

# Argentinian Digital Health Strategy

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**Abstract.** Digital Health is one of the three pillars for the effective implementation of Universal Health Coverage in Argentina. The Ministry of Health published the National Digital Health Strategy 2018-2024 in order to establish the conceptual guidelines for the design and development of interoperable health information systems as a state policy. The World Health Organization "National eHealth Strategy Toolkit", "Global Strategy on Digital Health" and other international and local evidence and expert recommendations were taken into account. The path to better healthcare involves adopting systems at the point of care, allowing for the primary recording of information and enabling information exchange through real interoperability. In that way, people, technology and processes will synergize to enhance integrated health service networks. In this paper, we describe the plan and the first two years of implementation of the strategy.

**Keywords.** eHealth, electronic health records, health information exchange, national health programs, health level seven, SNOMED.

## 1. Introduction

The United Nations have set universal healthcare coverage (UHC) as a target for sustainable development goal 3.8, to be achieved by 2030[1].

Only the appropriate use of digital technologies can enable the development of sustainable health systems that promote universal access to care. To deliver this potential, digital health initiatives must be guided by a robust strategy that integrates financial, organizational, human and technological resources [2]. History shows that ill-coordinated initiatives lead to vertical or stand-alone ICT solutions, that although well intended, often result in information fragmentation, and consequently poor delivery of care. Additionally, developing countries face specific challenges such as poor economics, political uncertainty, and the lack of cutting-edge infrastructure, that hampered the quality of healthcare [3].

Argentina has a complex federal healthcare system, where the national government, 24 jurisdictions and three subsystems interact: Public care, social security and private insurances. Many of its shortcomings come from its segmented and highly fragmented system, which also translates into the generation of information siloes. In many health centres in the country, health records are still kept in manual registries and logbooks. In a preliminary survey, at least 80% of the public healthcare facilities do not have

computers or Internet connection. This often results in duplication, over-reporting and underreporting for public health. To undertake this situation, in 2018 the Ministry of Health (MoH) promoted a National Digital Health Strategy, rising capacity building, engaging multiple stakeholders and promoting the development and interconnection of interoperable information systems, based on standards. This paper reflects the foundations and steps taken during the last two years to advance this mid and long term strategy.

## **2. Materials and Methods**

### *2.1. Setting*

Argentina is a Federal Republic subdivided into 24 jurisdictions, with an area of more than 1 million square miles and located in the southern half of South America. Its population is around 45 million people, unevenly distributed mainly in urban and suburban areas. Beyond the recurrent economic crises, it is an upper-middle-income country and has a developed healthcare system. However, health outcomes lag behind the country's potential, considering spending per capita of nearly 10 % of its gross domestic product. We have a mixed healthcare system with three components: public care, social security and private insurances. The social security subsystem is based on job taxes and covers 60% of the population, including active/retired workers and their families. Almost 2 million people (4%) pays for private insurance, leaving 36% (16 million people) with exclusive public care coverage based on jurisdictional states resources. There are significative gaps in morbidity and mortality outcomes between regions and subsystems. Since 2018, the National MoH has embraced an action plan to implement public health reform. Overall, the ultimate goal was to provide actual UHC by strengthening provincial health systems [4].

The existing fragmentation and segmentation of the healthcare system hamper the aggregation of patient data. Even though there is a need for digitalization, the creation of a single national health database is not possible given the political and health model. The incipient and progressive individual computerization of each system does not spontaneously solve this difficulty. Therefore, a distributed but interconnected health information ecosystem was selected as a feasible approach.

### *2.2. Methods*

Our National Digital Health Strategy was built, taking into account international recommendations, like the World Health Organization toolkit for National eHealth Strategies, and their recent global strategy on digital health. We also participated in working groups such as HL7 International, SNOMED International and the Global Digital Health Partnership (GDHP). We capitalized regional initiatives like Information Systems for Health (IS4H) and RELACIS from the Pan American Health Organization (PAHO)[5], and Inter American Development Bank sponsored RACSEL. We interacted with Latin American leaders in charge of other national digital transformation experiences like Uruguayan SALUD.UY. Our approach is also grounded in the Principles for Digital Development and the subsequent Principles of Donor Alignment for Digital Health. These principles highlight the importance of supporting strong

national digital health strategies for sustainable country ownership, avoiding project overlap and fostering coordination and alignment of implementation activities [6].

However, it was essential to uphold the local existing resources and capacities, based on public, private and non-government organizations stakeholders who have been using Information Technologies for health services improvement for many years [7]. Moreover, the OECD has highlighted the ambitious general digital agenda and the efforts taking place in Argentina to digitalize and improve data governance in its public sector and build the foundations for a digital government [8].

### 3. Results

Through Resolution 189/2018, the highest health authority in Argentina settled the way forward to build, in collaboration with provincial governments and referents of the three subsystems, a network of information systems focused both on the population and individual health of each patient. The MoH created a National Directorate of Health Information System to coordinate such a strategy. It was essential to work on governance, making agreements with each province within the UHC framework plan.

The investments that each jurisdiction makes in its digitization projects are reinforced with national and international funds. Multilateral funding organizations (such as the World Bank and Inter American Development Bank) support projects like so-called SUMAR, which strengthen public health coverage to protect the most vulnerable populations [9]. Recently, they have included the Digital Health Strategy goals and will give economic incentives to the provinces that accomplish them for the next four years. As a result, every digital health transformation project should be aligned with the National Strategy. Additionally, the MoH got the funding for a National Connectivity Plan for public healthcare facilities. It will reach 2,000 remote primary care centres in the next two years, using satellite connections and optic fibre.

