



THINK TANK

Healthcare Workforce and Organisational Transformation with AI – Enacting Change

ROUND TABLE SERIES 2020
SUMMARY REPORT
MARCH 2021

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Executive summary

The EIT Health 2020 Think Tank Round Table Series chose to discuss the topic 'Healthcare Workforce and Organisational Transformation with Artificial Intelligence (AI) – Enacting Change'. The objective was to look further into the findings of the joint EIT Health and McKinsey & Company report, 'Transforming healthcare with AI: the impact on the workforce and organisations', published in March 2020.



That report took a broad pan-European perspective of AI integration into healthcare, identifying levers for change in terms of workforce adaptations, infrastructure changes and the broader healthcare environment. The 2020 Round Table Series aimed to further explore the practical applicability of these findings at a Member State level and to propose recommendations across six domains (clinical leadership; education and skills; liability and

managing risk; regulation and policymaking; strengthening data quality, governance, security and interoperability; funding and reimbursement) for the changes that need to be driven at a **national** and **EU level** in order to achieve this necessary transformation.

Round Table Meetings were held in seven countries, each representing one of [EIT Health's six regional Innovation Hubs, plus its InnoStars cluster](#). Within each EIT Health

region, national-level decision-makers were identified and invited to participate in a Round Table Meeting. These decision-makers represented key stakeholders who develop and implement AI approaches at scale within national healthcare systems. Round Table Meeting participants comprised a mix of medical and clinical practitioners, data and AI experts, healthcare providers and payors, regulatory and policy experts, and patient organisations.

EIT Health would like to thank everyone who has contributed to the 2020 Think Tank Round Table Series – the Co-Chairs, the Round Table Moderators and participants, the EIT Health Co-Location Centres which hosted the meetings, the EIT Health Think Tank team, and external partners and collaborators.

Host countries for the seven Round Table Meetings during 2020



The outcomes of the 2020 Think Tank Round Table Series gave clear and consistent messages that reflected the findings of the joint EIT Health and McKinsey & Company report.

Impact of the COVID-19 pandemic

The challenge of the pandemic has undoubtedly helped accelerate the growth, adoption and scaling of AI in European healthcare systems, forcing the removal of some barriers as stakeholders have sought to collaborate and deliver care both rapidly and remotely.

There has been an increase in the use of digital tools, such as telemedicine, enabling remote consultation with patients, as

well as greater openness to data sharing. In addition, there has been an overall re-evaluation of the role of AI solutions and an acceleration in the uptake of AI applications, alongside greater investment in the AI sector.

This momentum should be harnessed in the context of AI to ensure that it can continue to benefit healthcare systems now and in the future.



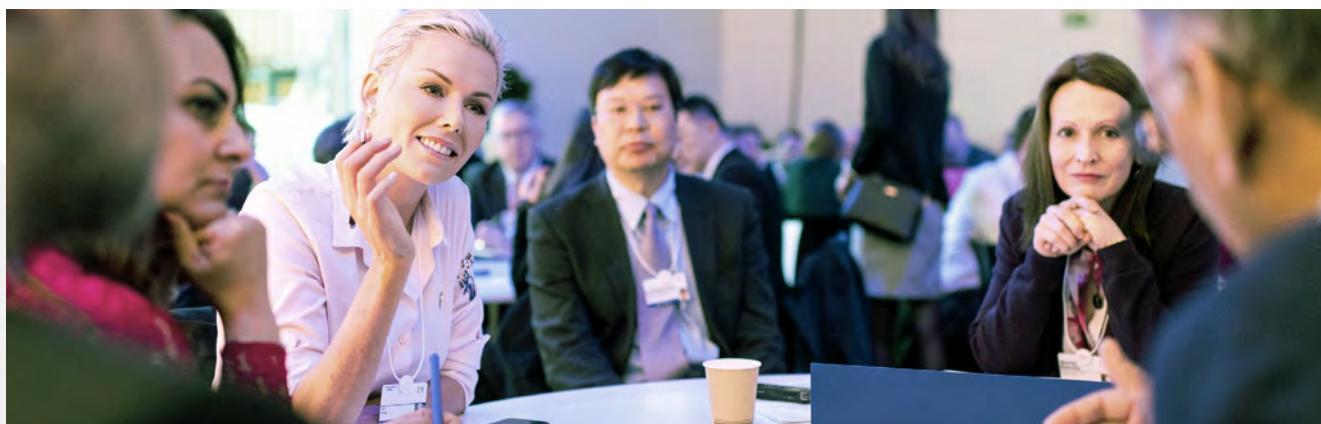
Actions needed at a Member State level

➤ Improve pan-EU, interdisciplinary collaboration

Any actions to maximise the benefits and minimise the potential risks of AI cannot happen in silos, whether those exist between different disciplines or across Member States. The Round

Table Meetings highlighted the need for greater collaboration, exchange of best practices and lessons learnt, and driving knowledge and education. This collaboration is essential both

between stakeholders (healthcare practitioners, AI developers, national bodies, patients and citizens) and across domains (e.g., for risk assessment, to determine liability, or for education).



➤ Leverage existing networks and infrastructures

Building on the work undertaken in the earlier joint EIT Health and McKinsey & Company report, a key recommendation to help advance the opportunities for AI in the healthcare sector is to leverage and build upon existing infrastructures. The Round Table Meetings clearly highlighted networks across Europe, such as the [Digital Innovation Hubs \(DIH\)](#). DIHs are one-stop shops that help companies become more competitive with regard to their business/production

processes, products or services using digital technologies. DIHs provide access to technical expertise and experimentation, so that companies can 'test before invest'. They also provide innovation services, such as financing advice, training and skills development that are needed for a successful digital transformation. It was suggested that DIH could support ambitious transregional projects for healthcare and may even be extended to support the development of health data spaces

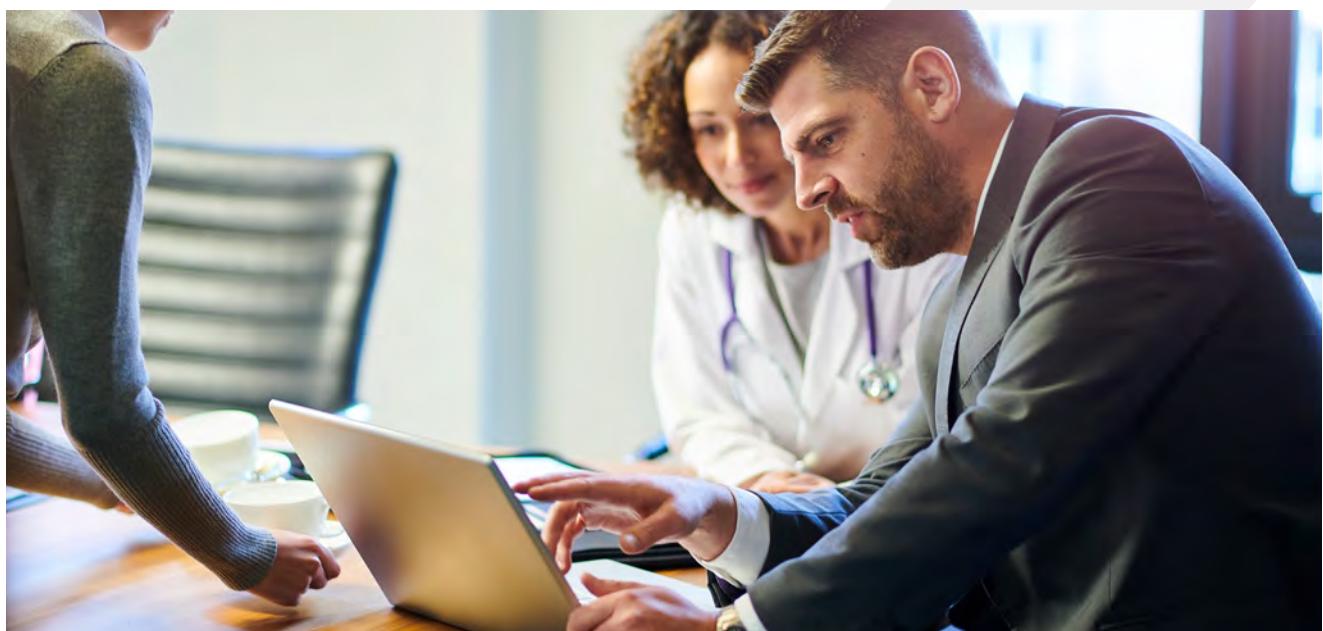
across Europe and sandboxes for the testing and verification of AI applications. Existing networks and infrastructures can also act as hubs, enabling exchange of information to support industry development and healthcare personnel in the shift towards an increased use of AI in a healthcare setting. Indeed, the creation of national and EU-wide bodies were suggested at the majority of Round Table Meetings to tackle and support this.

➤ Drive initiatives to improve education and skills

To ensure that all stakeholders have the necessary competencies to handle the current and future opportunities and challenges of AI, suitable education measures and reskilling are needed. In general, such initiatives can be driven at a Member State level, however EU support will be required to ensure wide deployment. Education and reskilling empowers not only those aiming to govern,

develop or interact with AI, but also ensures that patients and citizens themselves have a better understanding of the technology at hand and can make informed choices. Some steps in that direction have already been taken by the 'Elements of AI' course, developed by the University of Helsinki and technology partner, Reaktor, which is free and accessible to the broader public in all EU

languages. Furthermore, as part of the Coordinated Plan on AI, the European Commission and Member States agreed to develop awareness-raising campaigns. In addition, a proportion of the budget for the upcoming Digital Europe Programme will be dedicated to support advanced skills for AI.



➤ Develop value-based financial models

At a Member State level, new value-based financial models are needed within national healthcare systems to support the validation and deployment of AI-driven

innovations. These must take into account the fact that some AI applications are not replacements for existing processes or systems but additions to it, and while new

innovations may not necessarily generate immediate cost savings, they may provide longer-term benefits.

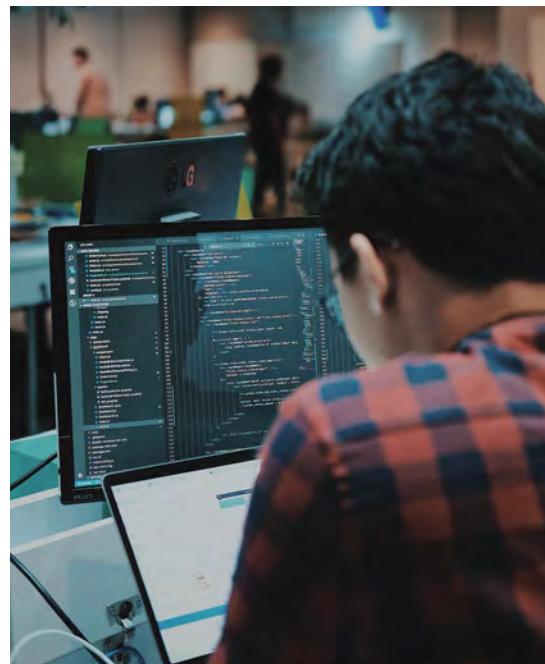


Actions needed at an EU level

It is recognised that there are currently many initiatives underway across Europe relating to digital healthcare, data science and AI, and many of these are driven by the European Commission. The Round Table Series identified three key areas where actions or guidance was needed from the EU to ensure smooth adoption of AI into healthcare systems across Member States.

➤ Build a robust data infrastructure for Europe

There is an urgent need to establish a secure, trustworthy and competitive cloud infrastructure for Europe that can benefit public administration, businesses and citizens.



➤ Provide guidance on data management and governance

There was a call for clear guidelines and common standards on data management strategies, including data collection, infrastructure and maintenance, storage, access, anonymisation, governance, and security, as well as business models for financial sustainability of data repositories.

➤ Provide guidance on regulation and risk assessment of AI solutions

At the regulatory level, it is important to bear in mind not only the benefits of the application of AI systems, but equally what benefits we deny society if we do not progress innovative solutions and hinder them with regulatory barriers. It is clear that a general regulation for AI will be difficult to achieve and might not always encompass all nuances inherent in the healthcare sector.

Assessments, analyses and stakeholder consultations across all sectors should form an ongoing part of the development process of any future regulation for AI and continue once such regulation has been achieved. Agile regulatory processes are needed that are sufficiently flexible and adaptive to the rapidly changing technological landscape.



Foreword from our Co-Chairs



Farzana Rahman

CEO, Hexarad

AI is already part of our day-to-day lives, whether it's the spam filters on our email, friend suggestions on social media or voice assistants, such as Alexa. Yet when we look at the use of AI within healthcare, we can see that its adoption has been slower than in other sectors. This is perhaps inevitable; healthcare deals with personal, sensitive information at times when we are at our most vulnerable. This has led to debates about the impact of AI within healthcare, with concerns being raised about the impact on workforce, ethical issues and the use of personal data.

However, aside from this, there are also very real organisational factors which can impede technological innovations such as AI within the healthcare setting. Healthcare providers, start-ups, and research centres often work in silos, not communicating with each other. Products that are developed without early input from clinical users may have limited efficacy resulting in poor uptake. Collaborative working between organisations is key to addressing this problem. This could also help address the challenge of resource distribution and scalability which can be a particular issue when looking at health systems in rural versus urban areas. Collaborative working will require alignment between both the people and technology within organisations, with interoperability and data-sharing being important factors to consider.

As healthcare organisations consider how they can use AI, they should also think about the investment in people and resources that will be needed to manage this change. This is especially important in healthcare where the stakes are high and there are serious consequences to getting things wrong. This requires strong leadership by decision makers, with an understanding that any investments in technology must be accompanied by investment in people.

It is also important for leaders to understand that improvements in efficiency and costs may take time to be realised and that the goal should be long-term improvement rather than short-term gain. By focusing on tools that support clinicians, such as those which reduce administrative burden, organisations can ensure buy-in and support for the use of these solutions from their staff.

Governments will need to think about funding mechanisms and how these could affect the uptake of AI within organisations. The reimbursement of AI remains complicated in Europe, with national and local payors often sharing responsibility for this. Consideration of reimbursement pathways, together with financial incentives for innovation, will be key when planning large-scale rollout of AI tools within healthcare.

