacity building	30%

LEGAL RULES

	65%
Readiness	75%
Availability	55%

LEGAL RULES

	57,5%
Development Strategy	65%
Capacity building	50%

FUNDING & RESEARCH

	70%
Readiness	60%
Availability	80%

FUNDING & RESEARCH

	40%
Development Strategy	50%
Capacity building	30%

LITERACY (PATIENT & WORKFORCE)

	42,5%
Readiness	35%
Availability	50%

LITERACY (PATIENT & WORKFORCE)

	25%
Development Strategy	50%
Capacity building	0%

Switzerland

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	84%
Readiness	82%
Availability	86%

IT GOVERNANCE

	92.5%
Readiness	100%
Availability	85%

IT WORKFORCE & INFRA

	89%
Readiness	88%
Availability	90%

HEALTH WORKFORCE & INFRA

	90%
Readiness	95%
Availability	85%

AI WORKFORCE & INFRA

	64.5%
Readiness	64%
Availability	65%

HEALTH GOVERNANCE

	53%
Development Strategy	81%
Capacity building	25%

IT GOVERNANCE

	80%
Development Strategy	90%
Capacity building	70%

IT WORKFORCE & INFRA

	97.5%
Development Strategy	95%
Capacity building	100%

HEALTH WORKFORCE & INFRA

	51%
Development Strategy	77%
Capacity building	25%

AI WORKFORCE & INFRA

	39.5%
Development Strategy	59%
Capacity building	20%

PRESENT DEVELOPMENT

PROSPECTIVE DEVELOPMENT

DIGITAL HEALTH (DH)

DH GOVERNANCE

	75%
Readiness	80%
Availability	70%

DH GOVERNANCE

	46%
Development Strategy	42%
Capacity building	50%

DH INFRA.

	93.5%
Readiness	87%
Availability	100%

DH INFRA.

	85%
Development Strategy	90%
Capacity building	80%

WORKFORCE (TECH & HEALTH)

	35%
Readiness	50%
Availability	20%

WORKFORCE (TECH & HEALTH)

	80%
Development Strategy	60%
Capacity building	100%

FUNDING & RESOURCES

	95%
Readiness	90%
Availability	100%

FUNDING & RESOURCES

	60%
Development Strategy	50%
Capacity building	70%

LEGAL RULES

	85%
Readiness	100%
Availability	70%

LEGAL RULES

	42.5%
Development Strategy	85%
Capacity building	0%

PRESENT DEVELOPMENT

PROSPECTIVE DEVELOPMENT

DIGITAL HEALTH (DH)

FUNDING & RESEARCH

	90%
Readiness	100%
Availability	80%

FUNDING & RESEARCH

	65%
Development Strategy	50%
Capacity building	80%

LITERACY (PATIENT & WORKFORCE)

	60%
Readiness	70%
Availability	50%

LITERACY (PATIENT & WORKFORCE)

	15%
Development Strategy	0%
Capacity building	30%

UAE

HEALTH & IT

PRESENT DEVELOPMENT | PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	78%
Readiness	91%
Availability	65%

HEALTH GOVERNANCE

	85%
Development Strategy	95%
Capacity building	75%

IT GOVERNANCE

	95%
Readiness	95%
Availability	95%

IT GOVERNANCE

	95%
Development Strategy	90%
Capacity building	100%

IT WORKFORCE & INFRA

	85%
Readiness	75%
Availability	95%

IT WORKFORCE & INFRA

	70%
Development Strategy	90%
Capacity building	50%

HEALTH WORKFORCE & INFRA

	61%
Readiness	85%
Availability	37%

HEALTH WORKFORCE & INFRA

	67.5%
Development Strategy	85%
Capacity building	50%

AI WORKFORCE & INFRA

	76.5%
Readiness	88%
Availability	65%

AI WORKFORCE & INFRA

	52%
Development Strategy	64%
Capacity building	40%

DIGITAL HEALTH (DH)

DH GOVERNANCE

	86%
Readiness	77%
Availability	95%

DH INFRA.

	61.5%
Readiness	78%
Availability	45%

WORKFORCE (TECH & HEALTH)

	40%
Readiness	70%
Availability	10%

FUNDING & RESOURCES

	85%
Readiness	70%
Availability	100%

LEGAL RULES

	77.5%
Readiness	100%
Availability	55%

DH GOVERNANCE

	41%
Development Strategy	57%
Capacity building	25%

DH INFRA.

	60%
Development Strategy	80%
Capacity building	40%

WORKFORCE (TECH & HEALTH)

	70%
Development Strategy	40%
Capacity building	100%

FUNDING & RESOURCES

	67.5%
Development Strategy	75%
Capacity building	60%

LEGAL RULES

	75%
Development Strategy	100%
Capacity building	50%

DIGITAL HEALTH (DH)

FUNDING & RESEARCH

	62.5%
Readiness	85%
Availability	40%

LITERACY (PATIENT & WORKFORCE)

	15%
Readiness	30%
Availability	0%

FUNDING & RESEARCH

	90%
Development Strategy	80%
Capacity building	100%

LITERACY (PATIENT & WORKFORCE)

	25%
Development Strategy	50%
Capacity building	0%

UK

HEALTH & IT

PRESENT DEVELOPMENT

HEALTH GOVERNANCE

	88%
Readiness	85%
Availability	91%

IT GOVERNANCE

	92.5%
Readiness	100%
Availability	85%

IT WORKFORCE & INFRA

	84%
Readiness	78%
Availability	90%

HEALTH WORKFORCE & INFRA

	84%
Readiness	100%
Availability	68%

AI WORKFORCE & INFRA

	94.5%
Readiness	99%
Availability	90%

PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	83,5%
Development Strategy	92%
Capacity building	75%

IT GOVERNANCE

	97.5%
Development Strategy	95%
Capacity building	100%

IT WORKFORCE & INFRA

	97.5%
Development Strategy	95%
Capacity building	100%

HEALTH WORKFORCE & INFRA

	87.5%
Development Strategy	100%
Capacity building	75%

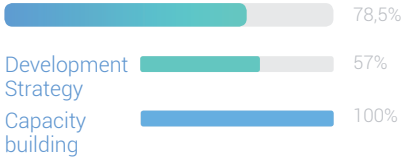
AI WORKFORCE & INFRA

	81%
Development Strategy	87%
Capacity building	75%

DIGITAL HEALTH (DH)

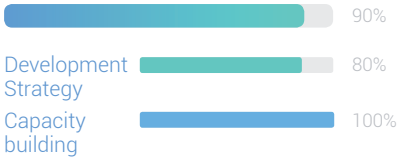
DH GOVERNANCE

DH GOVERNANCE

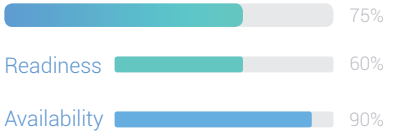


DH INFRA.

