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DOCTOR AT HOME: FACTORS AFFECTING ADOPTION AND IMPLEMENTATION OF VIRTUAL VISITS IN FAMILY DOCTORS' PRACTICES IN LATVIA

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Date

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Abstract

Video consultations in health care have promising benefits, enabled by the evolution of telecommunications technology, but their use remains highly limited. In this study, we set out to understand what factors affect the intention and readiness to use virtual visits among general practitioners and patients in Latvia and exactly how and why they are important. The results give actionable insights for shaping the future of telemedicine in Latvia. Basing our questions on a modified version of the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model verified in interviews with telemedicine experts, we interview 16 general practitioners and survey more than 300 patients, and process their responses using thematic text and regression analysis. We find that while most doctors and patients recognise the benefits of virtual visits, there are very powerful barriers to adoption, namely a lack of financing of remote visits by the State, issues with national legislation where there is a lack of consideration of telemedicine, and a lack of resources for implementing new solutions. We find that performance expectancy, perceived product advantage, hedonic motivation, social influence, and perceived security are significant predictors of patients' intention to use virtual visits in our model. Notably, the expected usefulness of video consultations is inversely related to age. There are indications that GPs and patients would like to use such a solution, but the wish is not communicated to the other party.

Keywords: telemedicine, telehealth, adoption barriers, technology acceptance model, virtual doctor appointments.

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1. Introduction

The evolution of information and telecommunications technology has opened many possibilities across all facets of daily life, including health care. Telemedicine — delivery of health services at a distance — has been a topic of interest for researchers and practitioners for more than 50 years (WHO, 2010; Sood et al., 2007; Barbosa et al., 2021). The COVID-19 pandemic showed that telemedicine offers many benefits in non-emergency scenarios by reducing risks of transmission of infections, reducing the burden on hospital and clinic resources, and, most importantly, improving overall access to care (Monaghesh & Hajizadeh, 2020). Innovation and adoption of new technologies within health care, however, pose a range of challenges, one of the crucial ones being the context of the environment and the surrounding social and organisational processes, the interaction of which can have an impact on the adaptability of new solutions (Robert et al., 2010). Norris et al. (2009) describe the health sector as "a notoriously late adopter of information technologies."

Despite the apparent benefits of telemedicine and the surrounding environment being more supportive than ever, telemedicine use falls below expectations in practice (Cho & Mathiassen, 2007; Standing et al., 2016). According to a 2017 Eurobarometer survey, only 18% of EU citizens had used health care services provided online in the last 12 months (TNS opinion & social, 2017). The COVID-19 pandemic has acted as an exogenous shock, boosting the broader adoption of telemedicine solutions. A McKinsey & Company report reveals that 83% of physicians in the US offered virtual services in 2021, whereas this number was only 13% in 2019 (Cordina et al., 2022). From exploratory interviews with experts from the Latvian health care and telemedicine landscape, we infer that while the COVID-19 pandemic has motivated the effort to digitise the health care sector, telemedicine use is far from mainstream adoption.

Based on previous literature, doctor and patient acceptance is the primary barrier to adopting telemedicine solutions. The history of digital health services in Latvia, such as the failure of the *E-Health* system (*E-veselība* — the E-Health system of the Republic of Latvia), reinforces the need to deeply understand the needs of the end-users before implementing new digital health solutions across the sector (Dienas Mediji, 2016; TVNET & De Facto LTV, 2021). To provide valuable insights for shaping the telemedicine adoption and implementation processes in Latvia, we gather and analyse empirical data from both family doctors (general practitioners, GPs) and patients in Latvia. We use a modified version of the Unified Theory of Acceptance and Use of

Technology 2 (UTAUT2) model to answer the following research question and sub-question:

RQ: What factors affect the intention and readiness to use virtual visits among general practitioners and patients in Latvia?

Sub-RQ: Why and how are the relevant factors important to doctors and patients in Latvia?

The contribution of our paper is, firstly, extending the UTAUT2 model (developed by Venkatesh et al. (2012)) by adding the management leadership factor (as seen in Handayani et al. (2017)) to the modified UTAUT2 model developed by Schmitz et al. (2022). Secondly, while UTAUT2 serves as the theoretical point of departure for our work, we go beyond understanding which factors are important and identify how and why they are important to doctors and patients alike, generally and in the Latvian context. Most GPs recognise the benefits of virtual consultations, like speed, saving time and resources, flexibility and accessibility, and epidemiological safety. However, barriers to the implementation of virtual visits seem to be more important than the gains. As for the patients, we find that performance expectancy, perceived product advantage, hedonic motivation, and perceived security are statistically significant predictors of patients' intention to use video consultations. Thirdly, we identify the critical barriers to implementing virtual visits in the Latvian health care environment, which are related to State competencies (legal and financial) and GPs' capacity, as well as formulate recommendations. Finally, this research focuses on a rapidly developing field that is increasingly significant for academia and various groups involved in developing digital health care.

Our work is structured as follows: in the literature review, we set the context for further discussion by defining telemedicine and outlining the challenges identified in the existing literature. Subsequently, we present our chosen analysis framework before proceeding with the analysis and discussion of the obtained results, also addressing the limitations of our research. Finally, we provide our conclusions, their implications and possible areas of future research.

2. Literature review

2.1 Defining telemedicine

The vast amount of research spanning over 50 years has provided many possible definitions and descriptions of telemedicine. Some of the earliest mentions of the term can be traced to Kenneth T. Bird's 1971 book *Teleconsultation; a new health information exchange system*, where it is described as "the practice of medicine without the usual physician-patient confrontation … via [an] interactive audio video communications system," (Sood et al., 2007; Bashshur, 1995).

Sood et al. (2007) found 104 different definitions for telemedicine in peer-reviewed articles. They describe these definitions as varying in terms of the scope of technologies and communication systems included and propose their own, all-encompassing version: "Telemedicine being a subset of telehealth, uses communications networks for delivery of health care services and medical education from one geographical location to another, primarily to address challenges like uneven distribution and shortage of infrastructural and human resources." The term "telehealth" used in the definition above is another term often used alongside telemedicine. According to Bashshur (1995), it originates from a 1978 handbook by Bennett et al., who use this term to refer not only to the physician and patient relationship but also include administrational and educational activities. In an international review of telemedicine, Swanson Kazley et al. (2012) make a similar distinction and describe telehealth as including "services that are provided by nonphysicians in settings outside of the traditional hospital or ambulatory care setting." Nonetheless, they use these terms interchangeably, as is common practice in many articles on the subject. Thus we also adopt this approach. Furthermore, we follow Swanson Kazley et al. (2012) approach and, for our research, use the definition of telemedicine provided by the World Health Organization (WHO): "The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for the diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities" (World Health Organization, 2010). This definition assumes four fundamental characteristics of telemedicine: "1. Its purpose is to provide clinical support. 2. It is intended to overcome geographical barriers, connecting users who are not in the same physical location. 3. It involves using various types of ICT

[information and communications technology]. 4. Its goal is to improve health outcomes." (WHO, 2010). The WHO (2010) also classifies telemedicine into two distinct types of solutions: 1) asynchronous, meaning exchange of data (e.g. patient records or messages) at different times, where both parties do not need to be present at the same time; 2) synchronous, meaning the exchange of data, communication in real-time. The parties to the conversation can be both health professionals and patients, while the exchanged media includes everything from images and text to video and audio.

Given that telemedicine remains a broad term under this definition, we narrow our focus on synchronous communication between clinicians and patients via a videoconference. We account for the development of telemedicine as a whole, especially taking note of telephone consultations as the predecessor of videoconferencing. These can be defined as teleconsultations and virtual visits respectively (McGrail et al., 2017). Subsequently, we alternate between these terms depending on the context of our analysis. The choice to narrow our scope to this particular use case of telemedicine is a combined result of our understanding of the current telemedicine landscape in Latvia and a need for more focus in previous studies, as identified by Garavand et al. (2022).

2.2 The telemedicine paradox

The history of telemedicine spans back as far as the 1960s. In a 1977 article by House & Roberts, the use of interactive video links between Nebraska Psychiatric Institute in Omaha and Norfolk State Hospital in the U.S. in 1964 is positioned as the start of telemedicine development. However, the roots of telemedicine also trace back to the National Aeronautics and Space Administration's (NASA) efforts in regards to the development of the manned space programme and the need to monitor human health in space (Lovett et al., 1979; Bahshur et al., 2000, p. 615; Ferguson et al., 1995). Wittson & Benschoter (1972) described the Nebraska-Norfolk project and concluded the project to be a successful proof of concept for the use of telemedicine technologies. Lovett et al. (1979) refer to the same case when discussing the history of telemedicine, describing the technology as being in a 'post-evaluation' phase at the time. They also note the main advantages of the technology, such as increased productivity of individual physicians and increased accessibility for patients — benefits that, as we find, remain relevant today. However, the same authors claim that client and provider acceptance was high, but there was no evidence of sustained, general use (Lovett et al., 1979). Bahshur et al. (2000) support this observation 20 years later, stating that despite high interest in the period up

to 1980, most programs related to implementation and trials of telemedicine technologies in the U.S. did not meet expectations and were ended before they could reach maturity (p. 616). Bahshur et al. (2000) explain that the 1990s saw a resurgence of telemedicine thanks to growing use and advancements in information technology and telecommunications (p. 616). However, Grigsby expresses concern regarding the low use of telemedicine in practice at the time of the article's release, referring to U.S. survey results showing that only 21000 telemedicine consultations were conducted in 1996 (p. 124).

In a review of telemedicine research from the year 2000 to 2015, Standing et al. (2016) find that researchers of the subject are often enthusiastic about the future use of telemedicine. However, these expectations do not manifest in practice. Despite seemingly obvious benefits, progress, increased investments in information technology (IT), and other facilitating factors, the potential of telemedicine remains unrealised (Cho & Mathiassen, 2006; Standing et al., 2016).