Zineb Nouns

CEO, Clinician, Medical Education Specialist & HR Manager

AI is fundamentally changing healthcare as we know it. AI offers the opportunity to boost healthcare services by increasing the speed of new developments, improving medical quality, freeing up working hours and ultimately lowering costs. However, this development also presents quite a challenge for people working in the field:

- **A fear of being 'replaced by AI'**
- **The need for learning and unlearning, which can be frustrating**
- **A lack of systems connectivity that puts a high burden on time-consuming and often redundant 'machine feeding' activities**
- **Ethical and data privacy concerns remain unresolved**

However, the progression of the integration of AI into healthcare is impossible to ignore. Therefore, we have to find ways to empower and enable our workforce to adopt AI and also to provide the expertise for its further development.

AI and automation will have a tremendous impact on the healthcare workforce. Not only will established professions change in their specific roles, but entirely new professions will emerge. In particular, where medical roles

and data science intersect, new professions – for example AI engineers – need to be defined, established, trained and integrated.

All healthcare professionals (HCPs), both established and newly emerged, will have to learn to work with one another as well as with new AI applications. The approach to patient communication will change around those new developments too. The educational challenge is far reaching – from a change of mindset, culture, skills and everyday behaviour to ultimately the establishment of entirely new workflows and medical practices.

Education and training curricula need to address the necessary shift in priorities. For example, clinicians should no longer graduate from university without a basic technological education. Similarly, it is no longer acceptable that nursing students devote more time to learning how to make a bed than how to use digital hospital systems or AI-supported processes.

The ability to work in interdisciplinary rather than hierarchical teams, as well as communicating with patients who nowadays have much easier access to substantial medical knowledge, will become even more crucial skills than they are today.





Charlotte Stix

**PhD researcher, Eindhoven University of Technology,
Fellow of the University of Cambridge, Leverhulme Centre
for the Future of Intelligence**

AI holds a host of promises to help citizens live longer and healthier lives. At the same time, the introduction, development and deployment of this technology must be well considered, trade-offs weighted accordingly, and steps taken to ensure safe, robust and trustworthy AI applications. While this holds for all sectors, it is especially crucial in the healthcare sector where AI is set to change how we prevent and tackle disease. Because of the sensitive nature of AI within this sector, it is vital to encourage diverse and inclusive multi-stakeholder processes by harnessing existing knowledge and highlighting opportunities as well as concerns.

The discussions and recommendations resulting from the EIT Health Think Tank Round Table Meetings were insightful and it is crucial that they are implemented and actioned, both on Member State and pan-European level.

First and foremost, it must be noted that many pointed out that the regulation of AI is challenging, especially when it comes to the nuances of the healthcare sector. The scope, depth and flexibility of any future regulation should take into account the opinions

and concerns of a broad range of stakeholders, from patient organisations to clinicians and more, in order to truly account for the needs and hesitations of those most affected. To that end, specific consultations and analyses could be undertaken, or multi-stakeholder alliances, expert advisory boards and cross-sectoral committees established, as has been suggested in the Round Tables. All this can serve to ensure that any regulation is adequately flexible whilst also being sufficiently precise.

To ensure informed regulation and policy, the knowledge gap that currently exists between various actors in the space needs to be addressed simultaneously, so that all, including the public, medical professionals and regulators alike, can benefit from being able to access a wider information network. Furthermore, co-creation empowers the regulators and policymakers to gain vital insight as much as it encourages stakeholders to gain ownership of the process and its effectiveness.

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After all, regulation should safeguard and protect individuals, and serve to encourage research and development (R&D) and not unduly hinder innovation. Indeed, policy, governance and regulatory interventions must not only consider the potential downside of a particular application of an AI system within a given scenario but also the downside of not deploying this system now and potentially in a revised version in the future.

However, as demonstrated in the Round Table Meetings, this balance is delicate and cooperation between Member States, as well as clear guidance at an EU level is needed. Importantly, it has been pointed out that the definition of AI itself, and the potential grouping of a range of technologies under one umbrella, might pose a challenge to policy and regulatory interventions, and in turn complicate their application.

Moreover, distinctions between the various application of AI systems in the healthcare sector will become crucial for policy as there is arguably a difference between those used in an infrastructural setting (e.g., to sort paperwork and free up clinicians' time) and those used in a direct clinical setting. Regulation and policy will need to account for this accordingly.

Finally, it has clearly transpired that shared practices, guidance and benchmarks to inform and implement policy will be needed on a pan-European level. This may be through a lighthouse centre dedicated to the healthcare sector, which would focus on implementation, fast delivery and creating a positive culture for AI transformation, whilst undertaking short-term, well-defined, measurable projects – serving as a model or 'lighthouse' for other similar projects in this sector. Additionally, through world reference testing and experimentation sites, through a specialised Digital Innovation Hub network, or new governance mechanisms and agencies.

The EIT Health Think Tank



The EIT Health Think Tank

The EIT Health Think Tank – a thought leadership forum – brings healthcare leaders together to prepare the ground for life-changing innovation and identify the next opportunity for a step-change in how healthcare is delivered.

We collaborate across disciplines and borders to explore and assess the most pressing topics impacting health and the uptake and adoption of innovation. These topics are explored through meaningful dialogue with relevant

stakeholders and experts. To facilitate this dialogue and its findings, the Think Tank drives a range of activities from our Round Table Series, to publications, opinion pieces and discussion videos.

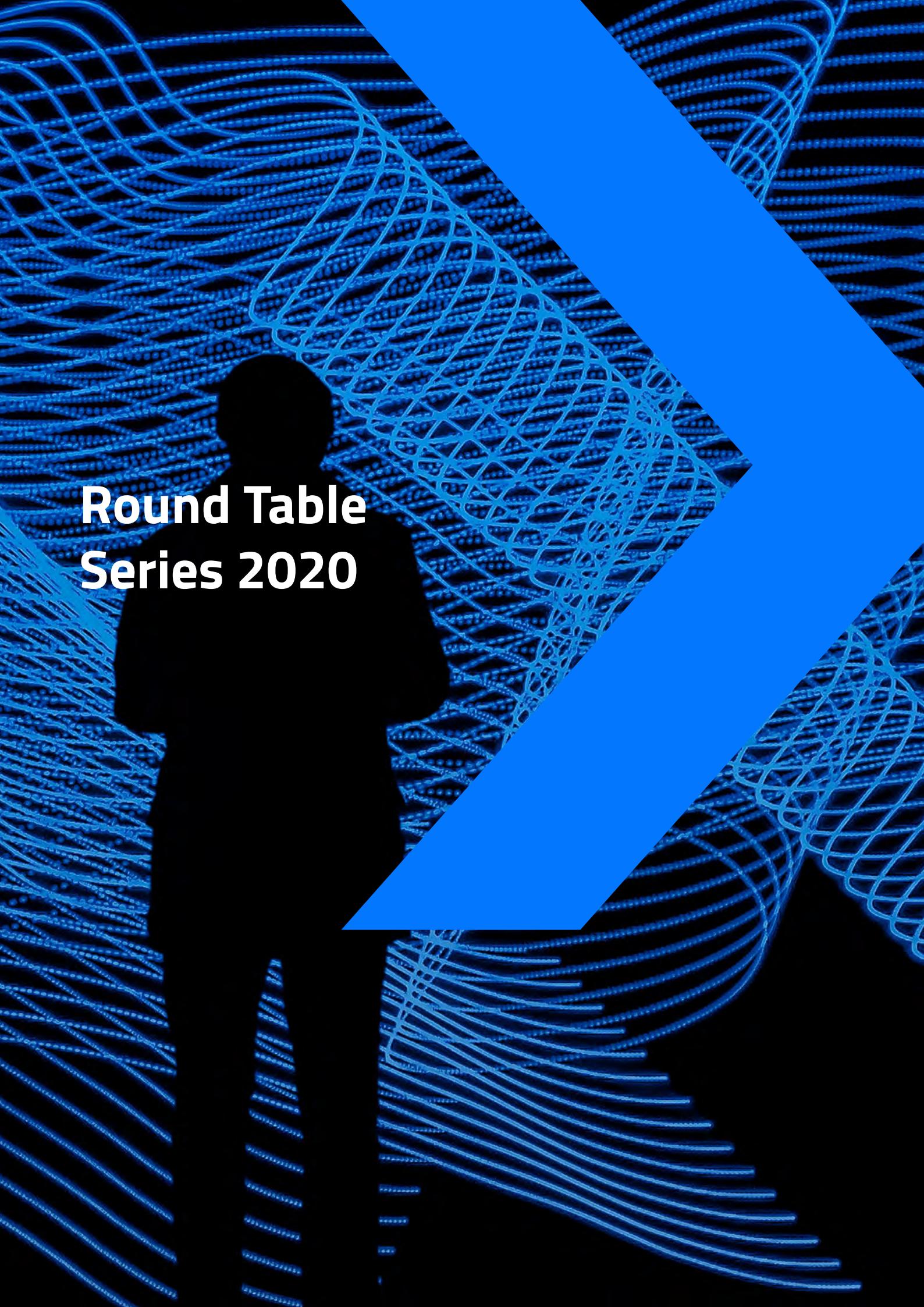
Think Tank drives a range of activities from our Round Table Series, to publications, opinion pieces and discussion videos.

Each year, the **Think Tank Round Table Series** focuses on a topic high on the European health agenda and takes a deep dive into it through meetings, which take place at Round Tables across the seven EIT Health regions. Selection of participants for these meetings draws on the experience, knowledge and skills of experts from EIT Health's broader community and beyond.

These regional meetings focus on specific Member State needs, opportunities and barriers, whilst also identifying successful

solutions and examples of best practice that could be replicated at a European level.

The expert recommendations gathered at the regional Round Table Meetings are translated into realistic and meaningful outcomes and actions, at a national, regional and pan-European level to support the acceleration of innovation in health for the benefit of all European citizens, so they are able to live longer, healthier lives.

The background of the image is a dark blue or black color. Overlaid on it is a complex, glowing blue pattern of lines and dots, resembling a 3D grid or a network. A large, solid blue diagonal shape, similar to a thick 'X', cuts across the upper right portion of the image. The text is positioned on the left side, partially obscured by a black silhouette.

Round Table Series 2020

Think Tank topic

For the 2020 Think Tank Round Table Series, participants discussed the topic 'Healthcare Workforce and Organisational Transformation with Artificial Intelligence (AI) – Enacting Change'.

The benefits of AI are many: accelerating the research and development of life-

saving treatments, supporting improvements in patient care, and allowing HCPs to spend more time with patients. At the same time, AI can increase productivity and efficiency of care delivery. However, for these benefits to be fully realised – now and in the future – existing healthcare

systems will need to undergo significant change. In addition, the many challenges that the use of AI tools raises, such as ethical issues associated with machine-led decisions and ensuring that AI applications are safe, robust and trustworthy, also need to be considered carefully.



In March 2020, EIT Health and McKinsey & Company launched a joint report, 'Transforming healthcare with AI: the impact on the workforce and organisations'. The report contributes to the debate surrounding AI in healthcare but goes a step further in helping to define the impact of AI on HCPs, and the implications of introducing and scaling AI for healthcare organisations and healthcare systems across Europe.

With AI in healthcare being a fast-moving field, the report provides a unique vantage point from the frontline of healthcare delivery and innovation today. Using a wide array of stakeholders, it outlines the potential of AI, the current state of play, and what is holding us back from widespread uptake and adoption.

The report took a broad pan-European perspective, identifying levers for change at the personnel, infrastructural and environmental levels. It created a foundation from which to further explore how these findings could be translated into concrete recommendations at a national level, whilst also understanding the role of the EU.

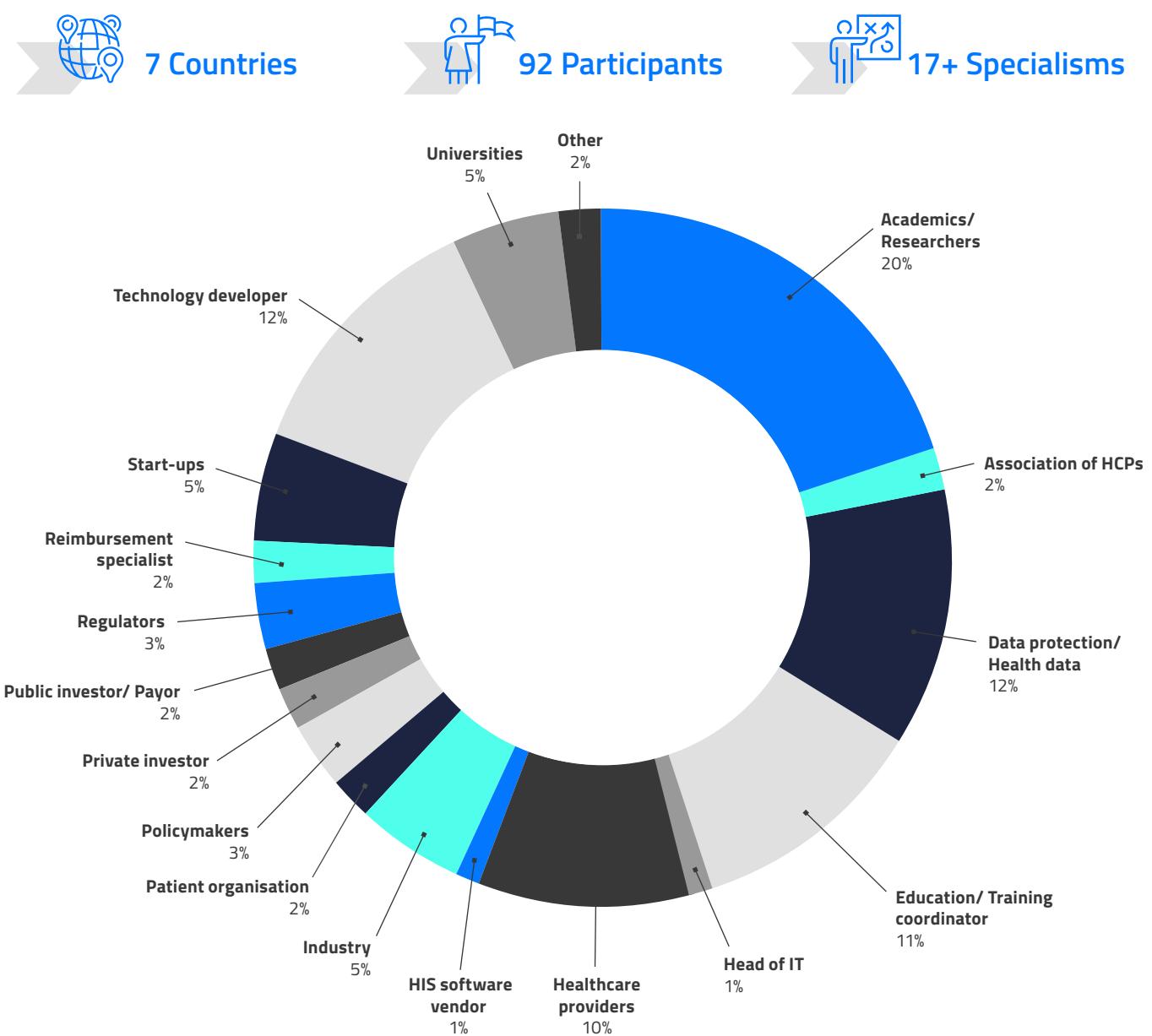
Round Table Meeting participants

For the 2020 Round Table Series, seven countries held Round Table Meetings, each representing one of EIT Health's six regional Innovation Hubs plus its InnoStars cluster. In each of the seven countries, decision makers representing key

national stakeholders were invited to participate in Round Tables. They were selected to represent a broad range of stakeholder groups including clinicians and other healthcare professionals, experts in data and AI, healthcare

providers and payors, regulatory and policy experts, and patient organisations.

