



# DIGITAL TRANSFORMATION IN HEALTHCARE

SPECIAL REPORT | 3 - 18 DEC. 2019  
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*The development of pioneering new digital treatments and technologies, including robotics, artificial intelligence and data networks, is set to transform our healthcare systems over the coming years, optimising our healthcare system and offering numerous benefits for patients and healthcare providers alike.*

*As such, the digitalisation of healthcare is high on the agenda of the new Commission, with new European Commissioner for Health and Food Safety, Stella Kyriakides, saying maximising the potential of the digitalisation of healthcare is a key priority in her portfolio.*

*However, these advancements are not without controversy as stakeholders highlight their significant ethical and environmental ramifications.*

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# No need to stargaze, digitalisation in healthcare is already here, say health experts

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By *Natasha Foote* | EURACTIV.com



[SHUTTERSTOCK]

Using digital tools to deliver care more efficiently presents a massive opportunity to relieve Europe's strained healthcare systems, but also carries significant ethical and environmental considerations, EURACTIV heard at a recent event.

The event, run by the European Brain Council, brought together a panel

of experts for a roundtable discussion on the digital transformation of healthcare in Europe, and how to unlock the potential of digital solutions for patients, healthcare providers and health systems.

The digitalisation of healthcare is set to be a hot topic for the new European Commission, with new Commission President Ursula von

der Leyen making 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.

This included a pledge to create a European Health Data Space and to

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adopt legislation on AI in the first 100 days of office.

Furthermore, in a recent speech, the new European Commissioner for Health and Food Safety, Stella Kyriakides, stated that more must be done on the digitisation of the health sector.

She said it is “very high on the Commission’s agenda” and added that maximising the potential of the digitalisation of healthcare is a key priority in her portfolio.

### STREAMLINING HEALTH SERVICES

Speaking at the event, MEP Eva Kaili from the Socialists and Democrats said digital health holds high potential to allow citizens to benefit from exchanges of information, specifically by helping them avoid additional unnecessary tests, providing information about patient histories, and avoiding the wrong diagnosis or medication.

Digitalisation was also highlighted as invaluable to making the operational side of healthcare more efficient, such as through the creation of ‘virtual hospitals’.

These simulations are designed to work out the most efficient way to operate the hospital, including the optimisation of allocation of services and beds. The use of technology in this way also eliminated the need for cumbersome logistics work, thus freeing up medical personnel to deal with patients.

Catherine Estrampes, CEO of GE Healthcare Europe, said at the event that virtual simulations of hospitals have been showing great potential to optimise hospital systems, with trial runs saving 35 beds in one hospital, reducing emergency department wait time by 35 percent and reducing patient waiting following surgery by 70 percent.

### HIDDEN ENVIRONMENTAL IMPACT

However, the widespread adoption of digital technology in the healthcare sector also carries considerable environmental implications.

Greenhouse gas emissions linked to digitalisation are considerable, with large amounts of electricity needed for processing and storing big data, as well as for the manufacturing of computers, screens and smartphones.

In a recent study, researchers Lotfi Belkhir and Ahmed Elmeligi found that by 2040, greenhouse gas emissions from the use of ICT could correspond to more than 14% of today’s total emissions.

Healthcare Without Harm, a non-profit coalition, in collaboration with Arup, recently released a report which found that, as it currently stands, if the global healthcare sector were a country, it would be the fifth-largest greenhouse gas emitter on the planet.

This is only set to get worse with the digitalisation of the sector. There is, therefore, concern that the healthcare sector, by inadvertently contributing to climate change through greenhouse gas emissions from its activities, could be undermining the health of the very populations it seeks to heal.

Speaking at the event, a representative from DG Connect highlighted the enormous environmental footprint of the digitalisation of the healthcare sector, saying that it carries significant environmental ramifications.

He added that the choice to digitalise must, therefore, include a thorough analysis of the environmental effects to ensure the appropriate use of technology which balances the effects on environmental and human health.

Ioana-Maria Gligor, head of unit at DG SANTE, European reference networks and digital health, said that this highlighted the need for joined-up politics across sectors.

