Foresight For Digital Health 2030: Scenarios, Barriers, And Enablers for A Sustainable Future

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ABSTRACT: Digital health is rapidly transforming European healthcare systems, offering opportunities to improve patient outcomes, enhance service delivery, and drive innovation. However, its future is shaped by numerous uncertainties related to regulation, technological advancements, and societal acceptance. The CONNECTINGHEALTH project conducted a structured foresight exercise to explore these dynamics through a series of thematic workshops engaging key stakeholders from across the sector. Four future scenarios were developed, each reflecting different potential directions for digital health in Europe by 2030. These scenarios highlight the critical role of policy development and public empowerment in determining the pace and scope of digital health adoption. This paper presents the methodology, findings, and recommendations derived from the workshops, providing a roadmap for decision-makers aiming to navigate the evolving digital health landscape.

KEYWORDS: digital health, multi-stakeholder ecosystems, future preparedness, futures workshops, future thinking

1. INTRODUCTION

Digital health has emerged as a transformative force for the European healthcare systems, offering the potential to improve patient outcomes, enhance healthcare delivery, and drive innovation. However, the rapid pace of technological change, combined with evolving regulations and societal expectations, requires a strategic approach to guide the future of digital health. To maintain its competitive edge and maximise the value of innovation in the digital health sector, fostering a long-term and sustainable vision, Europe must proactively look for opportunities to develop and deploy digital health solutions.

The CONNECTINGHEALTH project conducted the comprehensive futures exploring exercise involving a series of workshops with key stakeholders. By engaging diverse perspectives, the project aimed to identify critical trends, challenges, and opportunities shaping the future of digital health. This paper presents the methodology, key findings, and recommendations derived from these workshops, providing a roadmap for policymakers, industry leaders, and researchers to foster a thriving digital health ecosystem in Europe.

2. LITERATURE REVIEW

Over the years, numerous organisations have published reports that offer a vision of the future of digital health. The aims of those reports are often to help guide the stakeholder through the complex uncertainties and unknowns of the future, to create a positive ground for the upcoming changes, and to advocate for a certain vision of the future. The selected reports are presented and summarised below:

- "The Future of Health Services Research" report by the National Academy of Medicine[1], which explores the potential of digital technologies to transform healthcare. The report highlights the need for transformative change in healthcare delivery to address the challenges and opportunities of the future. It emphasises the importance of health equity, precision medicine, digital health, patient-centered care, and collaboration and partnerships across stakeholders to achieve this change.
- "The Future of Health" report by PwC[2], which looks at the impact of digital technology on healthcare delivery, patient experience, and workforce transformation. As PWC reports, based on the survey findings and the engagement with clients and partners, they expect the emergence of what is called the LIFEcare system, characterised by a convergence of wellcare and

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[1] Whicher, D., Rosengren, K., Siddiqi, S., Simpson, L., editors. 2018. The Future of Health Services Research: Advancing Health Systems Research and Practice in the United States. Washington, DC: National Academy of Medicine.

[2] Future of Health. How to transform BioPharma for the upcoming LIFEcare system, 2021, PwC, strategyand.pwc.com/de/en/industries/health/future-of-health-2021.html Retrieved 15.05.2023

disease care systems. Overall, more than 75% of healthcare executives agreed that LIFEcare systems will be widespread by 2035, especially in cardiovascular and metabolic diseases, oncology and neurology.

- "The Future of Digital Health" report by Boston Consulting Group, which was published in January 2023, provides the view on the future of digital health developments that takes into account the impact of the pandemic on the industry's development, as well as the economic instability and uncertainty that the EU and the world experience. The report provides the following insights into the future:[3] In general, despite the fact of the economic uncertainty, the report brings the exciting vision of the ongoing evolution of digital health. It brings the role of the grand retailers as well as the topic of women's health to the surface.

- "Digital Health: A Framework for Healthcare Transformation" white paper by the HIMSS[4], which proposes a framework for using digital technologies to improve healthcare delivery and outcomes. The report emphasises the potential of digital health to transform healthcare delivery and improve patient outcomes, while also highlighting the need for careful planning, collaboration, and investment to realise these benefits.

- "The Future of Healthcare: 2022 Hospital Vision Study" report by Zebra Technologies[5], which looks at how digital technology can improve patient care and hospital operations. The report highlights the importance of technology in healthcare delivery, as well as the challenges that hospitals face in integrating and optimising technology solutions. It emphasises the need for hospital leaders to carefully evaluate and invest in technology solutions that will improve patient outcomes, reduce costs, and enhance the overall quality of care.

