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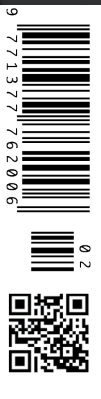
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Digital Health Diplomacy in Chained Globalised Health Context

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There cannot be a global approach to diseases and health promotion without a tremendous effort to create links. Interoperability of people, processes and information systems is crucial for this purpose. I advance a concept of Digital Health Diplomacy as concentrated international efforts towards supranational interoperability in eHealth/Digital Health. This could lead to better policy and technical collaboration and the implementation of common projects, which are urgently needed. I argue that to build a Global Digital Healthcare System, we will require a new set of skills, tools and forums, and this must be the purpose of Digital Health Diplomacy.



Key Points

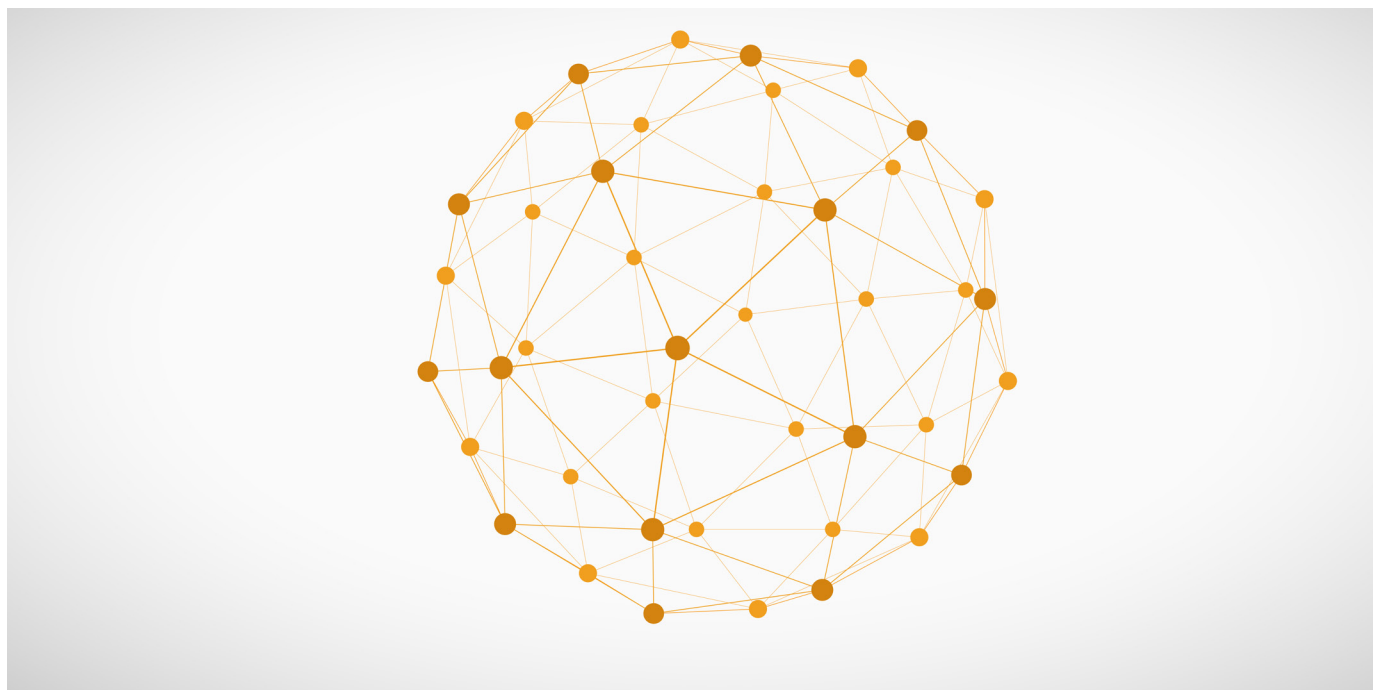
- A global approach to healthcare is only possible through creating interoperability between people, processes and technologies.
- Digital Health Diplomacy is the basis for real cross-border health data exchange between all healthcare actors. It is key to global health cybersecurity and the use of digital health for universal health coverage and integrated care systems.
- Establishing a worldwide interoperable health ecosystem requires policy and technical collaboration as well as common projects realisation.
- A global electronic health record (G-EHR) is achievable with focus, concrete steps, value creation and determination to explore certain elements.
- Information security and health cybersecurity is much more than the absence of cyber incidents.
- A LOST-IIS approach to digital health is needed at various levels, from national to global.
- Building a global digital healthcare system is possible with Digital Health Diplomacy.