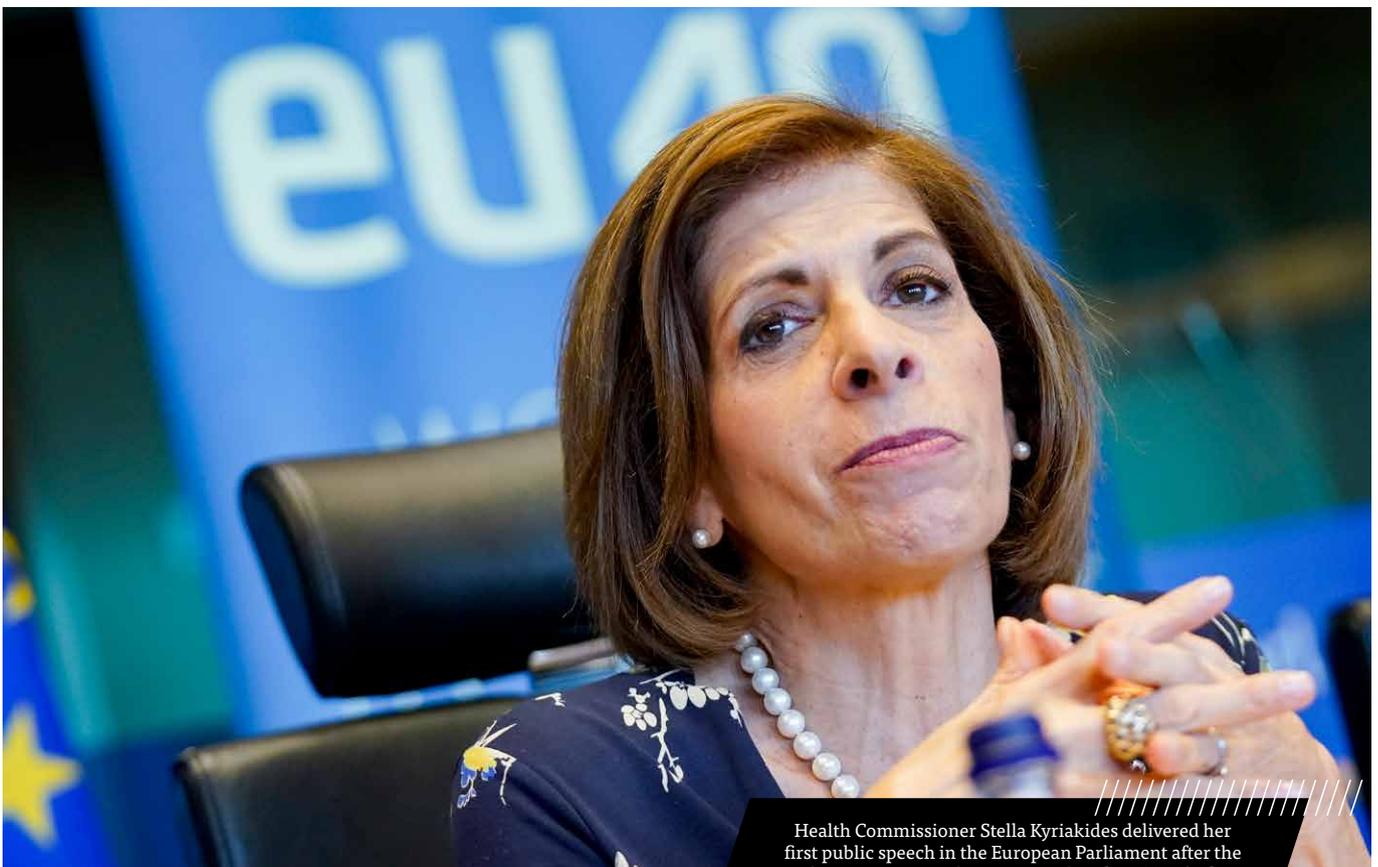
She acknowledged the environmental concerns surrounding the digitalisation of the sector but stressed that technological advancements can also help to reduce the need for unnecessary tests and procedures by more targeted and efficient diagnosis, thus reducing the number of inessential, energy-intensive procedures such as MRI and CT scans.

