

POLICY BRIEF 2025_02

Digital Health as Innovation in the Baltic Sea Region

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KEY MESSAGES

- ▶ Digital health has the potential to improve health and healthcare, particularly in peripheral regions, by making services available in remote areas that are concentrated in urban centres.
- ▶ The speed and depth with which digital health innovations are adopted and used varies between and within countries, depending on factors such as time preference, risk aversion, federalism, and how data protection regulations are interpreted.
- ▶ The adoption of digital health does not happen automatically; it requires political commitment to overcome barriers and reap the benefits of improved effectiveness and efficiency in the healthcare sector.

Background

Digital health is a powerful strategy for improving the effectiveness and efficiency of healthcare services. However, the degree of implementation and use can vary significantly across different contexts, organizations or regions, leading to different levels of success and impact. For example, countries in the Baltic Sea Region show wide variations in the penetration of digital health into healthcare processes. In order to harness the power of digital health in a country, it is worth analyzing these differences and identifying the success factors and barriers that prevent digital health from reaching its full potential.

Digital health is the deployment of information and communication technologies in the healthcare sector [1] with the aim of improving healthcare as a whole (prevention, diagnosis, treatment, management, etc.) [2, 3]. The dissolution of the unity of place and action is a central element of digital healthcare [4]. This can improve patient care by extending it to locations outside the service provider (e.g. hospital, doctor's office). This can also reduce the costs of traditional healthcare, for example by reducing travel expenses and concentrating scarce human and material resources where they are most effective [5]. This can lead to an increase in the efficiency of care [6, 7].

The technology and concepts can be easily imported into any country, so that one would expect digital health to have spread to all countries, at least within the European Union or the Baltic Sea

Region to a similar extent. However, this is not the case. In 2018, the Bertelsmann Foundation [8] published a Digital Health Index (DHI) for 13 selected OECD countries, which includes different dimensions of digital health, i. e. infrastructure (e. g. nationwide patient identification number, technical data infrastructure), legal framework (e. g. data protection regulation, data security), institutionalization (e. g. national digital health organization, standards, financing) and specific applications (e. g. digital patient records, e prescription, video consultations, health information, health research) for 13 selected OECD-countries. Of the Baltic Sea countries in the Bertelsmann sample, Poland (DHI 28.52) and Germany (30.02) had the lowest scores, Estonia (81.92) and Denmark (72.47) had the highest. These differences call for a thorough analysis of the causes and strategies to overcome the barriers of rapid and smooth diffusion of the digital health innovation.

Digital Divide

The following analysis is an essential element of the research consortium "Fragmented Transformations" within the Interdisciplinary Centre for Baltic Sea Region Research (IFZO) at the University of Greifswald. As a first step, the factors that determine the diffusion and penetration of digital health in the Baltic Sea Region were analyzed at an international and interdisciplinary workshop as part of a DFG-funded symposium on "Think Rural in the Baltic Sea Region" at the University of Greifswald on 23-25 March 2023. The workshop was attended by health researchers from all countries in the Baltic Sea Region (including Norway) except Russia. In a second step, we conducted and analyzed 15 indepth interviews with experts from all countries in the Baltic Sea Region.

The workshop participants and interviewees underline the digital divide between the countries of the Baltic Sea Region. In general, the Scandinavian countries are more advanced and have a deeper penetration [9]. However, the champion is Estonia with a long and deep tradition of digital health in almost all dimensions. Furthermore, several respondents see a rural-urban divide, with much higher penetration in urban areas, although it is generally felt that digital health is (even more) beneficial to rural areas.

This urban-rural divide is closely linked to a regional divide in several countries. Many respondents said that digital health is used differently in different states, provinces or regions. This is partly due to political differences. The more independent these political units are, the more likely it is that there will be differences in the uptake of digital health across these states, regions or provinces.

Workshop participants and interviewees indicated that in some countries, digital health has been an initiative for 2025 years. For these 'early knowers', digital health is now a standard, while others are lagging behind. A soft form of infrastructure is the knowledge and ability of the population to use digital services, but there are large differences between and within countries.

