COVID-19 AND THE USE OF DIGITAL HEALTH TOOLS: OPPORTUNITY AMID CRISIS THAT COULD TRANSFORM HEALTH CARE DELIVERY

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Summary: Prior to COVID-19, there was much unrealised potential in the use of digital health tools across Europe. Many digital health tools nevertheless became an immediate necessity during the pandemic and their use increased substantially to support communication and information, surveillance and monitoring, the provision of healthcare, and rollout of vaccination programmes. Changes to regulation, reimbursement, technical infrastructure investment and training for health professionals have been needed to facilitate uptake. Active strategies are now required to promote continued use of digital health. European Union funding and initiatives such as the European Health Data Space will support progress in this area.

Keywords: Digital Health, Remote Consultations, Regulation, COVID-19

Introduction

Digital health means the use of digital technologies to improve health. In principle, digital health technologies hold the potential to bring about major improvements in the efficiency of the health system, both in terms of care provision and the administration of the system as a whole. In practice, realising this potential in health care across Europe has proved to be a complex endeavour, with very mixed results.

Prior to the COVID-19 pandemic, much unrealised potential for digital health remained across Europe despite much effort, with wide discrepancies between countries in terms of policy and strategy development and implementation. While countries such as Estonia, Denmark, the Netherlands and Sweden were relatively advanced in this area, others were less so. Many of the biggest challenges to uptake have not been technical in nature, but instead stem from difficulties in making changes to wider processes of health and care. Facilitating the uptake of digital health tools requires a complex range of policy actions targeting regulation, financing, quality improvement and technical infrastructure (see Figure 1), but developments in many of these areas remained lacking. Across the region, insufficient investment, lack of a supportive and clear legal
The unique challenges generated by the COVID-19 pandemic have nevertheless created new needs and abruptly changed the motivation to make use of digital health. In many instances, digital health tools went from being seen as an interesting potential opportunity to an immediate necessity providing the impetus for very rapid development and uptake in practice. In this article, we summarise findings from a recently published European Observatory policy brief by Fahy et al. (2021) on the ‘Use of digital health tools in Europe: before, during and after COVID-19’; we encourage you to read the full brief to find out more about this topic.

**How has digital health been used during the COVID-19 pandemic?**

Digital health tools have been used to respond to COVID-19 in four principal areas: communication and information; monitoring and surveillance; supporting provision of health services; and vaccination.

**Communication and information**

Most countries have set up and implemented digital tools and platforms to collect and share data and information about COVID-19, either through existing tools or ones that have been specifically developed to better monitor the pandemic. This has included the creation of web pages and dashboards displaying key data such as on number of cases, deaths and vaccination rates. Apps have also been developed to communicate with the public, to provide information about the virus, to support recognition of symptoms, to connect with health services or to enable reporting of symptoms (e.g. Austria, Bulgaria, Italy).

At the national level, national health data gateways have been particularly important in response to the crisis by supporting COVID-related research projects, such as the Health Data Hub (HDH) in France, a single gateway to access health data. The HDH was officially created by law in late 2019 upon the request of the French President following a parliamentary mission on Artificial Intelligence. The HDH seeks to provide simple, unified, transparent and secure access to health data for public interest research, in compliance with regulations and citizen’s rights. The HDH also has the role of federating the French health data ecosystem and has been extremely active in European-level initiatives like the EHDS.

There have also been international and European and international initiatives to promote the use of health data. For example, PHIRI (Population Health Information Research Infrastructure) is a new health information project on COVID-19 financed by the European Commission, launched in November 2020, that includes 41 partners from 30 different countries. PHIRI supports research across Europe on health and well being of populations impacted by COVID-19. The aim is to share data and expertise between countries through a health information portal on population health in close interaction with key stakeholders in the health information landscape, in particular the European Centre for Disease Prevention and Control (ECDC), EUROSTAT, Joint Research Centre (JRC), the OECD, and the World Health Organization (WHO).