- Transforming healthcare with Artificial Intelligence (AI): The impact on the workforce and organisations, the joint report by McKinsey and the European Union's EIT Health[6] explores how AI can support improvements in care outcomes, patient experience and access to healthcare services, specifically looking at how practitioners and organisations will be affected. The report provides guidance on what needs to happen in order to realise the vision. Those elements are: (1) Collaborative work, (2), Rethinking education and skills, (3) Strengthening data quality, governance, security and interoperability, (4) Managing change, (5) Investing in new talent and creating new roles, (6) Working at scale, and (7) Regulation, policymaking and liability, and managing risk, funding. Overall, this report highlights the excitement of Europe-wide stakeholders, healthcare professionals, investors, and innovators about the impact of AI on European healthcare, and about the thoughtful approach taken across Europe to ensure this delivers ethical and trustworthy AI.

- Nordic Health 2030 Movement[7] - not a report itself but a movement focused on the Nordics and powered by the Copenhagen Institute of Futures Studies (CIFS), provides a vision of the future of 2030 with the following elements: The New Social Contract, The New Data Models, The New Business Models. This vision was elaborated as a result of a series of workshops conducted in 2019 by the CIFS.

It's important to note that those reports predominantly focus on the positive vision of the future of digital health (e.g., improving patient outcomes, improving safety, efficacy and efficiency, reducing costs, possibilities for business growth and development), neglecting threads, risks, obstacles and blockers, negative drivers and uncertainties. This is the gap that the CONNECTINGHEALTH project and its cross-sectoral, collaborative and co-creation futures workshops have aimed to fill, providing a more complete vision. By understanding the various scenarios, the stakeholders are not only able to understand that the preferred future is not granted and thus, requires commitment and effort, but also be prepared for adversities and surprising events.

3. THE CONNECTINGHEALTH PROJECT

The COVID-19 pandemic changed the world and healthcare, demonstrating the potential of new solutions (i.e., the use of digital technologies and data) and the ability of health and care systems to adopt them quickly.[8] While the crisis increased the uptake of

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[3] The Future of Digital Health, Boston Consulting Group, 2023,bcg.com/publications/2023/driving-the-future-of-digital-health Retrieved 05.05.2023

[4] Digital Health: A Framework for Healthcare Transformation, Snowdon A., HIMSS, 2020,

[5] The Future of Healthcare: 2022 Hospital Vision Study, 2022, Zebra Technologies, The Future of Healthcare: 2022 Hospital Vision Study, zebra.com/content/dam/zebra_new_ia/en-us/solutions-verticals/vertical-solutions/healthcare/white-paper/2022-hospital-vision-study-en-global.pdf Retrieved 08.05.2023

[6] Transforming healthcare with AI: The impact on the workforce and organizations, McKinsey & EIT Health, 2020, mckinsey.com/industries/healthcare/our-insights/transforming-healthcare-with-ai#/ Retrieved 15.04.2023

[7] Nordic Health 2030 Movement nordichealth2030.org/philosophy/ Retrieved 03.05.2023

[8] Baudier P, Kondrateva G, Ammi C, Chang V, Schiavone F. Digital transformation of healthcare during the COVID-19 pandemic: Patients' teleconsultation acceptance and trusting beliefs. Technovation. 2022 May 16;120:102547

digital solutions, it also highlighted disparities and disconnects in the implementation and design of available technologies across Europe and the need to further develop supporting innovation ecosystems.[9] [10]

Moreover, European nations, including those in the European Union (EU), in the United Kingdom (UK), and others, are confronted with intense global competition in the race to develop and embrace new healthcare technologies. The majority of these advancements originate from the United States of America (US) and China, posing a challenge to the European market and its citizens. Consequently, there is a pressing need for collaborative efforts, innovation, and investments that leverage the strengths of the European continent.[11]

In this context, the CONNECTINGHEALTH: Connecting the dots within digital health innovation ecosystems project (Grant agreement ID: 101070756) had an overarching goal of nurturing interconnected and inclusive innovation ecosystems throughout Europe. The aim of the project was to maximise the value of innovation in the digital health sector, fostering a long-term and sustainable vision. CONNECTINGHEALTH, a two-year preparatory action funded by Horizon Europe (co-funded by the European Union), sought out to facilitate interconnected and inclusive innovation ecosystems across Europe, focusing on maximising innovation value in the digital health sector. The project began 15 June 2022 and ended on 14 June 2024. The collaborative initiative involved four key partners in the Project Consortium: Lead Partner, ECHAlliance[12] (Ireland), and supporting partners - Scottish Enterprise (Scotand)[13], Pannon Business Network (PBN) Advanced Management (Hungary)[14], and the Seinäjoki University of Applied Sciences[15] (Finland).