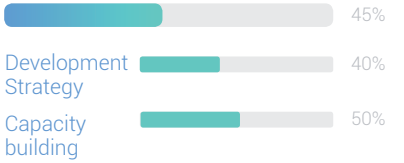
DH INFRA.



WORKFORCE (TECH & HEALTH)

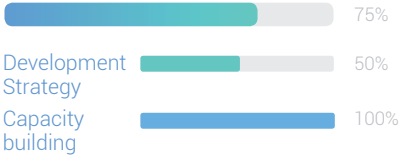


WORKFORCE (TECH & HEALTH)



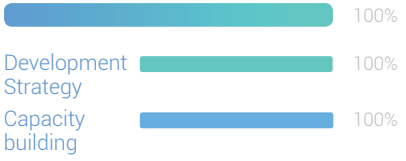
FUNDING & RESOURCES

FUNDING & RESOURCES



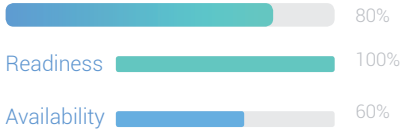
LEGAL RULES

LEGAL RULES



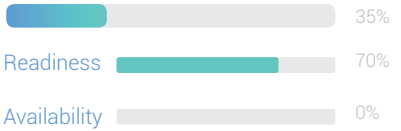
DIGITAL HEALTH (DH)

FUNDING & RESEARCH

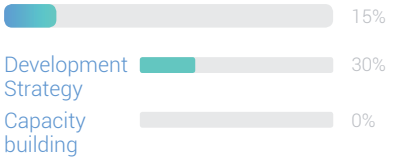


FUNDING & RESEARCH

LITERACY (PATIENT & WORKFORCE)



LITERACY (PATIENT & WORKFORCE)



USA

HEALTH & IT

PRESENT DEVELOPMENT

PROSPECTIVE DEVELOPMENT

HEALTH GOVERNANCE

	84.5%
Readiness	84%
Availability	85%

IT GOVERNANCE

	97.5%
Readiness	100%
Availability	95%

IT WORKFORCE & INFRA

	80%
Readiness	75%
Availability	85%

HEALTH WORKFORCE & INFRA

	90%
Readiness	100%
Availability	80%

AI WORKFORCE & INFRA

	97%
Readiness	99%
Availability	95%

HEALTH GOVERNANCE

	97.5%
Development Strategy	95%
Capacity building	100%

IT GOVERNANCE

	92.5%
Development Strategy	85%
Capacity building	100%

IT WORKFORCE & INFRA

	87.5%
Development Strategy	100%
Capacity building	75%

HEALTH WORKFORCE & INFRA

	86%
Development Strategy	97%
Capacity building	75%

AI WORKFORCE & INFRA

	97.5%
Development Strategy	95%
Capacity building	100%

DH GOVERNANCE

	96%
Readiness	97%
Availability	95%

DH INFRA.

	92.5%
Readiness	84%
Availability	100%

WORKFORCE (TECH & HEALTH)

	72.5%
Readiness	55%
Availability	90%

FUNDING & RESOURCES

	80%
Readiness	60%
Availability	100%

LEGAL RULES

	92.5%
Readiness	100
Availability	85%

DH GOVERNANCE

	88.5%
Development Strategy	77%
Capacity building	100%

DH INFRA.

	100%
Development Strategy	100%
Capacity building	100%

WORKFORCE (TECH & HEALTH)

	80%
Development Strategy	60%
Capacity building	100%

FUNDING & RESOURCES

	62.5%
Development Strategy	25%
Capacity building	100%

LEGAL RULES

	75%
Development Strategy	100%
Capacity building	50%

FUNDING & RESEARCH

	87.5%
Readiness	85%
Availability	90%

LITERACY (PATIENT & WORKFORCE)

	75%
Readiness	100%
Availability	50%

FUNDING & RESEARCH

	80%
Development Strategy	80%
Capacity building	80%

LITERACY (PATIENT & WORKFORCE)

	57.5%
Development Strategy	80%
Capacity building	35%

Annex.I

TAXONOMY - WEIGHTAGE		
HEALTHCARE GOVERNANCE - READINESS - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
National Healthcare Policy / National Healthcare Act - 25	Does the country have a National Healthcare Strategy?	10
	Is the National Healthcare Strategy updated?	5
	Is it a Short Term Strategy (duration <=5)?	5
	Does the National Healthcare Strategy Focus on Strengthening Digital Dimensions in Healthcare?	5
Health financing strategies & plans - 20	Does the Government provide Healthcare Financial Coverage?	10
	Is Healthcare financed only by the Government?	4
	Is the Healthcare both publicly and privately financed?	6
Country has adopted Universal Health Coverage as policy - 15.	Has the country achieved Universal Health Coverage?	9
	Does the Country have a Universal or Federal Health Insurance Plan for achieving Universal Health Coverage?	4
	Is the country working towards achieving Universal Health Coverage?	2
Laws on Health-data privacy and confidentiality - 15	Does the country have a law to protect Personal, Sensitive or Health Data of its citizens?	15
Policy for Controlling Diseases/Disease prevention - 15	Does the Country have National Strategy for Controlling Diseases?	7
	Does the Strategy focus on both the Communicable and Non-Communicable Diseases?	5
	Does the Strategy focus on either Communicable or Non-Communicable Diseases?	3
Agency for new drug regulations and approval - 10	Is there a Central Agency for Drug and Medical Devices Regulation and Approval in the Country?	10

TAXONOMY - WEIGHTAGE		
HEALTHCARE GOVERNANCE - READINESS - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Agency for monitoring policy enforcement - 10	Is there a National agency monitoring the policy enforcement?	10