Digital health tools have also proved pivotal in combatting misinformation on COVID-19. Countries have launched various initiatives such as chatbots or used social media platforms to help combat misinformation. In France, for example, mesconseilcovid.fr, a general public information site, was launched to enable everyone to know how health and sanitary measures applied to their own situation. France has also had a policy of open data relating to the health crisis to reduce misinformation. In contrast to their approach on other health issues, social media platforms have also begun to actively address misinformation relating to the pandemic and the European Commission has established a monitoring programme to assess the activities of social media companies in this area. Misinformation remains an
Box 1: Use of remote consultations in France during COVID-19

The use of teleconsultation has tremendously increased in France during the COVID-19 pandemic, with a total of 19 million teleconsultations reimbursed in 2020. A peak was recorded in April 2020 with 4.5 million teleconsultations (compared to 40,000 in February). The pace remained steady thereafter with 1.9 million teleconsultations in December 2020. About 80% of all teleconsultations were carried out by general practitioners (GPs) and the main other medical specialties were psychiatry, endocrinology, pneumology and paediatrics.

Teleconsultations have been reimbursed by the statutory health insurance since September 2018, provided they meet strict requirements (only for physicians, who had at least one face-to-face visit with the patient during the previous 12 months, in remote or under-served areas, provided through dedicated software). These requirements were drastically loosened to meet patients’ needs, during the pandemic; most health care professions were allowed to provide teleconsultations (including nurses and physiotherapists), they were permitted without a previous meeting with a patient, and through all technologies available, even by telephone (under certain conditions).

The increased adoption of teleconsultations by professionals and patients is likely to remain. This started to be translated concretely in September 2021, through a contractual agreement, signed by physicians’ associations and the statutory health insurance, which permanently removes the criterion of prior knowledge of patients.

Monitoring and surveillance

Most countries in Europe were already using digital health tools to support infectious disease monitoring and surveillance prior to the pandemic, but these systems have been adapted and enhanced. More novel ways of using digital health tools to support monitoring and surveillance have also emerged, such as genomic surveillance to track new genetic variants of SARS-CoV-2, and the use of transport and mapping information to track movement patterns and to help monitor the spread of the virus.

Mobile apps to support contact tracing operations have also been launched across the EU. In France, for example, “TousAntiCovid” (or “AllAgainstCovid”) uses the phone’s Bluetooth connection to detect other users’ phones nearby. Users activate it at appropriate times, such as before entering public transport or shopping malls. If a user tests positive for COVID-19, they can scan a code provided by the lab which will then send an anonymous alert to users who have been in close proximity to them. The European Commission has supported this area by establishing the European Federation Gateway Service, which facilitates interoperability to ensure national contact tracing apps can be linked and work across borders.

A further success story was the conception and implementation of the EU Digital COVID Certificate, which required the establishment of shared technical recommendations and regulations. This achievement, from design to implementation, made it possible to establish an international standard in only 12 weeks, mobilising a large number of Member States and EU actors.

Mobile and web-based applications have also been launched to support remote symptom tracking and self-diagnosis in many countries or to support or enforce self-isolation and quarantine. However, approaches in the later area raise concerns about privacy, the role of state and the acceptability of different forms and degrees of monitoring. The WHO and the ECDC have developed an indicator framework to evaluate the effectiveness of digital proximity tracing solutions.

Provision of health services

The use of remote consultations has proved critical to support the continuation of essential health care after non-urgent face-to-face care was suspended in most countries. While remote consultations have most often been used in primary care, they have also been used in secondary care, more widely across different types of care and for remote management of COVID-19 patients with mild symptoms or recuperating at home after hospital care. An example of the accelerated use of remote consultations in France can be seen in Box 1. The use of remote consultations has not been without challenges, though, such as determining when and for whom they are appropriate and sufficient.

Digital tools have also been used in some countries to help health facilities and regions manage patient capacity by monitoring in real-time information such as on free ventilation places, intensive care capacities and COVID-19 cases (see the article by Winklemann et al. in this issue on critical care). Some countries have also used digital health tools to match demand for health workers with supply, most often through web-based online portals (e.g. Estonia, Germany, the Netherlands).

Artificial Intelligence is being used in some countries to provide the rapid identification of COVID-19 infections and potential treatments. In this area, the Commission has supported the use of pan-European high performance computing to help identify existing drugs that could be repurposed to help treat COVID-19 via the EXSCALATE4COV consortium.

Vaccination

Digital health tools have played a key role in the effective rollout of vaccination programmes, which have been unprecedented in terms of their scale and speed. Most countries have made use of text messaging or online services to contact individuals eligible to receive a vaccination and for appointment booking and to support logistical issues such as
distribution to health facilities and storage. In addition, countries have had to develop prioritisation categories for vaccines, requiring identification of particular population categories such as on the basis of age or chronic condition; this has relied on having digital health systems that store this information or that link with other information systems. Digital systems have also been needed to monitor and provide rapid data on any adverse reactions, while the issuing of digital vaccine or immunity certificates have been used to support the re-opening of economies and schools.