An overall breakdown of all Round Table Meeting participants is shown in the Figure below.



Participants were asked to provide opinions and potential solutions that could be applied to enable practitioners, healthcare providers, patients and citizens to fully embrace the potential of AI.

This report analyses the feedback and recommendations arising from the seven 2020 Round Table Meetings held in Denmark, France, Germany, Ireland, Poland, Spain and the Netherlands.



“AI will have a transformative effect on healthcare and the way it is delivered. In fact, it already does so today. We would like to understand the barriers and the enablers to the accelerated uptake of AI at national, Member State level. And ultimately through that debate, outline a national plan of action to guide us when supporting the adoption of AI on a bigger scale.

Jan-Philipp Beck,
CEO, EIT Health

Context for the Round Table Meetings

Global healthcare challenges

Progress in medical science has raised life expectancy around the world. However, as longevity increases, healthcare systems face increasing demand, patients have more complex needs, costs are rising and the workforce is struggling to meet the needs of patients.

Healthcare spending is simply not keeping up. Without major structural and transformational change, healthcare systems will struggle to remain sustainable.

Despite global economic growth predicted to create 40 million new health sector jobs by 2030, the [World Health Organization](#) predicts there will be a 9.9 million shortfall of clinicians, nurses and midwives globally over the same period. Health workforce imbalances and shortages are a major concern in the European region.

There is, therefore, an urgent need not only to attract, train and retain more HCPs, but also to ensure that their time is used where it adds most value – caring for patients.



The potential of AI and the challenges of its adoption

AI has the potential to transform how care is delivered by addressing some of these challenges. It can support improvements in care outcomes, patient experience and access to healthcare services. It can increase productivity and the efficiency of care delivery, allowing healthcare systems to provide better, personalised care to more people.

AI can help improve the experience of HCPs, enabling them to spend more time in direct patient care and alleviating unnecessary workloads. For example, the EIT

Health and McKinsey & Company joint report noted that AI can help reduce the time spent on routine administrative tasks, which can take up to 70% of a healthcare practitioner's time, as well as improving the speed and accuracy of diagnostic tests, giving them faster and easier access to information for patient care. Finally, it can support the faster delivery of care by accelerating time to diagnosis. It can help healthcare systems respond proactively to population health needs, allocating resources to where they can have the most significant impact.

AI can help improve the experience of HCPs, enabling them to spend more time in direct patient care and alleviating unnecessary workloads

However, whilst recognising these benefits, the full potential of AI is still being evaluated. Questions have been raised about its impact on patients, practitioners and health systems. Issues around ethics, use of personal data and AI-related risks are also being debated. At the same time, healthcare

investments in AI are increasing, creating or accentuating disparities in the adoption of innovation in healthcare. This raises questions about the role that health systems, individual practitioners, public and private players can, or should, play in ensuring citizens fully reap the healthcare-related benefits of AI.



A synopsis of the findings of the joint EIT Health and McKinsey & Company report

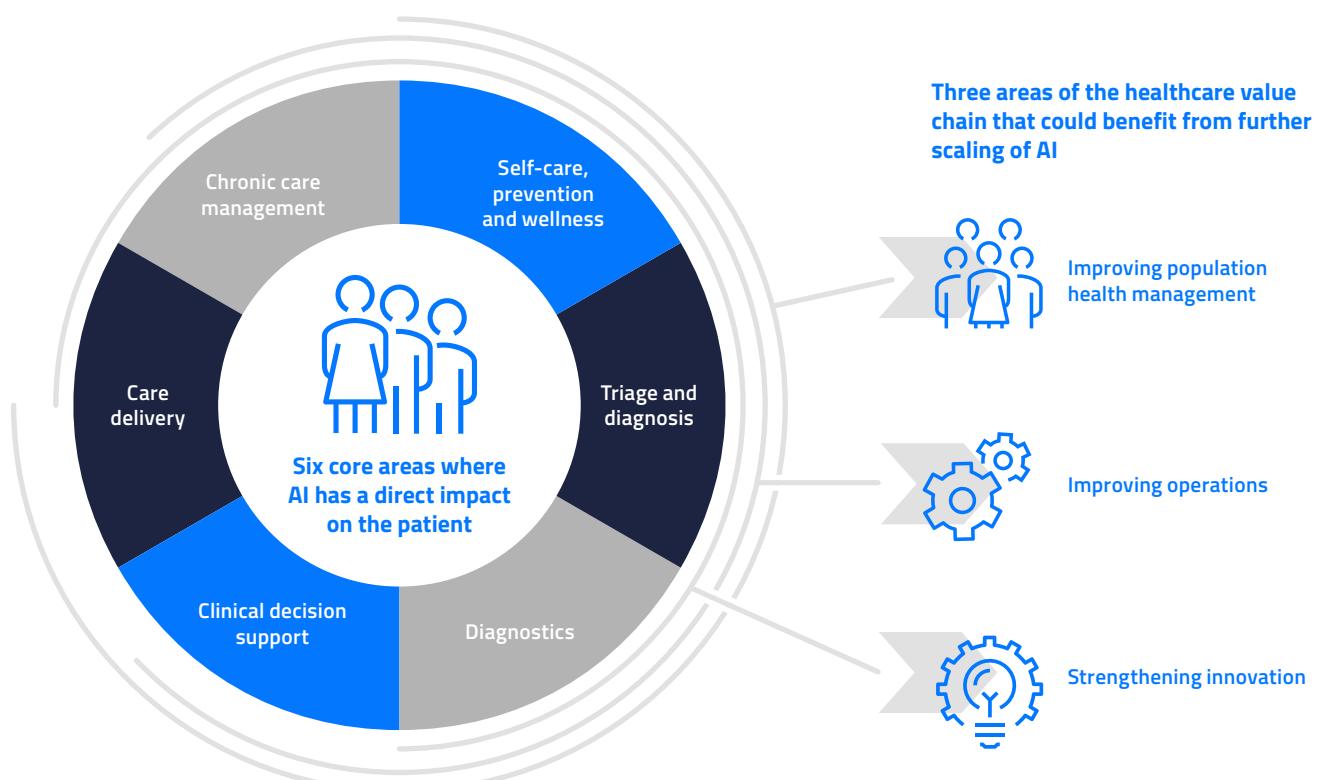
Research undertaken by McKinsey Global Institute assessing the impact of automation on the future of work was supplemented by new analyses on the future of work in healthcare. This was complemented by a further 62 interviews of public- and private-

sector decision makers and thought leaders across Europe, North America and Asia. It also included an in-depth survey of 175 HCPs, health investors and AI start-up founders and other executives, conducted between December 2019 and January 2020.

To make the impact of AI 'real', the report also looked at detailed examples of existing AI solutions

The report aimed to provide not only a comprehensive 'macro' perspective on AI in healthcare but also ground this view in the reality of the people tasked with increasing the utility of AI in healthcare delivery today; listening to their voices, hopes, frustrations and suggestions. To make the impact of AI 'real', the report also looked at detailed examples of existing AI solutions in six core areas where AI has a direct impact on the patient.

These are self-care, prevention and wellness, triage and diagnosis, diagnostics, clinical decision support, care delivery and chronic care management – as well as three areas of the healthcare value chain that could benefit from further scaling of AI: improving population health management, improving healthcare operations, and strengthening innovation.



A definition of AI

At the outset, and to avoid any misinterpretation, it is important to define and clarify what is meant by the term 'AI'. For the purposes of the report, EIT Health and McKinsey & Company employed the concise, working definition of AI used by the [European Parliament](#). This is deliberately broad and includes a functional continuum from the application of rules-based systems through to cutting-edge methodologies that include classic machine learning, representation learning and deep learning:

"AI is the capability of a computer programme to perform tasks or reasoning processes that we usually associate with intelligence in a human being."

The European Commission's [High-Level Expert Group on Artificial Intelligence](#) (AI HLEG) has also developed a more detailed [definition of AI](#) that describes its main capabilities and its associated scientific disciplines:



"Artificial intelligence (AI) systems are software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behaviour by analysing how the environment is affected by their previous actions."

"As a scientific discipline, AI includes several approaches and techniques, such as machine learning (of which deep learning and reinforcement learning are specific examples), machine reasoning (which includes planning, scheduling, knowledge representation and reasoning, search, and optimisation), and robotics (which includes control, perception, sensors and actuators, as well as the integration of all other techniques into cyber-physical systems)."

However, at Member State level there is currently no standardised definition of AI that all nations understand and endorse.



“ Maybe the biggest barrier to adoption is the term AI itself. There is the perception that AI is all-seeing and capable of making decisions autonomously. There is a fear it will ‘take over’ because it conjures images of robots taking over the world. When you say AI, people don’t really understand what that means or what AI can (and can’t) do. What we’re talking about these days is really ‘machine learning’ or ‘learning from data’. And I think those two terms reflect much better what we’re really doing – we are learning from the data that’s available to us. ”

Pepijn van de Ven, Professor in Artificial Intelligence, University of Limerick, Ireland

Round Table discussion domains

The EIT Health and McKinsey & Company report identified a set of key areas as levers for change that will need to be addressed to encourage the introduction and scaling of AI in healthcare. Whilst broad in scope and covering important and diverse topics, the levers also reflect a number of interdependencies. In order to ensure effective discussion and insight generation from Round Table participants, and make the best use of the time available, the domains were regrouped under the six topics, *as shown in the table overleaf*.

Ethics and ethical considerations are critically important elements of the use of citizens’ health data and the implementation of AI tools in healthcare. However, the report itself does not attempt to cover all facets of this complex issue but does reflect the efforts being made on this important topic led by EIT Health or other EU institutions. As a result, this aspect was purposefully not addressed in the insight generation and the report’s findings. Therefore, to adhere to the report’s methodologies, this was not specified as a topic

to address at the Round Table Meetings, and although in some meetings the topic was touched on peripherally, it was not discussed in depth.

At an EU level, issues around ethics and the use of personal data in AI solutions were discussed by the European Commission’s AI HLEG, set up from 2018–2020. Amongst its work, the AI HLEG published [Ethics Guidelines for Trustworthy Artificial Intelligence](#) in April 2019 and its final [Assessment List for Trustworthy Artificial Intelligence](#) in July 2020.

DOMAIN	DESCRIPTION AND KEY THEMES
Clinical leadership 	Effective clinical leaders are needed within healthcare institutions. They should have a clear understanding of the potential benefits of AI, who can drive its implementation and facilitate stakeholder collaboration, and who can ensure that end users understand its strengths and limitations. These leaders will be key to managing the transformational changes necessary for AI adoption at scale.
Rethinking education and skills and investment in new roles and talent 	To make the most of the opportunities AI presents, a new approach to education is needed, both in terms of clinical training and also the wider healthcare workforce, to ensure they have relevant skills in digital literacy and a sufficient understanding of data science and AI. To achieve this will require a concerted effort across all stakeholder groups. Healthcare systems will also need to embrace new professional roles that will be critical for AI adoption, such as data scientists, data engineers, or possibly hybrid clinical/data scientist roles.
Liability and managing risk 	Having clear guidance on liability will be crucial to enable the successful implementation of AI into clinical practice. Whilst patient safety is paramount, HCPs also have to consider the professional accountability of their clinicians, as well as the protection of their organisations from reputational, legal or financial risk from the use of AI applications.
Regulation and policymaking 	Clear guidance on how the safety and efficacy of AI solutions will be assessed and a consistent approach to their regulation (as exists for medicines and medical devices) are needed to prevent barriers to AI adoption.
Strengthening data quality, governance, security and interoperability 	Issues related to data are a significant challenge to accelerating the adoption of AI tools in healthcare. These include concerns about data quality and security (anonymisation), availability of datasets, the interoperability and connectedness of systems, and the governance surrounding data management and ownership. Effective deployment of AI will require digitisation of health systems to collect data and an interconnected data infrastructure.
Funding/reimbursement 	Clear criteria are needed for the reimbursement of AI applications to enable adoption at scale, alongside creative funding models that ensure the benefits are shared across organisations. The nature of how AI applications deliver benefit to healthcare systems and impact patient outcomes will likely require a shift to value-based healthcare, away from the traditional fee-for-service model.

Round Table development process

The specific objectives of the meetings were to:

- **Validate the relevant barriers and enablers indicated within the EIT Health and McKinsey & Company report for the successful adoption of AI at the Member State level**
- **Identify how to improve the 'on the ground' impact of AI by specifying obstacles to overcome and opportunities to maximise for each of the six domains described above**
- **Outline a national (Member State level) 'plan of action' to accelerate and expedite the integration of AI to drive workforce capability and organisational receptivity and to determine how management of the changes necessary to achieve these objectives can best be undertaken for each domain**
- **Evaluate the role the EU could play in encouraging greater adoption of AI in healthcare.**



Details of the development process for Round Table Series 2020 is described in [Appendix 1](#) and the Agenda for each meeting is shown in [Appendix 2](#).