## INTERVIEW

# Health Commissioner unveils roadmap for EU cancer plan

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By Gerardo Fortuna | EURACTIV.com



Health Commissioner Stella Kyriakides delivered her first public speech in the European Parliament after the hearings on Tuesday, 10 December. [BUISSIN/EP]

The Commission will kick-off the discussion on the 'Europe's beating cancer plan' on 4 February on the occasion of the world cancer day, while the communication and action plan itself is expected towards the end of 2020, Health Commissioner Stella Kyriakides announced.

Speaking at an event of the non-official intergroup of young MEP EU40 on 10 December, she said she wants the preparatory debate to be as inclusive as possible, inviting all stakeholders and patients involved in the process to make a contribution to this "ambitious, but realistic" plan.

"I want you to have high expectations of me," she said, adding

that without such hopes there's no chance of realising the EU's ambitions. But she also appreciated being surrounded by colleagues "who have a very high sense of reality as well."

Kyriakides described the fight against cancer as an issue very close to her heart, not only as one of

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her priorities in the mission letter received from Commission President Ursula von der Leyen but also because she herself was diagnosed with breast cancer many years ago.

Although she is close to patients' advocacy, having headed Europa Donna, the first coalition of European breast cancer patients, she is also a medical professional as a clinical childhood psychologist.

"Cancer concerns us all, in one way or another," she said.

### A SNEAK PEEK

Kyriakides, who was making her first public speech in the European Parliament since the hearing on her nomination, also enlisted some principles that will lead the Commission's endeavour in fighting cancer.

The first one is a horizontal approach to cancer, which is in line with the 'Health in All policies' principle endorsed by the previous Health Commissioner Vytenis Andriukaitis.

"Cancer cannot only be seen in doctor surgery or in the laboratory, but it has to be addressed everywhere from schools to public health policies through healthy life choices," she said.

According to Kyriakides, it is no longer simply the responsibility of the health sector and non-health actors have to come on board in beating cancer.

"We must understand, for instance, that a healthy diet is a key component of a healthy society," she said, adding that the EU's beating cancer plan will rely on the progress on the Farm to Fork (F2F) strategy, the new EU food policy.

Addressing risk-factors like tobacco consumption and alcohol abuse will remain on Commission's radar, as well as vaccination, physical exercise and healthy lifestyle in

general.

But Kyriakides also spoke about fair and equal access to treatment reducing inequalities among member states when it comes to screening, early diagnosis and innovative medicines.

"We do know that cancer patients have a much better survival rate if cancer is detected early, but early screening programs do not exist in some member states," she said.

She added that, since patients have the same fundamental right to access to innovative medicines and clinical trials, it is unacceptable that some EU citizens can't enjoy the same level of care.

### AGAINST THE TSUNAMI

In the EU, a new case of cancer is diagnosed every nine seconds, while 40% of Europeans will face a cancer diagnosis at some point in their lives.

Kyriakides pointed out that a cancer diagnosis has a huge financial and social impact on health systems, and the families of patients.

"People close to patients sometimes say that it's like being hit by a tsunami because everything around you is swept away by many feelings and emotions," she said.

Survivorship and quality of the care is another issue, as cancer is increasingly switching toward chronic disease, but there is also the challenge of discrimination for cancer patients returned to work or requesting insurance coverage.

"About 40% of cancer cases today are preventable, and that makes me feel very frustrated," confessed Kyriakides.

"But it makes me feel more determined as well because I think that if we really put our efforts in this area, we can change numbers and statistics around cancer," she concluded.

Dr. Ben Newton, general manager of global oncology at GE Healthcare, concurred, saying that there is a "wealth of valuable data from every

corner of our hospitals and society that – if managed appropriately – can accelerate and improve the entire cancer care pathway from enhanced diagnostics and clinical support to better outcomes".