Dedicated workforce to monitor development at local/regional level - 5	Is there a dedicated workforce for enforcement at state/local/municipal level?	5
Percentage of GDP Spent on Public Health - 30	Total GDP expenditure value range >8	15
	Total GDP expenditure value range 5-8	10
	Total GDP expenditure value range <5	5
	4. Domestic general government health expenditure (% of GDP) value >5	15
	5. Domestic general government health expenditure (% of GDP) value 3-5	10
	6. Domestic general government health expenditure (% of GDP) value <3	5
Availability of Web based National Health portals - 10	Does the Country have Web based National Health Portals?	10
Health Insurance for Citizens - 25	Is the Health Insurance Available in an Equitable Manner (To every Citizen of the Country)	10
	Is the Health Insurance for all citizen is in plan?	5
	Is the Health Insurance Available only to low income group/elderly people?	4
	Is there a Federal Health Insurance Fund Available?	6
Government's Engagement with the Private Sector for Stronger Implementation of the National Health Policy - 20	Has the country adopted the PPP for better implementation of national health policy?	20
TAXONOMY - WEIGHTAGE		
HEALTHCARE GOVERNANCE - DEVELOPMENT STRATEGY - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Any Improvement strategy for the better quality of the healthcare - 35	Is there any plan to improve quality of primary healthcare?	15
	Is there any plan to develop mental health strategy?	10
	Is there plan to establish new medical treatment?	10
Any strategy to strengthen and reform health institutions, laws and regulations, including legal frameworks for universal health coverage - 18	Any plan for re-orientation of public hospitals?	8
	Any plan for successful implementation/amendment of health law	10

Health and IT Taxonomy

Any Strategy for developing latest medical advancement/ eradicate any specific disease - 17	Any plan for improved access to MRI/ CT scanning?	5
	Is there any plan to improve the treatment of non-communicable disease?	6
	Is there any plan to improve the treatment/eradicate of communicable disease?	6
Strategy for building digital healthcare - 20	Is there any strategy to introduce E-health programme?	12
	Any plan to improve efficiency of infrastructure by deployment of digital tools?	8
Funding development in healthcare sector - 20	Is there any strategy to increase public health expenditure?	20
TAXONOMY - WEIGHTAGE		
HEALTHCARE GOVERNANCE - CAPACITY BUILDING - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Dedicated budget/funding - 50	Is there any fund to support healthcare projects?	25
	Is there any fund for workforce development?	25
Upskilling of workforce for the National Agency - 25	Is there any training programme to upskill the healthcare workforce?	25

TAXONOMY - WEIGHTAGE		
IT GOVERNANCE - READINESS - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
National ICT Policy - 30	Does the Country have a National ICT Policy?	15
	Is the National ICT Policy Updated?	7
	Is it a Short Term Strategy (duration <=5)?	5
	Does the National ICT Strategy Focus on strengthening network infrastructure?	3
General Data Protection Regulation - GDPR/Personal Data Protection Laws - 30	Is there any existing Data Protection Law?	15
	Does the Country update/amend the Data protection law?	10
	Is there any equivalent standard available in the system?	5
Interoperability Framework- 10	Does the ICT strategy have the Interoperability Framework?	10

Law of Cybersecurity, cyberspace- 15	Is there any existing Cyber security Law?	10
	Does the system follow privacy and encryption methodologies? Is it updated?	5
Governance principles by which all IT initiatives will be governed - 10	Does the country have Governance principles for all IT initiatives?	10
Strategy for application of IT in different sectors - 5	Is there any strategy for IT applications in various sectors?	5
TAXONOMY - WEIGHTAGE		
IT GOVERNANCE - AVAILABILITY - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
National agency monitoring the policy enforcement - 15	Is there a National agency monitoring the policy enforcement	15
Dedicated workforce to monitor locally/ regionally - 5	Is there any dedicated workforce for enforcement in state/local/municipal level?	5
Availability of Government Online Services - 50	Is there any official website for the Government services /E-service portal?	15
	OSI Index >0.95	35
	OSI Index is 0.9-0.95	30
	OSI Index 0.8-0.89	20
	OSI Index 0.7-0.79	10
	OSI Index <0.7	5
Government Open Data Portal - 15	Is there any official open data portal? (15)	15
Agencies to monitor Laws/Acts - 15	Is there any National agency monitoring the Law enforcement?	10
	Does the country have a Cyber security centre?	5
TAXONOMY - WEIGHTAGE		
IT GOVERNANCE - DEVELOPMENT STRATEGY - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**

Health and IT Taxonomy

Regulatory and Security Framework Strengthening - 30	Does the country have guidelines to ensure ICT security and maintaining standards?	10
	Does the country have a plan to establish/promote a comprehensive data protection for digital communications?	10
	Does the country have a plan to establish/promote the International Data Centres?	10
Integration of digital dimension in future strategies - 25	Does the country aim to create robust Digital Communications Infrastructure?	15
	Does the country have a plan to adopt modern technology for digital development?	10
E-Gov Strategies and ranking - 35	Does the country have a plan to adopt/promote E-Government?	10
	EGDI Index >0.95	25
	EGDI Index 0.9-0.95	20
	EGDI Index 0.8-0.89	15
	EGDI Index 0.6-0.79	10
	EGDI Index <0.6	5
Identified requirements - 10	Does the country have already identified the fields of development?	10
TAXONOMY - WEIGHTAGE		
IT GOVERNANCE - DEVELOPMENT STRATEGY - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Dedicated budget/funding - 40	Is there any fund to support IT projects?	20
	Is there any fund for IT workforce development?	20
TAXONOMY - WEIGHTAGE		
IT WORKFORCE & INFRASTRUCTURE - READINESS - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
IT Workforce - Number of IT graduates - 10	Current Percentage of STEM graduates >30%	10
	Current Percentage of STEM graduates <20-30%	8
	Current Percentage of STEM graduates <20%	5
IT Workforce - ICT skill rank - 20	Rank as per ICT skill<=10	20
	Rank as per ICT skill is 11-20	15
	Rank as per ICT skill is 21-30	10
	Rank as per ICT skill is 31-40	8
	Rank as per ICT skill >40	5