A pre-meeting survey was undertaken with all Round Table participants to gain insight into the current situation in their country regarding the use and

adoption of AI in the context of the report findings (see [Appendix 3](#)). The discussions and insights from each Round Table Meeting were summarised in individual 'Proceedings' reports (see [Appendix 4](#)).



Round Table insights

Impact of the COVID-19 pandemic on the perception and growth of digital healthcare and AI in Europe

Since the publication of the EIT Health and McKinsey & Company report in March 2020, the world has undergone a dramatic change.

The COVID-19 pandemic has significantly changed the way healthcare systems around the world operate, prioritise resources, and deliver healthcare. It has also accelerated the deployment of innovative

technologies in many countries, for example telemedicine, mobile apps or remote monitoring. This resourcefulness could be harnessed in the context of AI to make healthcare systems more resilient.

The pandemic underlined the urgent need for – and importance of – open data access

The pandemic underlined the urgent need for – and importance of – open data access, so that researchers and innovators may use, verify and analyse data to ensure that accurate, up-to-date patient information is available to clinical teams. This pressing need has helped accelerate the growth and scaling of AI in European healthcare systems, forcing the removal of some barriers as stakeholders have sought to collaborate and deliver care both rapidly and remotely.

In recognition of this acceleration in the use of AI-driven technologies, the European Commission has

launched the '[AI-ROBOTICS vs COVID-19 initiative of the European AI Alliance](#)' to collect ideas about deployable AI and robotics solutions, as well as information on other initiatives that could help face the ongoing COVID-19 crisis. This initiative aims to create a unique repository that is easily accessible to all citizens, stakeholders and policymakers as part of the common European response to the outbreak of COVID-19.

The impact of the COVID-19 pandemic was a topic that shaped the Round Table discussions with many positive trends and real-world examples highlighted.

Re-evaluation of the role of AI

An acceleration in the adoption and successful use of AI applications was reported at the Round Tables in several core areas, bringing direct benefit to healthcare teams, researchers, patients and citizens.

Faced with the shortage of hospital capacity, AI solutions have been used to automate and scale procedures, and to extend remote care.

Case studies:

Use of AI applications during the pandemic

[BrainScan](#) is an innovative start-up in Poland that has received EIT Health Headstart support to help accelerate development of its AI application. During the COVID-19 pandemic, BrainScan established cooperation with eight hospitals to perform analyses of CT scans of the chest. There are characteristic changes in CT scans associated with COVID-19 infection, however these changes are difficult to distinguish from other pathologies in a limited time. BrainScan developed a deep neural network model that can precisely and quickly capture minimal differences in images, helping radiologists to diagnose patients more quickly and effectively.

[Molecule.one](#) is a Polish start-up working on AI-powered software for drug synthesis design. The aim is to reduce the time-consuming drug discovery process through molecular optimisation with an AI-based approach. Molecule.one created a platform able to perform synthesis planning for thousands of molecules every hour. During the pandemic, Molecule.one gave free access to its synthetic accessibility screening capabilities for research teams working on potential drugs for COVID-19. The Massachusetts Institute of Technology (MIT) in the US and the University of Copenhagen in Denmark are among those who have already benefitted from using the platform.

Increased use of digital tools and data

Changes were also reported at the Round Tables in the adoption and use of digital tools by both patients and HCPs. There has been greater availability and easier sharing of data.

These improvements will undoubtedly help the rollout of AI tools that can add true value to patients and health systems.



Case studies:

Increased use of digital tools and data sharing in Europe

Telemedicine

In Poland, during the pandemic, telemedicine solutions gained unprecedented popularity. A survey conducted in April 2020 found 72% of Polish citizens considered telemedicine the safest method of contacting a doctor and 43.8% of citizens had used telemedicine (an increase from 6.8% in 2017). In addition, the Ministry of Health in Poland, together with the National Cloud and Centre for e-Health, created a teleconsultation platform for those with suspected or confirmed COVID-19.

Data sharing

'FAIR' principles refer to the Findability, Accessibility, Interoperability, and Reuse of digital assets. Within the Netherlands, [Health-RI](#) and the [GO FAIR Foundation](#) have been commissioned to develop a national observational COVID-19 data portal that will help researchers to find and reuse COVID-19 related observational data from Dutch HCPs. This includes a governance policy for data sharing: researchers can gain access to FAIR research data whilst adhering to legal conditions and the privacy of patient's data. The US and the University of Copenhagen in Denmark are among those who have already benefited from using the platform.

Key cross-domain factors needed for implementation of AI

A holistic, cross-domain approach is needed

While the EIT Health and McKinsey & Company report identified and discussed a range of separate domains as levers for change to drive AI implementation, feedback from the Round Tables stressed that they are all interconnected and interdependent, so an individual domain cannot be the sole focus of national, or indeed EU, efforts.



Ensure effective management of the cultural transformation

The report also noted that in addition to the technological transformation needed for AI implementation in healthcare, a significant cultural change will be required within healthcare organisations to adapt to new ways of working.

Round Table participants recognised that this is a complex change-management process that will need to be considered, whilst it will also call for careful delivery so that it is received positively and implemented effectively.

Inclusive, multidisciplinary stakeholder teams are essential

Multi-stakeholder engagement and the need for cross-silo thinking at the domain, institutional and national level were factors that emerged throughout the Round Tables as critical to ensuring a well-functioning and innovative 'AI in healthcare' sector. Importantly, AI innovation should address a

defined societal need and provide tangible benefits for patients and citizens. From the design phase onwards, multidisciplinary teams of stakeholders including clinicians, data scientists, patient/citizen representatives and innovators should be engaged to create AI solutions that meet those needs.

Public-private partnerships should be encouraged. These multidisciplinary teams should also include new hybrid roles that will emerge in the future, such as combined clinical/data scientists.

Develop an agreed definition of AI

For the purposes of the report, EIT Health and McKinsey & Company had employed the working definition of AI used by the [European Parliament](#). However, many Round Table participants felt that a standardised and agreed definition of what is understood

by AI would be beneficial to communication efforts and acceptance of AI.

AI is often used as an umbrella term covering various technological approaches, so clarity is warranted, particularly when

communicating to non-technical audiences. Importantly, according to the Round Table participants, AI should be positioned clearly as a complementary technology to human intelligence, not a replacement for it.

Generate AI use cases

The generation of positive case examples of AI projects that can be used to demonstrate effectiveness and value was a strong message emerging from the EIT Health and McKinsey & Company report.

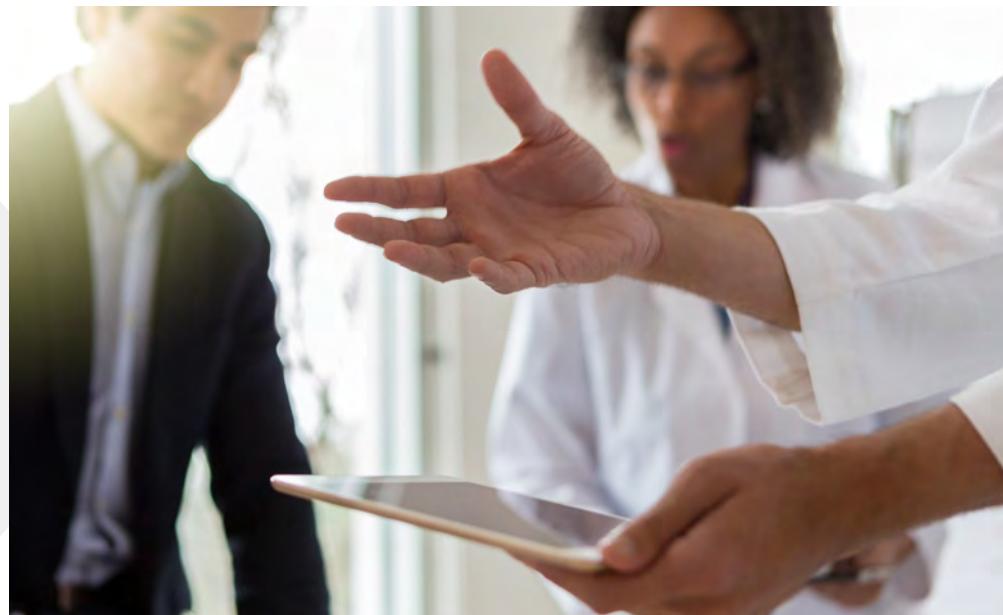
Round Table participants endorsed this approach as a means of

attracting further investment to enable scale-up. Efforts should focus initially on small datasets, which can be used to generate evidence to secure funding. To facilitate and streamline the process, institutions that are interested in AI and its benefits should be engaged in

this collaboration. However, this approach needs to be taken with caution as small datasets may not be representative of the wider population. Clinical validation with representative cohorts, as undertaken in the pharmaceuticals sector, needs to be considered.

Leverage existing networks: Digital Innovation Hubs

Several Round Table participants recommended leveraging the existing infrastructure of Digital Innovation Hubs across Europe to support the provision of access to technology, learning opportunities, and the sharing of knowledge and best practices. Whilst these hubs already exist, in the context of AI, communication between stakeholders needs to be improved so they can act as 'AI catalysts'.



Build networks for the future: sandboxes

Similarly, it was recommended that an EU-wide network of sandboxes should be developed. Sandboxes are environments established to encourage multi-stakeholder collaboration, information exchange, and

testing of AI systems in a risk-free, controlled manner prior to clinical verification in a 'real world' environment, such as a hospital.

The use of sandboxes may also help inform future testing centres where AI systems can be evaluated

for regulatory conformity. Rather than developing new standards for data development, existing international standards, for example the [Fast Healthcare Interoperability Resources](#) (FHIR) or HL7, could be referenced.



Promote patient and citizen empowerment

Whilst the EIT Health and McKinsey & Company report outlined the need for transparency and collaboration between all relevant stakeholders including patients, Round Table participants considered it essential that patients and citizens are put at the centre of all initiatives relating to their health. AI solutions should

start from the patient's needs and seek solutions that benefit them and wider society. It was also important to remember that AI has a role in disease prevention as well as treatment. Whatever the application, the overall aim should be to empower citizens as the owners of their health data.

The human factor should not be forgotten

The 'human factor' was felt to be a critical element across all six domains discussed at the Round Tables. When considering the role of AI, healthcare as a 'system' needs to be separated from healthcare as a 'clinical activity', delivering care to patients.

On one hand, there is the health system context and the potential of AI implementation, including

systemic optimisation, analysis of electronic health record systems, and more effective clinical management.

On the other hand, there is AI used in healthcare delivery, including decision support for doctors, improving the speed and accuracy in diagnostics and treatment, remote monitoring, and 'omics-based' care, including

genomics and proteomics.

This distinction between 'system' and 'clinical activity' is an important one as it will entail different approaches in terms of developing and deploying AI systems, and will also be associated with different ethical, policy and legal challenges.



Learn from other sectors

It would be of value to look to other sectors who may have already developed solutions to some of the challenges being faced by AI innovators.

An outward-facing approach will also help the healthcare sector learn from mistakes made by other sectors. Some examples of such sectors are:

- The pharmaceuticals sector, which provides clear guidance for stakeholders going through the regulatory process for medicines whereas in the case of medical devices regulators often have limited knowledge of AI applications
- The finance sector, which has expertise in data security
- Industry, which has obligations to provide open interfaces to promote research
- Within the pharmaceuticals sector, there is a move to create disease registries that allow data sharing across competitors in order to be cost efficient

Actionable recommendations for individual domains

At each Round Table Meeting, participants proposed actionable recommendations for each domain they felt would help drive the implementation of AI in their healthcare system in line with the report's findings.

They also identified stakeholders who might be key drivers of those actions. Whilst these recommendations reflect the specific set-up of national healthcare systems, there was a considerable degree of commonality between countries and alignment with emerging themes in the EIT Health and McKinsey & Company report.

A detailed list of the suggested actionable recommendations from each Round Table can be found in the individual Proceedings documents (see [Appendix 4](#)).

For each domain, participants highlighted case studies of initiatives (both EU and international) that they felt were positive examples of existing projects or represented best practices in that domain.





1. Clinical leadership

For the domain of clinical leadership, the key recommendations that emerged from the Round Tables centred on building the knowledge of AI and its benefits, and allowing clinical leaders to act as advocates to communicate the potential of AI to their wider teams and facilitate the process of integrating AI solutions into existing workflows. Strengthening the collaboration between stakeholders was also identified as crucial.

Financial incentives for AI development for both clinical leaders and departments were proposed. At the Polish Round

Table, the creation of dedicated roles within healthcare centres, such as Innovation Officers to drive digital healthcare including AI, were suggested.

From the perspective of workforce development, the attitude of clinical leadership in many Member States is yet to change. The role of clinical leadership in this ongoing transformation is to create a safe environment that allows all employees to take risks and fosters a culture of lifelong learning. Here, a fundamental change of mindset and culture is probably key. Clinical leadership

needs to comprise personalities who are highly cooperative as opposed to those who have a hierarchical approach. As role models they need to display a curiosity for innovation rather than a reluctance to change.

The use of Digital Innovation Hubs was recommended as a way of helping to close the gap between industry, research and clinical practice. In addition, the creation of sandbox-type environments to test AI applications in clinical practice was suggested.



“Collaboration between innovators and clinical leaders is crucial when it comes to implementing something within the healthcare system. These clinical leaders are actually the crucial people who can make other healthcare professionals adopt something, to learn something, because healthcare systems, maybe more than other industries, are still very much hierarchical.”

Zineb Nouns, Co-Chair of the 2020 EIT Health Think Tank Round Table Series



Case study:

Closing the gap between research and clinical practice

The [CT Innovation Unit](#) at the Department of X-Ray and Scanning, Herlev and Gentofte Hospital, Denmark, is an example of a clinical research unit located at the heart of a clinical practice.

The Innovation Unit (established in 2012) deals with need- and user-driven innovation across a range of initiatives and projects, where the results and solutions are implemented in clinical practice across organisational silos. The strategic focus areas are AI, advanced CT scanning and acute patient diagnostics.