The primary objective of CONNECTINGHEALTH was to encourage interconnected and inclusive innovation ecosystems throughout Europe while optimizing the value of innovation in the digital health sector, emphasising a sustainable, long-term vision. The specific objectives within the CONNECTINGHEALTH project are outlined as follows:

- Objective 1: To map the landscape of the digital health ecosystems in Europe and beyond including their stakeholders, resources, initiatives, projects and political frameworks.
- Objective 2: To explore the current and future opportunities for growth of the digital health sector, and its competitiveness.
- Objective 3: To engage a wide range of stakeholders from governments, industry, academia and society in the development of the multi-year action plan for the sustainable and thriving digital health sector in Europe.
- Objective 4: To connect and interconnect the existing regional and thematic digital health ecosystems for better cooperation, learning, exchange of best practices and wider impact.

One of the smaller tasks within the Project, which will be the focus of this paper, is focused on scenario planning – and more specifically, on the future of the digital health sector in 2030 in Europe and beyond. This specific deliverable had the objective of offering insights into "futures planning", with a specific focus on the realm of digital health. Through presenting an overview of the methodology and key findings from the CONNECTINGHEALTH Futures Workshop series, this paper aims to actively contribute to (and disseminate) a substantive discourse and the existing knowledge base concerning opportunities within the digital health industry and the potential risks confronted by diverse stakeholders during implementation. The outcome of this deliverable not only presented four distinct scenarios envisioning the future of digital health, deemed probable and plausible, but also identified a preferred scenario among them.

4. METHODOLOGY
4.1 Background for scenario "futures" planning
Scenario planning, or "future's planning" greatly shapes the future of digital health.[16] It helps anticipate challenges and opportunities, supports strategic decision-making, assists in risk mitigation, promotes enhanced collaboration while further aiding

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[9] D2.3 Paper: Lessons learned from other domains of health, CONNECTINGHEALTH 2024, https://echalliance.com/wp-content/uploads/2023/10/CONNECTINGHEALTH_D2.3-Paper-Lessons-learnt-from-other-domains-of-health.pdf

[10] COVID-19 and digitalisation, Eurofund, https://www.eurofound.europa.eu/en/covid-19-and-digitalisation

[11] The future of European competitiveness Part A | A competitiveness strategy for Europe, European Commission, September 2024

[12] https://echalliance.com/

[13] https://www.scottish-enterprise.com/

[14] https://www.pbn.hu/main.php?Lang=EN

[15] https://www.seamk.fi/en/

[16] Prioritizing scenario planning in health care How health plans and providers can plan dynamically for the future, Deloitte 2020

policy development.[17] In order to better identify areas and activities of cooperation, to improve the efficiency and performance of Europe's innovation ecosystems and to explain the potential for growth and competitiveness foreseen in the sector of digital health, the CONNECTINGHEALTH project decided to perform a futures planning exercise which included the mapping of the digital health ecosystems landscape and scenario planning that would later be complemented by further analysis of other project focus areas.

Futures planning, associated with strategic foresight, is a structured and systematic way of using ideas about the future to anticipate and better prepare for change.[18] Thanks to strategic foresight, it is possible to explore the different plausible futures that could arise, and the opportunities and challenges that could be present. Based on those ideas, it is possible to take better decisions and actions.[19] Scenarios can be used in a number of ways:

● To visualise the alternatives of the futures and identify the opportunities they hold,
● To define the preferred future that the actors should strive to achieve and the future that should be avoided
● To gather the collective understanding of the preferred future and mobilise the stakeholders to the joint action. [20]

Foresight from these scenarios can support planning and policy-making in the following main ways:

● Improved anticipation: to better anticipate changes that could emerge in the future
● Policy innovation: to reveal options for experimentation with innovative approaches
● Future-proofing: to stress-test existing or proposed strategies and policies.[21]