He added that we need to encourage policies that help shape health-related data to be used as a common good, such as interoperability, standardisation and security.

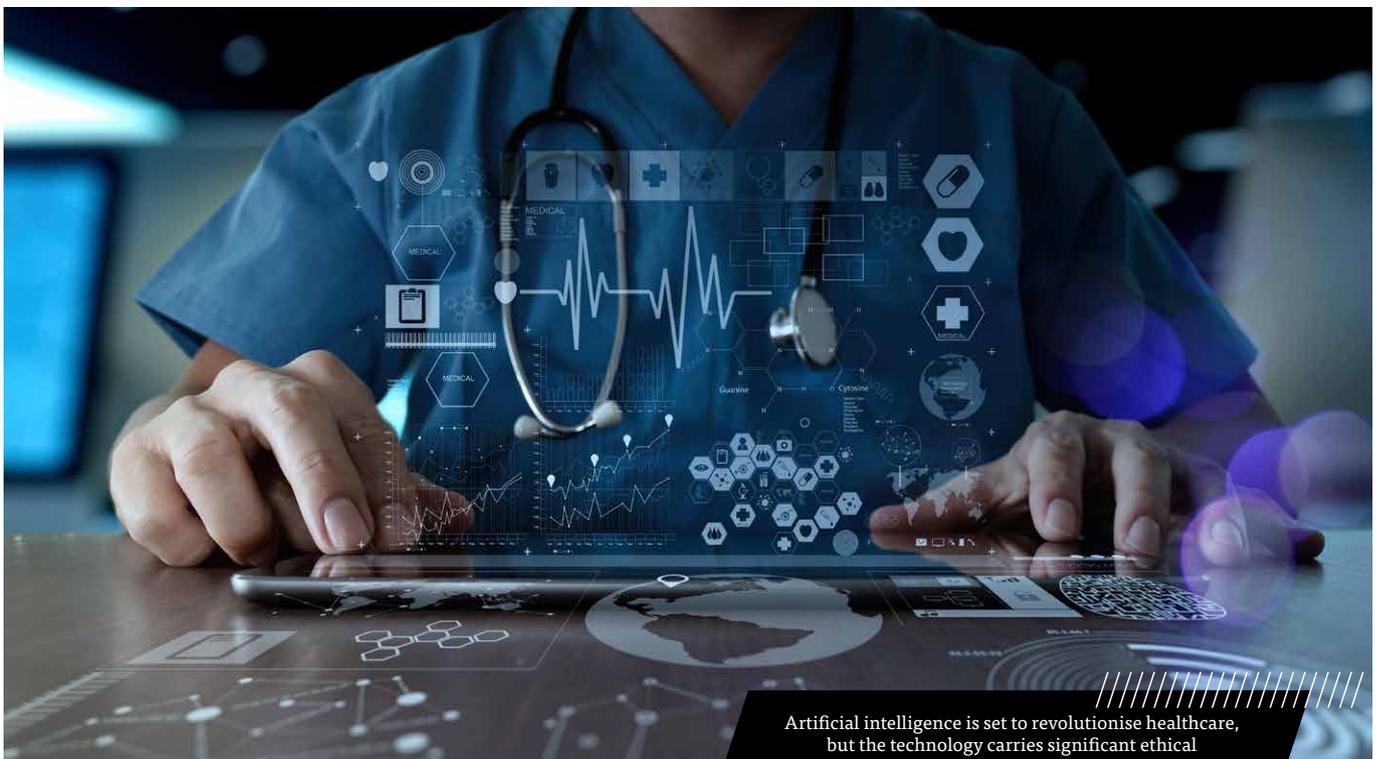
*Speaking at the same event, MEP Tomislav Sokol from the European People's Party said: "Cancer needs to be approached horizontally. Connecting all areas of life affecting your well-being and health is key to fighting one of Europe's largest killers."*

*Dr Vera Katalinić-Janković, Assistant Minister of Health of Croatia, emphasised the need to join efforts between the development and implementation of national cancer plans and what is happening at the European level. She also confirmed that Croatia's EU Council presidency will hold a two-day conference on oncology on 29-30 April 2020 in Zagreb.*

# Clear standards required for development and use of AI in healthcare

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By *Natasha Foote* | EURACTIV.com



Artificial intelligence is set to revolutionise healthcare, but the technology carries significant ethical considerations [SHUTTERSTOCK]

**W**ith digital technologies set to irrevocably change the face of our healthcare systems, the ethical concerns surrounding the use of artificial intelligence (AI) are increasingly gaining prominence in policy circles.