Need for Digital Health Diplomacy

The 'health of nations', to paraphrase Adam Smith's famous 'wealth of nations', has never been so at risk. At the same time, 5G technology, satellite internet and Artificial Intelligence (AI) are linking us and exploring data about us (European Commission 2019). As air travel and globalisation processes have risen, so has the risk of cross-border health threats (Alemanno 2020). Today we know a deadly biological virus spreads around the world within hours, leaving a trail of death. Likewise, in 2017, the harmful WannaCry cyber virus crippled, within minutes, many sectors of activity including healthcare. Paradoxically, a digital way to send across continents a person's list of diagnoses, medical conditions or

allergies in a standard, universally accepted terminology and an interoperable format is not available, although it is technically possible, and lures as a hard-to-reach target. If we accept the progressive nature of Digital Healthcare Systems (Martins 2020), chained globalisation in health will mean one thing: *Global Digital Health*.

There cannot be a global approach to diseases and health promotion without a tremendous effort to create links. Interoperability of people, processes and information systems is crucial for this purpose. Only through those means can orchestrated strategies emerge from common perspectives on regional and world health and disease. By no means this is a task only for the World Health



Organization (WHO) (WHO 2020), nor should it be left alone, like any other, on the global scene. Likewise, high-level responsible health agents, such as ministries or public health authorities, need to understand that, on the international and global scale, multinationals, and other private or third-sector agents, are key to global development. This is no different in digital health.

There are relevant global actors doing quite extensive work of connecting efforts from different countries. These include: i) Standard Developing Organizations (SDOs) like International Organization for Standardization (ISO), Health Level 7 (HL7) or Integrating the Healthcare Enterprise (IHE); ii) clinical terminology-focussed organisations like SNOMED International or LOINC terminology; iii) promoters of digitalisation efforts such as Health Information and Management Systems Society (HIMSS) or International Data Corporation (IDC) and, increasingly, the informatics community, for example the International Medical Informatics Association (IMIA), the American Medical Informatics Association (AMIA), its European counterpart, the European Federation of Medical Informatics (EFMI), and even national noteworthy examples like the Korean Society for Medical Informatics (KOSMI).

To reach a truly global digital healthcare system, however, we need to work much more profoundly and more decisively on real worldwide cross-border eHealth services, like a global ePrescription system or sharing of minimum sets of data (e.g. the ISO International Patient Summary) and progressively bigger components, such as a vaccination passport, summary or e-cards. For example, medical devices (e.g. insulin infusion pumps, or non-invasive home ventilators) are increasingly globally produced and standardised, yet, the information that they require and generate

seems to get 'chained' to local, regional or national health systems, in turn, chaining citizens down to their institutions, often their homes. People fear to travel to a remote location where access to their device or health data is not possible. They know healthcare may not be equally safe, which makes them feel unsafe to travel and 'chained'.