Employment in ICT Sector - 20	Rank as per ICT development Index is 1-10	20
	Rank as per ICT development Index is 11-20	15
	Rank as per ICT development Index is 21-40	10
	Rank as per ICT development Index is 41-60	8
	Rank as per ICT development Index >60	5
Network Readiness Index - 25	NRI rank is 1-10	25
	NRI rank is 11-20	20
	NRI rank is 21-40	15
	NRI rank is 41-60	10
	NRI rank >60	5
Telecommunications Infrastructure Index - 25	TII, UN data >0.95	25
	TII, UN data 0.90-0.95	20
	TII, UN data 0.80-0.89	15
	TII, UN data 0.70-0.79	10
	TII, UN data <0.70	5
TAXONOMY - WEIGHTAGE		
IT WORKFORCE & INFRASTRUCTURE - AVAILABILITY - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
	Fixed broadband subscriptions (per 100 people) >35	25
Broadband Connectivity - 25	Fixed broadband subscriptions (per 100 people) 25-35	20
	Fixed broadband subscriptions (per 100 people) 15-24	15
	Fixed broadband subscriptions (per 100 people) 5-14	10
	Fixed broadband subscriptions (per 100 people) <5	5
Mobile Subscriptions - 25	Mobile cellular subscriptions (per 100 people) >140	25
	Mobile cellular subscriptions (per 100 people) 130-140	20
	Mobile cellular subscriptions (per 100 people) 120-129	15
	Mobile cellular subscriptions (per 100 people) 100-119	10
	Mobile cellular subscriptions (per 100 people) <100	5
Availability of Disruptive Technologies - IoT and AI Services - 5	Has the country already started to integrate IOT and AI in the different sectors?	5
Cloud Services Usage - 8	Has the country already adopted/launched the cloud computing service?	4
	Does the country focus on growing the cloud storage?	4

Health and IT Taxonomy

Internet Usage - 25	Individuals using the Internet (% of population) >90	25
	Individuals using the Internet (% of population) 80-90	20
	Individuals using the Internet (% of population) 70-79	15
	Individuals using the Internet (% of population) 60-69	10
	Individuals using the Internet (% of population) <60	5
5G Network - 7	Is 5G network available in good extent?	7
	Is 5G network just launched in 2020?	2
IT research hubs/ labs - 5	Does the country pose the number of Government research labs?	5
TAXONOMY - WEIGHTAGE		
IT WORKFORCE & INFRASTRUCTURE - DEVELOPMENT STRATEGY - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Creating IT / ICT workforce - 20	Is there any plan to increase the number of IT workforce?	10
	Is there any plan to train/educate people to create suitable workforce?	10
Enhancing Broadband Connectivity - 20	Is there any plan to promote/enhance broadband connectivity?	10
	Does the country have plan to create universal access of Broadband?	10
Developing 5G Infrastructure - 20	Does the country focus on developing 5G network?	15
	Does the country have separate strategy document for development of 5G?	5
Promoting Cybersecurity Policy - 10	Is there any plan to promote/enhance cybersecurity policy?	10
Promoting IoT and AI - 10	Does the country focus on promoting the disruptive technologies?	5
	Does the country have separate strategy document for development/promotion of AI?	5
Promoting ICT Application in Education, Medicine, and Other Fields - 10	Does the country promote ICT application in various fields?	10
Digital Literacy Initiatives - 10	Does the country have a plan to promote/enhance the Digital literacy initiatives?	10
TAXONOMY - WEIGHTAGE		
IT WORKFORCE & INFRASTRUCTURE - CAPACITY BUILDING - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**

Introducing ICT Curriculum or Programming - 25	Is there any ICT curriculum in schools and universities?	25
Promoting ICT Research and Development - 25	Does the country promote ICT Research / innovation ?	25
Dedicated budget for Capacity Building in IT - 25	Is there any dedicated budget for capacity building in IT?	25
Public-Private Partnerships - 25	Is there any plan to develop PPP in ICT?	25

TAXONOMY - WEIGHTAGE		
HEALTHCARE WORKFORCE AND INFRASTRUCTURE - READINESS		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Primary care - 30	Does the country have strong primary care unit?	20
	Does the country have vaccination unit, free medicine in primary care level?	10
Emergency Healthcare Access - 20	Does the country have strong emergency healthcare access? RUral 24*7 critical care service? centralised hub? medicine , hospital	20
Ranking on Global Health Security Index - 25	As per GHS index, country score >=70	25
	As per GHS index, country score 60-69	20
	As per GHS index, country score 50-59	15
	As per GHS index, country score 40-49	10
	As per GHS index, country score <40	5
Existing Strategy for Increasing Skilled Professionals and Infrastructure - 25	Does the country have a strategy to increase skilled workforce and infrastructure?	25

TAXONOMY - WEIGHTAGE		
HEALTHCARE WORKFORCE AND INFRASTRUCTURE - AVAILABILITY		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Practicing Doctors / 1000 People - 15	Number of Practicing Doctors / 1000 People range >4	15
	Number of Practicing Doctors / 1000 People range 3-4	10
	Number of Practicing Doctors / 1000 People range 2-2.9	8

Health and IT Taxonomy

	Number of Practicing Doctors / 1000 People range <2	3
Practicing Nurses / 1000 People - 15	Number of Nurses / 1000 People range >12	15
	Number of Nurses / 1000 People range 10-12	10
	Number of Nurses / 1000 People range 7-9.9	8
	Number of Nurses / 1000 People range 5-6.9	5
Number of Hospitals and clinics - 15	Number of Hospitals and clinics >1000	15
	Number of Hospitals and clinics 500-1000	10
	Number of Hospitals and clinics 200-499	8
	Number of Hospitals and clinics 50-199	5
Availability of Hospital Beds - 15	Number of Hospital Beds/1000 populations >10	15
	Number of Hospital Beds/1000 populations 5-10	12
	Number of Hospital Beds/1000 populations 3-4.9	10
	Number of Hospital Beds/1000 populations 2-2.9	5
	Number of Hospital Beds/1000 populations <2	2
Digital Data Access in Health Care Facilities - 10	Does the country use digital healthcare data in good extent?	7
	Country just launched digital healthcare facilities?	3
Access to Critical Care, surgery, intensive - 5	Does the country have strong critical care unit?	5
Medical/Imaging devices - 15	Number of Medical Technology units >50	15
	Number of Medical Technology units <50	10
Healthcare Research Hubs - 10	Healthcare research hubs are present?	10