2.3 Telemedicine in Latvia

Research related to the topic of the adoption of telemedicine has also been done in Latvia. In 2021 Majore et al. assessed remote health care services, focusing on the patient perspective but also providing some insights about doctors' needs, claiming that a vital issue doctors currently face is that some data about patients is stored in each health institution separately and not in a single data storage portal — an issue relating to both the ease of use and usefulness that could potentially be solved with digital health tools. Furthermore, she finds that doctors increasingly choose to record information about patients in an electronic format (as opposed to paper patient cards). There are some concerns about safety/security, as in practice, the technological tools used are those readily available, such as WhatsApp or Zoom. When sharing data with patients electronically, most doctors do not use encryption. Majore et al. (2021) also found the main factors hindering the use of telemedicine solutions to be human factors (such as a lack of motivation for patients, lack of knowledge and digital skills), organisational factors (e.g., the question of how to organise the sign-up process for virtual visits), and cultural obstacles. There are also technological and financial factors (costs of telemedicine and a limited number of State-paid consultations). This study, however, mainly refers to existing research from other countries rather than the Latvian context and provides general guidelines rather than an in-depth analysis of factors that concern

patients and doctors. In addition, Ciekurs (2022), who assesses the regulation of telemedicine in Latvia, finds that a critical limitation is the lack of legal regulation of telemedicine.

Exploring recent news and events regarding telemedicine, we find that Latvia's experience with technological solutions in health care has been discouraging, with the *E-veselība* (*E-Health*) system implementation as a prime example — a costly project that did not take into account the needs of end users and was described by the health minister at the time as "an expensive, inefficient and poorly run project" (Dienas Mediji, 2016). In 2021, it was set to be replaced by a new system, bound to cost millions of euros to Latvian taxpayers (TVNET & De Facto LTV, 2021). In the context of the Digital health initiative, in 2022, the Minister for Health Daniels Pavļuts said: "At the moment, the wishes of doctors and patients regarding the convenience of the system have not been taken [into account] in the realisation of *E-Health*. The result is unstable, slow, and inconvenient, and it's time to change that," (TVNET/LETA, 2022). Following these observations, we set out to identify factors that could help facilitate the implementation of other telemedicine solutions in the future.

2.4 Telemedicine adoption barriers

In an attempt to identify all possibly relevant factors to the adoption of telemedicine, we explore previous research regarding different types of telemedicine solutions in a top-down approach, beginning with the overarching organisational challenges and narrowing them down to individual user-level barriers. Many studies attempt to identify and classify the factors influencing the acceptance and use of telemedicine solutions in differing contexts in terms of the level of adoption, geographical setting, and type of technology employed (such as Kwateng et al., 2022; Rahi et al., 2020; Menachemi et al., 2004; Rho et al., 2014; Ray et al., 2017; Almojaibel et al., 2020; Saigí-Rubió et al., 2014; Kim et al., 2010), and some also investigate the normalisation of implementation and integration processes (like Farr et al., 2018).

Swanson et al. (2012) conduct a review of 128 articles investigating the use of telemedicine across Europe, Asia, and the U.S. They find the key barriers in European countries to be "lack of funding and/or reimbursement, lack of standardisation, lack of training, and lack of user acceptance possibly due to fear of unknown consequences." In the U.S., they identify "licensure, liability, high staff turnover at sites, scheduling challenges between providers, the lack of reimbursement mechanisms, technical

challenges, no physical examinations, not seeing a patient face-to-face, interoperability with existing HIT [health information technology] systems, cost to start and implement a system, the lack of training for staff, vulnerabilities in security, and additional time needed to implement and use a telemedicine system for providers" as non-financial factors influencing the usage of telemedicine solutions. Interestingly, the authors also find that, unlike in the U.S., telemedicine in Europe and Asia is usually used for provider-to-provider rather than provider-to-patient communication. Standing et al. (2016) also review telehealth research and identify common themes such as institutional reluctance, health professionals' and patients' resistance, use of technology and interoperability of different technologies, as well as lack of cooperation between clinicians and lacklustre involvement of patients, poor knowledge management in telehealth systems and practices, and lack of government policy and financial support.

2.4.1 Patient and clinician demand

Our focus on patient and doctor acceptance stems from previous research indicating the importance of this particular aspect in the adoption of telemedicine solutions as a whole. Kim et al. (2010) name physicians as the "predominant users of telemedicine". Standing et al. (2016) identify multiple studies highlighting the unwillingness of actors within the health care system to adopt new technologies. They suggest that most telemedicine use barriers relate to individual behaviour and attitudes among health care workers rather than technology limitations. Similarly, Burke & Hall (2015) identify provider acceptance as a primary hurdle. These findings are unsurprising, as telemedicine fundamentally alters how doctors communicate with and assess patients (Harst et al., 2019).

In a study of Australian telemedicine initiatives, Wade et al. (2014) claim that patient demand does not play a significant role since it is induced through clinicians' recommendations rather than the public interest. However, numerous studies highlight the patient perspective and attempt to determine factors influencing their attitudes towards telemedicine solutions (e.g., Cimperman et al., 2016; Tsai et al., 2019). In a study of heart failure patients, Woo & Dowding (2018) raise attention to alarmingly low patient acceptance suggesting that it is another crucial factor in telemedicine solution adoption. Subsequently, Tenforde et al. (2020) find that physical, occupational, and speech therapy patients were highly satisfied with care during the COVID-19 pandemic and find high value in future telemedicine visits even beyond the pandemic. Finally, LeRouse et al. (2004) highlight that the key factors recognised by users in video consultation quality

assessments can differ significantly between providers and patients. Thus we choose to explore both the doctors' and patients' perspectives.

Cho & Mathiassen (2006) investigate the successful implementation of a telemedicine solution for stroke case assessment and find one of the overarching factors attributed to the success of this initiative is the presence of early adopters who lead the development of innovations. Wade et al. (2014) propose that clinician acceptance, being the primary barrier, if overcome, can ensure the successful implementation of these services despite other existing barriers. The aim of our study thus emerges as an effort to understand what prevents or motivates doctors and patients to adopt telemedicine solutions and how we can motivate them to become early adopters and champion the long-term implementation of telemedicine in health care. This also prompts us to narrow our focus to general practitioners. This specification is necessary since telemedicine can have wildly different implications and uses depending on the context, which can thus impact the strength and type of factors influencing use (Garavand et al., 2022). The work of general practitioners suits itself well for a comprehensive review of the implementation of virtual visits. Lehoux et al. (2002) point out that doctors from different specialities might be more prone to use either more objective (number and image-based) or more subjective (physical examination, verbal questioning) diagnostic methods. Thus, depending on the individual case, they might see virtual visits as either beneficial or unnecessary and more uncertain. We see general practitioners as lying in between — they work directly with patients and provide physical examinations but also often serve as an intermediary or interpreter of blood test results and specialist examination transcripts. Analysing general practitioners' attitudes also offers us a large sample of patients since we can assume that general practitioners are the first point of contact for most individuals seeking medical advice.

2.4.2 Individual acceptance

Gagnon et al. (2010) review more than 100 articles related to the implementation of various information and communication technologies (ICTs), including telemedicine, by health care professionals. They find the most relevant adoption factors to be perceived usefulness, ease of use, compatibility with existing processes and work practices, lack of familiarity with ICT, and the resulting learning and time constraint difficulties. They also find that patient-clinician relationships and patient attitudes towards ICTs play a role in facilitating or preventing adoption.

In a study of telemedicine solution use by U.S. military personnel in Europe, Lam et al. (2005) find that doctors' hesitation to adopt telemedicine revolves around a lack of perceived benefit and concerns about an increased workload without additional compensation. Furthermore, many of the participants of this study were not accustomed to telemedicine solutions and thus unaware of the benefits they could bring. Additionally, they also find that telemedicine is most often by leaders who volunteer to use new tools to increase their efficiency. Richards et al. (2004) survey rural U.K. general practitioners' attitudes towards E-Health and highlight similar factors — increased cost and workload, lack of suitable training, and impact on patient privacy and the quality of the consultation. Sharma et al. (2010). explore the use of telemedicine solutions for the monitoring of chronic patients and find that clinicians' concerns regarding the use of telemedicine in these scenarios include trust – both in regards to the practitioner-patient relationship as well as the relationship with technology –, with the main concerns being that telemedicine removes non-verbal communication and thus reduces 'Nursing Intuition', which can be important for diagnosing underlying conditions. Similarly, Nicolini (2006) approaches the issue of communication in telemedicine from a social perspective and also identifies aspects such as the delegation of tasks to nurses as having an impact on the formality of communication between patients and nurses, and doctors. Sharma et al. (2010) conclude that optimal training and involvement of clinicians in the implementation of these solutions are crucial to ensuring that their trust and feeling of safety are not violated.

In a 2010 survey, Kim et al. (2010) evaluate the suitability of two models — the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB) — for predicting physicians' acceptance of telemedicine solutions. They find attitudes towards telemedicine and social norms to be significant predictors consistent across both models. They also find that perceived usefulness is a more relevant predictor than perceived ease of use. In a recent study using a modified Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model, habit, performance expectancy, and hedonic motivation are found to be some of the factors with the most significant impact on providers' behavioural intention to adopt telemedicine solutions (Kwateng et al., 2022). Schmitz et al. (2022) conduct a study of German and United States patients using a modified UTAUT2 model to look at telemedicine adoption and find that "performance expectancy, hedonic motivation, perceived security, and perceived product advantage" all have a significant, positive, and direct effect on the behavioural intention to use video visits. Rahi et al. (2020) investigate patients' attitudes using the Unified Theory of Acceptance

and Use of Technology (UTAUT) and other theories and find that service quality is the most significant predictor. Cimperman et al. (2016) investigate the attitudes of patients aged 50 and above towards telemedicine solutions using the UTAUT model. They find that performance expectancy, facilitating conditions, perceived security and effort expectancy (particularly computer anxiety) are significant predictors. Ferrer-Roca et al. (2010) examine the benefits of telemedicine use among elderly rural residents in Spain and find that patients using telemedicine solutions see equal health outcomes compared to those not taking advantage of them, but they also see quality of life improvements in comparison due to less travelling and quicker diagnosis, examination, and treatment.

3. Methodology

3.1 UTAUT2 as the theoretical point of departure for the analysis

Harst et al. (2019) review a multitude of studies that employ technology acceptance theories and conclude that they can be successfully applied to analyse health care technologies, including telemedicine. According to Garavand et al. (2022), TAM and UTAUT models are commonly used for evaluating technology acceptance in health care. Harst et al. (2019) also identify TAM and UTAUT to be the most commonly used theories in such studies. The TAM model, developed by Davis (1986), assumes that attitudes toward a technology play a major role in whether it is used, and attitude is determined by perceived usefulness and perceived ease of use, which depend on the design of the technology. The UTAUT model, proposed by Venkatesh et al. (2003), combines the theories of TAM, the Reasoned Action theory, the Motivational Model, the Theory of Planned Behaviour, the Model of PC Utilisation, the Innovation Diffusion Theory, and the Social Cognitive Theory to form a comprehensive tool for determining intention to use by evaluating performance expectancy, effort expectancy, social influence, and facilitating conditions. For our research, we opt to use an extended UTAUT2 model, which includes hedonic motivation, price value, and habit as additional constructs, giving the model a customer-focused outlook (Venkatesh et al., 2012).