Figure 1 shows the barriers discussed by respondents. It is clear that poor digital infrastructure and high investment and recurrent costs are barriers to the implementation and uptake of digital health in a country. However, participants and respondents focused more on the culture of a country. Individuals, groups and nations differ in their time preference, i.e. short-term thinking, funding and planning will lead to a reduced speed of implementation of digital health, as digital health cannot be implemented in a short-term project, but requires a long-term commitment at all levels. The more future-oriented an individual or culture is, the more likely it is to develop a propensity for innovation and change.

Risk aversion is another cultural dimension that can be a barrier to the adoption of digital health. Changing an existing and working system to a new and unfamiliar one carries risks. The less people appreciate risk, the less likely they are to support digital health innovation.

Some respondents also said that digital health involves a power game between different levels of government. The more people insist on their power, the less they will delegate and the less they will value digital health that empowers local providers and patients. Power distance, risk aversion and time preference inhibit the propensity of an individual, group or culture to promote digital health.

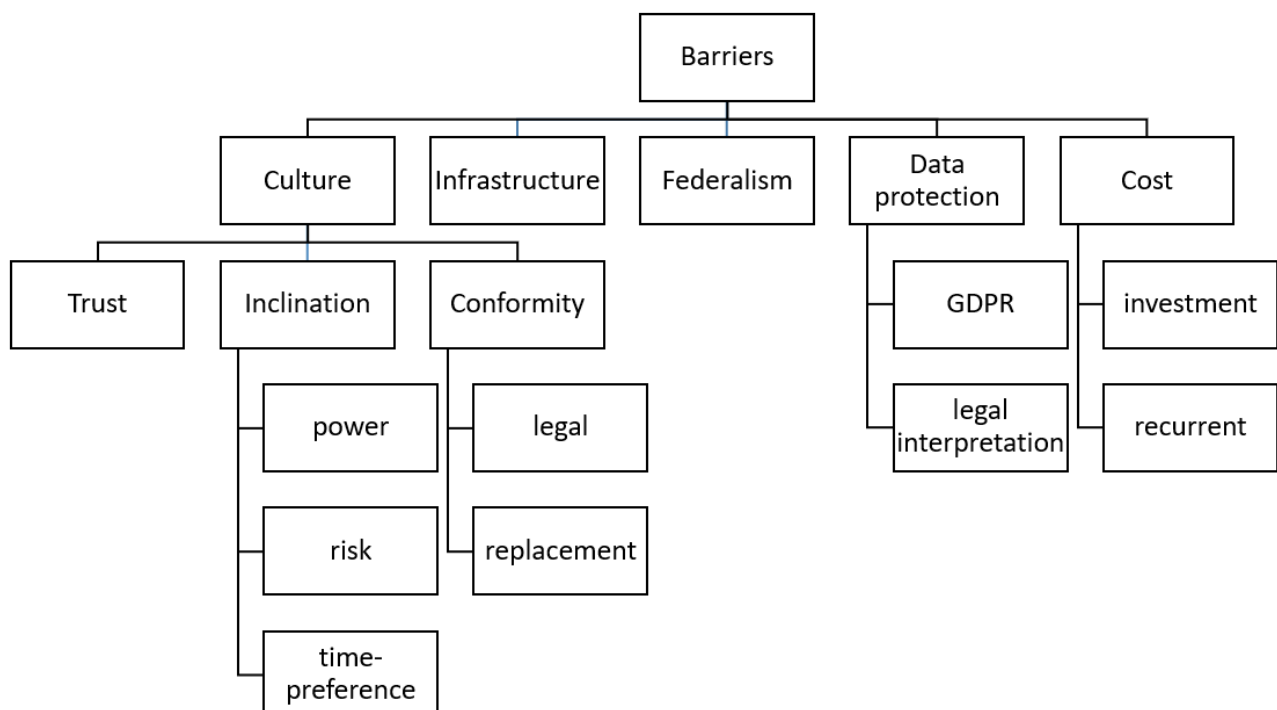


Figure 1 Barriers of Digital Health Innovation. Source: own.

Another cultural dimension is conformity, i.e., the "the tendency for an individual to align their attitudes, beliefs, and behaviors with those of the people around them" [10]. Legal conformity means that people tend to follow laws and regulations. Conformity can also mean that people want to be consistent with the past and not make major changes to processes or traditions. "We do what we have always done" is a major barrier to innovation.