The new von der Leyen Commission is expected to deliver a report on AI and ethics in its first 100 days, which could be oriented toward an 'ethics-

by-design' approach according to Legal Affairs Commissioner Didier Reynders. And, in terms of data protection, all EU AI stakeholders must comply with the GDPR regulation in safeguarding the personal data of healthcare patients.

Moreover, while talks in the European Council on the ePrivacy regulation have stalled, there could very well be an impact on the health sector in terms of the protection

of personal data in electronic communications, despite there being a carve out for emergency services in the Commission's original proposal.

Business Insider Intelligence reported that spending on AI in healthcare is projected to grow by 48% between 2017 and 2023. Furthermore, the Commission is increasing its annual investments in AI by 70%

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under the research and innovation programme Horizon 2020, predicted to reach €1.5 billion for the period 2018-2020.

However, speaking at a recent event on the digitalisation of healthcare, Ioana-Maria Gligor, head of unit at DG SANTE, European reference networks and digital health, that its implementation can vary between member states and can sometimes create complexity for both healthcare providers and researchers. She emphasised that the most important thing was to ensure transparency about how data is protected and used.

At the event, socialist MEP Eva Kaili said that although the GDPR must be involved in the regulation of AI in healthcare, we must be careful to “ensure it doesn’t stop innovation”.

She said that we must instead talk about the different kinds and uses of data sets which take into account who is using the data and for what purpose, saying that with “insurance companies who try to maximise profit, there is an issue” but that there should be a different consideration for scientists who want to use data to develop and research.

Boris Brkljačić, president of the European Society of radiology and professor of radiology and vice-dean at University of Zagreb school of medicine, told EURACTIV that AI is already a major area of research, with more than 5000 papers published on the use of AI in the field of radiology.

Beyond radiology, AI technologies are predicted to optimise the healthcare system in a whole range of ways, such as through targeted treatments, more efficient diagnosis, streamlined logistics and advanced data analysis.

AI commonly refers to a combination of machine learning techniques and robotics, combined with algorithms and automated decision-making systems, which

together are able to predict human and machine behaviour and to make autonomous decisions.

The use of such technologies is increasingly affecting our daily lives and the potential range of application is so broad that it has been referred to as the fourth industrial revolution.

The discussion around the control of these technologies and their impact on society is increasingly focused on the ethical implications of using such technology and the challenge this poses for policymakers and regulators.

These pertain to issues concerning personal data protection and security. This is especially relevant in healthcare as opposed to other industries due to the sensitive nature of the consumer data stored by healthcare providers.

In its various communications on AI, the Commission has set out its vision for AI, which is to be “trustworthy and human-centric.”

However, in a statement on their website, the European Society of Radiology state that as a new technology, AI “lacks clear standards guiding its development and use.”

The report states that the ethical use of AI in radiology should “promote well-being and minimise harm resulting from potential pitfalls and inherent biases”, ensuring that benefits and harms are “distributed among stakeholders in a just manner that respects human rights and freedoms, including dignity and privacy.”

This sentiment is echoed by Brkljačić, who similarly said that focus must be given to “minimising the risk of patient harm from malicious attacks and privacy breaches.”

Regarding the potential breach of data, he said there is an urgent need to “make clear guidance at both the European level and national level regarding the use, manipulation and ownership of data.”

He added that one of the main issues is that software is usually developed for business models and is

therefore profit-driven. He, therefore, said there was a risk of this being mismanaged, but it is “essential that information is used solely for the benefit of patients.”