The key element of strategic foresight is through the use of scenario planning to look into the plausible, probable and preferable futures by the development of multiple stories or imaginary pictures of what the future could look like in order to explore and learn from them. Scenario planning helps anticipate the impact of different scenarios and identify weaknesses. When these situations or future realities are anticipated years in advance, the subsequent weaknesses can be avoided, or impacts reduced more effectively than when similar real-life problems are considered under the duress of an emergency. [22] [23] [24]

In CONNECTINGHEALTH, the scenarios have been developed in a co-creative manner during a series of "futures workshops," with engaged ecosystems and stakeholders representing public and private actors, inclusive of academia, society-at-large, government and industry. These scenarios were complemented by the analysis of the focus areas and a SWOT analysis conducted in a later phase of the project.

4.2 Connectinghealth Futures Workshop Series
As leads of the CONNECTINGHEALTH preparatory action, the project partners aimed to explore the question "A future vision for digital health: What will the future vision for digital health look like in 2030?" over the course of six months across ten thematic, interactive, multidisciplinary workshops. By sharing multi-stakeholder perspectives to brainstorm about the enablers, barriers, and uncertainties surrounding the topic overall and different themes, the project focused towards generating creative solutions to the potential challenges.

With this in mind, the European Union is on the path to the "digital decade" – a guided course with various concrete targets and objectives for 2030, which is working towards Europe's overall digital transformation. For this purpose, the solutions that are being put forward must consider people at the forefront, freedom of choice, safety and security, solidarity and inclusion, participation, and sustainability. Coinciding, that also the Regional Digital Health Action Plan for the World Health Organization (WHO) - Europe 2023-2030 was launched with the intent to support countries in "leveraging and scaling up digital transformation for better health and in aligning digital technology investment decisions with their health systems needs, while fully respecting the values of equity, solidarity and human rights" – further emphasising that the time is now for futures discussions on this matter.[25]

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[17] Schwartz P., The Art of the Long View: Planning for the Future in an Uncertain World, Doubleday 1996

[18] Cordova-Pozo K. , Rouwette E., Types of scenario planning and their effectiveness: A review of reviews, Futures, Vol 149, 2023

[19] OECD, Strategic foresight, https://www.oecd.org/strategic-foresight/

[20] Wade W., Scenario Planning: A Field Guide to the Future, Wiley 2012

[21] OECD, Strategic foresight, https://www.oecd.org/strategic-foresight/

[22] Schwartz P., The Art of the Long View: Planning for the Future in an Uncertain World, Doubleday 1996

[23] Wade W., Scenario Planning: A Field Guide to the Future, Wiley 2012

[24] Ringland R., Scenario Planning: Managing for the Future, Wiley 2006

[25] Regional digital health action plan for the WHO European Region 2023–2030 (RC72)

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The conception of the CONNECTINGHEALTH Futures Workshop series was driven by the aim of advancing the overarching project objectives through initiating discussions with a diverse array of stakeholders. These discussions centred on shaping the vision for the advancement of the digital health sector in Europe, taking into account Europe's pivotal role in enhancing the growth, competitiveness, and innovativeness of digital health companies and organisations. The series was designed to facilitate collaborative gatherings, fostering the active involvement of stakeholders from various sectors in the co-design of the multi-year action plan deliverable within the project.

The sessions were crafted to take the form of intimate small-group gatherings, accommodating no more than 15 participants per session and covering a diverse range of topics. The selection of these topics was a result of a thorough process undertaken by the project team, involving a review of digital health trends, the formulation of a novel definition for digital health, partner-wide discussions, and considerations of each partner's interests and expertise levels. The identified topics were chosen through a synthesis of these factors. Following the theme selection, facilitators were determined with a careful balance between partner responsibilities and scheduling availability. The ultimate themes decided upon were:

- Digital Therapeutics & Digital Pharma
- Telehealth & Remote Patient Monitoring
- Virtual Clinical Trials
- Digital Health Softwares & Platform Solutions
- Reimbursements & Financial Mechanisms
- Digital Health Governance and Regulation
- Digital Health Workforce
- Digital Health Data

The initial methodology for the thematic workshops can be seen below:

Workshop: hands-on phase
1. Ideation (50 minutes)
   - Analysis of critique phase (10 minutes)
   - Brainwriting (10 minutes)
   - Analysis and elaboration of the initial mini scenarios (30 minutes)
2. Break (10 minutes)
3. Implementation (30 minutes)
   - Evaluate the registered mini scenarios
   - Formulate in concrete terms & choose the best mini scenarios (max. 2 per topic)

Prior to the workshops, registered participants received questions to complete in an online questionnaire on GoogleForms connected with their session enrollment. Preparatory steps were taken to feed the critique phase of the workshops with the following guiding questions:
1. What are the barriers/enablers encountered by (selected digital health issue) today?
2. What are the uncertainties (facilitating or hindering) that may occur in the future?

