



I-DAIR

THE INTERNATIONAL DIGITAL HEALTH & AI RESEARCH COLLABORATIVE

CEO Report 2022-2023

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The International Digital Health and Artificial Intelligence (AI) Research Collaborative “I-DAIR” builds on the outcome of the UN Secretary-General’s High-level Panel on Digital Cooperation and other high-level reflections on minimising harm and maximising benefits from digital technology for sustainable development. It seeks to shape the digital health research and innovation space through an end-to-end vision combining research, infrastructure, investments, interoperability, capacity development, benchmarking and governance.

With the exciting prospects of new digital health intervention and research acceleration by the use of AI and big data, there is a risk of a growing imbalance of knowledge power between the private sector, which invested US \$ 93.5 billion in AI in 2021, and the public sector. Further, as I-DAIR’s 2021 Global Research Map reveals, the divide between AI leaders based in a small number of countries and the rest of the world is also growing. The future could be so lopsided that governments, publicly-funded universities and a large proportion of the general public de facto lose all agency over the governance, R&D and use of AI.

Hence it is urgent and essential to develop a common AI research infrastructure, pool data sets, nurture expertise, and develop shared standards, benchmarks and governance mechanisms. Globally, there is an unprecedented opportunity to use digital technologies to move faster and more equitably on sustainable development in international priority areas such as health. I-DAIR is pursuing this vision with the mission of enabling inclusive, impactful, and responsible R&D into digital health and AI for health. The focus on R&D and innovation ecosystems (research institutes and academia, the public sector, private sector, investors) is driven by the need to empower countries and strengthen their capacity to lead and implement their own digital transformation.

A small cross-disciplinary team led originally by Ambassador Amandeep Gill, former Executive Director of the UNSG High-level Panel on Digital Cooperation and currently the UN Tech Envoy, has been steering I-DAIR’s incubation phase since August 2020. The three-year incubation phase is supported by Fondation Botnar (CHF 7 million) and the Wellcome Trust (GBP 2 million). The Bill & Melinda Gates Foundation has given a written letter of commitment and additional support by philanthropic foundations and development cooperation partners to I-DAIR activities in this phase is under active consideration. While the Secretariat is based in Geneva, in line with I-DAIR’s innovative distributed “CERN-like” vision the platform itself is being built as a research network with hubs in Geneva, Nairobi, New Delhi, Santiago de Chile, Singapore, Tunis and Johannesburg. I-DAIR plans to grow this network of seven hubs to a total of 35-40 across the globe.

Organisation

The current team composition is as follows:

- 5 employees: the CEO ad interim, the COO, the CSO, the CTO and the executive assistant
- 11 consultants: based in the USA (2), Egypt (1), Switzerland (3), Belgium (1), UK (1), India (1), Canada (1) and Singapore (1).

A research and development team composed of 5 computer engineers is employed in Tunisia through a sub-contract with a local Tunisian company. A second team of 3 engineers is being recruited and will be entirely dedicated to development under the direction of the CTO. The organization chart of the team is represented in the following figure:

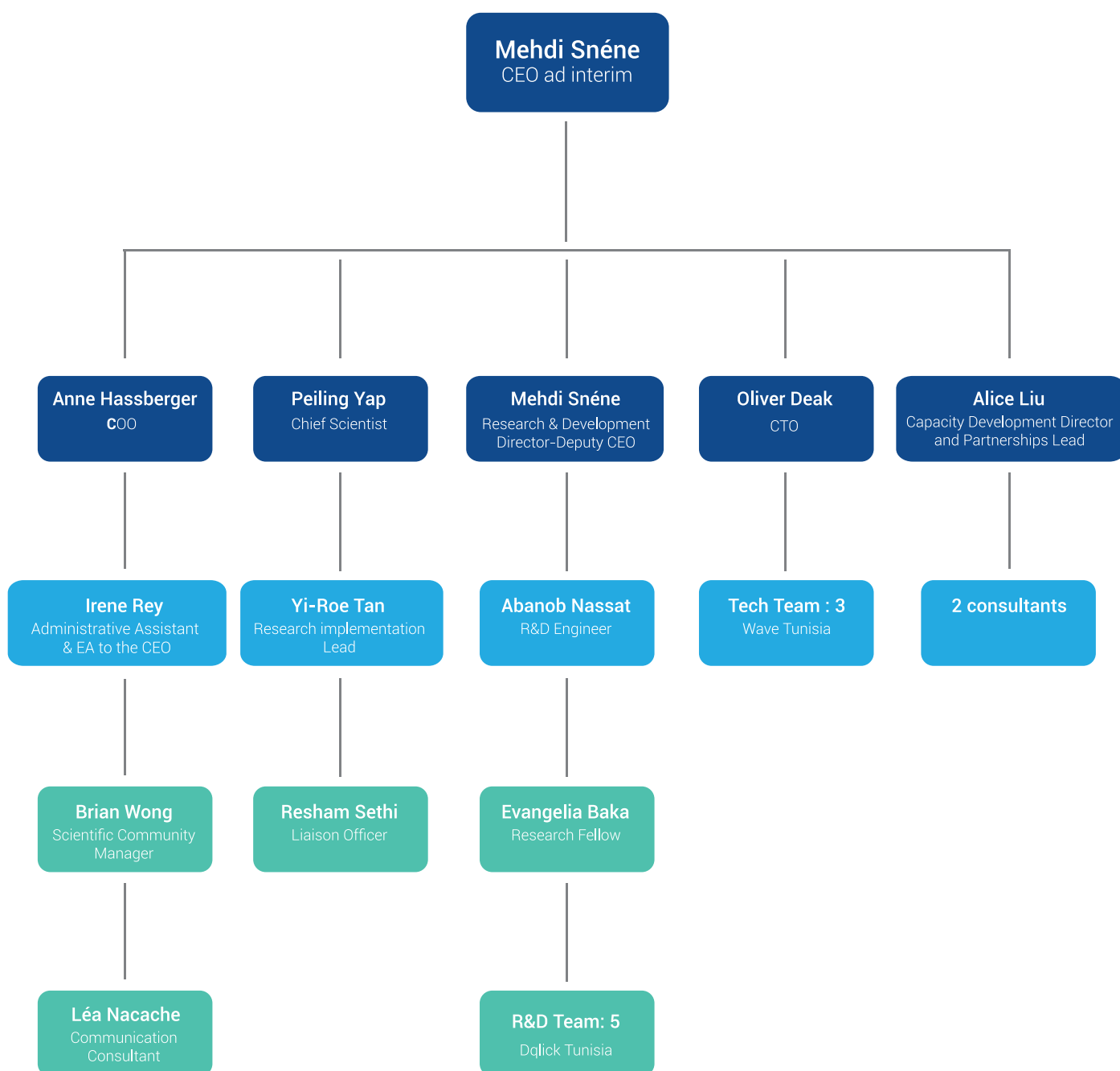


Figure 1. The organisation chart of I-DAIR

Through the recently awarded grant by "International Development Research Centre - CANADA" (IDRC) for the development of methods, guidance and framework and research for responsible and gender responsive AI, we aim to extend the team by the recruitment of three more consultants respectively for AI and ethics, technical toolkit for AI governance, and Gender Equality and Inclusion.

HUBS

I-DAIR's hubs are a network of collaborating research centres on Artificial Intelligence and digital health, which constitute the backbone of I-DAIR distributed architecture. They ensure that I-DAIR is able to meet the unique health and technology challenges faced by countries with solutions that are locally and regionally contextualised. Hubs collaborate with I-DAIR, in groups of two or more, by developing a common problem definition and using local expertise, datasets, clinical or community health settings to research health problems solutions answering to one or more PathFinder projects.

At term, the hubs will constitute a global infrastructure network and grow into regional centres of excellence, fulfilling I-DAIR's vision of a responsible data and AI governance model fostering a multilateral flow of digital assets and scientific knowledge.

