



COVID-19 Management

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Digital Healthcare System - Now More
than Ever

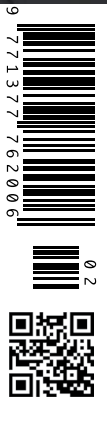
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Digital Healthcare Systems

Now More than Ever

Digital Healthcare Systems are needed in all contexts. Portugal's recent eHealth up-scaling used a crisis to leverage change. An expert who led the country on this way shares this experience and outlines the bases of a new way of looking at healthcare.



There is a global need for a new healthcare system organisation. The will for transformation was dormant, and the need has become prominent with COVID-19 crisis. Digital solutions are shaping eHealth (von der Leyen 2019) adding value to obsolete 20th century-born healthcare systems. Portugal's eHealth developments are a vivid example of how change is possible during and after a crisis. Digital healthcare, however, is something new and needed. Its shape and form are to be outlined, its citizen core to be energised. Courageous leadership will be able to exit COVID-19 crisis and step into that new era.

Portugal eHealth Developments in Brief

Portugal is a medium-sized country but now a reference point and an influencer in the digital health policy in Europe. Faced with a financial crisis, the 2011

government had to restore the National Health Service (NHS) sustainability, fighting fraud and waste while maintaining healthcare provision. We had an unstructured and mostly outdated eHealth infrastructure. Like in many other countries, even today, there was no official strategy and a plethora of home-grown and off-the-shelf solutions maintained by curious in-house programmers and bought from companies in an *ad hoc* manner. There were many vendor 'lock-in' situations and little documentation, system architecture or interoperability standards.

All countries have their strengths upon which to build eHealth. Ours were some generalised old legacy systems developed by the Ministry of Health, and few Information Systems (IS) technicians remaining from a period and a practice of national digital health solutions creation by public entities.

In 2012, a decision was made to revitalise eHealth. At the Ministry of Health, I outlined a plan under the new Commission for Clinical Informatisation. A dedicated eHealth agency would emerge from the restructuring of the Shared Services of the Ministry of Health (SPMS), inherent people and old information systems from other institutions.

Existing health-related systems were reorganised in new formats providing quick-win integration solutions. The prime example was the new Health Data Platform, which in less than nine months linked all public hospitals and primary care, allowing doctors and nurses to see health records nationally.

Secondly, IS were aggressively implemented in the areas of fraud in prescription and dematerialisation of all processes, such as issuance of sick leaves and death certification (Marques 2015), among others.

A citizen-centred digital health stream of initiatives was started. The first patient portal, launched in April 2012, enhanced e-booking for online appointments, but from a more strategic perspective citizens could document their health data, now accessible by the NHS staff pending their explicit consent. A citizen had become a source of data in the care process. Half a million enrollees benefitted immediately; now they are over 2.5 million. Co-created with the national data protection authority, the platform was already GDPR-compliant. It was continuously enhanced and later rebaptised under the new 2015 Government as 'Registo de Saúde Eletrónico' (Electronic Health Record).

This was a rare, but fundamental form of eHealth strategy continuum. Four evolutions of the portal came about over the years with design, usability, increased services, sophisticated self-

law. Our ePrescription includes not just medicines, but home respiratory care, or prevention interventions, such as prescription of physical activity (Mendes et al. 2020). Many other projects synergised to provide Portuguese population with a mobile app (MySNS wallet). It carries fragments of their electronic health record, such as their full vaccination data; gives further access to their data online; or allows to self-check their symptoms online for flu and other diseases, even before this dreadful COVID-19.

We developed our own national, publicly available telehealth platform in 2015. Through a working group, and later the new National Telehealth Centre, in 2017 institutions were given a new dynamic, which led to increased use. Financing mechanisms and clinical guidelines for telehealth were created, as was the framework for telederma-

infrastructural improvement and legacy system update, in which resources were the limitation. More remains to be done. We also did some things wrong, eg there was little direct clinical engagement in the beginning, as we trusted IT departments in organisations with this. Such pitfalls were later adjusted and contributed to the creation of [SPMS Academy](#).

Portugal enjoyed the benefits of EU co-operation under different projects, and led some of them in eHealth, like EXPAND or [eHAction](#). I served as representative and later Member-State chair of the [EU eHealth Network](#) – the eHealth policy forum. Many criticised such external activities. Digital health, however, only makes sense in the broader context as interoperable advances in each country need to align internationally. Citizens travel, and responses need to be European, if not global, as, unfortunately, COVID-19 crisis is showing.

Portugal is now in the forefront of eHealth in Europe. The new NHS portal is a potential game changer for access to services information

World Health Organization, Review of the Portuguese National System Report 2018

management of consent, EU compatible cross-border services (ePrescription and Patient Summary), access to national ePrescriptions, and a myriad of other services.