The facilitators expanded upon the critical ideas gathered earlier before the workshop, thoroughly analysing and categorising them. The aim of this phase was to develop a comprehensive understanding of various digital health topics and the challenges or facilitators associated with each.

At the outset of the session, a broad introduction to the workshop's focal topic was presented. Subsequently, participants were briefed on the key points identified during the critique phase, derived from the earlier collection of ideas. Following this, all participants had the opportunity to contribute their own thoughts, engage in comparisons and contrasts, and provide further elaboration on the discussed concepts.

Additionally, the sessions included an implementation segment. Initially proposed as a 50-minute duration (with some adjustments based on trial and error and continuous feedback from project partners), the ideation segment kicked off with a guiding question: "What could the (digital health topic of focus for the workshop) look like without any constraints, abundant resources, and no restrictive laws?" In the initial 10 minutes of this phase, participants were briefed on the key points raised during the critique. Subsequently, participants were granted 10 minutes to visually depict an exaggerated portrayal of future possibilities using a brainwriting technique. During this time, they were encouraged to propose solutions without being hindered by restrictions, traditions, or other barriers, promoting the exploration of unconventional ideas. After completing this exercise, each breakout room reconvened to share their innovative ideas.

Following this, the second phase unfolded with the resumption of breakout sessions, granting participants a 30-minute timeframe to refine the most promising ideas from the preceding phase into two preliminary scenarios. These scenarios were expected to distil down to a plausible and achievable essence. One scenario envisioned a positive outlook for digital health in 2030, assuming optimal conditions, while the other depicted a negative scenario, contemplating potential challenges and unfavourable outcomes. Ideas were prioritised through a collective analysis and evaluation process.

4.3 Workshop Planning and Preparations

Initiating the process, the development of the workshop series slide deck, considering the overall visual identity, was undertaken by members of the ECHA team. Additionally, promotional materials for the series were created by ECHA partners, and distinct visual templates were generated for each workshop within the series.

ECHA established a Google Form for gathering participant registration details, continuously monitoring it to facilitate an ongoing invitation process throughout the workshop series. One week before each workshop, Google Calendar invites were dispatched to registered participants, accompanied by a reminder email.

A guide for organisers and facilitators of the CONNECTINGHEALTH Futures Workshops was created and distributed as part of the preparatory materials (refer to annex 1). This guide was designed to assist facilitators in comprehending the session's content, ensuring an optimal flow, and providing guidance on the types of questions to pose to encourage active participant engagement. In anticipation of each workshop, ECHA team members would contact the designated speaker(s) to verify that all necessary arrangements had been addressed and presentation materials were ready. In the majority of cases, a pre-session call was scheduled to guide through the upcoming session, conduct technology tests, and ensure seamless coordination among all project members involved in facilitating the session. This was particularly crucial for virtual sessions, where four or more project members were often enlisted to support session facilitation, each assigned specific roles and responsibilities.

- Opening the call on the Zoom platform
- Recording the session
- Hosting the session
- Monitoring the waiting room for participants to accept into the call
- Monitoring the chat box for incoming queries or tech support needs
- Taking notes
- Creating breakout groups
- Leading breakout sessions

Furthermore, in the days preceding each session, ECHA team members would examine the Google registration forms to compile and share the relevant responses from interactive questions with the workshop facilitators. This information was then integrated into their slide decks to enhance and guide discussions. These activities were conducted in tandem with the continuous promotional efforts for the upcoming workshops.

The workshops were well received amongst the involved participants and turnout numbers ranged from 4 through 174 – averaging in the 20s. The participants and organisations represented within the workshops included a variety of sectors such as: health and social care providers or professionals, digital health companies, policy makers, payors digital health (investors, health insurances, and others), and the third sector (digital health associations, organisations and charities). In conducting an overview of the participant representations from a variety of sectors, it was found that the third-sector (digital health associations, organisations, and non-for-profit), education and research groups were most greatly represented, and the policy-makers group and payors digital health groups (including investors, health insurances, etc.) were the least represented.