TAXONOMY - WEIGHTAGE		
HEALTHCARE WORKFORCE AND INFRASTRUCTURE - DEVELOPMENT STRATEGY -100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Long Term Or Short Term Development Strategy - 8	Is it a Short Term Strategy (duration <=5 yr) ?	8
	Is it a Long Term Strategy (duration 5-10 yr) ?	5
Strategy for Regulating Healthcare Infrastructure - 32	Does the country have plan to promote medical infrastructure?	14
	Does the country focus on increasing hospital beds?	10
	Does the country have plan to improve availability of medical products/equipment?	8

Increasing / Regulating Public Healthcare Spending / Establishing Sustainable Funding Sources - 10	Is the country increasing the sustainable healthcare funding?	10
Private Sector Collaboration - 5	Is there any plan to develop PPP in healthcare?	5
Promoting Skilled Manpower in Remote Regions - 5	Does the country have a plan to promote the skilled workforce in remote/rural area (introducing quota, remuneration)	5
Integration of Digital Dimension - 25	Does the country promote Electronic health record/ Electronic patient card ?	12
	Does the country promote Telemedicine ?	8
	Does the country promote the healthcare software?	5
Creating More Workforce - 10	Is there any plan to increase the number of healthcare worker?	5
	Is there any plan to train/educate people to create suitable health worker	5
Strengthening Primary Healthcare - 5	Does the country have plan to strengthen the primary healthcare units?	5
TAXONOMY - WEIGHTAGE		
HEALTHCARE WORKFORCE AND INFRASTRUCTURE - CAPACITY BUILDING -100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Integration of advanced technologies - 25	Does the country integrate advanced technologies in healthcare ?	25
Public Funding of Medical Education - 25	Does the country have public funding for medical education/ free medical education ?	25
Funding development for Healthcare research - 25	Does the country promote/develop funding for healthcare research?	25
Increasing Number of Graduate Schools Teaching Medical Science or Public Health- adequacy of graduates with respect to market/ country need - 25	Does the country produce more healthcare graduates?	25

Health and IT Taxonomy

TAXONOMY - WEIGHTAGE		
AI WORKFORCE/INFRASTRUCTURE - READINESS - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
National AI Strategy - 25	Does the Country have a National AI strategy?	15
	Does the country have plan to publish AI strategy ?	5
	Does the National AI Strategy Focus on Strengthening Digital Dimensions of the country?	5
Framework for Ethical use of AI - 8	Does the strategy have the guidelines of ethical use of AI?	5
	Creating guidelines of ethical use is in progress	3
Data Protection and Privacy Legislation - 17	Is there any existing Data Protection Law?	10
	Does the Country update/amend the Data protection law?	5
	Is the law up to date as per global standard?	2
Existing Cybersecurity Initiatives - 15	Is there any existing Cybersecurity Law?	10
	Does the Country cybersecurity centre?	5
Overall AI Index - 20	As per Government AI readiness index, score >75	20
	As per Government AI readiness index, score 70-75	18
	As per Government AI readiness index, score 60-69	15
	As per Government AI readiness index, score 50-59	10
	As per Government AI readiness index, score <50	5
AI infrastructure- data centres, high speed performing computers - 15	Country is having National data centre	7
	Number of supercomputers >15	15
	Number of supercomputers 4-15	10
	Number of supercomputers	1-3
TAXONOMY - WEIGHTAGE		
AI WORKFORCE/INFRASTRUCTURE - READINESS - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
National agency monitoring the policy enforcement - 10	Is there a National agency monitoring the policy enforcement?	10
AI expertise in existing IT workforce - 10	As per government report, huge number of AI experts are present?	10
	As per government report, country is lacking AI experts	5

Digital Infrastructure for AI - 35	5G network is available in good extent?	10
	5G network is just launched?	5
	TII, UN data >0.95	25
	TII, UN data 0.90-0.95	20
	TII, UN data 0.80-0.89	15
	TII, UN data 0.70-0.79	10
	TII, UN data <0.70	5
Availability of data for AI Models - Open Data - 10	Does the country have open data source of AI models?	10
AI Research Hubs - 10	Does the country have AI research hub?	10
Number of companies working in AI field - 25	Number of AI startups >1000	25
	Number of AI startups 500-1000	20
	Number of AI startups 200-499	15
	Number of AI startups 50-199	10
	Number of AI startups <50	5
TAXONOMY - WEIGHTAGE		
AI WORKFORCE/INFRASTRUCTURE - DEVELOPMENT STRATEGY- 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Creation of data trusts /transparency - 10	Does the country focus on promoting data trust/ethical use of AI?	10
Digital Infrastructure - 5G and Full Fibre Networks - 20	Does the country focus on developing 5G network?	10
	Does the country have separate strategy document for development of 5G?	6
	Does the country focus on developing full fibre networks?	4
AI Infrastructure - 15	Does the country promote infrastructure for AI research?	10
	Does the country promote the possession of supercomputers?	5
Open source software libraries and toolkits - 10	Does the country focus on building/promotion of open source of software libraries?	10
AI Talent Development - 15	Do the universities float the STEM/AI courses?	10
	Does the country organize workshops to upskill the AI workforce?	5

Health and IT Taxonomy

Supporting AI Start-ups and Technology Unicorns - 10	Does the country invest in research and innovation?	10
Private Sector Engagement - 5	Is there any plan to develop PPP in AI development?	5
Attracting AI experts from abroad - 5	Does the country invest in AI research and innovation?	5
Availability of datasets - 10	Does the country have any plan to promote the availability of datasets?	10
TAXONOMY - WEIGHTAGE		
AI WORKFORCE/INFRASTRUCTURE -CAPACITY BUILDING - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Funding in AI field - 40	Does the country invest in research and innovation in AI field?	20
	Does the country invest developing the AI workforce ?	20
Promoting AI Research/ Training programme - 20	Does the country promote AI research/training programme ?	20
AI Curriculum in Schools & Universities - 20	Is there any AI curriculum in schools and universities?	20
Public-Private Partnerships for AI based projects - 20	Is there any PPP for country's AI projects?	20