In Germany, the [Medical Informatics Initiative \(MII\)](#) is funded by the German Federal Ministry of Education and Research (BMBF) and was created to close the gap between research and healthcare. All of Germany's university hospitals have joined forces with research institutions, businesses, health insurers, and patient advocacy groups to create a framework that harnesses research findings for the direct benefit of patients.

The Round Table in Denmark highlighted that there are often barriers to the collaboration between HCPs and industry

The Round Table in Denmark highlighted that there are often barriers to the collaboration between HCPs and industry, which is often treated with suspicion. This perception needs to change and can be replaced

with frameworks and practices that facilitate public–private partnerships. This will not only allow innovation to thrive, but clear guidelines can create trust within the healthcare community about the nature of these partnerships.



Case study:

Creating public–private partnerships

Vital Beats is an example of a collaboration between a start-up in Denmark and healthcare clinics that has resulted in the development of an AI-driven platform for the remote treatment of patients who have a pacemaker.



2. Rethinking education, skills and investment in new roles and talent

A key driver of change needed for the introduction of AI in healthcare noted in the EIT Health and McKinsey & Company report was the need to rethink the provision of education and skills development for the healthcare workforce. Ensuring they are informed and competent concerning AI will enable preparedness for the forthcoming transformation in healthcare.

Round Table participants in all countries were in agreement that opportunities for education about AI and its clinical potential were key, and should be accessible to all those involved in AI implementation in the healthcare sector, including clinicians, other HCPs and healthcare managers.

As a consequence, Round Table participants agreed that AI concepts should form part of the training and ongoing education components of all HCP courses.

This is something that can be driven at a Member State level through universities and other educational institutions.

Round Table participants agreed that AI concepts should form part of the training and ongoing education

In order to make room in the already overcrowded curriculum, a shift of priorities has to be supported by legislation and will require updates to certification requirements, which were developed decades before the current digital transformation occurred and put limitations on the addition of extra content, however urgent.

A suggestion from the Round Table in France was to create university Professorships specialising in biostatistics, data science and AI medical solutions, which can help provide these elements as part of overall HCP education.

The Round Table Meetings put forward some good examples of graduate and postgraduate

educational courses being implemented. Participants considered that the move to online learning as a result of the COVID-19 pandemic could be an opportunity to encourage flexibility in the curriculum, allowing the adoption of AI, data science and digital health content into professional education to help build knowledge and skills.



Case studies:

Building HCP knowledge and skills in AI

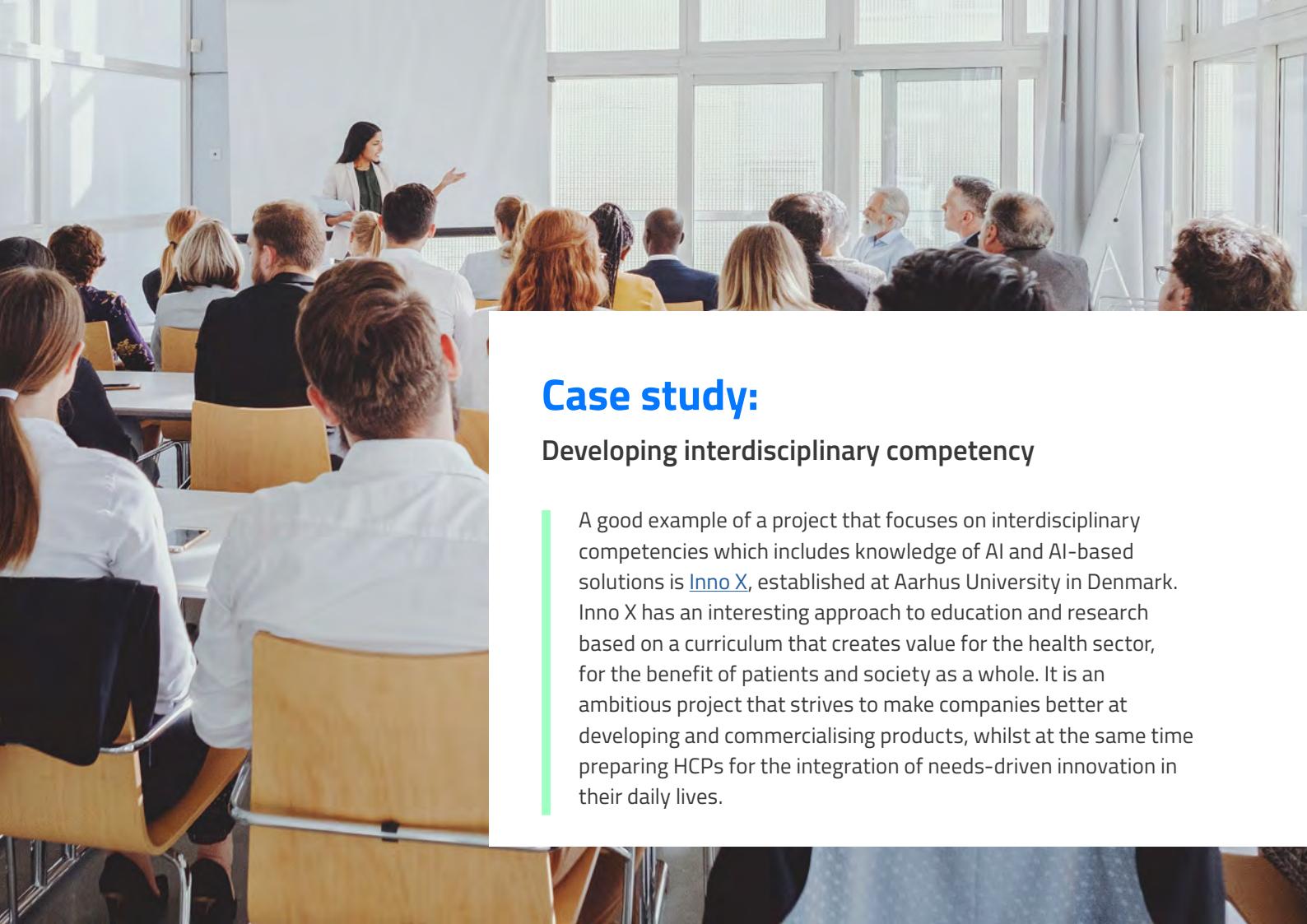
In Ireland, the University of Limerick has developed and implemented an online [Masters degree in AI](#) in under a year, sponsored by [Skillnet Ireland](#).

The [AGH University of Science and Technology](#) in Krakow, Poland, has implemented a successful one-year postgraduate education programme: 'AI in diagnostics and medical practice'.

Many doctors of the future will need a fundamental knowledge of mathematical concepts and data science, the basics of AI and machine learning, as well as knowledge of the regulatory and ethical aspects

of the implementation of these technologies in healthcare. Similarly, data scientists, data engineers, and innovators in AI will need to understand the clinical context in which their innovations will be deployed in order to be

able to develop meaningful solutions. Therefore, developing interdisciplinary competences is a key factor in skills development, so there is a need to create opportunities to achieve this.



Case study:

Developing interdisciplinary competency

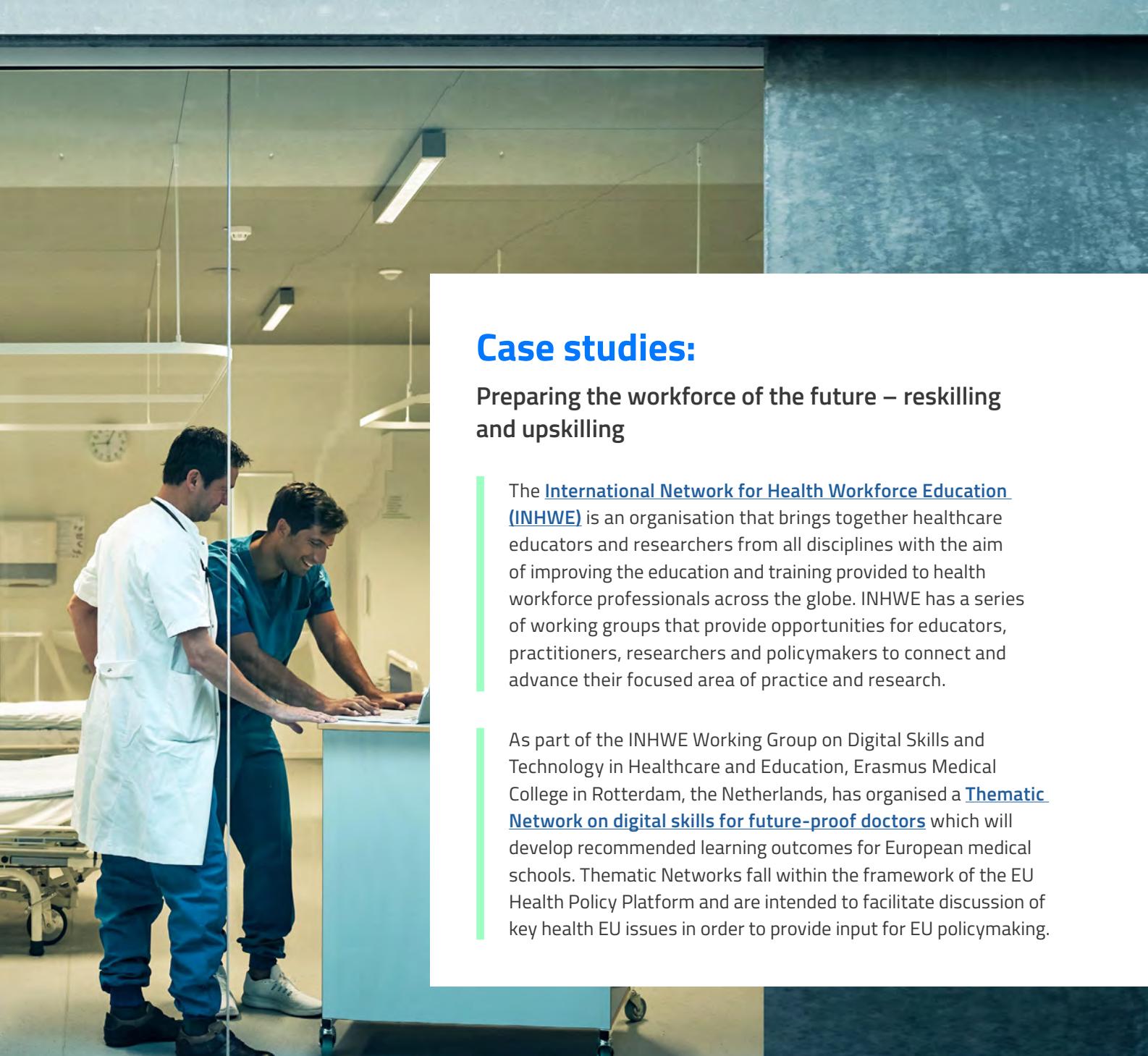
A good example of a project that focuses on interdisciplinary competencies which includes knowledge of AI and AI-based solutions is [Inno X](#), established at Aarhus University in Denmark. Inno X has an interesting approach to education and research based on a curriculum that creates value for the health sector, for the benefit of patients and society as a whole. It is an ambitious project that strives to make companies better at developing and commercialising products, whilst at the same time preparing HCPs for the integration of needs-driven innovation in their daily lives.

The EIT Health and McKinsey & Company report highlighted how implementing AI in healthcare will require new organisational structures that allow cross-professional working and the creation of new roles and job profiles.

The healthcare sector has traditionally been very hierarchical whereas multidisciplinary collaboration and flat organisational structures will be crucial moving forwards in the context of AI.

The Round Table Meeting feedback acknowledged the challenge of this transformation and the need to integrate new digital and AI-related skills into the existing workforce as well as incorporating new, specialised roles into existing structures.

Participants highlighted various initiatives ongoing at a Member State level to help upskill and 'future-proof' the healthcare workforce.



Case studies:

Preparing the workforce of the future – reskilling and upskilling

The [International Network for Health Workforce Education \(INHWE\)](#) is an organisation that brings together healthcare educators and researchers from all disciplines with the aim of improving the education and training provided to health workforce professionals across the globe. INHWE has a series of working groups that provide opportunities for educators, practitioners, researchers and policymakers to connect and advance their focused area of practice and research.

As part of the INHWE Working Group on Digital Skills and Technology in Healthcare and Education, Erasmus Medical College in Rotterdam, the Netherlands, has organised a [Thematic Network on digital skills for future-proof doctors](#) which will develop recommended learning outcomes for European medical schools. Thematic Networks fall within the framework of the EU Health Policy Platform and are intended to facilitate discussion of key health EU issues in order to provide input for EU policymaking.

Whilst education about AI is needed within healthcare institutions, specific initiatives should also be developed for patients and citizens.

Ultimately, AI tools in healthcare are patient-focused innovations that aim to improve diagnosis, treatment quality and effectiveness.

Therefore, citizens and patients need to be involved in the development of AI solutions as well as having access to educational initiatives about AI so they clearly understand the societal benefits. Not everyone

needs to become an AI expert, but awareness of what the technology is, its limitations, and the safeguards needed to protect citizens is important.

Citizens and patients need to be involved in the development of AI solutions as well as having access to educational initiatives about AI so they clearly understand the societal benefits



Case study:

Creating opportunities for citizens and patients to learn about AI

[Elements of AI](#) is a series of free online courses created by Reaktor and the University of Helsinki, Finland, to encourage a broad target audience to learn about what AI is and what it can do.



3. Regulation and policymaking

Regulation and policymaking are considered significant challenges for the implementation of AI in healthcare, although, if developed and implemented in a flexible and future-oriented manner, they can also serve to enable innovation whilst protecting individuals' rights.

Whilst the [EU Medical Device Regulation \(MDR; update expected in May 2021\)](#) and [EU IVDR \(In-vitro Diagnostic Medical Devices Regulation\)](#) in combination with the GDPR (General Data Protection Regulation) are already in place, Round Table participants in all countries considered that guidance is

needed from the EU regarding common standards, specifically focusing on development and regulation of AI and how the MDR should be applied to different AI applications. Whilst Member States do require a certain degree of flexibility for AI implementation into their healthcare systems, clear and simple directives regarding regulation are required. This ensures that the regulatory framework will not suffer from fragmentation and that innovation can be exploited across Europe for the benefit of society.