**What policy mechanisms were used to support implementation of digital health during the pandemic?**

Facilitating the greater use of digital health tools during the pandemic has required policy action across the four dimensions outlined in Figure 1.

**Regulation**

Many countries relaxed regulations on the number of remote consultations that could be conducted, what type of health professional could provide them, and who could access them. In the Netherlands and France, for instance, patients were allowed to make use of remote consultations even if they had not had prior face-to-face contact with the health provider, while Poland amended legislation to allow remote consultations to be used in non-emergency situations. A number of countries have also implemented emergency legislation to open up the use of digital health solutions such as enabling e-prescription (e.g. Austria, Greece, Ireland, Italy, Malta), allowing remote certification of sickness absence from work, or increasing scope of use of digital health in social care.

Although data privacy concerns have been prominent in discussion of concerns about digital health before the pandemic, they have had a relatively low profile as a policy issue during the pandemic, although some countries have specifically relaxed data protection rules during this period (e.g. the United Kingdom). Some countries have also made formal regulatory changes to existing laws in order to enable digital health solutions to be used. Finland, for example, provided a limited-duration legal basis for their national proximity tracing app, while others have made changes on the basis of executive authority rather than through legislative changes.

**Financial mechanisms**

Reimbursement rates for remote consultations have been adjusted in many countries to compensate for income lost from reduced face-to-face consultations (see article by Webb et al. in this issue on transforming delivery, for more information). This has included adding specific reimbursements for COVID-19-related consultations (e.g. Belgium, Denmark, Ireland, Romania) or expanding reimbursement for other conditions or more broadly across the health system, with remote health services generally reimbursed at the same or a higher rate than face-to-face consultations (e.g. Denmark, Estonia, France, Italy). These changes, however, have generally not taken the form of a general opening up of reimbursement for digital health; rather, countries with reimbursement limits have more typically expanded the scope of which professions can now provide remote consultations or the type of consultations that can be provided or both.

Greater investment has also been made to promote the use of digital health tools both during the pandemic and longer-term. In Ireland, for example, the 2021 budget committed €58 million to develop eHealth and ICT infrastructure as key drivers of efficient flows of health data. In Germany, meanwhile the Ministry of Health provided €50 million to public health offices to support upgrading of hardware and software for contact tracing and the training for use.

**Quality**

Efforts to promote quality improvement in the use of digital health tools have focused on training health workers and developing their competencies. This has occurred alongside a more general shift to distance learning for health workforce training. In Italy, the National Institute of Health (ISS) has set up dedicated webinars and distance learning courses, which also earn health professionals Continuing Medical Education (CME) credits. A small number of countries have targeted the provision of training on remote consultation to clinicians (UK, Sweden), or the development of professional guidelines on safe use of remote consultations and e-prescriptions (Malta, France). There have also been adapted pathways for care, such as enabling remote consultation between GPs and specialists in order to minimise referrals to hospitals (the Netherlands, Croatia).

**Technical infrastructure**

While some technologies used during COVID-19 were new, most built on and adapted pre-existing solutions. The most high-profile area of new digital health infrastructure has been the development of specific applications for contact tracing in relation to COVID-19. This has required substantial investment within individual countries, as well as increasing coordination at the international level both through the public sector (in particular through the WHO and through the European Commission’s eHealth network) as well as the private sector through the initiative by Apple and Google to provide a specific type of common platform for such applications. Some countries have also created additional platforms, such as to monitor patients remotely or to manage supply and demand for personal protective equipment, other equipment and intensive care facilities.

**How can policymakers build on the progress made with digital health during COVID-19?**

Digital health tools have formed an integral part of pandemic responses across Europe to support communication and information, surveillance and monitoring, the continued provision of health services, and transitions from pandemic-related restrictions. Digital health tools can help deliver more efficient and patient-centred care, but their sustained use and acceptance by EU citizens needs the support of all actors. So far, the primary focus of policy has been on removing limitations to the uptake of digital health tools, but the future focus should be on learning from the initiatives undertaken during this time and identifying policies.
and practices that can be put into place to create a supportive environment for the expanded use of digital health tools.