3.2 Augmenting UTAUT2

The purpose of using a version of an UTAUT2 model is to have a framework for creating the interview and survey instruments. While UTAUT2 covers a broad range of aspects, we want the insights from the subjects to be as nuanced as possible to gain a comprehensive understanding of doctor and patient experiences and thoughts.

Augmenting UTAUT2 by adding new factors is a common approach for tailoring it for the context of the study (Vimalkumar et al., 2021). In addition to the seven original factors (performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, habit) included in the UTAUT2 model as presented by Venkatesh et al. (2012), we include three more factors:

(1) Management leadership, as throughout the exploratory interviews it was identified as a potentially significant factor for doctors working at bigger medical institutions, e.g., hospitals (as opposed to those who have a private practice and are the sole decision-makers with regards to what innovations should be implemented in their work). Kairy et al. (2014) conduct a case-study on a telemedicine programme implementation and find that management leadership is an important factor that can support implementation. Suebsin & Gerdsri (2011) perform three case studies on IT adoption in healthcare organisations and outline management support as an issue affecting implementation in all three cases. For the purpose of our work, when it comes to technology acceptance models, we see that different studies treat this factor differently. For example, Mohamadali & Garibaldi (2010) mention it as a subset of facilitating conditions, while, as found in reviews by Gagnon et al. (2010) and Handayani et al. (2017), many studies outline it as an individually relevant factor to consider for a successful implementation of information and communication technologies (e.g. Chen & Hsiao (2012) present an extended TAM model and find management leadership to be a statistically significant predictor for physicians' acceptance of hospital information systems, Alsyouf & Ishak (2018) extend the original UTAUT model with a top management support factor, providing an extensive description regarding management support's importance in reorganising existing work processes for a successful implementation of electronic health record systems (EHRs), and find it to be a statistically significant predictor of adoption of EHRs). Subsequently, we decide to separate out this factor to distinguish between facilitating conditions related to technical capacity and availability of resources and the importance of management's willingness to support the introduction of new work practices;

(2) Perceived security (from Schmitz et al., 2022), which is relevant due to the sensitive nature of personal medical data. Our addition of this factor stems from a line of previous studies that have extended the UTAUT2 model with factors related to

privacy, security, and trust, starting with Alalwan et al. (2017) who expand the model by including a trust factor when analysing usage of mobile banking apps, followed by Vimalkumar et al. (2021) who separate out perceived privacy risk, perceived privacy concerns, and perceived trust as factors impacting technology adoption and find that while privacy risks do not directly influence consumers' choice to use voice assistant apps, their impact is reflected in privacy concerns and trust towards the product. In a study by Richards et al. (2004), GPs raise concerns regarding patient privacy and confidentiality in tele-consulting, while Burke & Hall (2015) highlight privacy as an important implementation barrier on the patient side as well. Finally, following the aforementioned studies, Schmitz et al. (2022) investigate the relevance of perceived security in the context of telemedicine adoption, citing the importance of doctor-patient confidentiality in medical care, and find that it indeed has a significant effect on adoption;

(3) Perceived product advantage (from Schmitz et al., 2022) is added because virtual visits are most often seen as alternatives for on-site appointments or telephone consultations. In existing literature, Piras & Miele (2019) make a distinction between substitutive and supplementary telecare, the latter being more applicable to the monitoring of chronic patients such as diabetics, when investigating the impact of remote monitoring on patient-provider communication. In the context of our study, however, video consultations are posed as the former, thus it is important to explore the perceived advantages as a factor that impacts the selection of virtual visits as a form of receiving care over face-to-face consultations. Schmitz et al. (2022) argue that for prospective telemedicine solution implementation, it is necessary to identify whether users see any benefit in comparison to physical consultations and find perceived product advantage to have a significant effect on the intention to use virtual doctor consultations. In our exploratory interviews, we hear that most doctors in Latvia are mostly not using telemedicine solutions beyond phone consultations, which also prompts us to investigate this phenomenon more closely and identify differences between the existing solutions. While this factor also aligns closely with the existing UTAUT2 performance expectancy factor, investigating it individually allows us to distinguish between factors that are important to the provision of any service remotely and those specific to healthcare and GP consultations.

On the one hand, these added factors could be grouped within the existing categories. However, separating them allows us to focus on specific aspects more effectively and obtain a more comprehensive and nuanced dataset. The added factors are adapted from existing research papers using UTAUT2 as the theoretical basis for the same reason.

We verify the relevance and quality of the model in exploratory interviews with experts (GPs and other experts in the field of telemedicine and the health care system, see Appendix A for expert profiles) to validate our methodology and survey questions, similar to Kifle et al. (2010). These interviews provided us with initial insights into the aspects of each factor of interest and their relevance. Validated by the interview insights (summarised in Appendix B), the set of factors of interest and their descriptions are summarised in Table 1.

Table 1. Factors of our modified UTAUT 2 model and their descriptions.

Factor	**Description**
1. Performance expectancy (from Venkatesh et al. (2012), original UTAUT2)	The extent to which the solution is expected to be useful.
2. Effort expectancy (from Venkatesh et al. (2012), original UTAUT2)	The extent to which the technology is perceived to be easy to use.
3. Social influence (from Venkatesh et al. (2012), original UTAUT2)	The degree to which the individual is influenced by their social circle (and norms) to use the technology.
4. Facilitating conditions (from Venkatesh et al. (2012), original UTAUT2)	The extent to which the individual believes that they have the resources, equipment, and environment necessary to use the solution (including legal environment).
5. Price value / financial incentives (from Venkatesh et al. (2012), original UTAUT2)	The extent to which the cost justifies the expected benefits.
6. Habit (from Venkatesh et al. (2012), original UTAUT2)	The extent to which the individual believes that the use of technology could become habitual (due to learning) and the level of difficulty of overcoming the existing habits in health care practices.
7. Hedonic motivation (from Venkatesh et al. (2012), original UTAUT2)	The expected pleasure/enjoyment or fulfilment that the use of technology could bring.
8. Management leadership (from Handayani et al. (2017))	The extent to which managerial support is important in facilitating the use of technology.

9. Perceived security (from Schmitz et al. (2022))	The extent to which the solution is perceived as secure for transmitting sensitive information.
10. Perceived product advantage (from Schmitz et al. (2022))	The perceived benefits from using the technology (relative to existing solutions).

Source: Created by the authors based on Venkatesh et al. (2003), Venkatesh et al. (2012), Schmitz et al. (2022), Handayani et al. (2017), and Huang & Kao (2015).

3.3 Dependent variables

The factors in Table 1. serve as independent variables in our analysis. As highlighted in Marikyan & Papagiannidis (2021), the dependent variables of an UTAUT2-based model are *behavioural intention* and *use behaviour*. One of the earliest depictions of the concept of behavioural intention is seen in Fishbein & Ajzen (1975), and Marikyan & Papagiannidis (2021) describe it as the subject's "subjective probability that he will perform some behaviour". This is a dependent variable for our primary research purpose (determining what factors affect the intention to use). To explore the subjective intention, we ask direct questions about the behavioural intention to the patients in survey question 15. (Appendix D), and doctors in section 12. of the interview (Appendix C), using the keywords "likely" and "probability".

As seen in Venkatesh et al. (2003), the use behaviour refers to the subject's actual use of the solution. To determine the use behaviour, we also ask direct questions about experience with virtual visits (and telemedicine solutions more generally) in survey question 5. (Appendix D) and interview section 1 (Appendix C).

3.4 Primary data collection

We explore both patient and doctor perspectives. We conducted online semi-structured interviews with general practitioners to learn about the factors affecting the behavioural intention to use telemedicine solutions in-depth. Although interviews are a time-consuming and effort-intensive data collection method, this instrument allows us to empirically analyse the importance of the various factors affecting telemedicine use and identify specific aspects of those factors as seen by doctors with different backgrounds. Furthermore, semi-structured interviews allow us to ask follow-up questions to capture more complex information.

As for the patients, we held exploratory interviews to help us understand different perspectives and design the survey, which we then launched to a small sample of patients in a pilot format. We then adjusted it according to the responses and launched it to a much

wider sample of patients before analysing the results using our developed framework. The key reason we chose to survey the patient population is the ability to gather a larger sample than would be possible by doing interviews, and a representative sample makes our findings more robust and relevant in the Latvian context. The survey instrument is scalable and cost-effective, and the results enable us to perform quantitative analysis. The relevant challenges include accessibility (due to the survey being digital) and less flexibility due to the static nature of the survey.

3.5 Selection of family doctors for interviews

We approached general practitioners from different regions of Latvia to participate in the interviews, using the contact information of GPs in Riga and other regions, accessed on the Latvian National Health Service's (NHS's) (2022) website. This source includes all GPs that have a contract with the Latvian NHS (meaning that they can provide State-paid visits), and in 2021 there were 1395 such doctors – 40.9% of them practise in Riga, 13.6% in Vidzeme region, 16.8% in Kurzeme, 18.4% in Zemgale, and 10.3% in Latgale. We sent an invitation to the interview to all doctor emails in the database (more than 900 addresses approached in total).

3.6 Interview guide and processing

To create the interview guide, we look at interview questions and descriptions of factor constructs used in other studies utilising UTAUT (like Madigan et al., 2017), UTAUT2 (such as Harborth & Pape, 2018), and some versions of similar models (such as Kim et al., 2010; Tran et al., 2019). We then customise the questions to suit our research topic and make our own additions. The list of interview questions is included in Appendix C. The interviews were conducted online (via Google Meet) from 13.12.2022. to 20.01.2023.

To determine the sample size necessary, we looked at the frequency of new insights. As we conducted more interviews, new insights were gathered at a diminishing rate due to repetition in answers. When we reached the point where no new insights appeared for 3-4 interviews in a row, we concluded that the sample is representative enough to draw meaningful conclusions. We reached this point at about interview No. 11, but we conducted five more interviews for redundancy.

The interviews were transcribed verbatim. We use thematic analysis to analyse the data, identifying and examining common and unique themes, subjects, and ideas.