4.4 Data Collection and Feedback

By highlighting a plethora of different topics within the CONNECTINGHEALTH workshops such as digital health skills, personalised nutrition, reimbursements and financial mechanisms, virtual clinical trials, and more, project partners were able to gather key insight into the matter to not only acknowledge the considerations of the EU and WHO frameworks previously mentioned, but to also prompt effective next steps for what needs to be done to manifest the desired future scenario

Throughout the duration of the futures workshop series, the project team collected meaningful data through the pre-workshop questionnaires and also during the productive group discussions. The cumulation of the findings can be seen below in the tables highlighting the identified barriers, enablers, uncertainties of each of the selected digital health topics focused on in the sessions, in addition to showcasing elements of both positive and negative scenarios, as perceived by the registrants and participants. This feedback directly fed into the final scenarios for digital health and will be the guiding force for further implementation and planning in the next steps of the CONNECTINGHEALTH project.

After each workshop, facilitators completed a standardised reporting tool developed collaboratively by project partners under ECHA's lead (see annex 2). Reports were shared and stored in the project Google Drive for future reference. The tool gathered key information such as date, type (virtual or in-person), organiser, participant count, special guests, and sector representation. Registrants also provided insights on the session's digital health topic, contributing to data for presentation slides and discussion. This included results from the Preparation Phase (barriers/enablers) and Critique Phase (avoidable/unavoidable challenges). During workshops, additional feedback and insights from breakout sessions, especially from the Ideation Phase exploring ideal digital health scenarios, were captured and integrated into the final report.

In addition to the session conclusions, recommendations and final comments, the most impactful component of the sessions from both a reporting standpoint and real-world application were the "ideal scenarios." The ideal scenarios emerged in hopes of transforming the most promising ideas for the future from the session into real world, applicable examples, which can be found in the next section of this report.

5. FINDINGS
When bringing together the results of the completed workshops, barriers towards a pro digital-health future included:
- Low digital literacy
- Lack of trust
- Concerns about data safety
- Poor data quality
- Conservative mindsets
- Lack of standards
- Limited resources
- Fragmented policy and implementation frameworks
- Lack of collaboration

On the contrary, the enablers of a future reality which successfully implements and integrates digital health that were most regularly identified included:
- Electronic health records
- Cost reductions
- Promise of health equity
- New insurance models
- Improving technology
- Increased public interest
- Increased use of digital health solutions
- Opportunity for engagement of the various demographics
- Digital health policies

These enablers and barriers are very much inline with the literature, and continue to showcase the importance of co-creation in health services. The future of digital health requires collaboration amongst all elements of the healthcare ecosystem, including: healthcare professionals, health systems, the patient, the insurers, the regulators, the payers, and the pharma industry.

Bringing these together, under the leadership of ECHA, the development of four scenarios for digital health in 2030 was completed. Task leads plotted around the two critical uncertainties: development of digital health policies (low-high) and people's empowerment (low-high), as seen on the image below:

Each of the scenario can be described shortly as follows:
- **Digital health is health** – Empowered and informed healthcare professionals, supporting staff and citizens who embrace new systems which address reimbursement and financial mechanisms. They also have adequate training to implement efficiently and effectively the digital solutions based on data and AI in their daily practice. Digital health helps cut the costs of healthcare and direct the limited resources in the most optimal way. The access to healthcare services has raised thanks to the availability of telehealth in remote areas, interpretation services and other solutions that help eg. visually impaired people to access health information and instructions. Digital health is not threatened as something special, but one of the ways to deliver health services.
- **It's a limbo** – There are shared standards, some good practices and advanced investments in digital health (technologies, training, implementation) but the update remains low due to the scepticism and lack of understanding of the added value of digital among people, who still prefer a face-to-face interaction with the healthcare professionals. This is mainly due to the insufficient training, education and information - people remain untrustful towards the technology and alienated from the innovations.
- **The black hole** – Technology giants have a much bigger control on the health sector compared to the current state, having an effect also on the financial mechanisms. People use digital services like applications but with a little understanding of how they

influence their health and what happens with their data. The policies that were supposed to create a better environment for digital health and health data exchange failed on the European level, and the national governments don't have power, resources and competences to implement them on their own. The gap is filled in by the private sector that "Americanise" the healthcare sector even further.