The development of national or regional policies and strategies on digital health that move beyond eHealth and also target mHealth and big data analytics will become increasingly important as these applications advance. Gaps in existing regulation, such as on liability and reimbursement levels, also need to be addressed in many countries. Even with a strong legal framework, concerns may arise that require clear values, communication and engagement to address. Notably, the development and application of digital health tools typically involves cooperation between the public and private sectors, which can raise concerns over trust and appropriate use of data. The governance of these partnerships needs to be tackled as part of the overall strategy for effective development and use of digital health tools. The establishment of the EHDS, as proposed by the European Commission, will help ensure that more and better health data becomes interoperable and available for reuse for research and policy making, while ensuring that the future health data sharing governance will remains under citizens’ control (see Box 2).

Greater strategic investment is also needed over the longer-term to support developments in digital health. This should target both the development of infrastructure within the health setting and outside (e.g. internet provision) and research and development to ensure that technologies continue to evolve. Moreover, financing strategies must encompass the individual, organisational and system changes involved in its use, such as putting in place pragmatic reimbursement provisions for digital health tools. Various European Commission initiatives including the EU4Health programme in response to COVID-19 and the Recovery and Resilience Facility fund will help support longer-term strategic investment in digital health (see the article by Mauer et al. in this issue on a European Health Union). The WHO Regional Office for Europe is also supporting countries in

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**Box 2: The European Health Data Space will work to promote access and the exchange of digital health data**

Following the publication of the European Data Strategy in early 2020, the creation of a European Data Space has been one of the priorities of the European Commission 2019–2025, including for the health sector. Indeed, the COVID-19 pandemic has highlighted the importance of having timely access to health data for research and policy making purposes, and the European Council has recognised the urgency to work towards a common European Health Data Space (EHDS).

The EHDS will promote better exchange and access to different types of health data (electronic health records, genomics data, data from patient registries, claims data etc.), not only to support health care delivery, referred to as primary use of health data but also for health research and health policymaking purposes, the secondary use of health data. A European legislative proposal following a public consultation and impact assessment in 2021 is expected in 2022.

The goals of the EHDS are to:

- promote safe exchange of patients’ data (including when they travel abroad) and citizens’ control over their health data
- support research on treatments, medicines, medical devices and outcomes
- encourage the access to and use of health data for research, policy making and regulation, with a trusted governance framework and upholding data-protection rules
- support digital health services
- clarify the safety and liability of artificial intelligence in health.

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**Box 3: WHO Regional Office for Europe: Leveraging digital transformation for better health**

To leverage and scale up a digital transformation for better health and to increase capacity to align investment decisions in digital technologies with health system needs, the WHO Regional Office for Europe will work with other agencies, Member States, academic institutions, civil society, and the industry in developing a Regional Digital Health Action Plan with four main areas of focus:

1) Setting norms and providing technical guidance to synthesise evidence and formulate guidance to support decision-making in digital health;
2) Enhancing or developing digital health strategies to support countries to strengthen their capacities to better govern digital transformation in the health sector;
3) Building networks and promoting dialogue and knowledge exchange to convene and facilitate dialogue with partners and stakeholders to steer the agenda for digital health innovation; and
4) Horizon-scanning and landscaping for solutions that can be scaled at country or regional level to anticipate and shape public health and health systems in the digital era.

This action plan will promote digital health systems in the European region as a lever to improve health at a large scale.
aligning investment decisions on digital health with health sector priorities (see Box 3).

The continued use of digital health tools relies on them not being seen as a ‘second best’ temporary solution by either patients or professionals. There has, however, been relatively little evidence on how patients and professionals perceived the use of digital tools during COVID-19 or on their efficacy and cost-effectiveness. Rapid evaluations of current digital health tool use, their benefits and challenges, and the consideration of patient and professional perceptions and preferences are therefore needed to provide an evidence base for what should continue in the future and what adaptations are required, including to help address the “digital divide” so that outcomes are equitable across different populations.

Finally, the pandemic has highlighted the ways in which Europe is reliant on third countries and parties for needs which turned out to be strategically essential during the health crisis. This was highlighted by the dependence of European governments on a technological solution for contact tracing determined by GAFAM (big tech companies). Developing and fostering European digital and “technological sovereignty” for Europe, including for digital health, is a term that has been used widely in the past years and, most recently, in December 2021 during the announcement of the priorities of the French Presidency of the EU Council for the first semester. Reaching “European digital health sovereignty” will require the mobilisation of the entire digital health ecosystem when setting up an ambitious action plan. Key issues that require consideration include whether certain minimum services for public health should be required of vendors within the EU, irrespective of their country of operation, and whether consideration be given to binding requirements for interoperability of systems to prevent dependence on particular vendors.

References