Adopting digital health as a new technology also requires trust in healthcare providers, IT services, government and life in general. The less trust people have in institutions, the less likely they are to entrust their data to anonymous processes such as the internet. Countries are trying to increase trust in digital health by building strong institutions (e.g. e-services and innovation department, Estonia 2014) [11, 12]). The General Data Protection Regulation (GDPR) can be seen as a tool to build trust that all data will be professionally protected. At the same time, several interviewees see the regulation as an obstacle, because the strict data protection rules make the transfer and use of data for medical decisions and research very cumbersome. Others argue that the same GDPR is interpreted very differently in different countries. It is mandatory for all EU member states, as well as Norway as a member of the European Free Trade Association (EFTA), but its application depends heavily on national interpretation. In some cases, the GDPR is seen as a driver of trust and therefore innovation, while in other countries it is more of an obstacle to the spread of digital health.

Finally, federalism is seen by some respondents as a barrier to innovation. Smaller countries, such as Estonia, do not have very independent states, while larger countries, such as Germany, are divided into states that act quite independently. In more centralized countries, digital health innovation can be implemented from the top down across the country, but in a federal system, the successful implementation of digital health in one state does not guarantee that other states will follow. In this way, federalism can become a barrier to digital health innovation.

Digital Health as Innovation

Digital health can be considered an innovation [13]. The new technologies and processes are available to all countries, but their adoption depends on a number of variables (see Figure 2) that also account for the wide variation between countries. The experts stress that financial resources or population size are not the determining factors. Instead, risk aversion, future orientation and willingness to change are much more important. Some respondents emphasize that trust is an important determinant of perceptions of digital health. The role of trust in the willingness to accept change has been much discussed in the literature, in particular the right mix of trust and control [14, 15]. Adoption of the digital health innovation is not possible without confidence that the data will be confidential and properly protected.

While individuals cannot assess this protection themselves, trust in government and its Digital health can be considered an innovation [13]. The new technologies and processes are available to all countries, but their adoption depends on a number of variables (see Figure 2) that also account for the wide variation between countries. The experts stress that financial resources or population size are not the determining factors. Instead, risk aversion, future orientation and willingness to change are much more important. Some respondents emphasize that trust is an important determinant of perceptions of digital health. The role of trust in the willingness to accept change has been much discussed in the literature, in particular the right mix of trust and control [14, 15].

Adoption of the digital health innovation is not possible without confidence that the data will be confidential and properly protected. While individuals cannot assess this protection themselves, trust in government and its However, even these cultural factors alone cannot explain the differences, which require further analysis. Respondents highlighted the role of data protection legislation and its implementation. This aspect is also discussed by Sliwa et al. for the uptake of e-health in Germany, Austria and Denmark. They identify complexity and documentation requirements as major barriers (Austria, Germany) and practical government regulations as promoters (Denmark) of e health [16]. Respondents to this survey also identified administrative barriers, but not necessarily the most important ones. Instead, they emphasize the role of data protection regulation and implementation. There is still relatively little literature on the role of data protection laws and individuals' willingness to share data in digital records as a barrier to digital health. The respondents strongly emphasize that this may be a key to understanding why digital health varies so much. In summary, the model shown in Figure 2 can help to understand the adoption of health innovations [17]. It also allows the identification of barriers and their impact on the adoption process, and the appropriate placement of available tools to overcome them.

At the center of the adoption process, however, is the promoter. Their propensity to innovate in general, their assessment of the need for change (based on the functionality of the existing standard), and their ability to manage complex change processes will determine whether digital health is adopted quickly or at turtle speed. If potential adopters are forward-looking and willing to take risks, they are more likely to embrace innovation. In addition, management style influences the propensity to innovate. The more rigid, hierarchical and dominant a management style is, the less likely it is that innovations will be developed and adopted [18, 19, 20]. For example, countries with very conservative leadership styles are less likely to adopt digital health innovations.