One proposal from the Round Table in Spain was for a quality certification standard for algorithms confirming that each one adheres to three basic characteristics: it should have no bias, be predictable, and be explainable.

Regulation and policymaking are considered significant challenges for the implementation of AI in healthcare

Another often mentioned line of approach is that outlined in the [Ethics Guidelines](#) from the European Commission's High Level Expert Group, which suggests seven key requirements that AI systems should meet in order to be trustworthy:

- **Human agency and oversight**
- **Technical robustness & safety**
- **Privacy and data governance**
- **Transparency**

- **Diversity, non-discrimination and fairness**
- **Societal and environmental well-being**
- **Accountability**

Evaluation based on these seven key requirements would cover the entirety of the AI lifecycle. Indeed, it has also been mentioned as one approach to create a voluntary labelling scheme across Europe in the [European Commission's White](#)

[Paper on Artificial Intelligence](#)

labels could equally be introduced and might serve to both steer competition towards trustworthy harnessing of AI and data. Standards and certification will play a crucial role in supplementing any legal framework. At the same time, the approach to achieving regulation must be consistent and the manner in which the AI systems are assessed be clear, in order to ensure that no undue barriers are created.



“We need to make sure that citizens and patients feel protected [by regulation], but that innovation and transformation isn’t stifled. ”

Farzana Rahman, Co-Chair of the 2020 EIT Health Think Tank Round Table Series

The field of AI is moving fast and, in accordance, regulatory strategies need to be agile, not only to allow more rapid implementation of AI solutions but also because AI algorithms are continually learning and evolving. Strategies will need to

be adapted so that applications can be reviewed and assessed periodically.

One approach suggested at the Round Table in France was for a 'Temporary Authorisation for Use' for AI applications that evolve over time, which could be monitored in

a similar manner to Phase IV post-marketing authorisation trials for medicines.

Another approach suggested across multiple Round Table Meetings made use of the concept of regulatory sandboxes for AI.

These would allow for a range of activities relevant to regulation and policy, such as for the testing and exploration of novel AI systems, to inform metrics and benchmarks as well as case studies, and to ensure that systems are safe prior to deployment.

Nevertheless, once deployed, AI systems should still be reviewed and retested periodically given the sensibility of the application sector. Auditability of AI systems and their development process will play a crucial role too, as well as future investigative powers for questions of liability, safety and security.

Participants at the Round Table Meeting in the Netherlands stressed there was an urgent need

for more data spaces across the EU to allow companies to gain access to data in order to test and validate AI algorithms, as well as to encourage the development of more precise and suitable AI systems. Access and use of these data would need to be curated and regulated, and users would need to be GDPR compliant.

Notably, the creation of a [European Health Data Space](#) is currently one of the priorities of the European Commission for 2019-2025 and might help address some of these challenges. The initiative is intended to promote better exchange and access to a range of health data to support healthcare delivery and research, and to inform policy. It

will be built on three fundamental pillars: a strong system of data governance and rules for data exchange, data quality, and strong infrastructure and interoperability.

At a Member State level, initiatives are also underway to create platforms that allow sharing and use of health data for research purposes.

Furthermore, Round Table participants suggested that the development of an EU-wide data donation scheme could be considered.

Overall, it will be important to cooperate and to coordinate across country borders to harness the full potential.

Case studies:

Shared data spaces for AI research and validation

The [Health Data Hub](#) in France is an example of a national data-sharing platform. It is a single platform for all citizens' health data, facilitating the use of these data for research projects, by both private and public entities.

[Health-RI](#), a non-profit foundation in the Netherlands, is currently aiming to build an integrated health data research infrastructure accessible for researchers, citizens and care providers.





4. Funding and reimbursement

In terms of funding for the development of AI tools, participants considered that investors need to develop a good understanding of AI and have knowledge of the expected financial return of a new AI application in order to decide appropriate investment.

Not every project will generate high revenue immediately, some will generate income or savings over time, but this needs to be clear from the start. It was recognised that quantifying return on investment can be difficult as the data generated by AI applications has a value in itself and should be considered in this calculation.

■■ It's important to work out what value an AI solution brings – what is the return? Does it save costs, does it make revenue? The biggest challenge in moving AI projects from proof-of-concept to pilot and through to being fully operational is establishing the project's value, and the associated investment required to launch it. ■■

Marie Wallace,
Data Strategist, IBM Watson

Cost-effectiveness of AI applications is an important consideration, and improved methods are needed for its assessment in order to determine whether the positive outcomes that data-driven technologies may bring can be balanced against the costs invested for their research and development.

Participants at the Round Table Meeting in Ireland proposed that national funding should be secured for the development of AI use cases to demonstrate their successful application.

The need for new financial models focused on outcomes-based/value-based healthcare reimbursement was universally agreed across the Round Table Meetings.

A key issue that was identified in many countries was a lack of funding within hospitals, not only for digital transformation, but also for the adoption of AI applications that are not discrete medical devices.

These types of AI solutions incur change management costs, workflow adaptations and training, and it is often difficult for hospitals to make such investments.



Case study:

Reimbursement for AI tools based on outcomes

In the US, the first cases of [reimbursement of AI tools by the Centers for Medicare & Medicaid Services](#) have been reported. Examples are an application that can diagnose a complication of diabetes that causes blindness and one that alerts a specialist when a brain scan suggests a patient has suffered a stroke.

Improved funding for AI

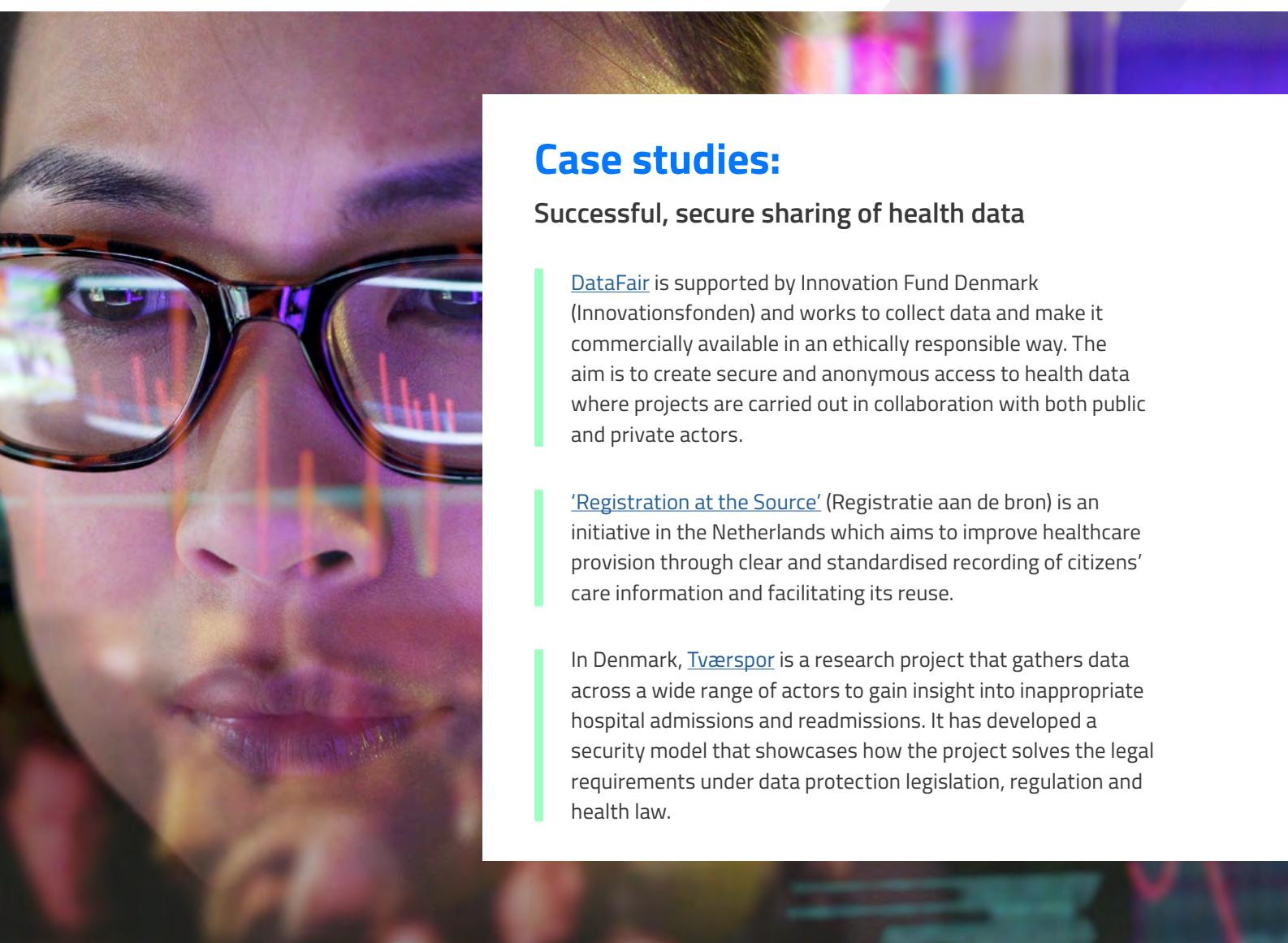
In Germany, the Hospital Future Act, passed on 20 September 2020, and the establishment of the Hospital Future Fund both offer improved opportunities for AI. Funds for digitising clinic areas became available on 1 January 2021. The federal government has promised to provide €3 billion and the federal states are to contribute a further €1.3 billion.



5. Strengthening data quality, governance, security and interoperability

Health data in many countries often exists in silos which is primarily a reflection of the personal nature of health data and the desire to maintain data privacy and security. As a result, there are often barriers to accessing health datasets to test AI applications, and the process can be slow.

The majority of the Round Table Meetings highlighted the need for greater collaboration between stakeholders involved in AI implementation to help overcome these barriers. Alternatively, it was suggested that a federated learning approach might be of value for testing in some cases.



Case studies: Successful, secure sharing of health data

[DataFair](#) is supported by Innovation Fund Denmark (Innovationsfonden) and works to collect data and make it commercially available in an ethically responsible way. The aim is to create secure and anonymous access to health data where projects are carried out in collaboration with both public and private actors.

['Registration at the Source'](#) (Registratie aan de bron) is an initiative in the Netherlands which aims to improve healthcare provision through clear and standardised recording of citizens' care information and facilitating its reuse.

In Denmark, [Tværspor](#) is a research project that gathers data across a wide range of actors to gain insight into inappropriate hospital admissions and readmissions. It has developed a security model that showcases how the project solves the legal requirements under data protection legislation, regulation and health law.

■■ In my opinion, the biggest barrier to adoption of AI in healthcare is actually the lack of electronic systems. Many are still paper-based and hospitals that are entirely electronic, are the exception. When you have a paper-based system, it's much harder to analyse the data. This can mean that people in different departments of different hospitals are working in silos. It's much more difficult to collaborate and small projects, even if successful, fail to scale up. ■■

Donal Sexton, Adjunct Assistant Professor, Clinical Medicine, Trinity College Dublin, Ireland

Round Table Participants called for EU guidance on common standards for data management, infrastructure, maintenance, storage, access, anonymisation, governance, and security. At the Round Table in Ireland it was suggested that national bodies could be created within Member States to act as guardians of citizens' health data.

Interoperability of systems and data is also considered key. However, interoperability is recognised as more than just connectivity, it should set out an agreement for the registration and coding systems to standardise data interpretation.

Round Table participants highlighted several ongoing initiatives that might be beneficial examples in this context, including

the European Commission's New [European Interoperability Framework](#) (EIF).

Similarly, it was suggested that global interoperability standards, such as those developed by [Fast Healthcare Interoperability Resources](#) (FHIR) for passing healthcare data between systems, should be encouraged and implemented.

Uniform standards for data acquisition and usage, resulting from international nomenclatures that have been introduced, such as [LOINC](#) or [Snomed CT](#), were recognised as an important prerequisite for interoperability and networking.

[EHAction](#), a joint collaboration programme between EU Member States, is developing its [Interoperability Guide](#) which is currently under consultation with expected delivery in Spring 2021. EHAction supports the [eHealth Network](#), a voluntary network that aims to ensure the progress of digital health and to bridge the gaps between the European Commission's governance strategy

and operational implementation. The Interoperability Guide is intended to assist healthcare providers when planning and procuring standards-based interoperable solutions.

It was suggested that the value of sharing and reuse of health data should be communicated to patients and citizens and data donation should be encouraged.

An example of this is the [Data Saves Lives initiative](#).

Led by the [European Patients' Forum](#) (EPF) and the [European Institute for Innovation through Health Data \(i~HD\)](#), Data Saves Lives aims to raise awareness amongst citizens and patients of the importance of health data and the benefits of responsible sharing and use.

Data Saves Lives aims to raise awareness amongst citizens and patients.



6. Liability and managing risk

Round Table participants endorsed the findings of the EIT Health and McKinsey & Company report that one of the most common questions that arises in relation to liability is: who is responsible if the algorithm prediction is wrong – the hospital, the doctor, the researcher, or the company which developed the AI tool?

AI applications in health are intended as decision support systems, so it was agreed that the ultimate decision rests with the clinician.

In addition, relating to liability and risk, there are a range of different challenges that will require different approaches. For example, those that an AI system presents because it is poorly implemented or governed (such as privacy issues) versus issues that are inherent to a more automated system (such as robustness and cybersecurity) and challenges that are inherently human, such as oversight and how to work with AI systems in order to achieve the best possible outcomes.

This highlights the complex liability issues linked to AI implementation in healthcare and the need for standardisation and agreement.

It was suggested that AI systems should be given an appropriate legal context with clear direction on whether it is obligatory to make decisions based on the information generated by AI systems that are used to support the human decision-making process. It is just as important to think about the impact of not using an algorithm as much as the impact of using it.

“A framework to work within that would protect healthcare professionals and organisations from reputational, legal and financial risk when using AI ...that would make people feel a lot more comfortable.”

Mark Kelly, Director & Chief Customer Officer, Alldus International Consulting

The need for 'explainable AI' in relation to healthcare – understanding how the AI application has reached its outcome or decision, as opposed to the 'black box' situation where the input and output from the

system or program can be seen, but there is no insight into the processes and workings in between and how the output has been arrived at – was also a subject of considerable debate in relation to liability and risk.