Our current hubs are the following:

+ **The National Center for Health Information Systems - Santiago, Chile**

The CENS is a non-profit corporation, formed by the Universities of Chile, Catholic, Concepción, Valparaíso and Talca, with the support of CORFO, to develop strategies and activities to achieve a more connected health system, innovate through health information technologies, close the gaps in knowledge and application of health information systems, and create criteria to ensure the quality of these systems.

Hub led by Dr. May Chomali - Executive Director, and Dr. Steffen Härtel, Professor.

+ **The Esprit School of Engineering - Tunis, Tunisia**

ESPRIT is the largest private higher education institution of Tunisia with over 4,500 enrolled students. It was founded in 2003 and has built up its reputation for excellence in Tunisia and several sub-Saharan African countries through its closeness to the business community, its partnerships with foreign universities, and its active pedagogy and problem-based learning method.

Hub led by Khaled Ghedira - Scientific Director.

+ **The Indraprastha Institute of Information Technology - New Delhi, India**

The Indraprastha Institute of Information Technology Delhi (IIIT-Delhi) was created by an act of Delhi legislature empowering it to carry out R&D, conduct educational programs, and grant degrees.

Hub led by Tavpritesh Singh Sethi - Associate Professor of Computational Biology, Founding Head at Center of Excellence in Healthcare, IIIT-Delhi.

+ The African Population and Health Research Centre - Nairobi, Kenya

The African Population and Health Research Center is a research institution and think tank, working to transform lives in Africa through research through generating evidence to drive policy action to improve the health and wellbeing of African people

Hub led by Gershim Asiki - Research Scientist, Senior Medical Epidemiologist.

+ The University of Geneva - Switzerland

The University of Geneva (UNIGE) is dedicated to teaching, research and dialogue with society. With more than 17'000 students of some 150 different nationalities, it is Switzerland's second largest university. Its domains of excellence in research include life sciences (molecular biology, bio-informatics), physics of elementary particles, and astrophysics.

Hub led by Dimitri Konstantas - Professor of Computer Science and Director of the Information Science Institute (ISI).

+ The Saw Swee Hock School of Public Health of the National University of Singapore - Singapore

Saw Swee Hock School of Public Health (SSHSPH), was established in October 2011, under the National University of Singapore, as the national school of public health to continually foster healthier communities in Singapore and the region. Through educational programmes and transnational cross-disciplinary research work, the school aims to impact public health programmes and policies.

Hub led by Professor Yik-Ying Teo - Dean of the Saw Swee Hock School of Public Health.

+ The University of Johannesburg - South Africa

Vibrant, multicultural and dynamic, the University of Johannesburg (UJ) shares the pace and energy of cosmopolitan Johannesburg, the city whose name it carries. Proudly South African, the university is alive down to its African roots, and well-prepared for its role in actualising the potential that higher education holds for the continent's development.

Hub led by Babu Sena Paul - Head of Department.

Currently we are in the process of redefining our strategic hubs partnership and engagement. This will be aligned with our new technical strategy and will target a further inclusion of our hubs in the process of project ideation, design and implementation. A strong emphasis will be put on the inter-hub collaboration by providing specific funding for consortium composed from three or more hubs working on projects that fall within our strategy. A first presentation of the new engagement strategy is expected fall November 2022.

Partnerships and Launch Plan

More than 40 partnership agreements across international organisations, public sector institutions and private companies underline the multi-stakeholder character of I-DAIR.

A major milestone has been achieved by the signature of the MoU with the WHO in July 2022. Other MoUs are in place with the UN University, the UN International Computing Centre and the UN Institute for Training and Research while I-DAIR has kept the UN Secretariat informed of progress in the context of follow-up to the Road Map on Digital Cooperation.

Currently, I-DAIR is engaged in advanced discussion for partnerships with the ITU on the digital transformation processes, assessment and implementation and with the UNICEF for the development of implementation framework for digital mental health intervention for youth and adolescent.

I-DAIR is taking an original approach with the support of "Joep Lange Institute" to nurturing a diplomatic coalition for its launch in 2023. The focus for I-DAIR has been on small States (population less than 10 million) of all income levels, which will reap more benefit from pooling data, talent and other resources, as well as low- and middle-income countries (LMICs) where there is a combination of need and science and technology talent that can be leveraged for innovation and global impact. An important ambition for I-DAIR is a US \$ 200-300 million fund to be established over the next five years. Philanthropic foundations could contribute up to \$ 100 million with the rest coming from governments. The early founders from small States and LMICs could contribute \$ 35-40 million with the remaining coming from larger donors.

Pathfinders and projects (2020-2022)

At the start of the incubation phase, ten pathfinders were identified through consultations. They are respectively: Global Research Map, Governance for AI and Data for Health, Bridging Research and Practice communities, Genomics/ Diseases Atlas, Digital Innovations in Health Systems, Real Time epidemiology and dashboards, Data Interoperability and Data Architecture, Responsible ecosystem for private companies, Mental Health and Benchmarking.

The following seven pathfinders have been included in the strategic plan for the first two years:

1 - GRM

The Global Research Map (GRM) is an interactive tool developed through an ontological approach to big data and AI to provide situational awareness of the Digital Health and AI research and development domains. Its main goals are increased visibility and understanding of current trends in the area, identification of gaps in research and innovation, and fostering academic, governmental and private sector collaboration on AI and digital health. The GRM includes a powerful visualization tool that can generate a detailed landscape of research publications and patents, where changes and trends can be visualized along with leading institutions and countries. The Map also addresses digital health strategies, by grouping the initial set of 23 surveyed countries into clusters, which constitute a new world map of collaboration opportunities. Countries can visualize their present strengths while prioritizing investments into future capabilities. They can also benchmark themselves with their peers using a set of neutral criteria and track the evolutionary impact of their strategies on research and innovation annually. The GRM is a necessary foundation for understanding the digital health domain and formulating related policies.

2- RTED

The global pandemic scheme aims to build science-based, data-driven, neutral and trusted collective capacity to improve the quality of local and national responses throughout the continuum of pandemic phases. We envision the development of the full scheme to span the next 5-10 years of our work and aim for the insights generated by the scheme to help provide a neutral and trusted source of information for local, regional and global actors to respond quickly to the next health crises without waiting for a political decision threshold to be reached.

- a. Citizen science intelligence for pandemic preparedness and response. Citizen science is defined here as a practice of public participation, collaboration, and co-creation in all aspects of scientific research to increase knowledge, build trust, generate accurate and timely data, and develop strategies in pandemic preparedness and response. There will be two projects going on in parallel under this topic. The first project is a mixed methods formative assessment to understand the awareness, reliability and acceptability of local communities (including marginalized and tribal communities) to citizen science, determine the citizens' level of readiness as well as the feasibility and sustainability of this approach. The assessment will be rolled out in 9 countries across Asia and Africa. The second project to deliver a proof-of-concept for applying participatory modelling, involving communities and policy makers, in pandemic responses in Vietnam, Kenya and Brazil. The use case will be to look at how to manage patients and resources within and outside of hospitals and predict shortages more effectively. Within this project, we will also develop an open-source digital platform to support online participatory modelling activities on a larger scale for diverse and non-scientific stakeholders.

3- Interoperability

A cross regional study on effective interoperability implementation in the context of the COVID-19 is undergoing. 3 countries are being included in the study: South Africa, Philippines and Tunisia. The overall goal of the study is to discover the effective interoperability means deployed on the ground and being used during the COVID-19 pandemic. More specifically, this study on effective interoperability for COVID-19 aims to analyse different interoperability models used in a variety of regional settings. It will then identify the principal constraints that are limiting quick adoption of interoperability models at different levels (local, regional, national, international), including in terms of data architecture, data integrity, data flow and services interoperability, and provide recommendations. The study will serve as a basis for a future study on the definition of a dynamic framework for interoperability by design method with the ambition to then apply it in the context of distributed clinical trials.