TAXONOMY - WEIGHTAGE		
DIGITAL HEALTH - DH GOVERNANCE- READINESS -100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
National Digital Health Strategy / e-health strategy - 25	Does the Country have a National Digital Health Strategy?	15
	Is the National Digital Health Strategy Updated?	5
	Does the National Digital Health Strategy Focus on strengthening Telemedicine/Teleconsultation?	5
Legal Framework for Data Protection - 20	Is there any existing Data Protection Law?	10
	Is the law up to date as per global standard?	6
	Is there any legal guidelines which country›s health department follows?	4
EHR Standards - 10	Does the country have any EHR standard?	7
	Does the system have HL7 / SNOMEDCT / ICD 10/11?	3
Interoperability Framework - 10	Does the DH strategy have the Interoperability Framework?	10
Existing Cybersecurity Laws and Initiatives - 15	Is there any existing Cybersecurity Law/strategy?	10
	Does the Country update/amend the Cyber security law?	5
Funding Allocated for Digital Health - 20	Is there any specific funds allocated for Digital Health?	20
TAXONOMY - WEIGHTAGE		
DIGITAL HEALTH - DH GOVERNANCE- AVAILABILITY -100		

INDICATORS - WEIGHTAGE	QUESTIONS	WEIGHTAGE
National agency monitoring the policy enforcement - 15	Is there a National agency monitoring the policy enforcement?	15
Dedicated workforce to monitor locally/ regionally - 10	Is there any dedicated workforce for enforcement in state/local/municipal level?	10
National Digital Health Web Portal - 15	Is there any National Digital Health web portal?	15
Presence of Government Medical Apps - 40	Does the Government have COVID related app?	15
	Does the Government have other (except COVID) health service related app?	25
Health Analytics Platform / Big Data - 20	Is there any Health data hub/platform?	20
TAXONOMY - WEIGHTAGE		
DIGITAL HEALTH - DH GOVERNANCE- DEVELOPMENT STRATEGY -100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Public-Private Partnership - 15	Is there any plan for PPP for the improvement of DH?	15
Long Term Or Short Term Development Strategy- 10	Is there a short term strategy (<=5 yrs)?	10
Global Collaboration - Collaboration between Countries and Exchange of Knowledge on DH - 12	Does the Government have plan to collaborate with others for knowledge sharing?	12
Promoting Remote Monitoring of Patients / Telehealth - 15	Does the Government promote Telehealth?	15
Strategy for strengthening Data Security - 15	Is there any strategy for strengthening data security?	15

Strategy for Reimbursement models - 8	Does the country provide any DH Reimbursement model?	8
Identified market needs for investment - 10	Could the Government identify the market need for investment?	10
Development of e-health apps/ medical education apps - 15	Does the Government have plan to develop e-health app?	15
TAXONOMY - WEIGHTAGE		
DIGITAL HEALTH - DH GOVERNANCE- CAPACITY BUILDING -100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Education and Training of government stakeholders, social workers on Digital Technology - 25	Is there any education/training organised for government stakeholders and social workers?	25
Investment - Research and development program - 25	Does the Government invest for DH research and development?	25
Dedicated budget /funding - 25	Does the government allot a dedicated budget for DH?	25
Upskilling of Workforce for the National Agency - 25	Is there any programme to upskill the workforce for the national agency?	25

Digital Health Taxonomy

TAXONOMY - WEIGHTAGE		
DH INFRASTRUCTURE READINESS -100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Data Centers - 2	Does the country have a National Data centre?	2
Medical Technology units - MRI+CT+-PET+Gamma camera, EHR - 10	Number of Medical Technology units >50	6
	Number of Medical Technology units <50	3
	Does the country have Electronic Health Record for the citizens?	4
Rules for data exploitation - ethical, privacy, security - 3	Are there any guidelines/rules for data exploitation?	3
Network Readiness Index - 10	NRI rank <=20	10
	NRI rank 21-50	8
	NRI rank 50-70	5
	NRI rank >70	2
Broadband Connectivity - 25	Fixed broadband subscriptions per 100 people >35	25
	Fixed broadband subscriptions per 100 people >25-35	20
	Fixed broadband subscriptions per 100 people >15-24	15
	Fixed broadband subscriptions per 100 people >5-15	10
	Fixed broadband subscriptions per 100 people<5	5
Mobile Subscriptions - 25	Mobile cellular subscriptions per 100 people >140	25
	Mobile cellular subscriptions per 100 people 130 -140	20
	Mobile cellular subscriptions per 100 people 120-129	15
	Mobile cellular subscriptions per 100 people 100-119	10
	Mobile cellular subscriptions per 100 people <100	5
Application of AI and IoT in Healthcare Services - 2	Does the country use disruptive technologies in Healthcare?	2
Cloud Services Usage - 4	Has the country already adopted/launched the cloud computing service?	2
	Does the country focus on growing the cloud storage?	2

Internet Usage - 15	Individuals using the Internet % of population >=90	15
	Individuals using the Internet % of population 80-90	12
	Individuals using the Internet % of population 70-79	8
	Individuals using the Internet % of population 60-69	5
	Individuals using the Internet % of population <50	2
5G Network - 4	5G network is available in good extent?	4
	5G network is just launched?	2

TAXONOMY - WEIGHTAGE		
DH INFRASTRUCTURE AVAILABILITY -100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Number of Healthcare professionals/hospitals adopting digital health technology - 20	Number of Physicians/hospitals have adopted EHR >70%	20
	Number of Physicians/hospitals have adopted EHR 50%-70%	10
	Number of Physicians/hospitals have adopted EHR <50%	5
Secure and Updated Digital health Software - 10	Are the DH software secured/updated?	20
Digital Health Services Available at National & Regional Levels - 60	EHR	15
	Telehealth/Telemedicine	10
	Mobile health (mHealth)	10
	ePharmacy / electronic prescription services	8
	wireless medical devices	7
	use of AI in healthcare	10

Taxonomy - Weightage		
DH INFRASTRUCTURE - DEVELOPMENT STRATEGY -100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Improving Internet Connectivity Throughout a Country (25)	Is there any plan to promote/enhance overall internet connectivity?	15
	Does the country have plan to create universal access to Broadband?	10
Improving 5G Connectivity Throughout a Country - 15	Does the country focus on developing 5G network?	10
	Does the country have separate strategy document for development of 5G?	5