3.7 Survey guide and processing

The quantitative dataset of patient information was obtained by distributing an internet-based survey (digitised using Qualtrics software). We distributed the call to participate in the survey via personal social media profiles and social media ads, by email to university students, patient organisations and other NGOs, medical institutions, and medical institution patients, and by approaching acquaintances and other channels to gain participants via snowball sampling. To obtain a sample that includes people with diverse backgrounds and experiences, we also contacted the Latvian Federation of Pensioners (the umbrella organisation for senior organisations in Latvia) and other senior organisations. The survey instrument (questionnaire) is included in Appendix D. The survey was open to responses from 06.12.2022 to 31.03.2023.

Using the data obtained from the patient survey, we calculate various statistical measurements to get a holistic view of the results. We examine the relationship between *behavioural intention* and the various UTAUT2 factors by running an Ordinary Least Squares (OLS) regression analysis with multiple regressors. The dependent variable is the answer to survey question No. 15 (*How likely are you to try out medical video consultations? [1-5]*) (see Appendix D for patient survey questionnaire). For the right-hand side independent variables, given that in most cases, each survey block and its sub-questions correspond to a given UTAUT2 factor raising concerns about multicollinearity, we perform a principal component analysis and construct the first principal component for each block (e.g. Questions 6_a, 6_b, 6_c — Performance Expectancy), and obtain latent factors for each observation in our dataset. These values are then used as inputs for the regression analysis. Questions 10_d and 11_a, 11_d, 12_a and 14_b are not used in generating the principal components for the respective blocks due to them not directly fitting the interpretation of the respective block. Additionally, we control for demographic attributes — age, gender, geographical location, and income. The final regression specification is as follows:

$$Q_{15} = \beta_0 + \beta_1 gender + \beta_2 age + \beta_3 location + \beta_4 income + \beta_i PC1_{Q_i} + \mu_i \quad where\ i \in [6;14] \quad (1)$$

The results of this regression are given in Appendix G, Figure G.1.

3.8 Formulating interview and survey questions

Below, we explain how we address the factors seen in Table 1. in the doctors' interviews (Appendix C) and the patient survey (Appendix D).

Table 2. Description of interview and survey question formulation process.

Performance Expectancy	With questions about this factor, we aim to understand the extent to which virtual consultations are expected to be useful. As Diño & de Guzman (2014) explain, the performance expectancy concept corresponds to "other technology acceptance models' theory constructs: perceived usefulness (TAM), extrinsic motivation (MM [Motivation Model]), job-fit (MPCU [Model of Personal Computer Utilisation]), relative advantage (IDT [Innovation and Diffusion Theory]), and outcome expectations (SCT [Social Cognitive Theory])" (p. 56), and these constructs are merged into performance expectancy in Venkatesh's et al. (2003) UTAUT. For the doctors, we ask what they think are the key gains of using virtual consultations, what functionality should be included in the solution for the doctor to want to use virtual consultations, and what could be improved in their day-to-day practice via virtual consultations. As Venkatesh et al. (2003) explain, the factor refers to the extent to which the subject believes that the solution will help them reach gains in occupational performance. Thus we use the keyword "gains" and paraphrases of this concept, like "improvements/improve" and "advantages", also asking about the extent to which the specific gains matter. For the patient survey questions, we use similar vocabulary, also adding "help" as a keyword (e.g., questions 6_a, 6_b in Appendix D), targeting to capture the expected gains of the solution; we ask about specific gains identified in expert interviews, such as improved accessibility and time savings. Additionally, the questions in this section are also used to probe into the more practical aspects of using telemedicine in the day-to-day work of general practitioners, mainly addressing the concerns raised by Lehoux et al. (2002) regarding the limitations of telemedicine in cases where physical examination is necessary. That can render telemedicine irrelevant and thus limit the expectations of health professionals adapting these solutions as part of their routine.
Effort Expectancy	Effort expectancy relates to the concepts of perceived ease of use and complexity, which are based on theories of TAM, IDT, and MPCU respectively (Diño & de Guzman, 2014; Venkatesh et al., 2003). To both doctors and patients, we ask about the extent of effort expected (or experienced) in the use of virtual visits (using keywords like "easy", and "effort"), also discussing the role of learning and existing digital skills, e.g., in questions 8_c and 8_a of Appendix D respectively.
Habit	Venkatesh et al. (2000) propose that past behaviour strongly predicts future behaviour. Based on our insights from expert interviews (Appendix B), we assume that habits can play a role in both facilitating, but also hindering the use of telemedicine solutions. We formulate doctor interview questions to address both the positive impact of the COVID-19 pandemic and the possible negative impact of doctors being used to existing procedures and processes, which might make them reluctant to accept change (Appendix C). Venkatesh et al. (2000) also highlight the importance of the initial experience when beginning to use new technology. Thus we aim to inherently address this aspect as well. The same reasoning is applied to the patient survey (Appendix D).

Hedonic Motivation	Including hedonic motivation as a predictor extends the UTAUT model beyond a purely cognitive and utilitarian approach to the issue, addressing the extent to which the enjoyment of using a technology contributes to use behaviour (Venkatesh et al., 2012). During expert interviews, we find that responses to our initial questions about hedonic motivation converge to a discussion of performance and effort expectancy or perceived product advantage. Thus, for the doctors' questionnaire, we formulate questions regarding doctors' overall likeliness to explore new methods for their job and how likely they are to go beyond their regular day-to-day responsibilities to intentionally learn and integrate new solutions to increase their own and their patients' satisfaction, allowing us to identify whether a doctor might champion innovation in their workplace and become a 'leader' (Lam et al., 2005). For the patient survey (Appendix D), we evaluate this factor directly by asking patients whether they find the experience of using telemedicine solutions enjoyable and if they might be motivated by the positive emotions associated with performance expectancy and perceived product advantage.
Management Leadership	As we determine in our expert interviews, questions regarding management leadership are only relevant to those doctors employed by a medical institution (Appendix B). We aim to gather insights about the extent to which management support is necessary (Appendix C). Organisational challenges associated with telemedicine implementation such as training needs and knowledge management (Swanson et al., 2012; Standing et al., 2016) can be related to the quality and involvement of managerial leadership. We do not include questions related to this factor in the patient survey since it is targeted towards patient experiences with general practitioners, in which case it is irrelevant.
Perceived Security	Based on our insights from expert interviews, we identify that the perceived security of telemedicine solutions can serve as an additional source of stress for both patients and doctors, although it is unclear to what extent it is important since both patients and doctors might choose to ignore these concerns in practice. More than one of our experts express concerns similar to those found to be relevant by Richards et al. (2004) regarding the possible spread of sensitive information within their community (Appendix B). We thus formulate both doctor interview and patient survey questions to help determine the possibly relevant security and privacy concerns and to what extent they are important predictors of the use of telemedicine.
Perceived Product Advantage	Following Schmitz et al. (2022), we include questions regarding the commonly cited benefits of telemedicine solutions when compared directly to onsite visits. In the patient survey, questions are directed specifically towards the most notable factors, such as time savings, improved access to care, improved access between levels of care, and improved quality (Hjelm, 2005). We also include a question related to the quality of communication in virtual visits compared to onsite visits, as both our expert interviewees and previous research highlight this as a possible concern (Sharma et al., 2010). Notably, we inquire about the informative and formative nature of patient-doctor relationships in remote consultations compared to in-person visits, following Nicolini's (2006) study of social aspects of telemedicine. The doctor interview questions are left open-ended to help identify advantages that might be unseen and specific to the Latvian environment.

Social influence	In the expert interviews, we find that (most) doctors interact with their peers, visit conferences, and are willing to try out new solutions if they have heard good feedback from colleagues, which relates to social factors in Venkatesh et al. (2003). We ask the doctors about their willingness to try out new solutions if they are recommended or used by peers, and the extent to which patients (a group important to doctors) can influence the doctor's use of telemedicine (section 4. of Appendix C), the latter question being related to subjective norms (Venkatesh et al., 2003). The expert interview insights also support our expectation that positive feedback about a solution from the people in the patient's environment (such as friends, family, and colleagues) is likely a good facilitator for trying the solution themselves. Drawing inspiration from Venkatesh's et al. (2003) questions about subjective norms, we ask the potential users to evaluate the extent to which the people important to the subject could influence the use of the solution (section 9. of Appendix D).
Facilitating Conditions	The key facilitating conditions, as identified in the interviews and by Venkatesh et al. (2003), are technical capacity (high-speed internet and computer / other devices, means of authentication), government support both in terms of favourable legislation and financing (resources and legal and regulatory environment) and assistance, as well as an already established contact between the doctor and the patient before the virtual visit. As revealed by doctors in expert interviews, compatibility with existing experiences is also a relevant facilitating condition, supported by Venkatesh et al. (2003). In the patient survey (section 10 of Appendix D), we ask about the extent to which the subject thinks the relevant conditions are met. In the doctor interviews, we ask what the relevant conditions are and to what extent they are satisfactory (section 5. of Appendix C).
Price/Financial incentives	To explore if the cost of the solution justifies the expected benefits, we ask the patients (section 11. of Appendix D) how the costs of virtual visits should compare to on-site visits (for them to consider using virtual visits), e.g., by using the phrase "good value for my money" when referring to virtual visits, and how important it is for the costs of virtual visits to be fully or partially covered by the State (as this aspect was mentioned in the expert interviews). As Venkatesh et al. (2012) mention, most often, users bear the cost of use, and "the cost and pricing structure may have a significant impact on consumers' technology use" (p. 161). As for the doctors (section 6. of Appendix C), we ask them both about the patient perspective (price value of virtual visits) and financial incentives: doctor's remuneration for virtual visits, whether they incur additional costs by introducing/providing virtual visits, as well as about the role of a lack of financing as an obstacle for using the solution.

4. Analysis and discussion

4.1 Interviews: sample description

We interviewed 16 doctors. The minimum and maximum age of respondents is 29 and 58, respectively, while their years of experience as GPs (including residency) range from 1 to 34 years. Most of the doctors interviewed practise in the Vidzeme region (11), about a third of the sample practise in Riga, and two doctors practise in Kurzeme. 13 of the 16 respondents have their own practice, one is part of a SIA (Ltd.) with three other doctors, and three work as employees at a medical institution.

4.1.1 Doctors' use behaviour

All of the GPs interviewed use some forms of telemedicine: audio (telephone) consultations and written consultations (mostly via WhatsApp or email). Five of the respondents use video consultations (31.25% of the sample).

4.2 Survey: sample description

We recorded 534 responses to the survey questionnaire, 343 of which had a completion status of more than 90% and thus were included in the analysis of the results. Of those, 77% of respondents were female, and 22% were male (Appendix E, Figure E.1).