I presided over SPMS, as it set itself to revolutionise digital health, and oversaw the IS directorates from 2013 to 2020. We went fast and in-depth. Digital health needs interoperability standards, enterprise architecture, service management, high-scale operation capacity, international cooperation, cybersecurity strategy, data usage roadmapping and ethical surveillance.

In September 2015, we launched ePrescription, which reached 98% coverage by October 2016. Now more than 10,000 doctors use the new mPrescription (mobile prescription with eSignature and paperless transfer to citizens), and, starting April 1, 2020, paper prescriptions have been banned by

tology, culminating with the approval of one of the first national strategies for telehealth globally in 2019 (Hashiguchi 2020). These are key examples that created grounds for 'digital thinking' in health, not to *show off*, but to *show how and why* it is possible to embark on similar journeys where needed.

Drawing on robust national systems such as patient index, prescription database, datawarehousing of all primary care data or digital mortality certification, Big Data projects were launched. For example, online open data, primary care public dashboards, or citizen centric dashboards on the NHS website ([Ministério da Saúde](#)) made various data available to scientists, journalists and citizens in general in early 2016. Artificial Intelligence projects with a focus on public health and health management issues always twinned with academia. More could have been done, namely faster

Similarly, because of organisational and technical interoperability, systems need to be cybersafe. We set in place robust governance for health cybersecurity, kick-started two European Health Cybersecurity collaborations (SPMS 2020) and collaborated under the newly formed Global Digital Health Partnership ([GDHP](#)). International relationships in a national agency are the door to innovation, standard promotion and broader thinking in digital health – a long-term investment.

Vision, strategy and political support; technical capacity, enthusiasm and emotions; willingness to try and acceptance of failure – these were the ingredients for Portugal's eHealth path. The first published strategy, for 2017-2019, benefitted from one year of reflection, WHO Europe contribution, lessons learnt from others, and consultancy input. Nine years of continuous political support through

four ministerial teams, including an additional boost through the change from the right-wing to left-wing government, was another factor. Public sector technical capacity developed through intensive reskilling of staff and new hiring. Enthusiasm and motivation came from meetings and events, which attracted health organisations, professionals and multiple associations. The willingness to try and accept failure had to be developed in SPMS and the ministry – it did not come naturally. I believe, however, in a ‘fail-fast’ methodology, or, as I called it, ‘à Gil’ approach (in reference to the well-known agile IT methodology but adapted to my leadership style: ‘à-something’ means ‘the way of’ in Portuguese, and Gil is my middle name), emotional leadership and fun are key to digital health.

Digital Healthcare System

Developing and deploying eHealth services that fit into and optimise existing healthcare systems is crucial to improve their performance, accessibility, comfort and efficiency, but it is not the same as the digital-first healthcare. A digital-based healthcare system is much more than using sophisticated information systems wisely (Ribeiro 2019) or undergoing digitalisation of healthcare (von Eiff and von Eiff 2020). It goes further than just achieving a stage where citizens have full access to their health data and better access to more effective and comfortable care, or improving system efficiency and sustainability through digital support. A new Digital Healthcare System (DHS) is more than that, and in the context of a country, a region or even a healthcare organisation, it can be conceived and should be implemented.

What are the bases for a digital-based healthcare system?

First, *healthcare transformation* – of processes, professionals and patients, or, alternatively, of the care philosophy, interprofessional collaboration and health-aware citizens.

Second, *significant investment in rethinking any need for physical*

interaction – even before COVID-19 crisis we knew that we should protect frail citizens from nosocomial infections, unnecessary travel, cost and suffering – and here telehealth is the new health.

Third, *security of data, privacy and interoperability* – the basis of trust necessary for the new social contract. This is required for using advanced population-based digital tools or for robotics professionals to step in where humans are at risk or insufficient, or where human-robot hybrids outperform both.

Fourth, *motivation* – rethinking healthcare systems worldwide was already needed. 2020 gave us extra motivation, especially if we now better understand why a digital-based healthcare system is desperately needed.

How will it look like?

Preventive, paperless, empowering, personalised and accountable. Digital healthcare strengths lie not in technology but rather in the fact that digital technology will be present in processes, professionals and people, *in ways such that everyone can be a healthcare creator*. They can be a prevention specialist; care for themselves and their family with the best scientific support; access digital therapeutics by default. Moving to any form of needed physical care, drug therapy, surgery, hospital admission, or ventilation support should be a last resort. *When humans know enough to care not in a domestic, amateur, unprofessional way, but are empowered with digital tools designed, oriented and monitored by scientists and professionals, we will have less shortage of resources to focus on highly specialised care that may still be needed*. In a digital-oriented healthcare system, professional associations, patient advocates, governments and industry will have to redefine their functions and relationships, and new leaderships will be needed (Martins 2019).