If AI applications are not explainable with full data transparency, then people are less likely to trust their outcomes.

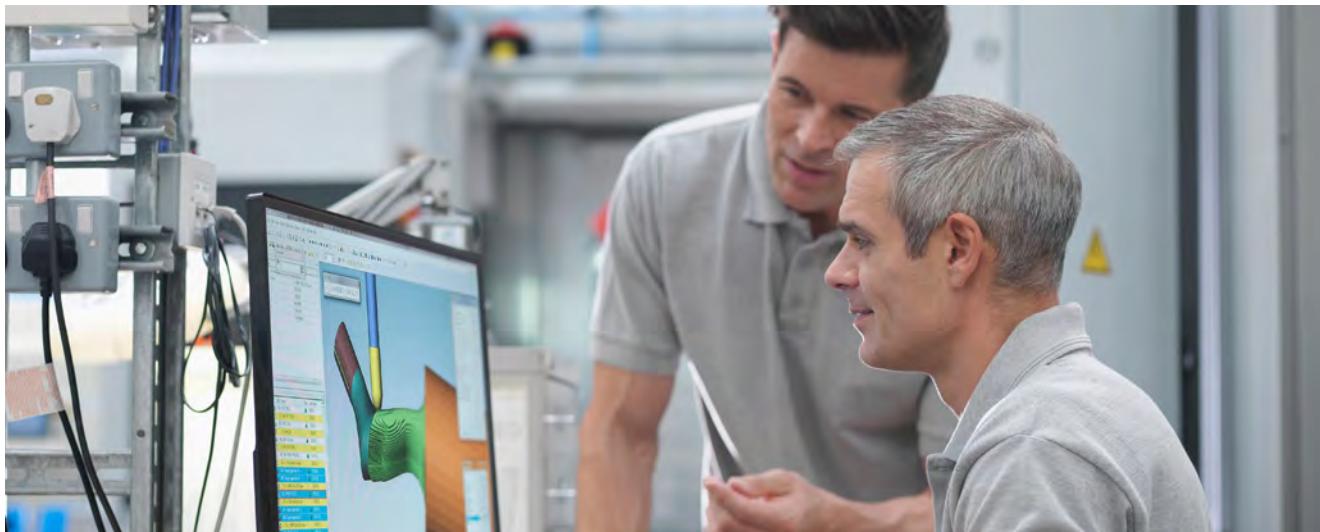
In general, Round Table participants considered that if AI applications are not explainable with full data transparency, then people are less likely to trust their outcomes. In addition, from a regulatory standpoint, AI algorithms and the data pipeline need to be auditable. At the Round Table Meeting in Spain it was suggested that safety-by-design – the integration of risk assessment methods early in the design process in order to eliminate or minimise harm – and ethics-by-design – the integration of ethics into the design process from the beginning – should be incorporated into the development of AI applications from the very beginning.

AI algorithms also need to be trustworthy. In order to support accurate clinical decision-making, the datasets that algorithms use for learning must be sufficiently large and representative of the population being tested (demographics, gender, etc.). Both Round Table Meetings in France and Germany suggested that once deployed in clinical settings, long-term monitoring of AI applications should be undertaken to enable ongoing assessment of the benefit/risk balance. Recording and tracking error states should be automated through logging and traceability concepts in order to gradually reduce possible application risks.



Priorities to be driven at a Member State level

Based on the feedback on the individual domains described above, Round Table Meeting participants considered the key Member State level priorities.



1. Improving knowledge, education and training

A greater focus on the comprehension of data science and AI is needed in certain parts of the healthcare system. In addition, there needs to be clear, accessible information about the use of data and AI, specifically tailored for patients and citizens. As part of this effort, clinical leaders need to become knowledgeable champions of AI, help communicate its benefits to support a wider understanding, and provide positive role models in what is often a hierarchical healthcare culture.

HCPs at all levels need further training regarding basic digital literacy, but also skills training in order to learn how to actually use and integrate new technologies into their working routines. Finally, a change of attitude towards innovation has to be fostered. This requires HCPs who can work alongside many different professions and roles, including those in AI-driven technologies. Action to drive this initiative lies at the Member State level (universities etc.), however EU

funding will be needed to achieve it.

The upcoming [Digital Europe programme](#) will provide a total of €700 million to support the development of advanced skills, including knowledge of AI. As part of the Coordinated Plan on Artificial Intelligence, Member States and the European Commission have agreed to work together to develop materials that can be used in awareness campaigns regarding the benefits of AI.



2. Establishing national networks

Several Round Table Meetings suggested it would be beneficial to establish national bodies or networks that would work across domains. These might be similar to, or even build upon, the existing Digital Innovation Hubs.

The objectives would be to boost the exchange of data and expertise, encourage seamless integration of clear standards, certification, innovation efforts across all Member States and provide support for regulatory bodies regarding the implementation of new rules and policies.

The objectives would be to boost the exchange of data and expertise, encourage seamless integration of clear standards, certification, [and] innovation efforts.

One such network is [CLaire](#) – the Confederation of Laboratories for Artificial Intelligence Research in Europe – which aims to strengthen European excellence in AI research and innovation across Europe, with a human-centred focus. The CLAIRE initiative intends to establish a

pan-European network of Centres of Excellence in AI, strategically located throughout Europe, with a central state-of-the art facility. The planned lighthouse initiatives of the European Commission, which bring together centres of research, innovation and expertise, may also have a role here.

3. Developing new financial models

New value-based healthcare financial models are needed within national healthcare systems to support the validation and deployment of AI driven innovations. These should be outcomes based, taking into consideration the entire patient pathway. This may require broader restructuring of payment models,

integrating both primary and secondary care. There will also need to be recognition that some AI applications are not replacements for existing processes or systems but additions. Whilst these new innovations may not necessarily generate immediate costs savings, they may provide longer-term system benefits.



Priorities to be driven at an EU level

Key priorities emerging from the Round Table Meetings that participants considered should be driven at an EU level were:



1. Building a robust data infrastructure for Europe

Participants at national Round Table Meetings expressed the urgent need to establish a secure, trustworthy and competitive cloud infrastructure in Europe that would benefit public administration, businesses and citizens.

It was recognised that there are ongoing discussions and projects within Europe that have similar objectives, which might provide opportunities for driving AI in healthcare:

- The European Commission, in collaboration with Member States, is currently undertaking preparatory work towards development of the [European Health Data Space](#), an infrastructure that will facilitate the sharing of health data for public health, treatment, research and innovation across the EU.
- [GAIA-X](#), a project being driven by representatives from the politics, business and science sectors in France and Germany, together with other European partners. This initiative aims to develop a secure, federated data infrastructure for Europe that meets the highest standards of digital sovereignty whilst still promoting innovation. Its objective is to develop an open, transparent digital ecosystem, where data and services can be made available, collated and shared in a trusted environment.



- In October 2020, the European Commission announced that all 27 EU Member States had committed to working towards developing a [secure, next-generation cloud for Europe](#) to provide interoperable, pan-EU, trustworthy data processing infrastructure and services for the public and private sectors. Such an infrastructure might be something that could support the hosting and sharing of health data across Europe.



- In September 2020, as part of the 'Digital Decade' agenda, the European Commission proposed a [new regulation for the European High-Performance Computing Joint Undertaking](#). This aims to advance Europe's leading role in supercomputing and quantum computing which will underpin the overall digital strategy, including big data analytics, AI, cloud technologies and cybersecurity. This initiative could boost scientific breakthroughs with AI in the healthcare sector.

2. Providing guidance on data management and governance

Feedback from the Round Table Meetings called for clear guidelines and common standards on data management strategies, including requests for data, data collection, infrastructure and maintenance, storage, access, anonymisation, governance, security and business

models for financial sustainability of data repositories. Whilst many such standards already exist across Europe, there is currently a lack of uptake of these tools; consequently, barriers to their adoption need to be explored.



Progress is already being made within the EU:

- The European Commission has recently adopted a Recommendation on a European Electronic Health Record (EHR) exchange format which will facilitate cross-border interoperability. This sets out a framework for further developing a format that will enable citizens to securely access their health data and for it to be shared with HCPs across borders in the EU. The recommendation will include a set of common technical specifications for the exchange of data and set out the principles that should govern this exchange, such as ensuring data protection and security, in line with GDPR and full compliance with the cybersecurity framework.



- [**EHA**ction](#), which supports the European Commission's eHealth Network, aims to facilitate the sharing of health data across borders, to improve interoperability and cybersecurity, whilst ensuring privacy and data protection requirements.
- The [**Ethics guidelines for trustworthy AI**](#) produced by the European Commission's AI HLEG along with the final [**assessment list for trustworthy Artificial Intelligence**](#) in July 2020 will help support the safe and transparent development of AI applications. The European Commission's White Paper on Artificial Intelligence has furthermore suggested that these guidelines may be used for training purposes and to establish voluntary certification schemes.
- In November 2020, as part of the 2020 European strategy for data, the European Commission proposed rules for a [**Data Governance Act**](#). This aims to improve data availability for use by increasing trust in data intermediaries and by strengthening data-sharing mechanisms across the EU. The act calls for the creation of a European Data Innovation Board (EDIB), an expert group that will ensure consistent practices in the processing of requests for data and regarding the general authorisation framework for data sharing services. The EDIB will provide support and advice to the European Commission and be composed of expert representatives of Member States as well as representatives of the different sectors and common European data spaces.



3. Providing guidance on regulation and risk assessment of AI solutions

The Round Table Meetings highlighted that guidance is needed from the EU regarding best practice in the development and regulation of AI solutions to encourage streamlined application and combat fragmentation.

Secondly, clarity is required as to how the existing MDR should be applied to the many different types of AI application. Questions

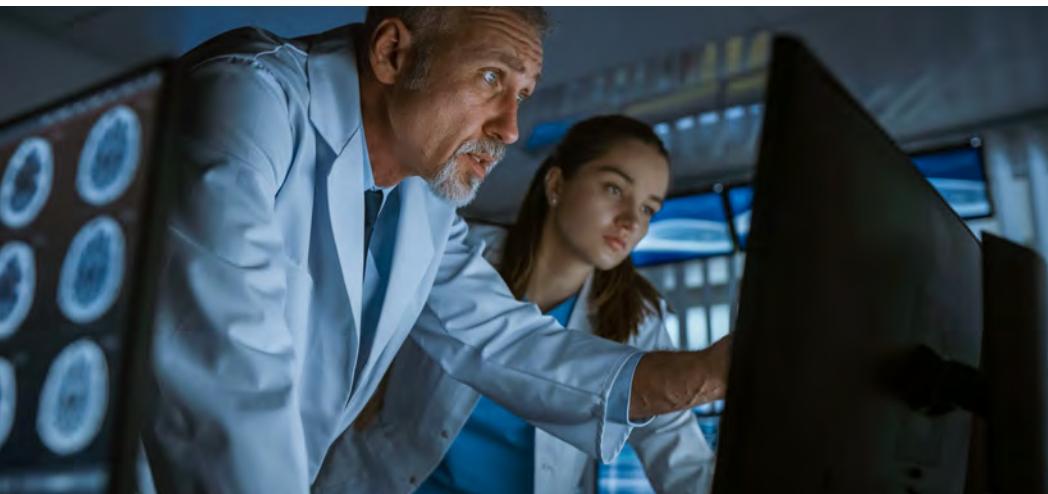
surrounding the specificities of AI surfaced in all Round Table Meetings. Regulation must make adequate an assessment about the type of AI system in question, and whether AI should be treated as a separate component. More clearly, the definition of AI from a regulatory perspective must be clarified and the distinction between any issues caused by AI or other components outlined.



The 'care versus cure' distinction that emerged from the Round Table Meeting in the Netherlands is important. Indeed, any future regulatory framework, risk assessment or policies must bear in mind whether the AI system in

question is used to directly affect a patient's life or to alleviate non-critical workload of healthcare personnel. As such, proposed measures across the EU must be coherent as well as sufficiently flexible and nuanced.

Proposed measures across the EU must be coherent as well as sufficiently flexible and nuanced.



Common European standards are required that can be adopted at Member State level.

It is clear that regulation should not hinder innovation but rather encourage it. To that end, it will likely benefit from being supplemented with standardisation and certification efforts.

Common European standards are required that can be adopted at Member State level. There are many large organisations that could be involved in these developments

and implementation, and where expertise could be harnessed, such as the International Organisation for Standardisation (ISO) and the World Wide Web Consortium (W3C). Beyond that, the European Commission has suggested that a self-certification or labelling scheme for trustworthy AI applications might be a promising incentivisation model across Europe to encourage the development of beneficial AI systems.



With regard to regulation, the European Commission is currently developing proposals for a [new legal framework](#) outlining the ethical principles and legal obligations to be followed when developing, deploying and

using AI, robotics and related technologies in the EU, including software, algorithms and data. The legislative proposal is expected to be published by the European Commission in the first quarter of 2021.

It may benefit Member States to create their own expert national bodies to drive regulation at a local level.

In all of these cases it may benefit Member States to create their own expert national bodies to drive regulation at a local level. These might equally be supplemented by expert advisory committees or groups, or more granularly by 'innovation ethics committees', supervising clinical trials in hospitals which involve AI systems.

Furthermore, a dedicated body representing multiple stakeholders and financed by the EU could support the establishment of the European Health Data Space to independently curate data, and navigate challenges and implementation across Member States.





This body could equally work on defining and clarifying the legal framework for data usage when it comes to the use of patient data for the benefit of society. As suggested at the Round Table Meeting in Ireland, this could also be a government-led body within a Member State acting as a guardian

of health data and connected to others in a network across the EU.

Multiple Round Table Meetings pointed out that Member States are already evaluating how to adapt existing bodies for the purpose of monitoring and regulating AI, and, for example,

the French data protection authority, CNIL, has already adopted standards for health sector data relating to the processing and retention of personal data, including that used for research, study, and analysis in the health sector.



Regulation, risk assessments, testing and experimentation as well as certification and standardisation efforts cannot exist within a vacuum. As previously highlighted, they must be firmly grounded within a novel infrastructure across the EU. To that end, the European Commission's White Paper on Artificial Intelligence has

suggested that the ecosystem within Europe will be supported by AI-on-Demand platforms, a public-private partnership on AI, data and robotics in the context of [Horizon Europe](#), and to facilitate the adoption of AI in healthcare, underpinned by a dedicated 'Adopt AI Programme', supporting public procurement of AI.