4- Benchmarking

Patient-Reported Outcome Measures (PROMs) captures a patient's perception of their function, disease symptoms, overall health, and quality of life in a structured and standardized format directly provided by the patient. Quality of Life (QoL) is measured from PROMs as an endpoint of treatment in most chronic conditions. However, this approach is often less than optimal for reasons including but not limited to questionnaire fatigue, recall bias, improper outcome analyses, cultural variations and language barriers. In this era of wearables and remote monitoring of physical health of patients through digital health platforms I-DAIR envisions that QoL assessments of patients can also be integrated into these devices. I-DAIR believes that this effort has the scope of changing the way medical science approaches QoL and other

patient reported measures. The e-PROM project is a first step under I-DAIR's benchmarking pathfinder to develop consensus on a shift in focus from technical accuracy to human-centered evaluation of digital health and AI solutions, and stimulate the development of a roadmap for the development of a new generation of human-centred benchmarks combining qualitative and quantitative methodologies.

5- Governance for AI and Data

To create impactful and responsible Digital Health and AI solutions for health globally, Digital Health and AI governance needs to be tiered, distributed and collaborative (multi-stakeholder and multi-domain). In order to ensure that countries and communities can benefit fully from emerging digital and AI opportunities, I-DAIR will develop an AI governance mechanism that supports co-ownership, collaboration and contextual adaptability of governance. The main design principle is trust-based 'relational' governance, and the proposed architecture brings together 1) stakeholder engagement; 2) innovations exchange; and 3) tiered governance principles and norms. This robust but flexible mechanism will allow governance tools to be collaboratively developed taking into consideration the varied national landscapes of AI regulation as well as the diverse maturity levels for digital health. It will also allow trust to develop in the sharing of digital public goods and AI/data solutions across facilities, localities, or countries. I-DAIR's vision also needs to be reflected in its internal governance and operating structures, in particular engaging and involving its hubs and partners in how I-DAIR works and is governed.

6- Bridging Research and Practice communities

a. **Capacity Development:** Capacity development for digital health and AI has been fragmented, with piecemeal training focused on specific technology solutions or single topics. Meanwhile momentum has been building for capacity for digital health in LMICs, with the COVID-19 pandemic putting a harsh spotlight on the gaps. There is also increasing recognition of and demand for data analytics, AI, and governance yet very little training is available. Moreover, training alone is insufficient; new practitioners learn best with hands-on practice opportunities to cement their skills and guidance from peer networks, coaches and mentors. Our vision is to create a global Capacity Development Network (CDN) for digital health and AI, composed of the I-DAIR hubs and key partners to leverage their faculty, expertise, courses, workshops and other forms of knowledge sharing for global impact. In our concept, the target learners - researchers and developers, and policy and decision makers - will be able to engage with any learning opportunity, regardless of geographic location. I-DAIR's more holistic approach begins with the foundation, a competency framework. A competency framework defines the range and depth of skills, knowledge and attributes across multiple subjects or domains involved in successfully planning, implementing and sustaining digital health and AI systems. I-DAIR is partnering with WHO and a global expert working group to develop version 1 by May 2023. This will be a jointly created and branded WHO product in response to the WHO Global Digital Health Strategy released in 2020, and builds upon the work by WHO AFRO in 2019-2020. The CDN curriculum will be mapped to the competency framework, with the intent to be modular and open to enable easier adaptation and adoption by countries and regions at varying levels of maturity. The CDN will leverage existing courses and programs as well as go beyond traditional classroom learning, such as bootcamps and case study discussion seminars. Learners will have access to the Trusted Research Infrastructure for hands-on learning, prototyping and demonstrations of digital health and AI. Mentors and coaches will provide both structured and ad-hoc gui-

dance via 1:1 and small group sessions. I-DAIR will establish an alumni and peer learning network that will foster experience sharing, knowledge exchange and continuous learning.

b. **Research Infrastructure:** The Digital Health Research Infrastructure will create a virtual repository that aggregates data from various sources and gives them a common data model under a data and learning federation approach. The Research Infrastructure project aims to develop a combined hardware and software infrastructure to help build research capacity in digital health and AI in different national settings. The research infrastructure is envisioned as a Global Public Good and an enabler to foster the development of local digital health and AI ecosystems while maximising the collaboration opportunities with partners beyond the local setting. An essential component of the research infrastructure vision is data sovereignty. The envisaged federated approach to medical and health data flows aims to maximise privacy, ethical and secure exchanges while keeping the data within predefined national, regional or local ownership boundaries. On top of the federated approach, the infrastructure is designed to maximize the value of data to clinical scientists and researchers by providing intuitive, well-integrated software solutions, intelligent data management strategies and tools, and thoughtful application of data science and machine learning methods. Together, these capabilities optimize the capture, standardization, integration, analysis, interpretation, and flow of medical data throughout the lifecycle of digital health and Machine Learning research projects.

7- DIHS

a. **Open Health Project :** it aims to shift the current telemedicine paradigm to a more open approach through three pathways: 1) opening telemedicine to pooled virtual medical appointments and peer to peer healthcare; 2) leveraging digital tools to open up early health assessments/prevention to the community; 3) creating an open research and innovation ecosystem by understanding culturally appropriate methods to deliver these technologies and facilitate trust-building between R&D players and the community by having open conversations and co-creating digital tools and capacity that apply beyond a single project. Using digital as an opportunity for improving patient-centric health outcomes and community activation, a research-driven approach will explore the feasibility of a pervasive and ambient environment for care delivery with the strong involvement of the community and patient cohorts. Recently, due to our partner request we have shifted the scope of interest of the OH project to Mental Health for Youth.

b. **AMR:** Data-driven AI can play a critical role in the clinical management of infections by allowing for a complex matrix of data, such as clinical severity, comorbidities, host immune status, prior antibiotic use, local resistance profile and more, to be analyzed prior to the prescription of appropriate antibiotics. Through this project, we are keen to explore how the power of digital and AI can be best harnessed across the AMR challenge spectrum to optimize antibiotic prescribing decisions for the empiric in tertiary hospitals. Furthermore, I-DAIR, as a neutral escrow, will offer and maintain the learning and interventions arising from this project to the world as a public good to reduce the global burden of AMR.

c. **MOTHER:** the project aims to improve maternal and child health (MCH) outcomes in Nepal and co-develop a digital health platform that links pregnant women with female community health volunteers and with health facilities. On the proposed platform, mothers are able to access medical advice throughout their pregnancy and timely referrals to care

when necessary; female community health volunteers will be able to follow up with their patients better, particularly in settings where patient outreach is limited by geography; and the health facilities can better predict the needs for institutional delivery and emergency surgery and prepare for them in advance.

8- Community Building

a. The Scientific Consortium "SC" is an Independent and representative group of trans-disciplinary scientists & thought leaders that help marshal scientific expertise from across the globe to solve common challenges. The SC is mandated to come up with a potential list of priorities and recommendations for a global R&D agenda on DH/AI4H as a global public good and to review, take part in consultations, and provide advice on strategic documents and key activities (e.g. GRM). The SC objective is to enhance & catalyse I-DAIR's outreach and cooperation with the larger science community, regional scientists and science networks, national and international research organisations.

b. The scientific conference will be an Annual Summit that will act as I-DAIR's flagship event, bringing together researchers and key stakeholders/decision-makers in the digital health and AI space. Researchers from I-DAIR's network of hubs and partners will have the opportunity to share updates from their work on/related to I-DAIR's various Pathfinders and receive feedback from the wider network of digital health & AI experts. Moreover, this event will serve as a major networking platform for those who are interested in research on digital health & AI and those wishing to translate it into policy/practice.

A brief overview of our major projects and deliverables during the incubation phase is presented in the following table 1.