As an integrationist, system thinker and a change agent, I have learnt to be an intercultural broker, fostering attention to strategy but also to real implementation when talking to end users and IT programmers alike. I know both worlds. Having been active in policy advice and law-making, I know appropriate legal frameworks are highly needed for truly global digital health maturation. Patient access rights, AI, digital ethics and privacy-as-a-platform are moving targets. These topics will be critical in the future. To create this global digital health network and explore the value of this international ecosystem, we need to mature Digital Health Diplomacy, which could be defined as follows:

Digital Health Diplomacy refers to the concentrated international efforts towards supranational interoperability in eHealth/Digital Health. These may include international agreements for mutual health data transmission, recognition of information systems or common approaches to the use of international standards. It is the basis for real cross-border health data exchange projects, pilots and infrastructure creation, connecting all healthcare actors worldwide through data. It is key to global health cybersecurity risk alert and response, and to the use of digital health to contribute decisively to global health threats.

Digital health diplomacy is not just a matter of commercial interest or the facilitation of interoperability amongst Electronic Health Records (EHRs). It is equally a matter of



healthcare provision, increased and improved cross-border care, and, so important these days, fighting cross-border health threats.

World strategies, memorandums and declarations about telehealth, eHealth and now digital health are not in short supply from many international and global organisations (World Health Organization Regional Office for Europe 2016). Real working sandboxes and green fields await. Policy collaboration, technical collaboration and concrete common projects realisation are key to establishing a **worldwide interoperable health ecosystem**, which is urgently needed. Digital health policy is an issue of growing interest in the world health policy. Like many other international efforts, this one equally requires targets and a common mission. That of global Digital Health Diplomacy should be threefold:

- 1) To reach full digital health interoperability
- 2) To uphold health information cybersecurity
- 3) To guard from digital threats to human health and dignity.

Global Electronic Health Record

A global electronic health record (G-EHR) is not something utopic. It requires focus, concrete steps, value creation and determination to explore the following elements.

- 1) Creating a worldwide voluntary patient and health professionals' registries
- 2) Setting up a global regime/governance forum for the advancement of agreements and common creations
- 3) Enacting legally binding agreements grounded in international treaties of voluntary participation, on three dimensions:

Cybersecurity for Digital Health is Global Task

Current efforts in international cooperation in health cybersecurity, as those happening under the Global Digital Health Partnership (GDHP), should continue. They can be expanded, and this is likely to be of benefit to healthcare systems and societies in multiple countries. Such expansion can happen by:

- 1) Making existing cooperation in health cybersecurity more sustainable and structured
- 2) Expanding stakeholders' engagement to involve, in particular:
 - i) patient associations and professional scientific societies
 - ii) industry, from medical device and equipment manufacturers to software development companies
 - iii) research and higher education institutions
 - iv) standards setting organisations
- 3) Enlarging the number of involved countries and working under the auspices of larger, well-established international bodies like NATO, OECD or WHO.

In Europe, it means eventually using the Eastern Partnership (EaP) and/or Central European Initiative (CEI) to enlarge the debate and capacity building outside immediate EU influence. Likewise, other regional organisations like the Asia-Pacific Economic Cooperation (APEC), the Association of Southeast Asian Nations (ASEAN), or the African Union (AU) should be more engaged with international health policies, and at the intersection of economic and well-being concerns ensure the security of their increasingly digital national health systems. At the global level, following this

We need to make sure that digital health comes with solid defence. Otherwise, it may bring more risks than benefits

- a. Global rules for telehealth
- b. Global rules for the detailed reporting and information exchange in cross-border health threats
- c. Decisions on the implementation and governance of concrete digital health services.

Finally, as a profound believer in *Incremental-but-real-Interoperability* (IBRI), I advance the following worldwide cross-border eHealth services as initial steps:

- 1) Global ePrescription system
- 2) Global sharing of minimum sets of data (for example, the ISO International Patient Summary) and, progressively, bigger components, such as vaccination passports/summary/e-cards
- 3) Internationally approved minimum information sets for advanced data-rich medical devices
- 4) Internationally approved and maintained digital information leaflets for prescribed drugs.

direction means ensuring such collaboration with regard to cybersecurity in general could eventually be hosted, in a sustainable manner under the UN umbrella, or at WHO.