The difference in the response rate by gender is likely explained by women being generally more health-conscious, paying more attention to health-related information (Ek, 2013; Renahy et al., 2010). The age of respondents ranged from 17 to 83, with the mean age of respondents being 42 (Appendix E, Figure E.2). 47% of respondents live in Riga or around Riga. Four of the respondents who chose the option "Other" live abroad (Appendix E, Figure E.3). The income distribution of respondents is presented in Appendix E, Figure E.4 — around 45% of respondents earn above EUR 1000 per month, the rest of the respondents earn below that amount, with 8% earning less than EUR 100 per month.

The mean values of Likert-scale based questions (questions 6 to 15 in Appendix D) are given in Appendix E, Figure E.5. Visual distributions of respondents' answers are given in Appendix E, Figure E.6 and are further analysed in the following sections. The correlation matrix of all Likert-scale questions, gender, and age is presented in Appendix E, Figure E.7. It can be seen that correlation between age, gender, and all the other questions is almost non-existent. A slightly negative correlation can be observed between age and questions 8_c and 10_a — both of which are associated with the use of technology, thus supporting the argument that older respondents are likely to have difficulty dealing with digital technology. However, this relation is quite weak. Correlation coefficients of 0.6 and above can be observed in multiple cases. We identify that this can mostly be explained by the fact that questions are similar in their nature (e.g., questions 6_b, 7_b, and 13_b all indirectly relate to the time-saving aspect of video consultations). Questions in the same section (e.g., 6_a, 6_b, and 6_c under Performance Expectancy) also tend to have high correlation coefficients. The arising issue of multicollinearity is addressed by utilising principal components in the regression analysis.

4.2.1 Patients' use behaviour

Out of all patient survey respondents, 41% indicate that they have used telephone consultations, 31% have used WhatsApp, Email, or SMS to contact a doctor, while 17% have not used any type of telecommunications to consult with a doctor. Only 10% of respondents state that they have previously used video consultations (Figure 1). Under "Other" uses, respondents indicate that they have only contacted doctors remotely regarding prescriptions of drugs or have electronically signed up for a doctor's visit.

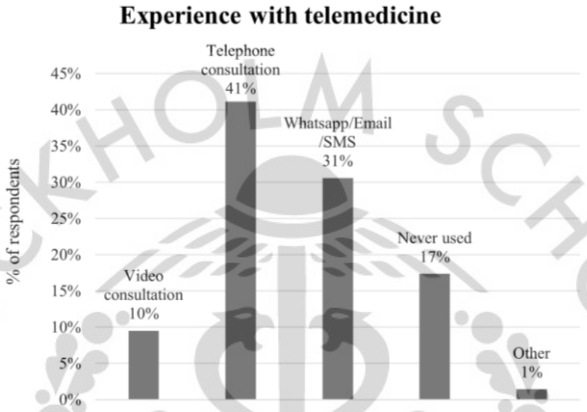

Figure 1. Percentage distribution of respondents' answers to Patient Survey Questionnaire question 5. (Graph created by the authors)

Among the 10% who have already used video consultations, the average age is 43 and 70% live in Riga or in Riga's suburbs. Around half of the respondents in this group also indicate that they have communicated with a doctor using WhatsApp/Email or SMS.

4.3. Results illustrated through the modified UTAUT2 factors

We describe and analyse the results related to each of the modified UTAUT2 factors by discussing the main insights from doctors' interviews and illustrating them by quotes. Each section also includes a description of the patient survey results (Appendix E, Figure E.6) and how they relate to the insights gathered from doctors. For a condensed summary of doctor interview insights see Appendix F.

Performance expectancy

Interviews

The doctors' views on performance expectancy differ: some see a lot of usefulness in virtual consultations, while some — none. Practically, some doctors substitute the key functionality of video consultations with a combination of audio (telephone) consultations and messaging communication, mostly via WhatsApp, also covering the visual function (e.g., patients sharing pictures of the health problem). Since they already have a functioning remote consultation solution that covers both audio and visual aspects

(synchronous audio function plus asynchronous text/images function) as a part of their routine practice, they see the usefulness of (switching to) video consultations as low (in line with Lam et al. (2005)). However, these less formal *WhatsApp consultations* of patients often put an additional strain on doctors with no compensation: patients communicate with them on WhatsApp and via their private number about anything and anytime (i.e., an informal, unstructured, undocumented, unpaid consultation):

> "*I do not want to use the words that come to mind when I see 15 new chats on WhatsApp with dots. Everyone expects to receive an extensive response, of course. (...) From an unknown number about an absolutely unknown matter… "But I did send it then". Sometimes I spend several minutes on one chat to understand what they need from me. No well-being.*" (Aivars, 37)

This should be seen as a concern in the context of doctors being at a high risk for burnout (as indicated in the interviews). Video consultations are a way to bring back structure and borders to remote consultations of patients, a chance to *"control the length of visits*" and "*organise the patient flow*".

The keenness of patients to contact their doctors personally and outside of working hours does, however, indicate that there is patient demand for quickly available telemedicine services, and most doctors do see the usefulness in video consultations, the key gains of digital visits being:

- Flexibility and accessibility — being able to consult from anywhere and patients being able to get help from any place; some doctors mention the use case of consulting patients abroad.
- Saved time and resources — while most doctors emphasise this gain as more pronounced for patients (especially those who have issues with mobility, live in remote areas / far away from their doctor, or lead busy lives) who can skip the commute to consult with a doctor, some doctors also see this as a benefit for themselves. For example, while in most cases the doctor would still need to come to their office, home visits (which "*take up quite a lot of time and resources and are often not paid for either by the patient or the state*" (Rihards, 40)), control consultations, and medical test results discussions in person could be replaced by video consultations. As mentioned, some doctors also say that video consultations can make the practice more efficient, by aiding the patient flow organisation.
- Epidemiological safety — limiting the spread of infections and diseases by consulting infectious patients remotely before determining whether they need an in-person visit.

The expected usefulness of digital consultations is likely to be related to age: younger people, both doctors, and patients, are expected to perceive the video consultation solution as more useful than older individuals in aggregate, which can be related to the capacity of individuals to effectively utilise such a solution (digital skills, also relevant to effort expectancy) and having the right mindset and background for it (more in section *Effort expectancy*).

Survey

Around 34% of the respondents indicate a neutral attitude in their response to the statement that video consultations could improve their state of health (question 6_a), 15% either disagree or strongly disagree, and more than half of all respondents indicate that they agree with the statement. In response to the claim that teleconsultations could save them time (question 6_b), 50% of respondents indicate that they strongly agree and 29% indicate that they agree with the statement. Interestingly, the result is slightly less positively skewed in response to question 6_c regarding the improvement in accessibility of health care thanks to video consultations, however, still, the majority (64%) of respondents agree or strongly agree with the statement, 22% indicate a neutral stance.

Expectedly, accessibility and time savings are highly valued by patients and this corresponds with the advantages highlighted by doctors on patients' behalf. The distribution of responses to the first question (Figure 2), however, possibly reflects the same concerns as those raised by doctors and signals that patients are not quite confident about the performance of virtual visits. This factor is also statistically significant for predicting patients' intention to use video consultations in the future (Appendix G, Figure G.1), in line with the findings of Schmitz et al. (2022), Kwateng et al. (2022), & Cimperman et al. (2016).

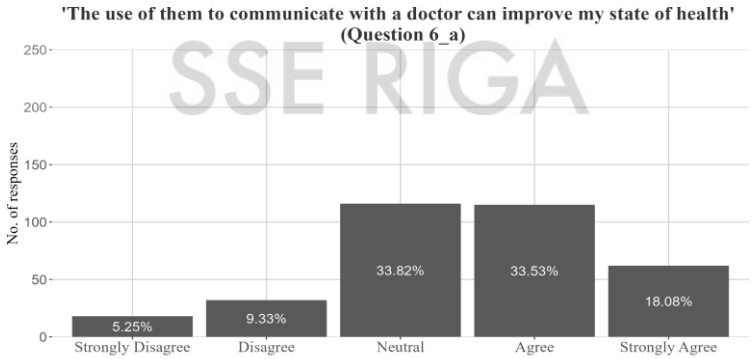

Figure 2. Percentage distribution of respondents' answers to Patient Survey Questionnaire question 6_a. (Graph created by the authors)

In a text answer one respondent raises doubts about the benefits of video consultations relative to telephone consultations:

> *"How would that actually impact the physical examinations, communications alone could be better done through regular phone call - no need for video."*

Effort expectancy

Interviews

The extent to which digital visits are perceived to be easy to use has several dimensions. First, one needs some digital skills in order to use a video consultation solution. Most doctors have accepted modernisation:

> "*Digital solutions are self-explanatory nowadays — the new doctors are prepared for the digital environment, there should be no problem in introducing and using them if you work with digital solutions every day. [...] If colleagues have difficulties, it is only due to a lack of digital skills.*" (Aivars, 37)

But the interviewees indicate that operating with a computer and applying digital skills is likely much easier for younger doctors, for whom digitisation is more familiar, compared to older practitioners.

> "*When you enter the associations of family doctors and paediatricians, anthroposophic physicians, all of us there are around my age, about 50. Look at our posture and physique in any association meeting, and I can say that in my generation we are pretty unfamiliar [Latvian: "esam uz Jūs"] with technology,*" and "*I need an assistant for Zoom.*" (Maija, 56)

Nonetheless, there is no consensus about when does *old* begin. One doctor says that 50-year-olds still can introduce digital solutions with relative ease, but for older doctors, it is likely challenging. Furthermore, older doctors often need support staff to utilise a computer, and they ("*nurses, helpers, registrars*") would likely play an important role in older doctors' introduction of video consultations. As some doctors note, they already assign most of the administrative tasks to the nurses, including transcribing notes from consultations and inputting data digitally, thus the introduction of any new digital solution simply becomes the burden of already overworked supportive staff. As per Nicolini (2006), nurses already often informally contribute to many of the doctor's tasks, even those formally beyond their competency. On one hand, introducing telemedicine might offer better separation of duties, however, it might also complicate nurses' and doctors' collaborative workflow.

Overall, most interviewees agree that the keenness and prowess to use digital technologies is inversely related to the age of the doctor. The same goes for patients (also

highlighted by Cimperman et al. (2016)): older patients may have difficulties in the execution of a virtual visit.