Table 1. Major Projects and deliverables during the incubation phase

Pathfinder	Sub-Project	Key Partners	Deliv
RTED	Pandemic Scheme	1. 32 SWG members	R&D agenda with investment case+Scientific publications + Proof of concept for an AI modeling platform
DIHS	Open Health	1. 3 sites: Punjab; Nagaland; Kenya (APHRC) 2. Advisory group members 3. IIT-Ropar 4. PGI 5. AIMS Mohali	Report
DIHS	MOTHER	1. CDFI 2. Jacaranda Health 3. NYAS 4. Bagmati	Report + Scientific publication
DIHS	AMR	1. CMC Vellore 2. TTSH 3. IIT-Madras 4. University of Maryland	Report + Scientific publication
GRM	GRM	Internal Development	Tool
GRM	Traditional Medicine	1. WHO GCTM	Proposal
DADI	DADI	1. South Africa 2. Tunisia 3. Philippines	Report
Benchmarking	E-PROM	TMC Kalkota + CMC Vellore Errazi Hospital + HUG	Open source platform
BRP	TRI	1. UNICC 2. APHRC 3. Razi Hospital 4. Punjab	Hardware and Integrated Software suite
BRP	Capacity development	1. Hubs (Delhi, South Africa, Kenya, Tunisia, Geneva, Chile) 2. WHO 3. Global Health Center, IHEID 4. Chitkara University South Arm Training and Development 5. UNSW 6. PHFI 7. United Global Parliamentarians Network 4. Taltech	Report + competency framework
Governance	IDRC Grant	Selected Grantees	Tool + Report

Strategy for 2023

I-DAIR aims to “be the neutral and trusted platform for enabling global research collaborations on digital health and Artificial Intelligence for health”.

Our fields of exploration are shared across three primary domains namely: digital and AI, health-care systems (clinical and medical science), and governance and policy making. Our vision revolves around these three elements while placing the patient at the centre of the interactions. From the early beginning of the I-DAIR, four types of interventions have been identified as key pillars of our activity, namely: support for research activities, implementation and coordination of multi-stakeholder projects, benchmarking and standardization, and convening and community building (see Figure 2, Annex 4).

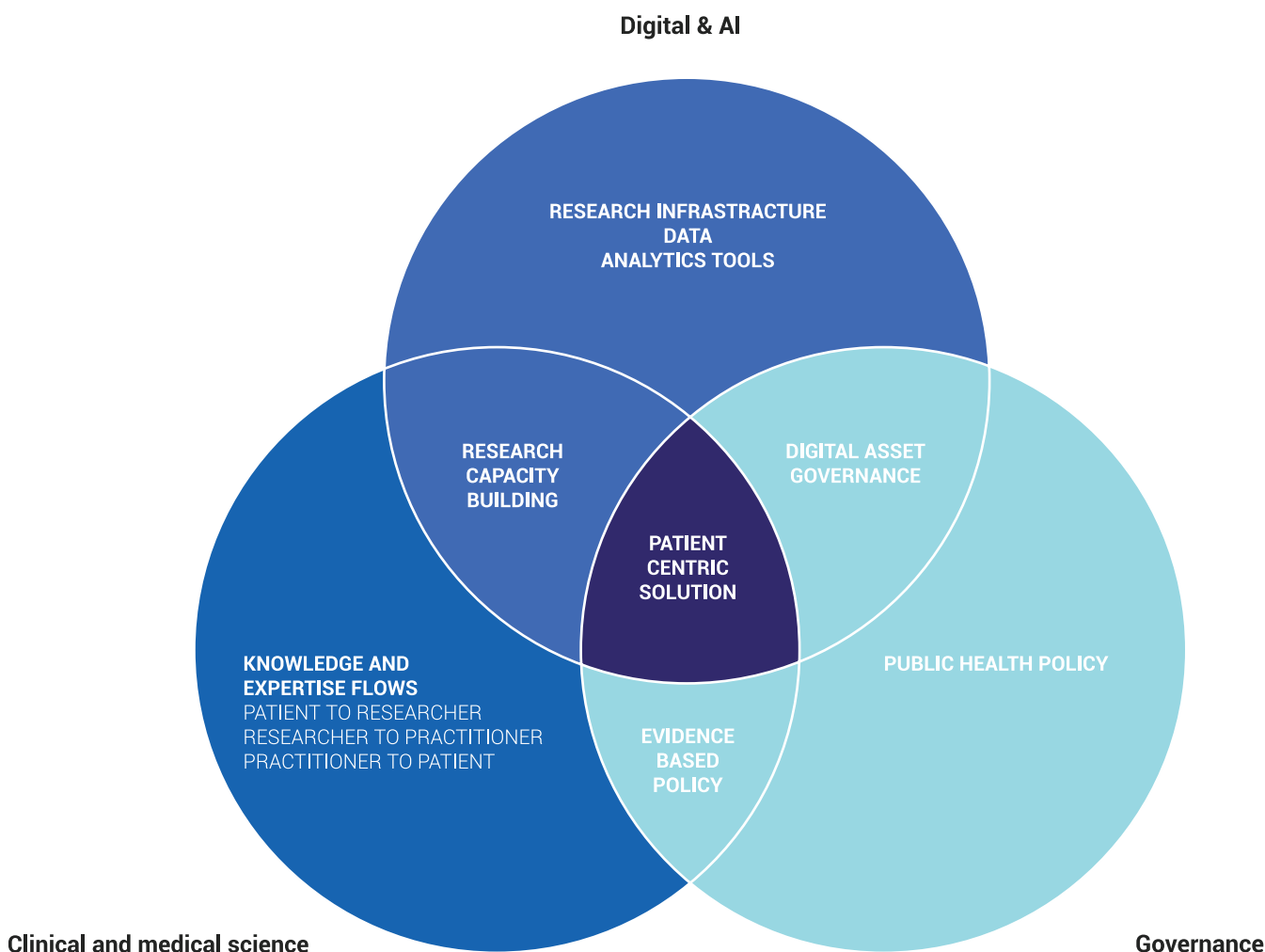


Figure 2. I-DAIR areas of intervention

In view of previous reviews (Botnar Foundation, Pathfinders Review Committee) and the diversity of our projects and our pathfinders, and in order to update our strategic vision, it is essential today to reconsider the list of projects and accentuate the digital and machine learning component through a common thread that will solidify and amplify the impact of separate projects but also lead to an integrated set of outputs. This will allow a clear and effective positioning of I-DAIR in the space of digital health and AI and allow us to highlight our uniqueness and added value.

