

Empowering nurses through digitalising the healthcare sector

The digitalisation of the healthcare sector is transforming the way healthcare is provided by nurses in primary care, hospitals, and community care. It has the potential to ease frontline nurses' daily workload and reduce administrative tasks; in doing so, it creates opportunities for nurses to spend more time with, and focused on, patients. The key to successful digitalisation lies in fostering co-creation with nurses and other frontline healthcare professionals. The EU political agenda and strategy on digitalisation is a policy opportunity for the nursing profession and nursing researchers. However, for the strategy to work, policymakers and politicians must first be willing to engage nurses and nursing in co-designing European-wide digital healthcare initiatives.

What is the issue?

Europe is facing unprecedented challenges to guarantee sustainable and accessible healthcare solutions for every citizen. Research and innovation are instrumental to upscale system level developments and engage frontline knowledge, understanding and know-how through life-long learning.

A recent communication¹ from the European Commission called for enabling the digital transformation of health and care in the Digital Single Market: empowering citizens and building a healthier society, is a key starting point for change.

The European Commission President-Elect Ursula von der Leyen has made clear her ambition to ensure that the next five-year EU legislative cycle harnesses the potential of digital innovation to drive improvements in all aspects of healthcare. To support this, she has pledged to create a European Health Data Space and to adopt legislation on artificial intelligence (AI) in the first 100 days of office.

This political cycle in the EU presents a unique opportunity for nurse researchers to address sustainability in healthcare systems, increase

quality, and improve access for patients. This is especially relevant in the EU, where national healthcare budgets are under severe pressure, and health inequalities persist from country to country. The outbreak of the Coronavirus (COVID-19) pandemic in 2019 has showcased the need for better connected healthcare systems and a more coordinated approach in cross-border health policies in the EU.

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Technology – and digitalisation in particular – has the power to drive innovation in healthcare. The digitalisation of healthcare is completely transforming not only the way healthcare is provided by nurses and other healthcare professionals, but also the clinical experience of patients. Healthcare provision is a field requiring continuous and systematic innovation to remain cost-effective, efficient and timely. This is due to the constantly increasing life expectancy across all EU countries and the resulting pressures which

Keywords: improve patient safety, quality of nursing care, improved health outcomes, co-design

that increase brings to bear: the rise of people living with chronic diseases and/or co-morbidities; the ageing population; and the extra demand all these pose on the national healthcare systems.

The digitalisation of healthcare is attracting the interest of EU institutions, national governments, industries and non-governmental organisations in the healthcare sector. They are unanimous in advocating that the development of the new digital revolution be applied to healthcare. Cutting costs may be the driving force here, but at the same time it will improve the clinical experience of patients in primary care, hospitals, and/or community care.

It is crucial, therefore, that the development of sustainable healthcare ecosystems goes hand-in-hand with the concept of co-creation and co-design, enabling the end user to develop fit-for-purpose solutions. Without end user co-creation, the result is a patchwork of discordant digital health apps and tools, which inevitably leads to a mistrust of digitalisation in healthcare. Many existing digital tools neither support the healthcare ecosystem, nor its frontline workforce.

What is the European digital agenda?

For the European Commission, digital transformation means empowering and including every citizen, and strengthening the potential of every business, while meeting global challenges with EU core values.

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In this debate, the digital transformation of health and social care has been identified as a major priority; one in which action is needed to tackle the digital skills' deficit in Europe. This was highlighted in the Digital Single Market strategy of the EU (2014–19),² conceived as one of the seven flagship initiatives of the Europe 2020 strategy and focusing on modern technologies and online services. It defined a key role for the

use of information communication technologies (ICTs) in helping Europe to succeed in its ambitious 2020 goals (namely to create jobs and promote economic prosperity), and in the New Skills Agenda for Europe³ released by the European Commission on 10 June 2016, listing ten actions (including Digital Skills and Jobs Coalition) to make the right training, skills and support available to people in the EU. '

The European Commission Directorate General for Communications Networks, Content and Technology (DG CONNECT) also published an Action Plan on eHealth 2012–20. This focuses on interoperability, standards, health literacy and legal clarity, where it clearly states that :

A significant barrier lies in the lack of awareness of eHealth opportunities and challenges for users (citizens, patients, health and social care professionals). For professionals (health and scientific communities) the focus will be on developing evidence-based clinical practice guidelines for telemedicine services with particular emphasis on nursing and social care workers.
(EC 2012:13)

The EU policy initiatives set out in the European Commission's Digital Agenda ensures close cooperation between EU member states and different stakeholders, that can act as the driving force to making clear implementation proposals in the field of digitalisation.