- **The status quo?** – People love digital solutions for health and wellbeing and for how efficient and effective they can be. However, due to the limited regional and national uptake, the use remains fragmented and on a case-by-case basis. Despite best efforts, The policies that were supposed to create a better environment for digital health and health data exchange failed on the European level and the fragmentation continues.
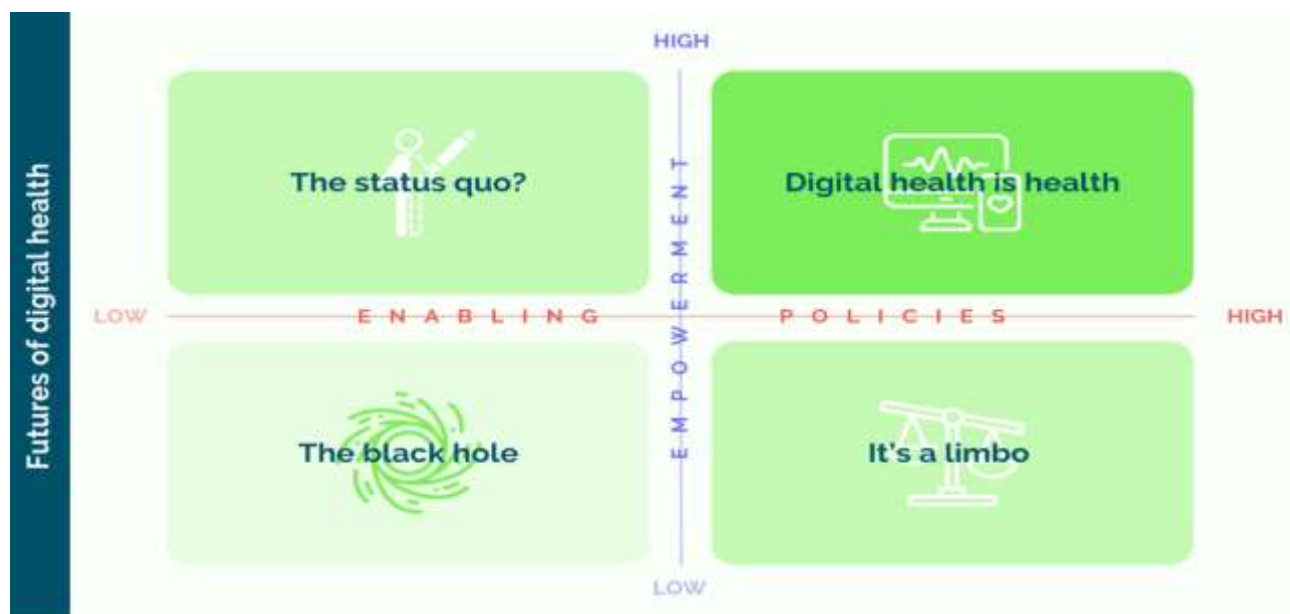

Figure 1: CONNECTINGHEALTH four scenarios for digital health in 2030

6. LESSONS LEARNED

The CONNECTINGHEALTH project's scenario planning exercise provided a valuable opportunity to explore potential futures for digital health in Europe. Through a series of workshops and collaborative efforts, we gained valuable insights into the key trends, challenges, and opportunities shaping the future of this dynamic sector, crucial for the competitiveness and innovativeness of Europe.

In this section, we will present the key lessons learned from this experience, divided into three categories:

1. Methodology: Insights into the approach used for scenario planning.
2. Stakeholder engagement: Lessons learned from involving diverse stakeholders in the process of scenario planning,
3. Results and insights: Key takeaways from the analysis of the developed scenarios.

Regarding the methodology, the fact that the workshops focused on exploring the different futures in a collaborative manner with the stakeholders coming from academia, industry, government and society sectors, and from different countries, sparked interest and creativity. Many participants admitted that this was their first experience with scenario planning and the fact that we approached the future from the perspective of plausible, possible and preferred and found it thought-provoking and inspiring. This means that bringing new methods and diverse groups of stakeholders can open new horizons for learning and exchange.

Regarding stakeholder engagement, we must admit that engaging a diverse group of stakeholders was challenging, particularly those from the government and industry representatives. This might be due to the limited time and resources and the understanding of their role in the participatory process of scenario planning. To overcome this challenge, it is essential to effectively promote the workshops, provide clear and concise information about the benefits of participation, and create an engaging environment. In practical terms this means e.g., shortening the duration of the workshop to 1 hour and providing careful moderation that help guide the discussions and build the bridge between the stakeholders coming from different sectors.