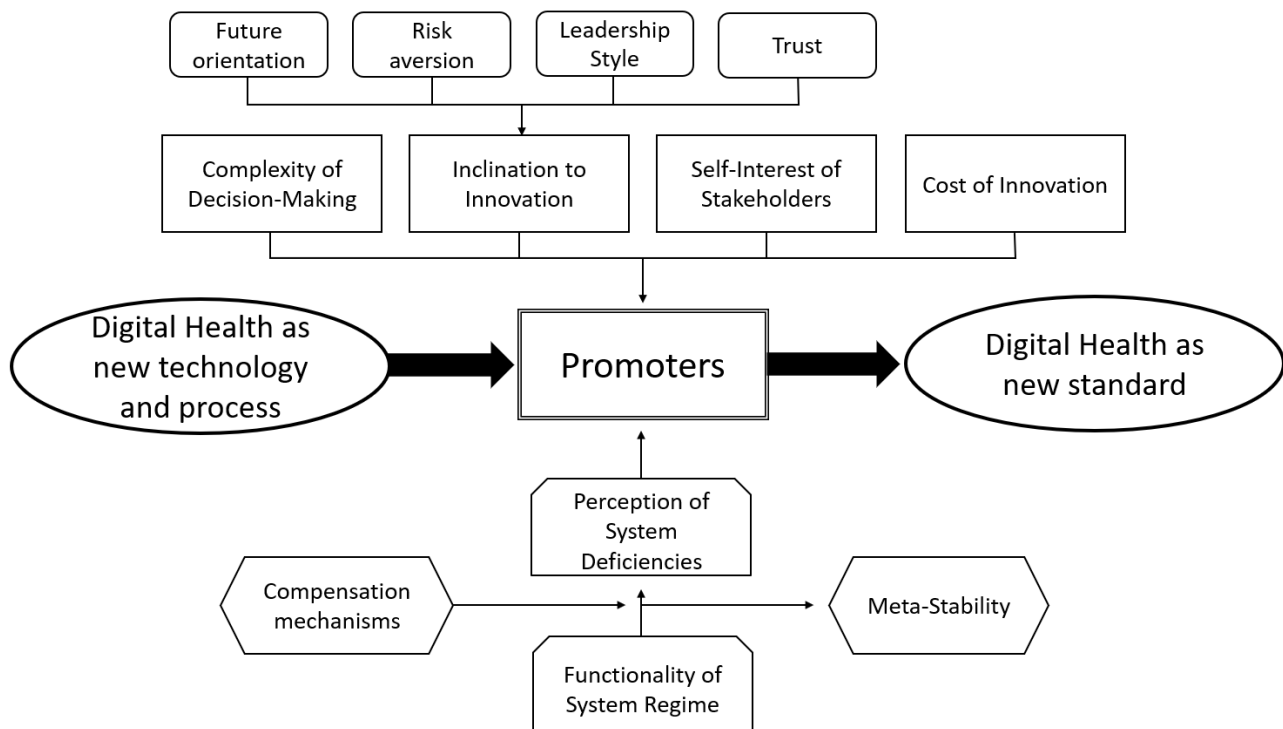


Figure 2 Model of Adoption of Healthcare Innovations [17]

Conclusion

Based on these findings, we can conclude that the adoption of digital health is not automatic. It requires committed political decisions to overcome the barriers and reap the benefits of improved effectiveness and efficiency in the healthcare sector. The example of Estonia teaches us that we need leaders or champions who make digital health "their child" - who fight for it, keep it on the agenda and believe in it even when there are setbacks. The implementation of digital health depends less on economic conditions than on the commitment of policymakers to make it happen. There is no doubt that future developments, in particular artificial intelligence in healthcare, will require even deeper penetration of digital health. There is an urgent need to overcome the barriers to digital health in some countries (e.g. Germany). Otherwise, they will fall further behind.

Policy Recommendations

1. Innovations in digital health are readily available throughout the Baltic Sea Region, but their uptake varies considerably. This requires political will to learn from other countries or regions, overcome barriers, and strengthen digital health promoters.
2. The rapid implementation of digital health requires champions who are dedicated to equitable and efficient healthcare, particularly in peripheral regions and among deprived sub-populations, and who overcome the barriers of not knowing and not wanting.

3. We are on the threshold of a new era of digital health based on artificial intelligence, which has the potential to transform many paradigms of healthcare provision. Policymakers should think big and adopt innovations rapidly to make the best use of them.

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The Interdisciplinary Centre for Baltic Sea Region Research (IFZO) at the University of Greifswald studies cooperation and conflict in the Baltic Sea Region, focusing on key societal, political and economic questions of our time. Across its research projects, IFZO seeks shared solutions in the fields of ecology, innovation, energy and security.

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