As we see the global discourse on the increased speed in the digitalisation of healthcare and the increased need for international collaboration, we need to make sure that digital health comes with solid defence. Otherwise, we think digital is good for health, but it may bring more risks than benefits. Countries should implement national digital health strategies and be willing to support and contribute to international efforts and agencies where sharing of that implementation can help them and boost these much-needed efforts. Inspired by the WHO [definition of health](#), we should see **information security and health cybersecurity as a total state of integrity, availability and privacy, and not just the absence of cyber incidents**. In a digital

health environment, cybersecurity concerns are critical as the essence of the health system functioning depends on the 'health' of the information systems that support it.

“First, Do No (Digital) Harm”

Most doctors will follow the “first, do no harm” rule as they have voluntarily been *chained* to their Hippocratic Oath. If the absence of digital solutions has been associated with lower patient safety, it is also true that digital threats to human health and dignity can come from misuse or abuse of digital health technologies. Such trade-offs are often the case with any impactful human invention. An increasing number of scientific reports point out to the dangers of digital technology and its damaging effects on health. Literacy, digital and health literacy are powerful *digital vaccines* to fight this menace.

These digital vaccines and some digital therapeutic interventions face distribution problems, their scope is often limited, the incentives and political visibility is often surpassed by more glamorous and eye-catching technologies. This is the case with blockchain-EHRs or robotic physiotherapist care in highly matured digital health settings. A focus on literacy is essential, but it is possible to promote both. This has been shown in examples of mHealth use in low-resource rural areas to help healthcare provision and foster literacy, while capturing valuable data for further sophisticated secondary data uses.

Human dignity is at risk in privacy matters, in cybersecurity breaches, in robotised clinical decisions. It is also at risk when two years of waiting time for a visit to a dermatologist could be cut down to two months with the use of simple teledermatology screening. Reflection, pondering and, sometimes, waiting and awaiting – these are old remedies to some of these challenges, although not the panacea.

Conclusion

We are LOST, if we do not work to develop Legal, Organisational, Semantic and Technical (LOST) interoperability global alliances. Efforts, such as HL7 collaboration with HIMSS or SNOMED International, operate at the Semantic and Technical levels. We have the GDHP and some regional efforts by WHO Regional Offices trying to create bridges at the

Organisational level, but we have no common Legal grounds.

An international treaty on digital health is urgently needed for two reasons:

- 1) Pandemics, present and future, and the increasingly important role of digital health in their deterrence
- 2) Telehealth as a world and globalised phenomenon, where medical liability and privacy issues need to be minimally regulated if we are to harvest the great benefits that can come from such technological advancements into healthcare prevention, promotion and provision.

Finally, I argue that the famous LOST interoperability framework should be enhanced with two final 'I's' and an 'S', which would stand for:

- a) International – or, ideally, global interoperability
- b) Intelligent – advancing AI global standards for its better use in health
- c) Security – health information cybersecurity that presents particular challenges and requires global positioning and response.

A LOST-IIS approach to digital health is needed at each nation's level, but also in the EU, or other regions, and globally for all citizens alike. Through a holistic, global and sustained approach to digital health worldwide, I believe we will see digital health as the only way forward for Universal Health Coverage, for fair and balanced healthcare transformation, and for fighting the emergence and prevalence of many diseases and health-threatening conditions, including new digital-born and old and present serious cross-border threats to health.

We need to lead (Martins 2019) into what I profoundly believe is needed in the European region and worldwide – new Digital-First Healthcare Systems. Yet, as Cassese (Cassese and D'Alterio 2016, p. 3) notes, “in the global space, several global regulatory regimes act without subjection to one hierarchically superior regulatory system. This is the empire of the ‘adhocracy’, because there is no uniformity and no common pattern.” Therefore, building this global digital healthcare system will require new set of skills and forums to face a chained globalised world. This is the space of Digital Health Diplomacy.

Conflict of Interest

No conflict of interest declared. ■

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