Overall vision

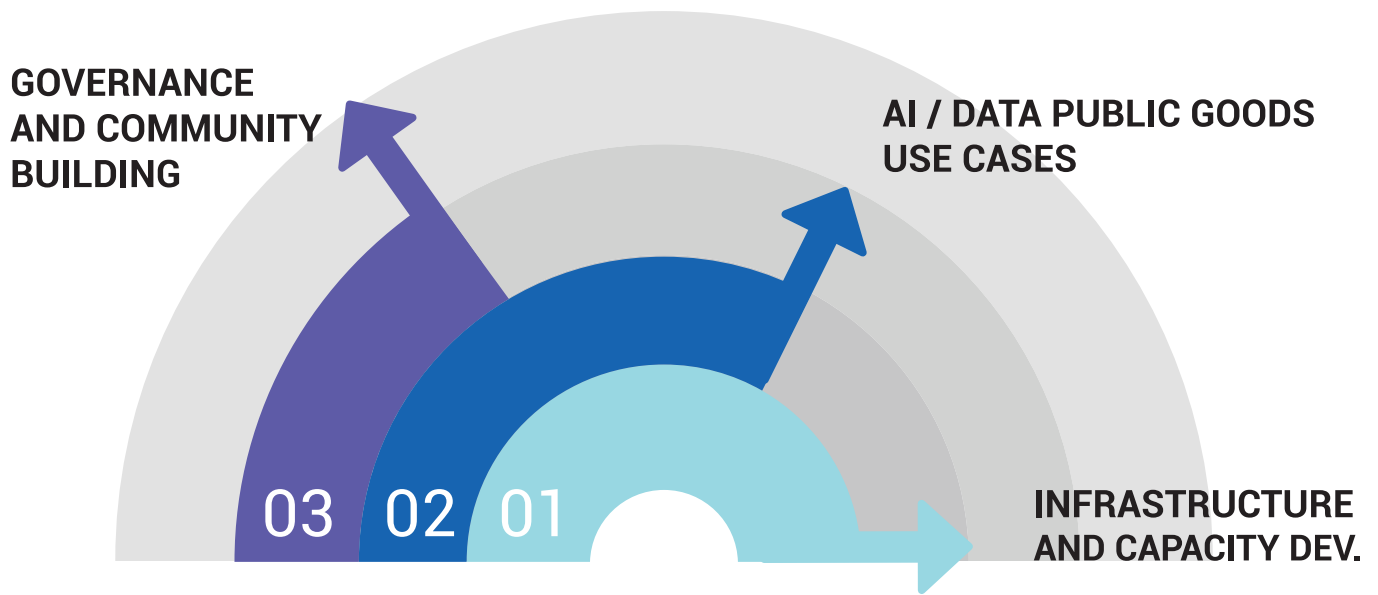


Figure 3. Strategic Objectives

We structured our objectives around a complete life cycle of research implementation in order to be able to assist and support the different steps and to ensure that we can cover different operations, needs and requirements. Our three main objectives are the following:

Obj 1. Strengthen Research infrastructure and capacity in DH and AI in LMICs.

The primary objective is structured around 3 essential components that we have identified as the entry barriers in many countries. Firstly, we aim for the development of specific hardware architecture for data storage and for computing capacity required for the development of ML dealing with large and big amounts of data, for instance medical imagery analysis and signal processing in real time. We hope that the Trusted Research Infrastructure "TRI» will also facilitate the networking of different stakeholders and thus enable the initiation of multilateral and transdisciplinary cooperation. At the centre of the network will be an open cloud platform hosted at the UNICC in Geneva where tools and source code will be maintained, updated and distributed to the "edge" boxes (connection to the UNICC core will be optional). It will play a critical role as an AI and digital health validation and benchmarking environment to test models, algorithms, and tools, as well as a host for data when data sharing is allowed. Since it will not be dependent on commercial cloud services, it will be a neutral host, as well as a node for Geneva innovators and for those users who do not want or need a Research Infrastructure (RI) box or want to try it out before getting their dedicated one. See Annex1

Such infrastructure will require specific software components for learning and practice purposes to ease the learning curve for practitioners coming from a non-computer science background. We have initiated the development of Palex: Personalised and assistive learning experience and the Co-dex: Code-less experience. These two environments will be tested during the first TRI deployment in Kenya, India and Tunisia. Finally, a specific Capacity development program will be developed tailored for each of our identified end user spaces: Technical, clinical and policy making. I-DAIR would like to be positioned as THE thought leader in creating the definitive AI for Health competency

framework and curriculum for researchers, developers, policy makers and decision makers. The GRM will help in the identification of gaps between different research programs as well as supporting countries in the assessment or the implementation of their Digital and AI healthcare strategy.

Obj 2. Development and curation of AI and Data Public Goods.

Under this objective a specific attention will be given to AI models, Data assets and Digital services. I-DAIR would like to be positioned as THE authority that assesses, validates, sustains and disseminates AI Public Goods for health, aka “a sort of global regulator for open source AI and ML for health”. In fact, an essential element of our vision is to help the community of researchers, regulators and clinicians to overcome the lack of expertise and/or of data for the selection and validation process of existing ML development to be integrated within their research, healthcare infrastructure or decision-making process.

A key element of the strategy is to lower technical barrier to access, use, experiment and implement AI public goods. Most of existing approaches are very close to the open source approach (sharing) while we would like to extend ours to an open knowledge approach (collaborative). Moreover, clinical and medical researchers often lack time and technical resources and knowledge to use open AI models. We target the implementation of a sandbox space to run live AI models listed as public goods, so they can be tested by researchers either by using their data or an existing open data set with no specific technical requirements. The sandbox will be host by our partner, the UNICC.

The early development will be driven by selected use cases within a multilateral digital cooperation framework. Early identified use cases are mental health and wellbeing of youth and pandemic preparedness.

For the mental health, in partnerships with the Punjab Government, we aim to build an RBSK-like approach (India's child health assessment tool) for mental health and a framework for digital and AI- enabled interventions for prevention and early assessment of mental health in primary schools. We target the inclusion of two more countries as pilot sites within different geographies, context and population.

For the Pandemic Preparedness, preliminary work is ongoing for the identification of important ML development and digital services that could represent an initial step towards the development of an integrated framework for pandemic preparedness and response.

Obj 3. Enhance Governance framework and Community in DH and AI.

We aim to develop and share common guidance, frameworks and tools for the development of responsible AI. A four years grant from the IDRC International Development Research Development Center- CANADA (IDRC) has been awarded and the project will start soon. It aims to develop a common understanding of the governance principles and the responsible and gender responsive AI development in health for LMICs across different use cases and regional contexts. Annex 3 summarises the project objectives and activities.

At the research level, in partnerships with three partners in India, Tunisia and Switzerland, we have undertaken the process of building a multilingual E-PROM project, as an open source platform for the global community of researchers for the benchmarking of medical interventions (similar to the Redcap for the Clinical Research Form).

We aim to build and coordinate a community involved in the development of predefined projects

and as early adopters of our results and public goods. The community will further accelerate the community validation and adoption of developed standards. It will also serve for the development of a specific R&D agenda of the digital and AI for health space. This will be done through two main activities: the organization of a science consortium composed of selected scientists and, hubs representatives to design an R&D roadmap for digital health and AI. The second will be the organization of a flagship conference on frontier tech in digital health and AI jointly with all satellite events related to our individual projects.