> "*(...) a lot of people do not even have a bank account. You cannot even imagine. They do not understand how to properly make a call or read what they have to do tomorrow from a piece of paper*." (Rihards, 40)

For people with poor digital literacy, digital visits would not be seen as easy-to-use in most cases, and this is an important factor in hindering their use by this group. Even for those who could implement the solutions, however, introducing video consultations would require a significant effort (and resources) in terms of reorganising their work (as also found by Swanson et al. (2012)).

A few doctors highlight the potential displeasure of using video consultations that arises due to the reduction of in-person human contact with an increase in remote visits, which also raises an important point about the nature of the doctor's profession:

> "*The challenge would be to sit in front of a computer, look at the camera, and not meet people. That is pathetic. Any job that asks something like this from people is not humane. For doctors… That is not really the doctors' job. That is a job for technicians.*"
> (Valdis, 50)

An interesting dimension we observe is that many doctors have a negative bias against digital solutions in health care in general due to negative experience with using Latvia's digital health care portal *E-Health* (*E-veselība)*:

> "*[to introduce virtual visits] The desire to do it is needed. (...) And it shouldn't be complicated, should be easy to use, it should be so that there are no such problems like the ones that we had with E-Health. We have had a negative experience with the e-system [E-Health], how we have struggled, fought, and then there are days when you open it and it just doesn't work… [...] We have struggled a lot with E-Health, that's why there is this negative taste." (Dagnija, 58)*

Some doctors admit that they might expect more problems and challenges in practical use than advantages from digital solutions due to the negative experience in using this system, which is a factor that hinders the use of digital solutions, such as virtual consultations, among GPs.

Survey

In this section, responses to all 3 questions (questions 8_a, 8_b, 8_c) were similarly distributed. 62% Strongly agree that using digital solutions in their day-to-day life is easy for them (question 8_a), 25% agree, only 7% are neutral and 6% disagree or strongly disagree; 88% of respondents agreed (20%) or strongly agreed (65%) that digital skills would not be an obstacle to using video consultations (question 8_b); 84% of

respondents agreed (26%) or strongly agreed (58%) that learning new tools for conducting video consultations with a doctor would not take much time (question 8_c).

Interestingly, although we see a slight negative correlation between the responses to questions in this section and the respondents' age, overall, respondents of the survey seem unconcerned with possible challenges posed by digital solutions (Figure 3). We do not find *Effort expectancy* to be a statistically significant predictor for the intention to use video consultations (Appendix G, Figure G.1.), which goes against the findings of, e.g., Cimperman et al. (2016), who conducted a study of patients aged 50 and above. However, the fact that our sample is skewed towards younger patients who, in the aggregate, have better digital skills could be one explanation as to why we find this factor to be insignificant.

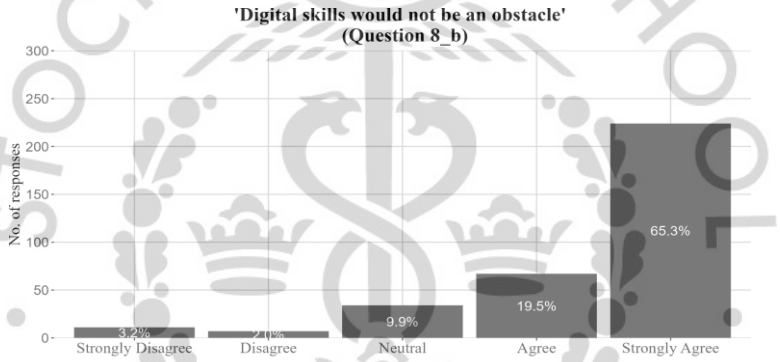

Figure 3. Percentage distribution of respondent's answers to Patient Survey Questionnaire question 8_b. (Graph created by the authors)

In a text answer, one respondent highlights a psychological factor in online communication that may be challenging for some users (also seen in Cimperman et al. (2016)):

> *"Communication in a remote environment is harder / less natural than in person."*

Wherton et al. (2020) suggest that conversation flow can be impeded due to latency and the quality of video transmission. Shaw et al. (2020) expand on this through the lens of linguistic ethnography. They also find that technical issues can impede doctor-patient communication and thus affect the quality of the consultation, however, they conclude that these challenges are mostly overcome and face-to-face communication patterns are adapted to suit the format. They, however, also confirm the concerns raised by our doctors in that older patients may have more difficulties dealing with that.

Social influence

Interviews

A positive review from peers — other doctors — is a strong facilitator for trying out a technological solution or innovation (as also found by Cho & Mathiassen (2006) & supported by Kim et al. (2010)), given that the doctor sees a potential benefit for themselves in their own situation. There is generally a lot of experience-sharing among colleagues in the medical profession (both in private conversations and conferences, seminars, etc.).

Patients can also facilitate the doctors' use of telemedicine, and patients are often those who ask if a consultation can be carried out remotely. Most doctors care about what is in demand: if they saw an increase in patients' demand for digital consultations, they would introduce them. If a patient asked for a teleconsultation, they would be willing to provide it if it was suitable in the specific case — a common answer was that "*it all depends on the situation*".

Survey

In responses to statements regarding whose recommendations would motivate respondents to use video consultations, results for family and friends, and acquaintances were slightly positively skewed — 44% agree or strongly agree that they would use it if family or friends recommended it, 24% disagree or strongly disagree (question 9_a); 36% agree or strongly agree that they would respond to recommendations from an acquaintance, 27% disagree (question 9_b), while in the case of recommendations from well-known people, 46% disagree or strongly disagree and only 18% agree or strongly agree (question 9_c). A recommendation from a doctor would seemingly have a much higher impact, as 72% either agree (32%) or strongly agree (40%) that they would use video consultations if their doctor recommended it (question 9_d). This goes in line with Wade et al. (2014) who highlight that if the doctor acceptance barrier is overcome, it may ensure the successful adoption of the solution even despite other challenges.

The results show that ultimately it is the doctor's recommendation that is most likely to prompt a patient to use video consultations (Figure 4). Nonetheless, we infer from the doctor's responses that, unless they are committed to providing video consultations, they are unlikely to consider it as an option unless the patient asks for it. The combination of these results hints that there is a gap in communicating the needs and expectations between patients and doctors and, while both sides would be open to using the video consultation solution, they are unlikely to communicate it to the other party.

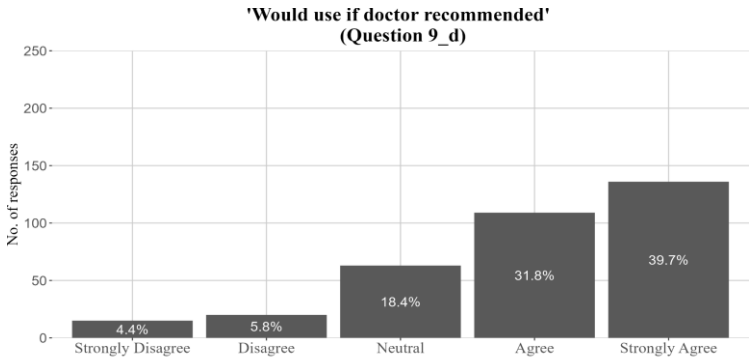

Figure 4. Percentage distribution of respondents' answers to Patient Survey Questionnaire question 9_d. (Graph created by the authors)

In a text answer, one respondent highlights the importance of social influence and norms in the acceptance and use of video consultations:

> *"If more people that I know would use it and recommend me, if that would become a normal practice and a typical way of communicating with doctors, I would consider such an option more because it indeed has its lots of benefits, however, it is still unusual for me."*

This factor is found to be a statistically significant predictor for the intention to use video consultations in our regression analysis (Appendix G, Figure G.1). While literature findings vary, Or & Karsh (2009) emphasise that the significance of social factors' impact on consumer health technology acceptance has both an empirical and a theoretical basis (e.g., doctors' and relatives' recommendations could encourage use).

Facilitating conditions

Interviews

All of the doctors interviewed had the equipment needed to conduct video consultations, and they thought that this generally would not be a problem for other doctors as well. Nonetheless, we recognise that due to the interviews being conducted online, we did not take into account the views of the group of doctors who may not have a well-working computer with a camera at their disposal.

Furthermore, remote consultations are seen as potentially even more useful if there are remote monitoring devices available (i.e., the patient can do a test at home and discuss the results with the doctor remotely).

Another technical aspect — likely especially relevant to older doctors — of the introduction of virtual visits is the help for setting up the system: IT support and training (also highlighted by Swanson et al. (2012)). The GPs' relatives, medical support staff, and neighbours are all mentioned as actors who may be relied upon for IT support. As for the use of any specific video call solution, several older doctors indicate that they would

appreciate it if there was a phone number to call in case of any questions, while younger doctors seem to be keener on using instructions available online.

It is fitting not only to discuss facilitating conditions, but also hindering factors. The three that stand out are: a lack of time and resources, lack of financing of remote visits by the State (more extensively covered in the section *Financial incentives*), and issues with State-level legislation, regulation, and Health Ministry guidelines. A key challenge in the introduction of virtual visits is finding the time (and/or resources, like supporting staff) to test and implement a new process (even one that could generate efficiency gains): the capacity of GPs practices is limited, and most are operating at or beyond full capacity.

Doctors who are not directly involved in digital health initiatives have a limited understanding of how you can and cannot use telemedicine. Many doctors mention legislation and guidelines as key obstacles for video consultations.

> "*Well, the legislation must change the view of what a consultation is, because, I think, it is written in the law that it includes the patients' examination and an organised reception, and there is nothing mentioned about the option to do it virtually.*" (Rihards, 40)

Doctors also have a varied understanding about what one can and cannot do remotely. For example, there is no consensus on if and when you can remotely open and close a sick-leave certificate. Unclarities about the legal aspects of remote consultations (at their core arising due to the lack of consideration of telemedicine in legislation and Ministry of Health guidelines, which is also pointed out by Ciekurs (2022)) are a factor that hinders the implementation of virtual visits. Looking at the latest available regulations on the procedure for issuing and cancelling sick-leave certificates, we find that these certificates can only be issued remotely under exceptional circumstances such as "if a person has been diagnosed with any of the dangerous infectious diseases" (Cabinet of Ministers, 2022).

Roberts (45), a doctor with a very digitised practice who extensively provides video consultations already, mentions two significant facilitating conditions: a manageable number of registered patients (1500-1600) (if there are more, capacity has to be expanded via longer hours or extra staff) and a radical reorganisation of work, as the one he performed when he introduced digital sign-ups for visits — "*you do not need a separate employee who sits by the phone and signs patients up*". He also mentions another key challenge for virtual visits: the fact that the number of GPs falls every month. Fewer

doctors mean more patients per doctor, which amplifies the issue of a lack of time and resources to implement innovations.