Moreover, testing facilities and regulatory sandboxes might be useful to establish across Europe for the initial testing and assessment of AI systems and to inform regulation and standardisation of the capabilities of AI systems on an ongoing basis. Regular monitoring of capabilities should be continued post deployment.

Conclusions

Driving acceptance and utility of AI in healthcare

The EIT Health and McKinsey & Company report identified a range of key focus areas that must be addressed at an EU level, particularly in the context of the COVID-19 pandemic, in order to maximise the potential of AI in healthcare moving forwards and to ensure effective workforce and organisational readiness.

Insights from the 2020 Think Tank Round Table Series, held across seven countries, have validated the report's findings and added greater granularity to the changes that need to be driven at an EU- or

Member State-level to ensure the necessary changes that will drive acceptance of AI and its effective integration into healthcare systems.

Overall, these actions covered the following key themes for which Round Table participants proposed a range of key stakeholder actions:

Promote coordination across Member States

Bring together diverse stakeholders across Member States, nurturing a pan-European way of thinking about the challenges ahead to leverage strengths and investments at every level (regional, national, EU).

The development of jointly-led plans on key issues where Member States require support was needed, for example:

- Identifying core AI in healthcare use cases
- Developing or strengthening shared standards, for example in interoperability, security and access, and a shared approach to governance, regulation and risk for healthcare data
- Creating a blueprint digital health and AI in healthcare strategy and a business case for investing in digital health, supporting countries in transitioning to a 'digital first' healthcare system
- Aligning on timings, deliverables and milestones for the implementation of a pan-EU 'AI in healthcare' strategy to ensure that Europe is at the forefront of innovation in digital healthcare and AI



Improve collaboration between stakeholders

The Round Tables recognised the importance of thinking and working in a holistic way and agreed that collaboration was key to success. All Round Table Meetings acknowledged the importance of engaging stakeholders across the healthcare spectrum

to ensure that AI solutions are truly valuable for patients. This could be facilitated through existing networks and the creation of new networks, such as Innovation Hubs for digital healthcare and analytics.



Invest in education and skills development

The education and training offered to HCPs needs to be revised to ensure high digital and data literacy at every level. The importance of investing in people was highlighted, with the need to develop strong clinical leadership and to provide comprehensive educational opportunities, from undergraduate training to continuing professional development.

Preparation for the integration of new occupational roles and hybrid roles into organisations will be necessary. To meet these challenges will require cooperation between healthcare institutions, schools and universities, and industry within Member States.



Patient and citizen engagement are key

To ensure the successful rollout of AI in healthcare, patient and citizen involvement is essential. Round Table participants considered that early dialogue, transparent processes, and a culture of learning and accountability would help build trust and also give patients confidence when they consider whether they should share their health data.

AI technology and digital tools in healthcare are ultimately patient-centred and optimised around patient needs. This means that citizens must be included in the development of AI applications.



Create new, agile regulatory frameworks

Regulation around AI standards and data-sharing was identified as pivotal to the development, improvement and rollout of AI. The Round Tables recognised that the strategies around regulation needed to be agile given the fast pace of change within these fields. Regulation must be sufficiently nuanced and flexible to account for this and encourage innovation. It will need to keep up with a steadily transforming sector that is intrinsically linked to people's wellbeing and quality of life.

This also applies to those developing the frameworks for governance, such as regulators and policymakers. Round Table participants believed that there could be considerable benefit derived from closer engagement between industry and academia, as well as with clinical expertise, to ensure that the competence available matches the task at hand.



Ensure a coordinated approach to developing standards and building trust

Beyond empowering knowledge across sectors, we must also ensure that there is sufficient trust for the implementation, the policies, and the risk assessments associated with those deployed AI systems in healthcare. Crucial for that are also trusted spaces for data and best practice exchange across the EU.

The need for a coordinated approach within Europe is clear; collective, complex, societal challenges such as healthcare benefit from a collective approach. This includes the need for a coordinated and clear regulatory framework, cross-border testing and experimentation

facilities, such as innovation pilots, sandboxes and many more.

Some of these are already beginning to take shape in some form at a European level, be that through the upcoming regulation of AI, the future lighthouses for AI research, or through the 'Coordinated Plan on AI', which encourages exchange and coordination between Member States. A proportionate regulatory approach alongside a strong ecosystem will ensure that the EU can remain competitive internationally whilst promoting a version of AI that adheres to the fundamental and democratic values of our society.



Focus on value-based healthcare

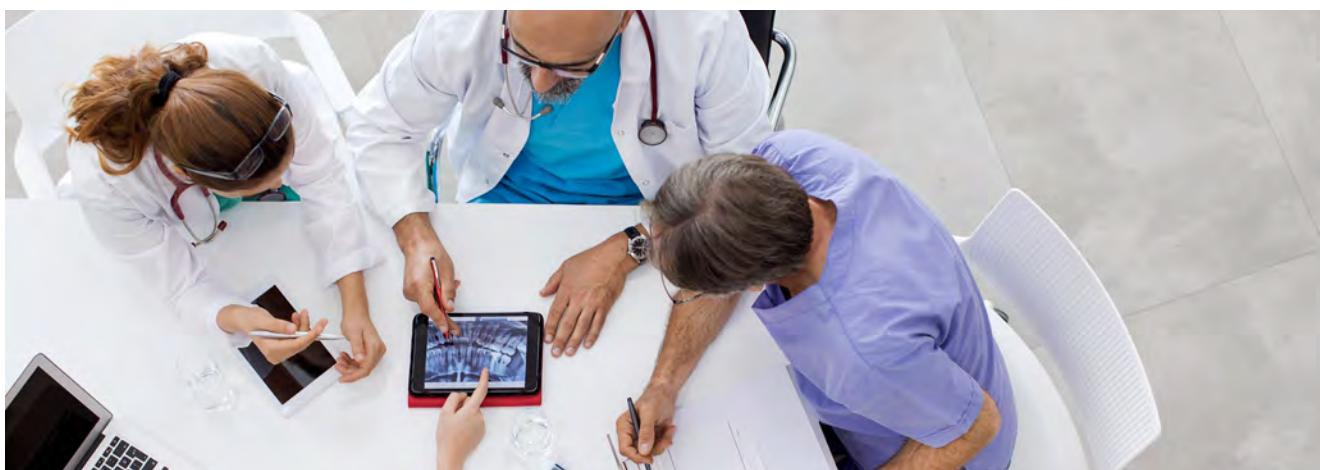
Funding and the lack of it within some hospitals was identified by the Round Tables as a significant factor that could impede the rollout of AI. It is important to recognise that return on investment can be complex,

as not every project is immediately revenue generating. The need for new financial models focused on outcomes-based/value-based healthcare reimbursement was universally agreed.

Looking forward

Continuing to raise awareness of the findings from the extensive research undertaken in the report, 'Transforming Healthcare with AI: the Impact on the Workforce and Organisations', will remain a core component of ongoing activity to drive the necessary digital transformation of healthcare in Europe.

The longer-term implications of COVID-19 on the way healthcare is received and delivered remains to be seen, but the changes evidenced since the beginning of the pandemic clearly demonstrate what is possible. It is indisputable that investment in health is a critical facet of strengthening healthcare systems in the post-pandemic era.



It is indisputable that investment in health is a critical facet of strengthening healthcare systems in the post-pandemic era.

EIT Health has the unique benefit of accessing a breadth of knowledge and expertise through its network of partners as well as interacting with a number of the relevant actors who will play a role in achieving the ambitions outlined in this document.

EIT Health is committed to shining a spotlight at the EU and Member State level, armed with a defined set of practical measures for what needs to change, how it needs to change, and who needs to be involved to make it happen. The momentum and impetus

generated by COVID-19 for the increased adoption of digital tools, re-evaluating the role of such solutions, as well efforts to facilitate the utility of data, must be maintained, the urgency underscored and the gains fully realised.



Appendices

Appendix 1: Round Table Series process for 2020

Seven Round Table Meetings were held across Europe between September and November 2020 in Denmark, France, Germany, Ireland, Poland, Spain and the Netherlands.



2020 THINK TANK CO-CHAIRS

The three 2020 Think Tank Co-Chairs – Zineb Nouns, Farzana Rahman and Charlotte Stix – provided insight into the development of the Round Table Meeting agenda, reviewed outputs from each of the national Round Table Meetings, and provided input and analysis into this summary report.

SELECTION OF ATTENDEES

Those invited to participate at each Round Table Meeting are active enablers of change within each national AI health ecosystem and were a mixture of medical and clinical practitioners, data and AI experts, HCPs and payors, regulatory and policy experts, and patient organisations. Whilst every effort was made to achieve wide representation in each Round Table, it is acknowledged that they may not provide a fully comprehensive opinion sample.

FORMAT OF ROUND TABLE MEETINGS

Due to the COVID-19 pandemic, the 2020 Round Table Series comprised a combination of online and face-to-face meetings, each facilitated by a local moderator, which may have limited attendance and hampered the usual exchange of ideas and information that happen more easily in face-to-face meetings.

OUTPUTS FROM NATIONAL ROUND TABLES

The discussions and insights from each Round Table Meeting were summarised in individual Proceedings reports (see [Appendix 4](#)) which also outlined participants' recommendations and suggested actions that need to be undertaken to support national level adoption and implementation of AI, as well as the support required at an EU level.

PAN-EUROPEAN SUMMARY REPORT

This report provides a pan-European overview of the recommendations arising from all seven Round Tables, focusing on the proposed role of the EU as well as relevant policy levers that need to be deployed to support national efforts. The opinions expressed in this report are not necessarily shared by each individual attendee of the national Round Table Meetings, the authors of the report, or the 2020 Think Tank Co-Chairs. Instead, the report aims to highlight emerging themes across all Round Tables.

SELECTION OF COUNTRIES

The seven countries that held Round Table Meetings each represent one of [EIT Health's six regional innovation hubs plus its InnoStars cluster](#).

Appendix 2: Round Table Meeting agenda

Session I

Validate the relevant barriers and enablers as indicated within the report for the successful adoption of AI at the Member State (MS)

level, whilst also identifying similarities and differences between countries.

Sessions II–IV

Identify how to improve 'on the ground' impact of AI by specifying obstacles to overcome and opportunities to maximise within these six domains:

The discussions were devised to outline a national (MS level) plan of action to accelerate and expedite AI integration, to drive workforce capability and organisational receptivity, and to determine how management of the changes

necessary to achieve these objectives can best be undertaken for each domain. Participants also evaluated the role the EU could play in encouraging greater adoption of AI in healthcare.

- Clinical leadership
- Rethinking education, skills and investment in new roles and talent
- Regulation and policymaking
- Funding and reimbursement
- Strengthening data quality, governance, security and interoperability
- Liability and managing risk

Session V:

Driving acceptance and utility of AI in healthcare

An overall summary of the meeting's findings and the actionable recommendations proposed by participants that would help bring about personnel,

infrastructural and systemic transformation and accelerate the development and deployment of suitable AI applications.

Appendix 3: Round Table Meeting participant pre-meeting survey

1

Please identify which organisation/expertise you represent:

- Patient Organisation
- Industry
- Healthcare Provider
- Academic/Researcher
- Public Investor/Payor
- Start-up
- Regulator
- Association of Healthcare Professionals
- University
- Policymaker
- Education/Training Coordinator
- Data Protection/Health Data
- Reimbursement Specialist
- Private Investor
- HIS Software Vendor
- Head of IT
- Technology Developer
- Other (please specify)

2

What is your personal experience with AI in healthcare in your organisation, or organisations you interact with? (e.g., as part of health system, innovation hub/network, as an area of discussion/interest or other)?

3

Are there any areas where you have introduced/are in the process of introducing AI? (e.g., prevention, diagnosis, care delivery, education, training, other)

4

Are there areas in which you are thinking about introducing AI in the future?

5

Would you describe the reality of both introducing and adopting AI into your national healthcare system as challenging? Can you please describe why?

6

The joint EIT Health and McKinsey & Company report, 'Transforming Healthcare with AI: the Impact on the Workforce and Organisations', launched earlier this year, looked specifically at the impact of AI on healthcare practitioners, and the implications of introducing and scaling AI for healthcare organisations and healthcare systems across Europe. The report identified, in general, six domains, where change is necessary:

- Clinical leadership
- Rethinking education, skills and investment in new roles and talent
- Strengthening data quality, governance, security and interoperability
- Regulation and policymaking
- Liability and managing risk
- Funding/reimbursement

Please order, the first being the greatest priority/needs to be tackled with urgency, the change most relevant to your national infrastructure to facilitate wider utility and adoption of AI. Please note: the important topic of ethics/ethical considerations was not specifically addressed in the joint report, but rather it reflected the efforts on this led by other EU institutions.

7

How likely is it that meaningful change can be driven in these six domains? Where possible, please provide some brief insight into why you chose this answer.

8

Of these six domains, what should be driven at the national Member State level and what should be driven at the EU level?

9

With respect to your national healthcare system and infrastructure, do you agree that these domains, as described (please refer to either the full joint report or the Round Table series project brief provided to you), are the 'right' domains?

10

How ready would you say the healthcare system in your country is for the introduction/scaling of AI in its healthcare organisations?

11

To what extent is your national healthcare system and/or relevant actors, institutions and organisations working towards adopting AI?

12

Are you aware of other countries who are adopting AI 'well'? In which areas?

13

Has the current pandemic had any effect on the adoption of AI?

14

Any other thoughts/comments?

Appendix 4: Links to national Round Table Meeting proceedings

NATIONAL ROUND TABLE MEETINGS

DATE	COUNTRY (INNOVATION HUB)
15.09.20	Poland (InnoStars)
22.09.20	Germany
01.10.20	Ireland (UK-Ireland)
05.10.20	Spain
23.10.20	Netherlands (Be-Ne)
05.11.20	Denmark (Scandinavia)
06.11.20	France

THINK TANK

Healthcare Workforce and Organisational
Transformation with AI – Enacting Change

CONTACT:

EIT Health e.V.
Mies-van-der-Rohe-Str 1C
80807 Munich
Germany

Phone: **+49.89.215.474.820**

Email: **info@eithhealth.eu**



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