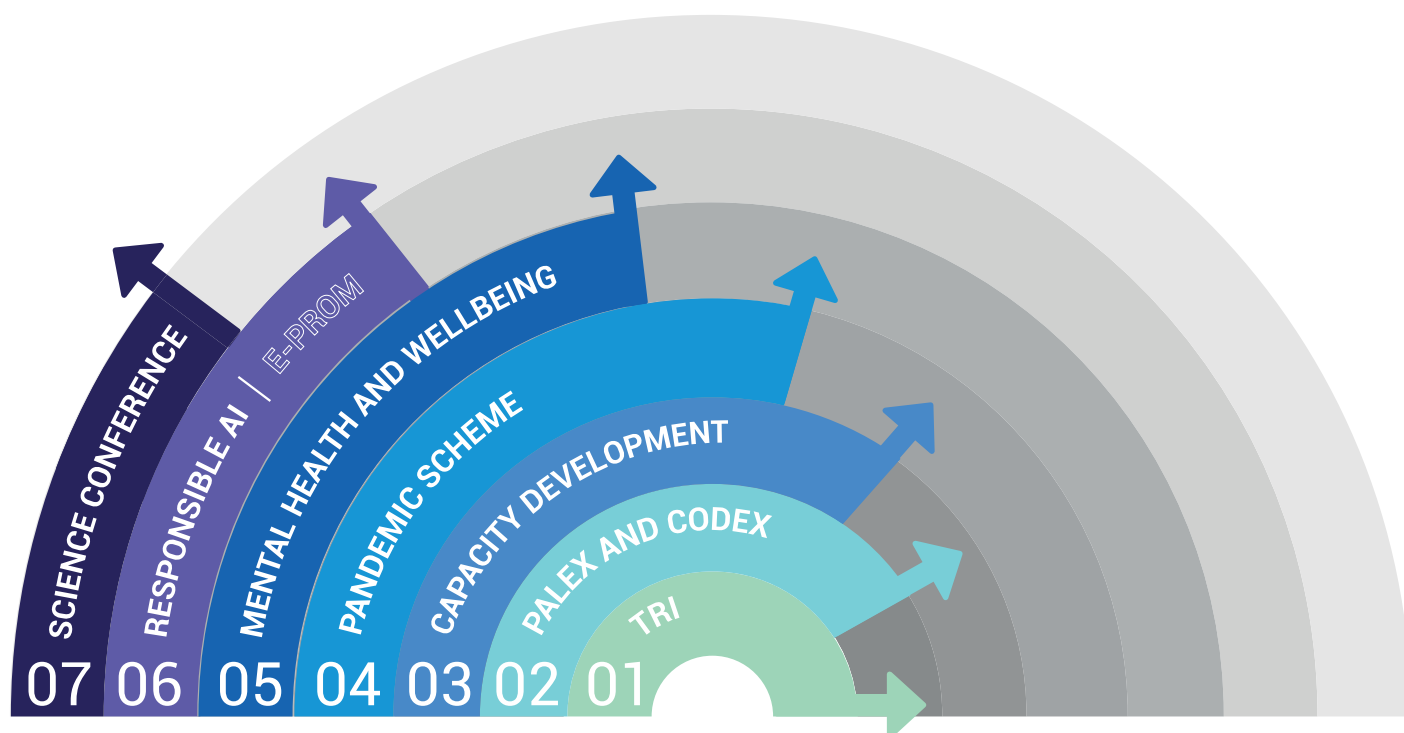


Figure 4. Strategic projects

Strategic Projects

A readjustment of the objectives of certain projects is necessary in order to align with the framework period of one year following the launch of the foundation. Given the resources we have, some projects that do not within our strategic vision will either be canceled or postponed. Projects that are already funded by specific grants will remain unchanged.

	Status	Description	Expected Del. Next 12months
MOTHER	Canceled		N.A
AMR	Canceled		N.A
Open Health	Redefined	Shift the focus to mental health and wellbeing, digital prevention for youth and digital assessment of mental health status. Exploration of opportunities in Sexual and reproductive health projects (e.g Digital Kegel exercise in MENA)	Framework of implementation of digital intervention for preventive mental health and wellbeing for youth. Updated definition of Social Determinants of Mental Health Distributed and replicable use case across at least 3 countries. A developed and tested digital intervention for a selected context. Feasibility study and consortium building for Sexual and reproductive health.
TRI	Redefined	Extending the TRI offering to include teaching and practicing AI in medical schools and outside of the health space "STEM". Increasing the specific software offering and the federated aspect	Integrated and networked suite of Software and hardware: Palex + Codex. Federated data and learning toolkit. Curate library of AI public goods First conference for the TRI stakeholders
RTED	Redefined	Reducing the scope of the development to fit within the 12 months plan Shifting the orientation towards generic development for reusability: e.g. health crisis framework.	Specification of technical and scientific framework for selected sub element of the schema: unusual Data discovery, missing data and advanced digital surveillance sentinel. Dissemination and endorsement strategy and early adopters
Interoperability	Canceled	Reorienting the Interoperability work towards ML and AI interoperability	Model for interoperability for the ML and AI, integrated within the governance work plan.
Capacity Development	Unchanged	Collaboration with WHO on the digital health and AI competency framework Landscaping existing courses, competency frameworks, programs, etc	Digital Health and AI Competency framework Identification of first cohort of learners A mini course : 3 to 4 lessons.
GRM	Unchanged	Delivery of the Mental health and Digital health versions	Development of dedicated offering based on the developed methodology
Governance	Unchanged	IDRC project - Responsible and Gender Responsive AI for Health in LMICs	First version of a three-part governance mechanism
Science Conference	Redefined	Includes all satellite events: E-PROM, TRI, RTED. Focus on Frontier tech for Digital Health	Call for papers Conference scheduled for May or June 2023 Building the steering and reviewers committee.
Science Consortium	Unchanged		
E-PROM	Unchanged		Multilingual opens source platform for E-PROM and E-PREM Dissemination strategy. First EPROM-Com meeting

Major Events

In the upcoming 3 months (Sept-Nov), I-DAIR will be present in high level conferences and events.

- Board meeting: 1-2 Sept
- I-DAIR side-event at the UN, "Accelerating progress on the SDGs by empowering researchers and innovators to use data and AI", 7 Sept.
- UNGA Science Summit, "Artificial Intelligence Research in Health: Tackling Global Challenges as One"- 22 Sept
- Mental Health GRM Launch -10 October
- WHS, Session "How to Achieve a Global Health Data Space" - 18 October
- Annual I-DAIR event- GRM V2 Launch – TRI Presentation - 28 November
- Science Consortium meeting - 29 November
- Raisina Dialogue (TBC)
- World Health Assembly- side event (TBC)

Expected Milestones

- Sept 2022 - RTED: Launch of citizen science formative assessment in 9 countries
 - Sept 2022 - RTED: Build out of the pandemic scheme a proof of concept with a focus on explainable AI models
 - 10 of Oct: Open Health: Mental Health GRM, kick start of the Mental Health framework implementation project. Annex 2 gives an overview of the current development of the GRM of Mental Health and Wellbeing.
 - Oct 2022 – RETD: Launch of participatory modeling pilots in 3 countries
 - 29 of Nov: GRM of Digital Health V2. The new version will link obtained results with data sources of research papers and patents that are being examined for the landscaping. It will also include 25 more countries for the maturity assessment of digital health strategy.
 - Nov 2022 - RTED: Deployment of Proof of Concept of explainable AI platform live predictions in 1-2 selected countries
 - 24 of February: E-PROM: Start of clinical trials in Tunisia and India
 - Feb 2023: RTED: Completion of citizen science formative assessment and participatory modelling pilots
 - Mar 2023: RTED: Integration of online participatory modelling activities with Proof of Concept of explainable AI platform
 - April 2023: Open Health: First draft of Mental Health digital intervention, kick start of the implementation
 - May 2023: BRP: Launch of first version of the Digital Health and AI for Health Competency Framework at the World Health Assembly
 - June 2023: Science conference and satellite events for the TRI, E-PROM
 - September 2023: TRI: Deployment of first RIs in Tunisia, Switzerland, Kenya and India. First course of AI in a medical school in India. Annex 1 is the concept note of the TRI Project.
 - September 2023: G20 Health track participation
- Annex 1.

Introduction to I-DAIR Trusted Research Infrastructure: **AI LAB IN A BOX**

The design, development and implementation in phases of the Research Infrastructure for digital health and AI is critical to the building of a networked transdisciplinary research and innovation community across the I-DAIR hubs. The conceptual work on the Research Infrastructure has already started with funding support from the Wellcome Trust, and in partnership with the Geneva-based UN International Computing Centre (UNICC), with three initial nodes in Kenya, Tunisia and India participating in the proof of concept.

In essence the RI is a distributed digital infrastructure for the confederated use of data and AI that can scale independently of the current infrastructure areas dominated by the tech giants, by focusing on small states and low- and lower-middle-income countries (LMICs) and on innovators and researchers (rather than businesses and individual customers). The RI will support the unique characteristics and needs of health data and clinical trials data which are not well-supported today by the major cloud hosting companies. The RI is where theory can be put to the test. It will be an environment for hands-on practice, prototyping and demo opportunities with digital health and AI software, data, models and algorithms.

The Research Infrastructure (RI) will be turnkey and easy to set up, allowing easy integration of the new AI/machine learning (ML) infrastructure with pre-existing digital systems. It will be extendable to a "neutral" cloud-based service in Geneva hosted by the UNICC. It will be preloaded with open-source repositories and a "What You See is What You Get (WYSIWYG)" interface. The software part is designed to onboard end-users with different backgrounds and should be easy to use for non-technical as well technical people. There will be no hidden data costs (full data sovereignty). It will provide reliable capacity built from off-the-shelf to fully do-it-yourself AI/ML tools. Thus, the RI will seed the development of AI capacity within partner organisations.