# Health professor: AI has huge potential, provided ethical issues can be solved

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By Gerardo Fortuna | EURACTIV.com



Professor Boris Brkljačić is the President of the European Society of Radiology (ESR). [ESR]

**R**adiology is at the forefront of artificial intelligence (AI) in the healthcare sector, as it can help enhance the quality of diagnosis on the basis of knowledge acquired from other patients, said medical professor Boris Brkljačić.

Three years ago, Canadian physicist Geoffrey Hinton shocked the medical world when he said radiology will be replaced by artificial intelligence (AI)

in five year's time. Radiologists should not be trained anymore because of that, he argued.

Others beg to differ, however. "It's not really the case," said Boris Brkljačić, Professor of radiology and Vice-Dean at the University of Zagreb School of Medicine in Croatia, who is also President of the European Society of Radiology (ESR).

In an interview with EURACTIV, he said artificial intelligence has a huge

potential in helping radiologists do their work, for instance by allowing better interpretation of imaging and, consequently, diagnosis. However, he believes the technology won't replace radiologists altogether.

"But it can also help in many other ways, even in the workflow with patients and integrating clinical decision with support systems," he

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said.

He pointed out that lots of imaging data are currently stored in different hospitals from different countries with no purpose of research nor other use.

“This data can actually be integrated for clinical use, and then, together with the so-called radiomics, AI can help to extract some features automatically with computers, which humans cannot do,” he added.

The potential of AI is not only in better diagnosis but also in making complex relations linking imaging with genetic liability and even lifestyle to predict certain outcomes. “In precision or personalised medicine, this will play a major role for sure,” Brkljačić said.

Although feasible in the long run, dealing with these aspects requires more work, and entails training radiologists and students in this new area. One of the priorities of the ESR, Brkljačić’s association, is indeed to integrate AI and data science into training curricula.

### ETHICAL PROBLEMS

Despite all the enthusiasm for AI, plenty of questions remain when it comes to the link between AI and ethics in the field of healthcare. This is particularly the case with regards to patients’ protection of privacy and data.

Among those is the use of patient data for commercial purposes, Brkljačić says, as some AI products will eventually deal with sensitive data belonging to patients.

“There are some countries like China where maybe these issues might not be so important,” he said, but this is not the case in Europe where the GDPR law protecting data privacy is crucial, he said.

Another issue involves the accountability for potential mistakes

in diagnosis when an AI algorithms assisting a radiologist would come to wrong conclusions.

“Somebody has to be legally responsible. Is it the software developer? Or is it really the radiologist who signed the report?” he wondered.

An aspect to avoid as well is what he called the “black-box phenomenon,” when human medical skills are completely overcome by computers.

“You wouldn’t like to be the patient who’s told by a doctor: you had to go to surgery but I can’t tell you why because the computer told me so,” he said.

### CURRENT LIMITS

A technical limit that still needs to be addressed is the crucial and arduous process of labelling RAW imaging data to train algorithms with examples in order to deliver a diagnosis.

“It has to be done by somebody who knows very well radiology and those data have to be representative,” Brkljačić said. That could be an issue particularly for very rare diseases where the number of cases are insufficient to train the algorithm properly.

Standards are another potential problem, as AI software are supposed to function in different types of scanners manufactured by different companies.

The European Society of Radiology recently published a paper to get a glimpse of AI’s real implementation in daily practice, mentioning several uses like in neuroradiology brain, multiple sclerosis and prediction of Alzheimer.

“But I don’t think that the technology is still ready for full-time clinical use,” Brkljačić warned.

Asked if AI could increase inequalities between hospitals that have the technology and those that don’t, Brkljačić said it could go both ways. If properly used, AI might in fact reduce costs of healthcare systems, and lower inequalities, he said.

However, he also admitted that the

technology will first be implemented in the wealthiest hospitals that can afford it. “It’s true that, in the first glance, AI will be implemented in some major academic centre in most developed EU countries,” he said.