Regarding the results and insights, the development of the four scenarios highlighted the important role of policy and public trust in shaping the future of digital health. The "Digital health is health" scenario, where policies support innovation, data privacy, and equitable access, underscores the importance of a strong regulatory framework. On the other hand, the "Black hole" scenario emphasises the risks of a fragmented regulatory landscape and a lack of public trust in digital health technologies. These findings highlight the need for policymakers to create a supportive environment that encourages innovation while protecting patient privacy

and ensuring equitable access to digital health services. They were instrumental for the development of the CONNECTINGHEALTH Policy recommendations.[26]

7. RECOMMENDATIONS

In defining strategies and actions regarding the implementation of futures planning in the context of digital health, a handful of considerations should be taken into account. Some clear steps to put the findings of futures planning of this CONNECTINGHEALTH activity into practice within the realm of digital health can be seen below:

1. Stay aware and updated on industry trends within digital health – which includes new technologies, regulations, consumer demands in different geographical contexts, in order to seek industry gaps, opportunities, challenges, etc.
2. Continue to identify emerging technologies with potential impact and application within the digital health domain – such as AI, machine learning, virtual realty (VR), etc., in order to better understand how they may assist or enhance achieving specific digital health solutions.
3. Conduct additional market research with the findings of the workshop series as the crux of the discussion to further understand specific market segments and associated needs, and to continue to identify and define gaps, barriers and opportunities for innovation in digital health. This is especially important from a multisectorial, multi stakeholder approach for gathering the most holistic and relevant information to apply.
4. As a project, aim to define strategic objectives in the next phase of work based on the key insights achieved by the futures planning workshops which focus on a specific digital health initiative that addresses current and future trends, anticipated needs, etc.
5. Create a roadmap action plan for approaching the above strategic objectives paired with relevant activities and realistic timelines (considering SMART goals throughout).

Additionally, these findings could help with forecasting future health or digital health trends, and assist with overall risk mitigation and adaptability. Beyond these steps for moving towards implementation, it is important for the project to act as a "thought leader" in continuing to spread the message of collaboration amongst its diverse, multidisciplinary followership. By continuing to lead a dialogue about the importance of cross-sectoral collaboration in digital health amongst a variety of stakeholders (i.e., healthcare providers, technology vendors, regulatory videos, patient advocacy groups, etc.), CONNECTINGHEALTH can strive to accelerate progression at a systemic level which will further aid in leveraging implementation efforts effectively. Moreover, to accommodate all-of-society digital health transformations, flexible infrastructures must be built. Because digital health is evolving so rapidly, flexible and scalable infrastructures must be considered in order to address the needs of emphasising interoperability, data standards, and ensuring compatibility and compliance with emerging technologies, systems (and needs).

8. CONCLUSION

Reiterating the overarching objectives of CONNECTINGHEALTH, it is evident that the actions taken in the futures scenario's workshops have been targeted, meaningful and effective.

Futures workshops have been recognised as being an effective tool in driving digital health innovation, and workshops such as these within the CONNECTINGHEALTH programming are designed to explore potential future scenarios and facilitate creative thinking around emerging technologies, trends, and user needs. By bringing together a diverse group of stakeholders, such as healthcare professionals, researchers, technologists, and patients, futures workshops can foster collaboration and generate valuable insights and ideas in order to pre-emptively plan, pivot quicker, and ultimately improve outcomes.

Although insightful, the work conducted and the results found in this aspect of the CONNECTINGHEALTH project are only just a starting point, and more research and multidisciplinary, cross-sectoral action must be taken. As such, collectively, the CONNECTINGHEALTH partners hope to continue addressing the gaps and taking actionable steps forward in the upcoming phase of the project to develop the meaningful multi-year action plan that will inform the European Commission, partners, businesses and other stakeholders about the next steps in developing the digital health in Europe and beyond.

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[26] Freiheit R, Mackiewicz K (ed), Fostering Innovation in the Digital Health Sector: Policy Recommendations for the EU, CONNECTINGHEALTH 2024, https://echalliance.com/wp-content/uploads/2024/06/Connectinghealth-Policy-Recommendations-for-the-EU-1.pdf

gather in order to work towards a future with a desirable vision of (digital) health made into a reality. CONNECTINGHEALTH project was co-financed by the European Union under the Grant Agreement 101070756.

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