In practice, its visible front end will consist of an 'AI lab in a box' (see Figure 1) and will be customised for users in different I-DAIR nodes or "edges", forming a federation with the centre in Geneva.



Figure 1: the AI Lab in a box

Initially, the boxes will house infrastructures tailored to three types of settings: a data science research setting (Public health data, deployed in the African Population Health Research Centre or APHRC, Nairobi, Kenya), medical imagery analysis for neurological conditions research (Razi Hospital, Tunisia), and a clinical and teaching hospital setting (Christian Medical College, Vellore, India). The customisation at the hardware and/or software level, will help optimise the RI for each setting. These initial setups will also help I-DAIR understand needs, assess existing capacity and create the first project portfolios for AI.

At the centre of the network will be an open cloud platform hosted at the UNICC in Geneva where tools and source code will be maintained, updated and distributed to the “edge” boxes (connection to the UNICC core will be optional). It will play a critical role as an AI and digital health validation and benchmarking environment to test models, algorithms, and tools, as well as a host for data when data sharing is allowed. Since it will not be dependent on commercial cloud services, it will be a neutral host, as well as a node for Geneva innovators and for those users who do not want or need a Research Infrastructure (RI) box or want to try out the RI before getting their own box. For a high level view of the architecture, Figure 2 shows how the RI schema will work as a confederated setup, allowing for both public and private “sandboxes” to support both data sharing and data sovereignty.

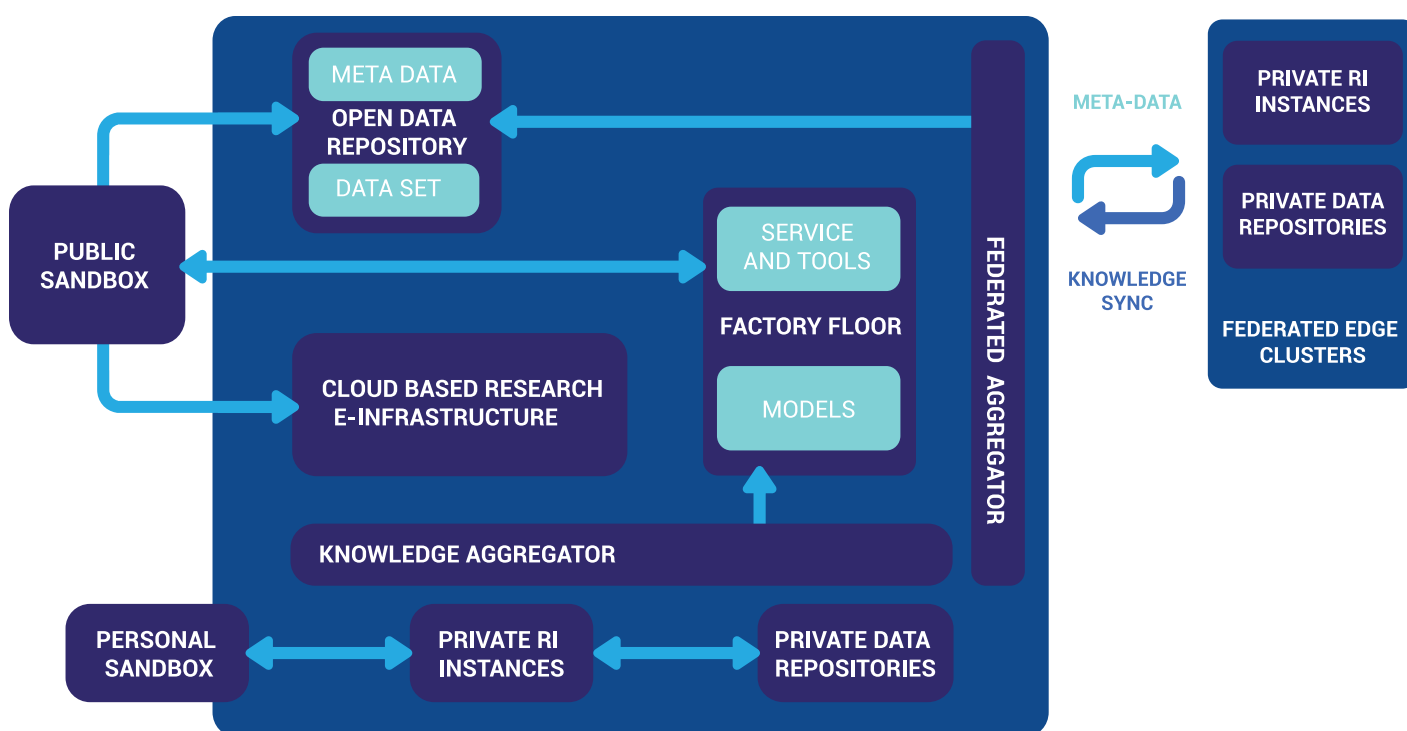


Figure 2. RI Schematic

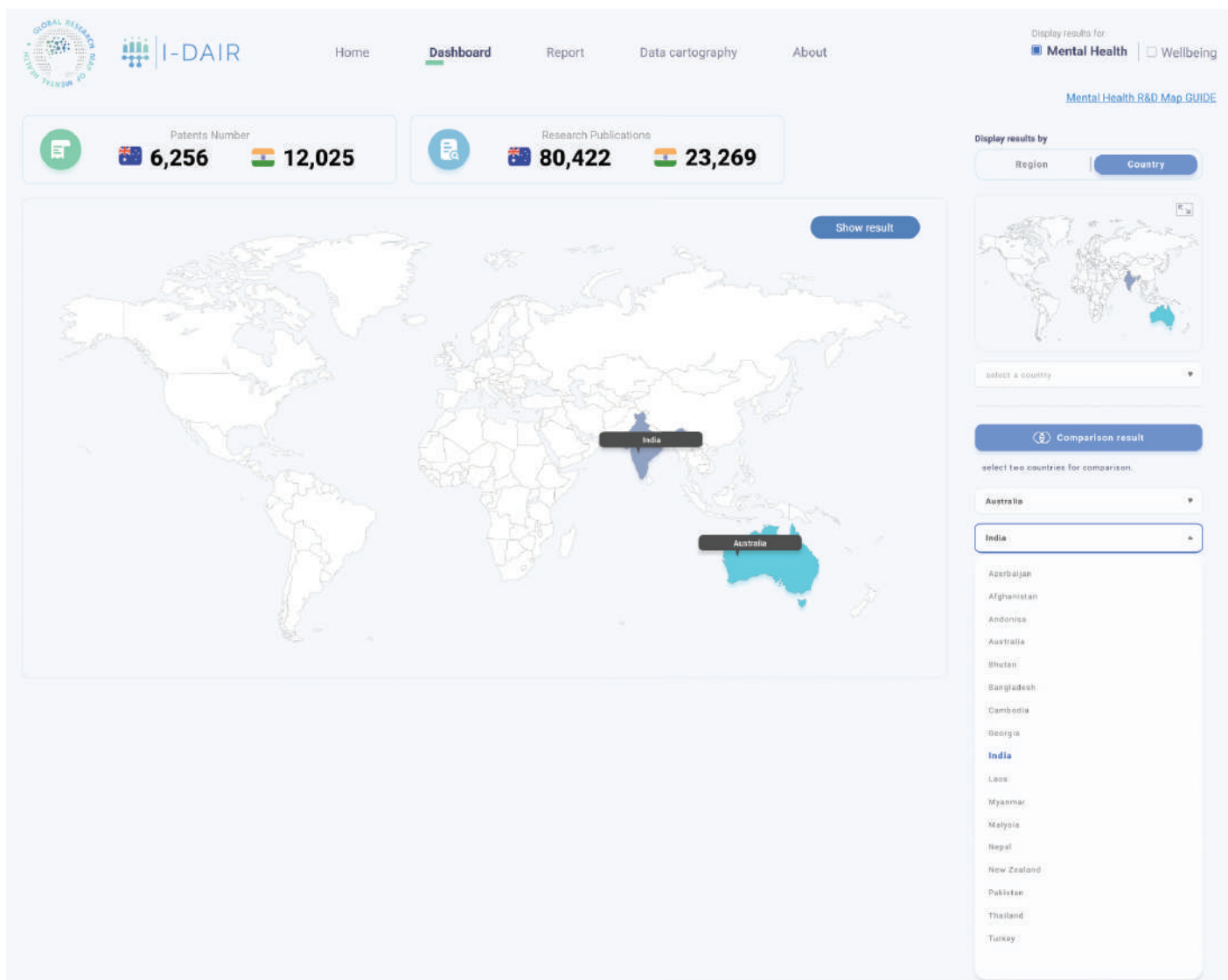
Once the first three prototypes have been successfully tested, a second phase of scale-up will target the inclusion of 20 more nodes during the first two years and 50 nodes by the end of the 4th year, creating a knowledge exchange network. During this phase, clinical validation trials can begin so as to create a collaboration model for distributed and recursive clinical trials using open hardware, devices and software between all participating nodes. The balance between clinical sciences and computer science will lean towards the former in order to create a better niche for users from the transdisciplinary digital health community gathering in clinical or public health settings. This will also foster new ways of pooling data and scientific knowledge at the junction of clinical science,