Nurses' contribution to the Europe 2020 strategy and particularly its flagship initiative Digital Agenda for Europe – in which the European Commission has put forth a strategy for smart, sustainable and inclusive growth, to develop an economy based on knowledge and innovation – is key. Nurse researchers have contributed to this flagship initiative, in which eHealth services ambitious in nursing and social care are highlighted. as a means of fostering quality of care. Based on this evidence, co-design of digitalisation initiatives is urgently needed. To ensure that digitalisation is beneficial to all, the EU will promote access and education regarding digital technology for as many people as possible.

In February 2020, the European Commission issued a communication⁴ on the current developments of its agenda, 'Europe fit for the digital age', which outlines key actions that should be accomplished over the next five years and makes it clear that digital transformation can only work for all and not only the few.

What are the major advancements in the digitalisation of healthcare?

Data clouds

These are networks of remote servers hosted on the internet and used to store, manage and process data in place of local servers or personal computers. Files and programmes can be stored there. However, the use of data clouds for optimising resources in the healthcare sector also poses some risks and concerns that need to be tackled; although these may not apply equally to all clouds or to frontline nurses. According to the literature, the most commonly identified risks relate to implementation; data privacy; security and regulatory compliance; possible cloud collapse; and reliability and possible failures.

Electronic health records

With technological advancements, more and more people are asking to have their health data made available on their smartphone or other digital devices, so they can share these with their nurses and/or other healthcare professionals at different facilities and across borders. Having one's health records gathered in a European health data space can lead to better treatment for major chronic conditions, for example, but it also means equal access to high-quality health services for all patients.

Some EU countries have successfully implemented electronic health records (EHR) in their national systems. However, there is not a single common EHR system operating across all EU member states. Not all countries have an EHR system, while those that do often have different systems implemented at the regional or municipal level. The European Commission is working on this and has identified the promotion of EHR based on a common European exchange

format as one of its key priorities over the next five years.

Blockchain

This technology enables the storage of digital information in 'blocks'. Each of these blocks includes several data other than the core information: data about the time and date of a transaction, its participants and other information distinguishing it from the other blocks.

This very concrete way of storing and exchanging digital data has several benefits for the healthcare sector, such as fostering the deployment and adoption of EHR and ensuring that all digital technologies applied to healthcare comply with the EU's General Data Protection Regulation (GDPR). Moreover, blockchain's built-in audit trail is advantageous for nurses who may need to demonstrate when and how they have accessed a patient's health data.

Artificial intelligence

Artificial intelligence (AI) is an area of strategic importance and a key driver of economic development, with the ability of bringing solutions to the many societal challenges of treating diseases. If we take into account the resource allocation and technological capabilities of the EU member states, AI presents a great challenge for Europe.

As such, socio-economic, legal and ethical impacts must be carefully addressed. The European Commission has increased its annual investments in AI by 70 per cent under the research and innovation programme Horizon 2020, with €1.5 billion for the period 2018-20. With its white paper on AI, the European Commission aims to support its development and uptake in the EU, and to ensure that European values are fully respected.

Nursing research and the nursing profession can successfully integrate innovative solutions and AI into their discipline to offer interoperable and cost-effective solutions to healthcare ecosystems to boost personalised healthcare.

Robotics

The rapid increase in the use of robots in our daily lives shows how they can benefit society as a whole, and how priorities to stimulate robotics should be defined in their evolution to best develop the potential for growth, jobs and innovation in Europe. In terms of nursing, robots can perform tasks that complement the work of nurses, lowering their workload and supporting continuity of care with technological advances that assist them in their daily practice in ways that were unthinkable only a few years ago.

How should co-creation in digitalization be carried out?

Digitalisation in healthcare is of key importance for the EU member states. The starting point for implementing digital innovations in healthcare settings – and to take it to the next level – is co-creation with frontline nurses and healthcare professionals. This is a way to ensure that these new innovations are fit for purpose and that they empower patients and nursing. As a result, digitalisation also has the power to move current healthcare systems towards an integrated care system based on proactive health promotion and empowerment.