Digital Health Taxonomy

Integration of AI, Robotics, IoT, Machine Learning, Virtual Reality in Healthcare - 20	Does the country focus on promoting the disruptive technologies?	10
	Does the country have separate strategy document for development/promotion of AI?	10
Promoting Cloud Services usage - 10	Does the country focus on promoting the cloud service?	10
Government policies to promote Apps - 10	Does the Government have policy to promote apps?	10
Data protection/ Cybersecurity - 10	Is there any plan to promote/enhance cybersecurity policy?	10
Sustainability plans - Updatation - 10	Is there any sustainability plan for promoting DH?	10

TAXONOMY - WEIGHTAGE		
DH INFRASTRUCTURE - CAPACITY BUILDING -100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Integration of advanced digital technologies for health - 20	Is there any plan for the advancement of the integration of technology and health?	20
Public - Private Partnerships - 20	Is there any plan for the PPP for advancement of DH infrastructure?	20
Dedicated budget/funding - 20	Is there any dedicated budget for the advancement of DH infrastructure?	20
Upskilling of workforce - 20	Is there any plan for the upskilling of the workforce for the betterment of DH infrastructure?	20
Research in Digital health/ AI in health - 20	Is there any plan for the DH/AI research for the advancement of infrastructure?	20

TAXONOMY - WEIGHTAGE		
WORKFORCE - TECHNICAL AND HEALTH CARE READINESS - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
IT Workforce - Number of current STEM Graduates - 35	Current Percentage of STEM graduates >30%	35
	Current Percentage of STEM graduates <20-30%	25
	Current Percentage of STEM graduates <20%	15
Community Health Workers Trained in Digital Health - 10	Community Health Workers Trained in Digital Health	10

ICT Skill rank - 25	Rank as per ICT skill<=10	25
	Rank as per ICT skill 11-20	20
	Rank as per ICT skill 21-30	15
	Rank as per ICT skill 31-40	10
	Rank as per ICT skill >40	5
Human Capital as per AI Index - 30	Human Capital Score >70	20
	Human Capital Score 60-70	15
	Human Capital Score 50-59	10
	Human Capital Score <50	5
TAXONOMY - WEIGHTAGE		
WORKFORCE - TECHNICAL AND HEALTH CARE AVAILABILITY - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Percentage of healthcare professionals who currently use digital health technology or mobile health apps - 50	Percentage of healthcare professionals >80%	50
	Percentage of healthcare professionals 70%-80%	40
	Percentage of healthcare professionals 60%-69%	30
	Percentage of healthcare professionals <60%	20
Number of companies working in AI, development of digital technology - 50	Number of AI startups work in healthtech >1000	50
	Number of AI startups work in healthtech 500-1000	35
	Number of AI startups work in healthtech 200-499	20
	Number of AI startups work in healthtech 50-199	10
	Number of AI startups work in healthtech <50	5
TAXONOMY - WEIGHTAGE		
WORKFORCE - TECHNICAL AND HEALTH CARE - DEVELOPMENT STRATEGY - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Training of Healthcare professionals - 20	Is there any training programme for healthcare professional?	20
Training Community Workers on Digital Health - 20	Is there any training programme organised for healthcare community workers?	20
Collaboration for Knowledge Exchange - Knowledge Networks, Hubs, Partnerships - 20	Is there any Government collaboration for knowledge exchange?	20

Digital Health Taxonomy

Incentivising Digital Health Providers - 20	Is there any plan for incentivising of DH providers?	20
Recruitment plan for DH and AI specialist - 20	Is there any Recruitment plan for DH and AI specialists?	20
Taxonomy - Weightage		
Workforce - Technical and Health care -Capacity Building - 100		
Indicators - Weightage	**Questions**	**Weightage**
Education of Healthcare Providers on Digital Technology - 50	Is there any education programme organised for healthcare providers on technology?	50

TAXONOMY - WEIGHTAGE		
FUNDING AND RESOURCES - READINESS - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Government's funding in digital healthcare - 50	Does the Government invest for EHR?	15
	Does the Government invest for E-medication/Tele consultation?	10
	Does the Government invest for AI based DH infrastructure (robotics etc.)?	15
	Does the Government invest for supercomputers used for DH?	10
Strategy for making cross-sectoral partnerships at national, regional levels - 10	Is there any strategy for cross sectoral collaboration?	10
Public - Private partnerships for Investment - 20	Is there any Public-private partnership for DH funding?	10
	Is there any private organisation who invests independently in DH?	10
Funding/Collaborations with International agencies - e.g.WHO - 10	Is there any collaboration/funding with WHO/UNICEF ?	10
Funding programmes from international agencies like Asian banks/others - 10	Is there any funding programme with International financing agency like Asian Bank?	10

TAXONOMY - WEIGHTAGE		
FUNDING AND RESOURCES - AVAILABILITY - 100		
INDICATORS - WEIGHTAGE	QUESTIONS	WEIGHTAGE
Launch of the health apps/health portals - 30	Is the Government funding the launch of the health apps/portals/ improving M-health?	30
Research and development initiatives - 35	Is the Government funding innovations?	35
Digital Health Infrastructure - 35	Is the Government providing funding to improve DH infrastructure?	35

TAXONOMY - WEIGHTAGE		
FUNDING AND RESOURCES - DEVELOPMENT STRATEGY - 100		
INDICATORS - WEIGHTAGE	QUESTIONS	WEIGHTAGE
Strengthen collaboration of Startups/ Venture Capitalists are invited to work for digital health - 25	Is the Government interested to strengthen the collaboration of Startups/Venture Capitalists for digital health?	25
Building/Strengthening cross-sectoral partnerships at national, regional and global levels - 25	Is the Government interested to strengthen the cross-sectoral partnerships at national, regional and global levels?	25
Funding for innovative digital health - 25	Does the Government have plan to enhance the funding for DH innovation?	25
Strategy for international collaborations - 25	Is there any plan for international collaboration?	25

TAXONOMY - WEIGHTAGE		
FUNDING AND RESOURCES - CAPACITY BUILDING - 100		
INDICATORS - WEIGHTAGE	QUESTIONS	WEIGHTAGE
Increasing employment - 40	Does the Government have plan to enhance the funding for employment?	40
Dedicated budget for building skilled DH workforce - 30	Does the Government have plan to increase the Dedicated budget to make skilled DH workforce?	30
Dedicated budget for advanced technology- 30	Does the Government have a plan to increase the dedicated budget for advanced technology?	30