Survey

Respondents almost unanimously agree (81% strongly agree and 13% agree) that they have access to a computer with a camera and microphone that could be used for video consultations (question 10_a). The results are almost the same for the question of whether respondents have ways to authenticate themselves digitally (question 10_b). Asked whether they have friends or family that could assist with technical difficulties (question 10_c), 67% agree or strongly agree, while 16% disagree or strongly disagree. Finally, asked whether they would feel more comfortable communicating with a doctor through a video call if they had already met in person, 69% answered positively (42% strongly agree, 27% agree, 10% disagree). For patients, this factor is not a statistically significant predictor for the intention to use video consultations according to our regression analysis (Appendix G, Figure G.1). This finding goes against Cimperman et al. (2016) who conducted a study with patients aged 50 and above (facilitating conditions were significant), and the contradiction, again, could arise due to our sample being skewed towards younger patients, for whom the facilitating conditions required are likely nothing extraordinary.

Price value / Financial incentives

Interviews

A key aspect of financial incentives is payment for the consultation. At the moment, the Latvian NHS does not provide doctors compensation for virtual visits. Thus the doctors can a) provide them for free or b) provide them as a private service (the patient covers all the costs). This is a key hindering factor for virtual consultations.

> "*If the Latvian NHS would introduce some kind of compensation, there wouldn't be any problems.*" (Ieva, 38)

Several doctors express the idea that the Latvian NHS should introduce a virtual consultation manipulation, so that they can be compensated for it. The recognition of virtual visits by the Latvian NHS as a standard manipulation/service would act as a strong facilitator for the development of virtual visits in Latvia. Swanson et al. (2012) & Lam et al. (2005) also identify the concern about additional work without compensation as a factor hindering the use of telemedicine. Nonetheless, doctors who also provide private services can set whatever price they want, and a very digitised doctor Roberts (45) provides video consultations at a discount to in-person consultations to facilitate patient

use of them through a financial incentive. For him, this has resulted in increasingly more patients using (and asking the doctor to use) the virtual visit solution.

As for the compensation/visit price amount, most doctors think that the compensation and price for remote visits should be the same as for in-person visits. Other, less popular opinions, are that remote visits could be a little bit more expensive, as the patient pays for the convenience of not having to come into the practice/hospital/clinic and the doctor may need to cover costs for the video consultation solution and equipment, or a little less expensive as to incentivise the use of virtual visits and because one cannot do all the manipulations you could do in person remotely.

Survey

37% agreed that they would only use video consultations if the cost was covered by the State (question 11_a), while 32% disagreed. In a text answer to another question about use cases, one respondent highlights: "*It would be very important to develop them [video consultations] within the range of services compensated by the state.*" 63% agreed and 13% disagreed that they would use video consultations if they were cheaper than an in-person visit (question 11_b), only 9% agreed that they would agree to a virtual consultation if the cost was higher than for an in-person visit (question 11_c) with 64% disagreeing. In the case of costs being the same (question 11_d), 41% were neutral, 31% agreed and 28% disagreed.

Overall, it seems that patients in our sample are quite sensitive to price and would be open to using video consultations if they cost the same or cheaper than the face-to-face alternative, but likely would not use them if they cost any more. This result coincides with patients' answers in the *Perceived Product Advantage* section, showing that people's expectations of video consultations when compared to in-person visits also have an impact on their willingness to pay. In relation to the interview insights, offering video consultations at a slightly discounted price can serve as a strong incentive, however, this is only relevant in case of private services. However, we do not find this to be a significant factor in our regression analysis for predicting intention to use video consultations (Appendix G, Figure G.1).

Habit

Interviews

We asked the doctors how big the chance that after trying out video consultations, one would form a habit of it, and they estimated the probability to be quite high. Many doctors base their estimate of this likelihood on experience with the popularity growth of

telephone consultations (most say that now there are more of them than before the COVID-19 pandemic).

> "*To be honest, in the past I did not think that there could be so many teleconsultations too. In my childhood no one even dreamed of the chance to just call a doctor (...) Time goes on.*" (Maija, 56)

The COVID-19 pandemic has made us more comfortable with the remote format. Nonetheless, we also asked the doctors whether the habit of conducting medical consultations in person could hinder the use of virtual visits. Several doctors emphasised the in-person human connection and the sense of security it provides (a concern that Sharma et al. (2010) also find to be relevant) as an important aspect that would hinder the use of virtual visits for a part of people — both patients and doctors:

> "*This is the biggest obstacle to the introduction of virtual visits, because a person needs the other person, and they need them in-person. But, if the in-person visits are frequent enough, there should be no issue with meeting remotely in the middle.*" (Rita, 29)

There is also the viewpoint in which the level of digital literacy and the capacity to use digital solutions play a central role in facilitating/hindering the use of digital visits by limiting the opportunity to break old and form new (digital) habits. This again highlights that effort expectancy is a significant factor for the use of virtual visits.

Survey

In responses to whether the habit and familiarity of visiting the doctor in person would prevent respondents from trying out video consultations (question 12_a), 36% agree, 39% disagree, and 26% remain neutral. For the statement that the habit of communicating digitally could positively impact their willingness to consult with a doctor in a video call (question 12_b), 42% agree, 34% are neutral, and 23% disagree. Finally, asked if, assuming that video consultations were widely available, respondents would prefer them over in-person visits (question 13_c), 37% disagree, 26% are neutral, and 37% agree.

Again, even though patients are open to trying out video consultations, only some would prefer them over in-person visits. This aligns with the doctors' view that video consultations could serve as an additional tool, but not as a complete replacement for in-person visits. This factor is not statistically significant in our regression analysis (Appendix G, Figure G.1).

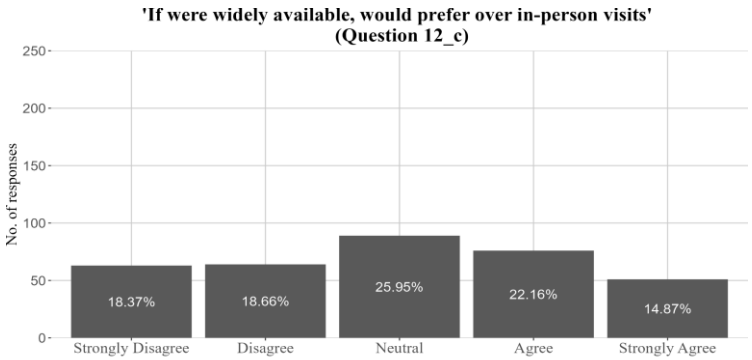

Figure 5. Percentage distribution of respondents' answers to Patient Survey Questionnaire question 13_c. (Graph created by the authors)

Hedonic motivation

Interviews

When we explore the hedonic motivation aspect of telemedicine and digital visits, doctors list several hedonic benefits. For most, the key element that brings them positive feelings is the ability to help the patient flexibly, both in terms of time and place.

> "*I get a peace of mind because the patient has received primary care [via a video consultation].*" (Ieva, 38)

> "*Here I see an opportunity to be in a place where I want to be, but make the time for the job and consultations.*" (Iveta, 52)

Another element is time economy, e.g., in cases where it is possible to replace a home visit with a video consultation.

Most doctors actively seek ways to improve efficiency and the quality of care provided (the only hindrance to this is a lack of time and resources due to most doctors already working at full or beyond full capacity), and the discovery and use of new solutions/methods in work with patients can definitely bring satisfaction, and this can be a great motivator for innovation. Virtual visits could provide more structure, reduce the chance of doctors working outside of working hours via telephone and WhatsApp consultations (increasing their risk of burnout) and provide a more realistic chance of documentation. The hedonic motivation aspects of this possibility are potentially freeing up the doctors' professional capacity and improving the quality of their private life.

Most doctors emphasise that the patients are the ones who might enjoy video consultations the most: they gain even greater flexibility in terms of time and place (they do not have to make the transit to the doctor) and accessibility, which Ferrer-Roca et al. (2010) also refer to in terms of life quality improvements through these channels.

Survey

Across the whole sample, 38% of respondents agree that using video consultations is or could be fun (question 13_a), 27% disagree, and 35% are neutral. 64% agree, 16% disagree that transport-cost and time savings provide satisfaction in consulting with a doctor remotely (question 13_b); 47% agree and 21% disagree that video consultations could positively impact their well-being (question 13_c). We find this to be one of four significant factors for predicting the intention to use video consultations in the future (Appendix G, Figure G.1.), which is also found to be significant by Schmitz et al. (2022).

Management leadership

Interviews

Most of the doctors interviewed have their own practice and thus are their own managers, therefore, they are both the initiators (in most cases) and the decision-makers when it comes to introducing new solutions. A few doctors we interviewed are employees at medical institutions (or shared their experience of working in one). While in some institutions doctors can suggest innovations, in most larger organisations the initiative comes from the top — the leadership of medical institutions plays an important role in driving the implementation of innovations, such as virtual consultations, and it is not possible without their support. Handayani et al. (2017) also note that hospital management has an important role in increasing user acceptance of innovations.

Perceived security

Interviews

Doctors expect that a virtual visit solution that is certified and registered, and approved by their peers, will have the security standard suitable to transmitting sensitive information, and the solution provider is the one who has to think about all the necessary safety measures and standards. Some doctors mention that when choosing any specific solution they would be concerned about who stores the patient and visit data and who will have access to it (Richards et al. (2004) also highlight the impact on patient privacy as a relevant concern that GPs have). Most doctors do not get too technical but are aware of some key safety and security features that matter to them, such as authentication safety measures, encrypted channels, and consensual data processing.

In reality, however, in most doctors' daily work unencrypted, sensitive information gets transmitted over the internet over commonplace channels, such as WhatsApp, SMS, or email, all the time by the patients (communication with patients using these channels is also noted by Majore et al. (2021)). The doctors theorise that

patients do not really care about the privacy and safety of their medical data as long as everything is okay — they trust their doctor, want medical advice, and often do not really think about the channel they use to get that advice, most often relying on channels they use for every other type of information.

> "*The patients do not think about data security at all — they send their medical examination results, their and their childrens' photos on WhatsApp without thinking twice.*" (Iveta, 52)

This indicates that the patients would probably trust the platform that their doctor uses for virtual consultations. There is also the dimension of the mental sense of security:

> "*If there is a matter that the patient does not feel comfortable solving in person, you can immediately offer to solve it remotely.*" (Aivars, 37)

Additionally, the ability to receive a consultation from the comfort of one's own home may provide a sense of security and the ability to share all sorts of information with the doctor over the video call.