From a nursing perspective, it is imperative that nurses are constructively involved in the co-creation of innovative solutions that will shape

healthcare in the current environment. They are in pole position to give voice to the quality principle and to lead the development of new models of care. In this case, co-creation relates to the relationship between IT developers and nurses (as end-users) when creating new digital innovations.

For both nurses and developers, benefits can be reaped from ongoing communication in terms of breaking down information barriers to ensure both are heading in the same direction. Ideally, nurses can tell IT developers what they need, and IT developers can show them a range of options on what can be done and how, for them to choose the most suitable solution.

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Co-creation can ensure the usability and suitability of the developed digitalisation tool. Moreover, one of the key advantages of fostering end user co-creation in the implementation of digitalisation in healthcare is that it builds trust between the nurses, the patients and the developers. This is beneficial for all, as the frontline nursing workforce clearly knows what needs to be developed and what for, whereas IT developers have the know-how. With co-creation, new digital tools can achieve clinical relevance.

Ultimately, co-creation and co-design in digitalisation is also a way to ensure return on investment, knowing that co-creation means:

- research methods that involve end users in developing ideas and concepts to be implemented
- actively engaging with the different stakeholders on an equal basis

- identifying a shared value
- building the chosen solution – and related processes and ecosystem – around that shared value.

Digitalised healthcare will not succeed and will not be fully implemented unless it is done in co-creation with all stakeholders, in particular with the end-user.

What nursing research is needed to strengthen EU policymaking related to digitalisation of the healthcare sector?

Nursing research is crucially important in the transformation of healthcare: it breaks down information barriers and ensures that the solutions developed in digitalisation of the healthcare sector are fit-for-purpose and suitable for the end-user.

‘Nursing research has a key role to play by looking at how to better adapt digitalisation to the nursing workforce’

The rapid pace of digitalisation is changing the way our healthcare systems work, the daily routine of healthcare professionals and the way patients manage their health. In turn, this is leading to a gap between the digital skills expected from the health workforce, and their actual suitability and/or time to assimilate these skills. Nursing research has a key role to play by looking at how to better adapt digitalisation to the nursing workforce, making sure that both nurse researchers and nurse practitioners are aiming to go in the same direction.

Additionally, it is important to pay attention to gender specific healthcare professions where equal opportunities are extremely important. A gender perspective in the co-creation of digital solutions is of paramount importance to develop fit-for-purpose tools that, in turn, imply better health and social care outcomes. Therefore, improved health literacy and empowerment leading to shared decision-making are the starting points to build upon.

What is the impact of digitalisation on nurses and nursing?

The impact of digitalisation on nurses and nursing is substantial: it may lead to a decrease in nurses’ workload and better health outcomes due to increased health literacy and patient empowerment. It is socially and economically unsustainable to maintain the traditional vision of healthcare delivery, focused on diseases and curative approaches. Moving towards preventive care will make digital healthcare deliver at its fullest potential, with nurses and nursing research co-designing tools and programmes to facilitate access and successful deployment in the many environments in which nurses are located, including home care and nursing homes, hospitals and primary care settings.

The patients of the future will, for example, have access to all their personal health data through electronic health records. Will the nurses of the future have to act as counsellors who help patients make sense of the data? The need of people to be able to access their own health data is becoming an all-important priority at EU level. However, it is essential that these tools respond to real frontline needs and facilitate daily work, allowing healthcare professionals to spend more time with patients. Therefore, as end users, nurses – and nursing research – must be able to influence the development of technology reflecting both usability and user-friendliness, to deliver ‘fit for practice’ innovative digital solutions that empower patients, and make health systems sustainable and more accessible.

What digital tools can be used to empower nurses on the frontline?

Digital tools are already actively helping people in the EU to take care of their health data. And for healthcare professionals, this means that they are much more precisely informed on the health of patients. All in all, this is contributing to the equal provision of healthcare within countries. There are many ways digital healthcare tools can help foster health equality and drive high-quality care, both within a country, as well as across European countries.

For digital healthcare to deliver its full potential, co-designed tools and programmes, co-created with nurses and nursing research, and other end users, is a facilitator for successful deployment and investment for change. Digital tools should focus on patient safety and empowerment, support continuity of care throughout the patient's journey, safeguard the quality of care and life, and reflect the multi-professional approach.

Why is it important to put digitalisation at the top of EU policy and its political agenda?