The Digital Health Strategy has two consecutive phases. Phase 1: Consensus, Infrastructure and Scalable Projects (2018-2019), which define the technical, regulatory and political foundations, with the participation of the community of experts and jurisdictions. Phase 2: Deepening, scaling up, and maturation (2020-2024) focuses on the adoption extension of the Digital Health tools and the functional enhancement of Information Systems. The priorities for the first stage were to:

*Define interoperability standards:* SNOMED, FHIR, ICD, etc.

*Make the Central Infrastructure available:* the enterprise service bus (EBS).

*Identify and integrate the information needs:* governance on the data flow.

*Enhance local information systems:* licensed, homegrown, or open-sourced.

*Define the architecture to share clinical records,* with HL7-FHIR.

*Inform and empower the patient* through a Citizen Health Portal (*Mi Argentina*).

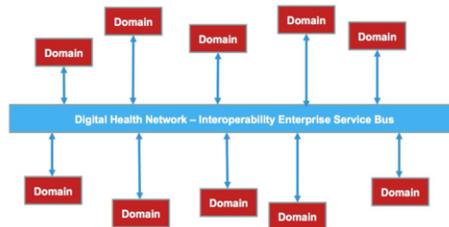
*Advance in the legal framework* for digital health transformation.

*Grow capacity building:* train human resources in health information systems.

Argentina joined the SNOMED International Consortium in 2018. The National Release Centre has published three local extensions during the last 18 months, including medication codes to allow interoperable ePrescriptions. The MoH stated SNOMED as the clinical terminology standard for electronic health record (EHR) systems, leaving ICD for statistical and other administrative tasks. In addition, FHIR (Fast Healthcare

Interoperability Resources) [10] a next-generation standards framework created by HL7, was chosen as the standard for health care data exchange.

The National Digital Health Network was launched in April 2019, using an enterprise service bus technological infrastructure to connect different domains (EHR systems) across the country, as shown in Figure 1. We defined the required interoperability standards based on international recommendations and extensive local expertise in the field. By involving multiple stakeholders, we understood their views and gained their collaboration, support and endorsement of the strategy. A joint team including MoH, HL7 Argentina and Hospital Italiano (HIBA) experts developed the HL7-FHIR Enterprise Service Bus. The network enables the communication between domains but does not change the current processes of storage of health information. The data remains in each information system repository, and is only communicated to other domains when necessary (i.e. when the patient visit another clinic).



**Figure 1.** Simplified ESB architecture of the National Digital Health Network.

The MoH acquired RedHat OpenShift® licenses and services to support such infrastructure, hosted at the main Government Datacenter (ARSAT). The MoH team has been adopting this open-source container application platform based on the Kubernetes container orchestrator for enterprise application development and deployment, to guarantee the Health Network required availability and performance level.

After two years, every province (24) has defined its Digital Agenda for Health. Regarding their information systems, they have freely decided whether to acquire commercial EHR licenses, develop locally or adopt open-source software. There are advanced Projects in 16 of 24 states, where they selected pilot areas to carry out the digital transformation. Human resources, technology and processes were aligned to fulfil the project goals. Adopting a change management strategy was crucial for EHR implementations. The national MoH helped local teams to implement standards like SNOMED and FHIR in their systems. Vendors are progressively adopting standards to comply with National recommendations. Up to date, there are more than 2 million patients registered in the Network: it means that they have received care in an institution with interoperable EHR, and if they attend to another clinic, it would be possible to ask individually for such records through the network.

In collaboration with the Ministry of Modernisation, we launched a Citizen Health Portal. As of October 2019, more than 2 million users had been registered on the digital public service delivery platform *Mi Argentina*. It gives personal information like the Digital Vaccination Card, but also works as a patient privacy manager, to configure the opt-out consent for the information exchange through the EBS health network.

We developed and implemented a National Telehealth Platform to perform eReferrals and eConsultations nationwide. It allows every clinician to interact with other healthcare professionals (specialists) using a personal computer or a mobile device in a secure environment, even if they do not have an EHR in place. As the Telehealth

Platform is connected to the National Enterprise Service Bus, different EHR can interoperate with it.

Besides the existing legal framework that rules Health IT implementations (Digital Signature, Personal Data Protection, EHR, etc.), the MoH dictated several resolutions to promote digitization while caring for privacy, confidentiality and security. In addition, there is a Digital Health Law project to be discussed at the Congress. Every jurisdiction can dictate their legal regulations, or endorse national laws.

We promoted several initiatives to enhance capacity building. In 2018 the MoH, PAHO and HIBA launched the “100 Leaders” Training Plan, using an online AMIA 10x10 course. There is also a monthly open course on standards and Conectathon, both onsite and online. We developed a basic online course on EHR fundamentals for more than 1,500 healthcare staff. The next big step is introducing these topics in healthcare professionals’ undergraduate curricula.

#### 4. Conclusion

The Digital Health Strategy is not an end in itself but has the vision of reducing quality gaps in health care, implementing information systems that identify the characteristics and needs of the population, allowing longitudinal and comprehensive monitoring of people throughout the entire health system and providing innovative tools to health professionals and patients.

This paper underlines the role of the MoH in setting a National Digital Health Strategy for Argentina. Even though it has been a short period, since 2018, there have been several achievements that should be sustained. Besides its mid and long term planning, the strategy itself has to prove that it can succeed the time challenge of political transitions. Using international benchmarks and strategies like IS4H could be useful to support this initiative.

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