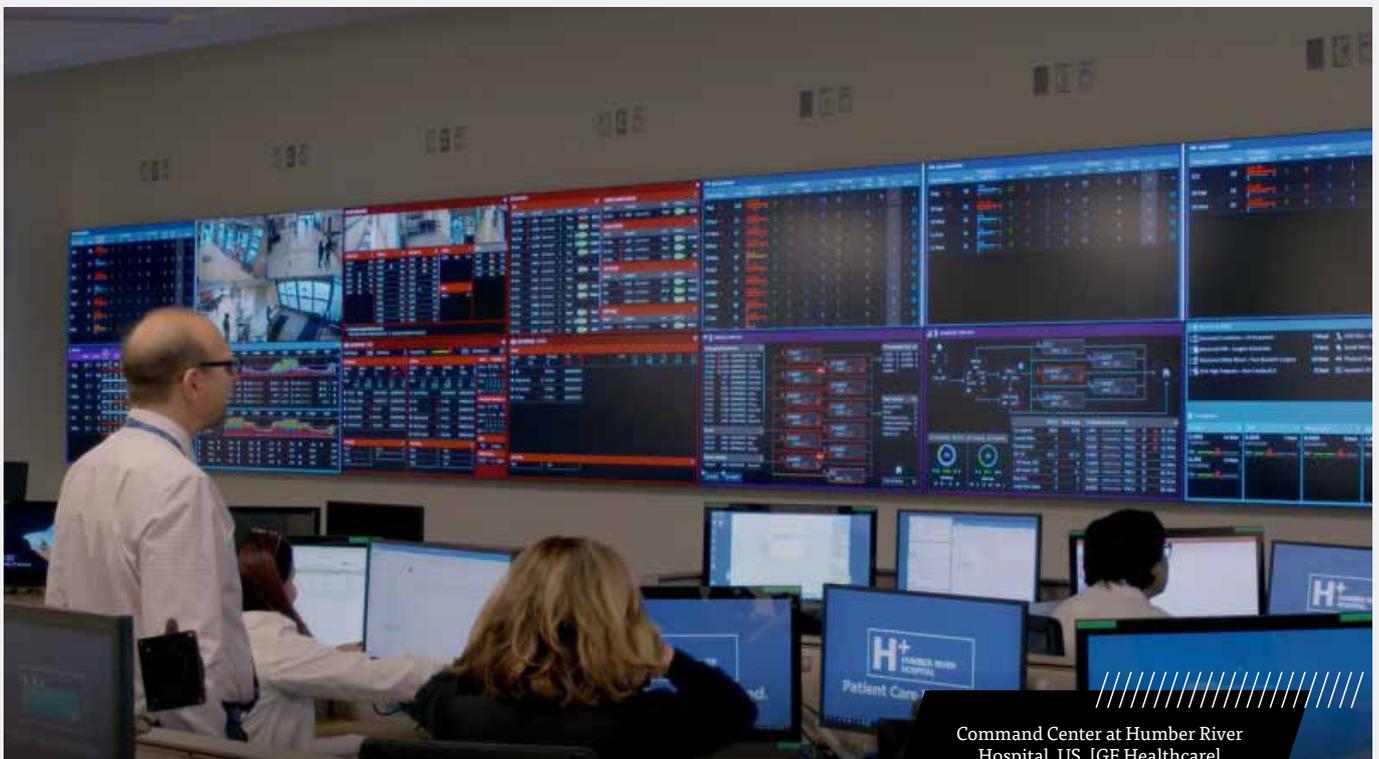
But in the long run, Brkljačić believes AI has the potential of making the healthcare systems more homogeneous, for instance by integrating pathology data from all over Europe, to the benefit of patients.

## PROMOTED CONTENT / OPINION

*DISCLAIMER: All opinions in this column reflect the views of the author(s), not of EURACTIV.COM Ltd.*

# How the data wave in healthcare will help improve patient outcomes

*By Catherine Estrampes | GE Healthcare*



Command Center at Humber River Hospital, US. [GE Healthcare]

**H**ealthcare has never been more accessible, intelligent or dynamic. The increased use of advanced data analytics, connected devices, genomics and AI is ushering in a new era with the potential for real breakthroughs in patient outcomes and operational efficiencies across every facet of care. Never before has innovation in healthcare been more digital.