digital technologies and public health.

The Research Infrastructure (RI) work is closely related to I-DAIR's work in two other critical areas: capacity development and the governance of data and AI for health. The RI will stimulate the global science collaboration network not only through the provision of enabling software and hardware but also by providing a skills practice area for the use of AI in clinical research and medical practice, customised for each participating node. In parallel, we are establishing a capacity development network for digital health and AI for health with the I-DAIR hubs and partners, developing a competency framework for digital health and AI with WHO as a key partner, and leveraging a range of existing and new practical, interactive, unique educational offerings as well as coaching and peer-to-peer learning networks. Both will bolster the sustainability of the collaboration network and the continual use of the resources deployed.

For governance, I-DAIR seeks to develop a collaborative AI governance scheme that facilitates exchange of governance innovations and outcomes across different nodes. During the first phase of the development of the Research Infrastructure (RI), we will document governance requirements around data and AI at the collaborating institutions in India, Kenya and Tunisia, and how they relate to national regulatory requirements as well as international normative guidance from the WHO and other forums (for instance the UNESCO AI Ethics Recommendation and the OECD AI Principles). We will also study how these requirements vary across the AI development, deployment and assessment phases, and how they can be reflected in the RI and the practice of the collaborating community. The aim will be to create the foundation for peer-to-peer exchange of governance responses across the collaborating institutions in India, Kenya and Tunisia.

Together these three connected areas of I-DAIR's work – a distributed research infrastructure targeted at small states and LMICs, a capacity development network for digital health and AI, and a collaborative AI governance scheme – form core components to provide more knowledge, tools and resources to countries and institutions as they pursue the digital transformation of the health sector.



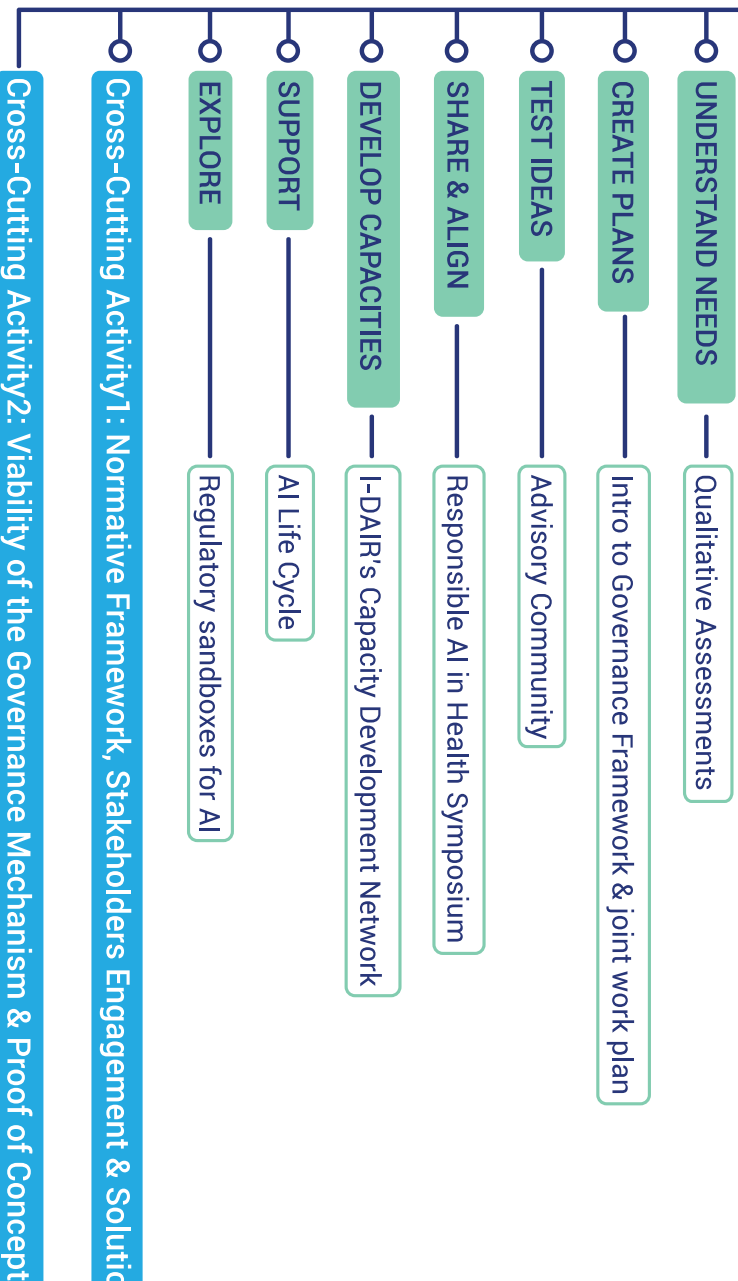


Annex 3.

Responsible and gender responsive AI for Health in LMICs

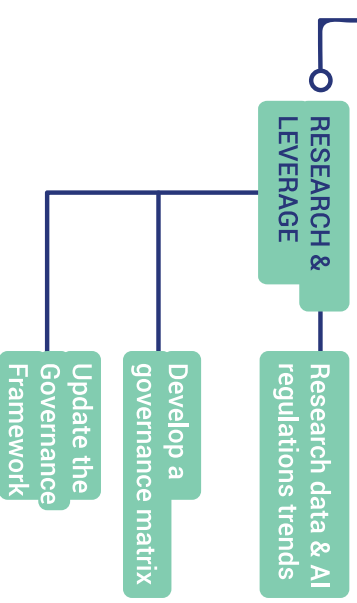
Objectives 1 & 2: Deepen understanding & strengthen the capacity of AI researchers and innovators to implement responsible and gender responsive AI across a diversity of development contexts

Activity



Objectives 3: Expand the international research agenda on AI governance

Activity



Annex 4.

	DIGITAL AND AI	CLINICAL AND MEDICAL SCIENCE	GOVERNANCE AND POLICY
Support	<div>Research Infrastructure</div> <div>Capacity Development</div> <div>Strategy Support: GRM</div>		
Implementation and Coordination of Research Program	<div>Open Health</div> <div>AMR</div> <div>Mother</div> <div>RTED</div>		
Benchmarking and Standardisation	<div>Governance Toolkit</div> <div>E-PROM</div>		<div>Governance Framework</div>
Convening	<div>Scientific Consortium</div> <div>Scientific Conference</div>		