Why could it be better?

A new healthcare system that is based on a full digital landscape can provide value to citizens in multiple ways.

There are several studies showing the value of digital tools in surveillance, screening programmes, awareness campaigns, social media-based interventions on behavioural diseases, or the value of digital health literacy. There is no shortage of scientific evidence that people can benefit from digital tools in healthcare. However, most uses have focused on restoring health, and too few on prevention, or eradication of certain risk factors. In a DHS, digital tools are used to reduce the need for healthcare. Societal design of education, workplace and play can be improved. Through the integration of knowledge about medicine and human behaviour with architecture, engineering and law, digital-born solutions can create the grounds for a healthier society. While the focus of eHealth use in *existing healthcare systems* is better access, comfort and efficiency, the *hallmark of a Digital Healthcare System is not better care, but less need for care. Less is the new better*.

How do we achieve it?

Countries or regions wishing to make use of digital tools for better health will need to invest more time, money and political attention in a solid yet rapid deployment of technology in healthcare processes. The desired outcomes for eHealth have been redundantly covered in reports and recommendations, such as from the World Health Organization (2019) or the [eHealth Network](#). Practical guidance on how to get to an interoperable ecosystem, create systematic involvement onto a change momentum, or glue up disperse systems in a meaningful way, is still missing. Being an international eHealth expert and a policymaker for over eight years, I have been arguing that creating strong eHealth agencies, increasing their capacity and having a ‘fast-drive’ eHealth national strategy designed with inputs from outside experience, are critical success factors.

This journey, fundamental if a minimum eHealth maturity has not yet been reached, only leads to a healthcare

system 'augmented' by eHealth. Healthcare where eHealth is extensively used is not the same as digital healthcare. Telecare should be provided by default, like e-banking. Digital engagement and surveillance tools, virtual reality, AI technologies, which are readily available or can be accelerated in less eHealth-mature contexts, need to be considered in a revision of the eHealth strategy, and then followed with strong leadership into healthcare transformation.

Profound deconstruction of existing physical and traditional models is needed to get to the latter. It is not only about redesigning policies for fostering prevention, home care, integrated services, financial sustainability, or multiprofessionalism, which are needed; but rather about revisiting the social contact between society, individuals, governments and the so-called 'social state.' *The pillars of new Digital Healthcare Systems are digitally enabled citizens.* Managers, doctors, nurses, allied health professionals, informaticians, IT specialists and all others, should be enablers and actors, to trigger, respond to and guide the *informed health-aware citizen*. Such citizens will be the new propelling force, and both new and existing professionals need to learn new sets of skills (Martins 2010). Access to good digital tools would help to wake up this force, give it its form and purpose. Open data about healthcare facilities' performance create urgency for questioning old ineffective ways. Simple online digital literacy materials coupled with digital inclusion programmes and a paper-free philosophy, creates the new

generation of patients and healthcare staff.

Why is COVID-19 crisis a non-return point in transition to DHS?

Mitigation of the negative spillover of health system temporary reorganisation as well as advances in diseased surveillance and patient follow-up systems are needed to improve the existing healthcare. However, as exhausted healthcare systems and organisations exit the crisis, there may be a temptation to 'go back' to finishing unattended 'business-as-usual.' *Alert leadership should use this momentum and avoid doing only that*, because a new telesociety will be emerging. Online shopping, teleeducation, telework, telehealth will be used more extensively, or improvised to offer quick services to quarantined households. People are unlikely to go 'back to normal,' such as unnecessary travel to care facilities or exposure to nosocomial infections and other risks. They are the missing fuel cell to defeat the initial inertia of the much-needed healthcare transformation.

Conclusion

'Digital' is available. People leaving their houses and isolation pods will want to see it going into healthcare more extensively. Portugal's eHealth journey shows it is possible to leapfrog. We should use the current crisis to push for the needed healthcare transformation. While finishing the basis of solid eHealth ecosystem, countries, regions and health organisations need to rethink healthcare.

All citizens have a right to digital

healthcare. It is better, more sustainable and empowering. A new daily routine is desirable and will be desired. More crises will come, and we will want to be much better prepared. This means not only intense use of digital tools in today's healthcare, but, most importantly, creating new Digital Healthcare Systems and healthcare organisations. ■

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Key Points

- It is possible to speed up eHealth adoption with a strong eHealth agency and national strategy based on international input.
- New Digital Healthcare Systems are needed. The concept and its benefits are presented, and details briefly outlined.
- Reaching Digital Healthcare Systems is not a matter of digital and healthcare transformation, but of a fundamental revision of the role of professionals and organisations and the new role of digital citizens in health.
- The COVID-19 crisis may be the leverage that many countries, regions and health organisations needed for embracing digital healthcare.

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