*Catherine Estrampes is President & CEO of GE Healthcare Europe.*

Looked at another way, however, the healthcare system has never been under more pressure. The growth and ageing of global populations, the rising levels of chronic disease coupled with escalating costs, growing complexity and inadequate infrastructure are forcing a fundamental re-think of every aspect of healthcare – from

health policies via care delivery to payment systems.

The new political cycle in the European Union presents a unique opportunity to address some of these challenges together and to create a path for precision health—an emerging approach to healthcare that is integrated, highly personalized for each patient, and that helps healthcare

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systems be more sustainable, increase the quality, and improve access for patients. This is especially relevant in the European Union, where national healthcare budgets are under severe pressure and health inequalities still persist from country to country.

A key ingredient to address all of these challenges is healthcare data, which exists in abundance. Today, hospitals are producing 50 petabytes of data per year.<sup>1</sup> This includes clinical notes, lab tests, medical images, sensor readings, genomics, and operational and financial data. Yet 97 per cent of this information goes unanalyzed or unused. Too often, important patient data is siloed in different departments, devices, medical records or even hospitals and, as a result, the care team lacks a fully informed clinical picture.

The convergence of biomedical understanding, ever-increasing computing power and the omnipresence of data have paved the way for the development of AI capabilities in almost all areas of life. Especially in medicine, patients and doctors rightly expect that the development of AI is rooted in ethical principles. GE Healthcare's AI Principles<sup>2</sup> is firmly built upon the understanding that AI systems exist to augment human intelligence, not replace it. Through medical imaging, diagnostics, therapy, monitoring and clinical operations, AI has the transformational potential to improve patient outcomes by supporting clinical decision making and freeing up doctors' and healthcare professionals' time to look after their patients.

The European Commission's ambition to create a European Health Data Space should encourage the promotion of standards for healthcare data to enable interoperability, accessibility and high quality to drive innovation, including through the creation of AI algorithms. At the same

time, a harmonized, effective, clear and reliable healthcare data protection framework is paramount to ensure the trust of all operators and patients and meet the challenges of cybersecurity.

Storage, access and use of data are key to unlock the potential that the digital world holds for healthcare. National governments are showing the way with encouraging examples:

- In Germany, the new Digital Supply Act foresees a more widespread use of electronic health records soon, doctors will be able to prescribe digital health apps to patients, and data governance is finally looked at with a view to making data available for research and improving healthcare.
- In Finland, the Findata initiative is already now considered as a role model for health data governance in Europe: Anonymised data and a dedicated clearing authority handling access request in a GDPR-compliant manner.
- In France, similarly, the recent creation of the Health Data Hub is a tremendous opportunity to serve innovation in artificial intelligence in the health sector using a unique data platform.

With the digital transformation in full swing, decision-makers in Brussels and national Health Ministers need to keep in mind that access to timely and high-quality diagnosis and treatments is still inconsistent across the European Union, which was just recently confirmed by the latest State of Health in the EU Report<sup>3</sup>. In this respect, initiatives such as the Commission's Europe's Beating Cancer Plan Cancer are a unique opportunity to create tangible improvements in cancer prevalence and survivorship in Europe. To deliver on the ambitions of better healthcare for all people across the European Union, we need to ensure a robust budget for research & innovation in healthcare as well as funding for healthcare infrastructure

via the EU's structural funds. The physical and digital infrastructure is a precondition for people to get access to the screening programs, medical consultations and treatments they need.

The ambition must be that in 5 years, we should be able to look back and say, we did something for patients across the EU and that healthcare in Europe is not only better tomorrow than it is today but a leader on the global stage.

At GE Healthcare, we are committed to helping Europe succeed on this path. With 16,000 people, across 40+ countries and on 7 research and development sites in the European Union we strive to make all healthcare data count.



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