Nursing in Europe is undergoing a profound change, both academically and professionally, to adapt and meet the healthcare and social needs of the European population, in which more people live longer with long-term conditions, and where professional mobility is a key principle of the single market, alongside large migratory movements and digitalisation of the health sector.

‘ENS4Care developed evidence-based standards in five core areas ... for the deployment of eHealth services in nursing and social care’

It is important that nurses and nursing research contribute to the sustainability, quality and safety of European health and social care ecosystems by providing nurses with knowledge of EU national, regional and local health and social policies. This includes:

- the prevention of disease and the promotion of health
- accessible high-quality and safe healthcare services
- deployment of new technologies to advance practice and processes to deliver better outcomes, including digitalisation.

Nursing research has for many years been recognised as having a vital role to play in maintaining and promoting the health of European citizens while fostering the development of quality, efficient and safe health services delivery. In the context of digitalisation, the EU project ENS4Care⁵

(2013-2015), led by the European Federation of Nurses Associations, developed evidence-based standards in five core areas: prevention, clinical practice, advanced roles, integrated care and nurse ePrescribing – for the deployment of eHealth services in nursing and social care, which is highly relevant to the Commission's political agenda on the digitalisation of the healthcare sector.

With this project, it was possible to harness the potential of eHealth systems to make effective guidance available in accessible formats through multi-stakeholder collaboration, both with health professionals and social workers and with those using their services, such as informal carers, patients and people in the community. The main conclusion was: ‘Nurses and social workers should use eHealth and innovate their practice to face today's challenges’.

In this process of collaboration and innovation, the new EU research and innovation programme's (Horizon Europe) focus on unleashing the potential of new tools, technologies and digital solutions in healthcare is key, but not without impactful end user engagement. The nursing profession can contribute significantly to the areas of intervention laid out in existing and future EU research programmes.

Frontline nurses and nurse researchers must remain a part of this debate and developments making sure digitalisation is at the top of the EU policy and political agenda and bringing EU added value by combining data, infrastructure and expertise. Nurses and nursing research can address three key elements of the current transformation of health ecosystems: building trust, promoting user-centred innovation and ensuring an appropriate use of data to enable technology.

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Acknowledgements

This briefing was developed in the context of the InteropEHRate and Smart4Health projects, in which the European Federation of Nurses Associations (EFN) is a partner. Building on this work, this briefing explores the policy and evidence behind this topic, with a view to informing evidence-based policy making. The InteropEHRate 42-month project is funded by the European Union to support people's health by opening up new ways to make health data available whenever and wherever it is needed. Smart4Health is funded through the European Union's Horizon 2020 research and innovation programme, and aims to develop prototype applications that allow users to collect, manage, share and donate their health-related data throughout the EU. For more information, see <https://smart4health.eu/en/> and www.interopehrate.eu.

Recommendations

What should policy makers do?

1. **Advance digital knowledge**, skills and competencies as a new core component of training for future and current nurses.
2. **Promote innovative structures and networks** to create diversity in digital skills training for nurses.
3. **Invest in co-creation training** for nurses in institutional digitalisation strategies and policies.
4. **Increase interoperability** and mobility for students, nurses, patients and data.
5. **Deploy digital tools** and systems that reduce the workload of nurses and safeguard the quality of care.
6. Make sure digitalisation is the driver to **bring nurses closer to the patient**, and that digital tools developed are a complement, rather than a substitute for the face-to-face contact with patients.
7. **Support nursing research** in the area of digitalisation, to ensure future initiatives meet the demands and needs of frontline staff and the patients they serve.

What should nurse leaders do?

1. **Foster collaboration** with all relevant EU stakeholders and researchers to analyse the common eSkills for the appropriate use of eHealth services.
2. Pro-actively **engage in the co-design process** including from a gender-specific perspective.
3. **Collate and share good practices** that can be linked to combatting inequalities in the use of ICT to empower patients and citizens.
4. **Raise awareness of the potential of digitalisation** in healthcare, while acknowledging potential for unintended consequences.
5. **Understand possible concerns and reservations** of frontline staff and develop collaborative approaches to addressing these.
6. **Engage with policy makers** at all levels, focusing on the added value that frontline nurses and nurse researchers can bring to current and future initiatives.
7. **Advocate for greater co-design and co-creation of digital health solutions**, harnessing the experience and expertise of frontline nurses.

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