Digital Health Taxonomy

TAXONOMY - WEIGHTAGE		
RESEARCH PROGRAM AND FUNDING READINESS - 100		
INDICATORS - WEIGHTAGE	QUESTIONS	WEIGHTAGE
Government's contribution in digital health and technology research - 75	Does the Government invest for Healthcare research?	25
	Does the Government invest for digital health research?	25
	Does the Government invest for AI based health research ?	25
International collaboration in research and development - 15	Is there any International collaboration in research and development?	15
Centre of Research and dedicated Researcher - 10	Is there any national research centre?	10

TAXONOMY - WEIGHTAGE		
RESEARCH PROGRAM AND FUNDING AVAILABILITY - 100		
INDICATORS - WEIGHTAGE	QUESTIONS	WEIGHTAGE
Ongoing Government funded Research programme - 20	Is there any ongoing Government funded Research programme?	20
Government and private funded programme - 20	Is there Government and private funded Research programme?	20
Organization of seminar /colloquium to motivate funding agencies - 20	Is the Government encouraging the holding of colloquium?	10
	Is the Government arranging colloquium on DH?	10
Health Data availability - 20	Is the Government financing Health data availability?	20
Research infrastructure - 20	Is the Government financing DH research infrastructure?	20

TAXONOMY - WEIGHTAGE		
RESEARCH PROGRAM AND FUNDING - DEVELOPMENT STRATEGY - 100		
INDICATORS - WEIGHTAGE	QUESTIONS	WEIGHTAGE
Increasing Government funding for Research and Development field - 50	Does the Government have plans to increase the fund for DH research and Development?	25
	Does the Government promote Biomedical and Biotech research as per Ehealth vision?	25

Encouraging Researchers to come up with innovative projects - 30	Does the Government have a plan to encourage the researchers?	30
Motivating funding agencies - 20	Does the Government have plan to motivate funding agencies for DH?	20
TAXONOMY - WEIGHTAGE		
RESEARCH PROGRAM AND FUNDING - CAPACITY BUILDING - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Developement of national infrastrucutre for DH research - 50	Does the Government have any plan to develop research infrastructure?	50
Promotion of regulated framework for Health data sharing for clinical research - 30	Does the Government have a vision for health data sharing?	30
Increasing scholarships in DH - 20	Does the Government have plans to increase the research scholarship?	20

TAXONOMY - WEIGHTAGE		
LEGAL RULES - READINESS - 100		
INDICATORS - WEIGHTage	**QUESTIONS**	**WEIGHTAGE**
Data Protection Law/ Data Privacy policy/ Cyber Security - 45	Is there any existing Data Protection Law?	15
	Is the data protection law implemented throughout the country?	10
	Is the law up to date as per global standard?	5
	Is there any existing Cyber security Law/strategy?	15
Policy on apps/ Medical device software License renewal - 35	Is there any Medical Device regulation?	15
	Is there any medical device registration process?	10
	Is there any policy/law on app/medical software?	10
Strategy of Regulatory affairs - 15	Is there any strategy for regulations of pharma products?	10
	Is there any strategy for regulations of other therapeutic products?	5
Policy for allowing private digital health apps - 5	Is there any policy for allowing private DH apps?	5

TAXONOMY - WEIGHTAGE		
LEGAL RULES- AVAILABILITY - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
National agency monitoring the law enforcement - 30	Is there a National agency monitoring the policy enforcement?	15
	Is there a committee for medical devices?	15
Dedicated bodies to monitor rules/acts locally/regionally - 15	Is there any dedicated workforce for enforcement in state/local/municipal level?	15
Updated software / certification to ensure security and privacy - 15	Is there any updated software/certification to ensure security and privacy?	15
Key data hub management services - 15	Are there any key data hub management services?	15
Cyber Security Centre to ensure data security - 25	Is there any national cyber security centre?	25
TAXONOMY - WEIGHTAGE		
LEGAL RULES- DEVELOPMENT STRATEGY - 100		
INDICATORS - WEIGHTAGE	**QUESTIONS**	**WEIGHTAGE**
Strategy to strengthen/reform rules and regulations and legal framework for better healthcare service - 100	Is the Government interested to strengthen/amend the rules for data protection?	25
	Does the Government have plan to strengthen the ethical use of technology in healthcare?	20
	Is the Government interested to create a safe and strong cyber infrastructure?	20
	Is the Government interested to strengthen the legal framework for ehealth?	20
	Is the Government interested to make a comprehensive guide for e-health apps?	15
Taxonomy - Weightage		
Legal rules- Capacity Building - 100		
Indicators - Weightage	**Questions**	**Weightage**
Continuous Education program for the development - DH and Law - 50	Is there any education programme/on-job training programme for the development of DH?	50
Development of monitoring and assessment framework - 50	Does the Government have any plan to develop the monitoring system for DH framework?	50

Taxonomy - Weightage		
Literacy - patient+ workforce - Readiness - 100		
Indicators - Weightage	**Questions**	**Weightage**
Education of the rural/ AGED people to use digital health services - 30	Is there any programme to educate rural/ aged people?	30
Plan to make skilled and trained digital healthcare workforce - new curriculum, faculty positions for DH - 70	Is there training programme for DH workforce?	35
	Is there certificate course/curriculum for DH workforce?	35
Taxonomy - Weightage		
Literacy - patient+ workforce - Availability - 100		
Indicators - Weightage	**Questions**	**Weightage**
User manual for digital health services - 50	Has the Government made a user-friendly manual?	50
Availability of certification programme for digital healthcare workforce - 50	Is there available certificate course/curriculum for DH workforce?	50
Taxonomy - Weightage		
Literacy - patient+ workforce - Development Strategy - 100		
Indicators - Weightage	**Questions**	**Weightage**
Initial digital health awareness prog. - 50	Is there any Gov organised DH awareness programme?	50
Making adaptable workforce - 30	Is there any plan to create adaptable workforce?	30
Strengthen Gender Parity - 20	Is the Government focusing on gender parity?	20
Taxonomy - Weightage		
Literacy - patient+ workforce - Capacity Building - 100		
Indicators - Weightage	**Questions**	**Weightage**

Digital Health Taxonomy

Strengthened digital literacy - smartphone use, stable internet facility, user friendly apps - 70	Does the Government produce user-friendly-app?	35
	Does the Government have plan to strengthen digital literacy in rural area?	35
Increased use of Mobile Apps/digital portals - 30	Does the Government campaign for the use of DH portals?	30