Survey

55% of respondents agree (28%) or strongly agree (27%) that their data is as safe in a video consultation as it would be in an in-person visit (question 14_a), 16% disagree and 9% strongly disagree. 34% strongly agree and 27% agree that data security is important to them (question 14_b), while 25% are neutral and 14% disagree or strongly disagree. According to our regression analysis, *Perceived security* is a statistically significant predictor for patients' intention to use video consultations in the future (Appendix G, Figure G.1), which corresponds with the findings of Schmitz et al. (2022).

Perceived product advantage

Interviews

When thinking about perceived product advantage, we can look at video consultations as substitutes for traditional solutions: in-person visits and other remote communication solutions — telephone consultations / written consultations. In both cases, a benefit enabled by video consultations that multiple doctors name is more effective and efficient planning and use of time and saved resources (e.g., costs of gas and parking for home visits for the doctor, as well as costs incurred by the patient).

When looking at the advantages of a video consultation relative to an in-person visit (in situations where it is possible), one of the key gains doctors mention is speed (in line with Orruño et al. (2011) findings on teledermatology):

> "*Speed. Speed in which we can communicate and resolve the issue. In the case of a digital consultation, the patient is prepared and has written their questions on the [video consultation] platform — they try to ask their questions in a concentrated manner. The answers are available on the platform after the consultation as well.*" (Roberts, 45)

On the negative side, factors limiting the expected usefulness of virtual visits include the fact that you cannot do a physical examination remotely, you cannot always make a diagnosis remotely, all patients (and doctors) are not able to operate a computer, and, for some of the interviewees, there is a lack of the human contact in a video visit which is also traditionally an important part of the doctor-patient relationship. Our finding aligns with that of Jiwa & Meng (2013) who find that doctors are reluctant to consult patients over video for the purpose of diagnosis due to a lack of ability to touch the patient. Shaw et al. (2020) examine video consultations in which a physical examination has been carried out by the doctor instructing the patient and find that this can require the patient to simultaneously communicate, follow instructions and examine himself and could prove to be particularly challenging for older patients.

In comparison to telephone consultations and messaging, there is an obvious advantage video consultations have over audio and written consultations — the visual aspect, the ability to see the patient's face in real-time. This is not just about non-verbal communication, expressions that help to read emotions (and thus understand the patient and their needs better, infer insights about the symptoms), but it also is possible to see some symptoms, like rashes. Some worry about the lack of non-verbal communication in a video call (as also seen in Sharma et al. (2010)), but Aivars (37) says that "*Non-verbal communication is possible in a video call. You hear the sound and see the patient — this is a high level.*" Hammersley et al. (2019) suggest that video consultations can offer better rapport-building with patients in comparison to telephone consultations. Furthermore, virtual visits may be more suited to record information — like the fact that the consultation took place, what were the issues, and after-visit recommendations — and provide more structure to remote communication with the patient.

Generally, the doctors we interviewed think that virtual visits could replace a part of in-person consultations. There are different situations and patient types where this is possible and can be effective, for example, anything related to known issues, discussion of medical tests and their results, corrections/adjustments, chronic patient care, care of patients with limited mobility or mental illness, infectious patients, patients who are far away, and situations when a physical examination is not needed. When it comes to acute

issues, the opinions on whether such situations can be handled via a video consultation differ. In a study of Norwegian general practitioners, Johnsen et al. (2021) find that general practitioners estimate only about 20% of consultations could be replaced by video consultations.

Survey

One major benefit many of the respondents describe is that video consultations could offer the possibility to see a doctor sooner, not due to geographical distance, but rather long queues to see doctors: *"There is no possibility to see a doctor in-person in a year's time."*

Multiple survey respondents pointed out an aspect related to a sense of psychological security in a text answer: *"Visiting the doctor gives a placebo effect in a sense when the doctor tells you that everything will be okay. A video call cannot give the same sense of security if something goes wrong or some pain becomes stronger."* This point was also raised by some of the doctors in our interviews, who suggested that for some patients the simple act of coming to the clinic or hospital and seeing the doctor, and getting examined physically can be an important emotional factor, which is lost in a video consultation. Wherton et al. (2020) touch upon this issue and highlight that traditional rapport-building and greetings such as shaking hands and inviting the patient into the office are absent for online visits, thus more time must be given at the start of a video consultation for activities that can substitute for this and put the patient at ease.

In response to the question of whether avoiding exposure to germs is a significant factor (question 7_a), responses are somewhat evenly distributed, with roughly 38% indicating that they agree or strongly agree, 33% indicating that they disagree or strongly disagree, and 29% remaining neutral. The flexibility offered by video consultations, however, is evaluated highly as more than 73% of respondents indicate that they strongly agree (44%) or agree (29%) with the statement (question 7_b). The option to receive a second opinion is valued highly by roughly 60% of the respondents, while 27% remain neutral (question 7_c). In response to question 7_d on whether patients think that video consultations have significant benefits in comparison to face-to-face visits, around 40% disagree with the statement, 30% agree (of whom only 11% strongly agree), and 30% are neutral. The distribution of responses to the statement that the quality of communication with the doctor is not negatively impacted by opting for a video consultation solution as opposed to an in-person consultation (question 7_e) is negatively skewed with 43% of respondents disagreeing with the statement, while 31% agree and 26% are neutral.

Responses to sub-questions d and e provide important insights and relate to similar observations in previous sections — while patients recognise the benefits of video consultations, they are quite critical of the negative aspects and the results show that for the majority of patients, the negative aspects can outweigh the positives when comparing directly to in-person visits. *Perceived product advantage* is also a statistically significant predictor for the intention to use video consultations (Appendix G, Figure G.1).

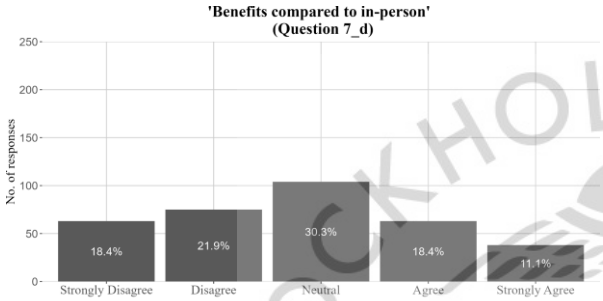

Figure 6. Percentage distribution of respondents' answers to Patient Survey Questionnaire question 7_d. (Graph created by the authors)

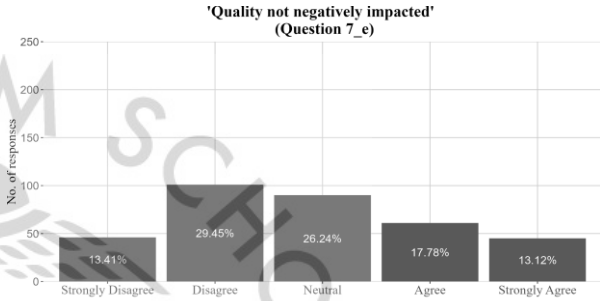

Figure 7. Percentage distribution of respondents' answers to Patient Survey Questionnaire question 7_e. (Graph created by the authors)

In addition to the Likert-scale questions, the survey respondents who have experience with virtual consultations had the option to leave written comments next to question 15. on how they evaluate their experience with these consultations and whether they plan on continuing to use these types of services. In responses to this question, the respondents describe the experience as being good, highlighting the advantage of time-savings both due to travel as well as not having to wait in a queue at the clinic, and in the case of those living outside the capital – savings on transportation. One respondent describes their experience, highlighting a benefit relative to an in-person consultation:

> *"Experience was good, productive […] The visit was long, so I could discuss all the questions I had. I've observed that in face-to-face visits there is a sense of urgency, which leads to a situation, where I cannot ask all the questions I have, but, remotely, it is cool that you can also ask follow-up questions (if the doctor allows it, of course). I truly have a very good experience."*

Some respondents, however, raise concerns about the quality of remote consultations relative to in-person consultations, also mentioning that the "*doctor's attitude in a video consultation is not always the same as in a face-to-face visit*".

Respondents who indicated that they have used video consultations before were also asked in what use cases would they deem a video consultation to be a valid way to communicate with a doctor. The results are displayed in Figure 8. 59% of these respondents and 54% agree that video consultations are appropriate for routine check-ups

with a GP and consultations with GP due to acute illness. Interestingly, contrary to our expectations, only 26% see it as appropriate for discussing sensitive issues, and only 52% see it as fit for consultations with a specialist.

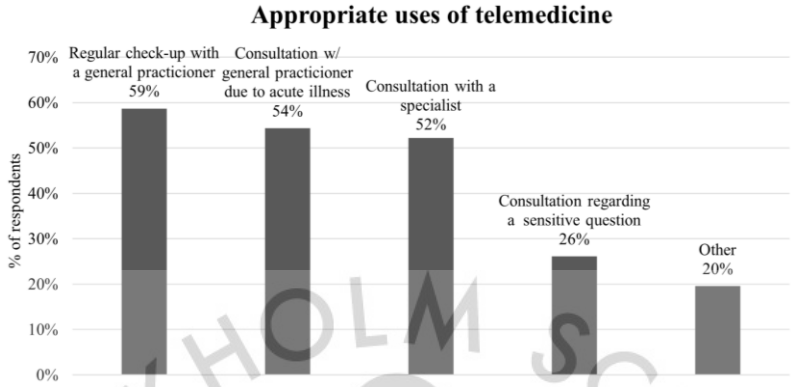

Figure 8. Percentage distribution of responses of respondents who indicate as having previously used video consultations to Patient Survey Questionnaire question 17. (Graph created by the authors)

This group of respondents also had the option to describe other use cases in addition to the given options. In addition to the use cases already mentioned by doctors, respondents recognise the potential of video visits to improve access to leading specialists.

Behavioural intention

Interviews

Most of the doctors interviewed would try out and even see themselves using video consultations in the future, especially as a response to growing patient demand; overall, younger doctors show a stronger behavioural intention. Most frequently mentioned hindering factors are those mentioned under "facilitating conditions" — a lack of consideration of telemedicine in legislation, NHS and Ministry of Health guidelines, unclarity about the legal aspects of remote consultations, a lack of opportunities to provide State-paid video consultations and time for testing and implementing new processes. As Maira (50) puts it, overall, the introduction of video consultations "is a generational and legislative issue".

Survey

Across the whole sample, 27% of respondents strongly agree that they are likely to try using or continue using video consultations (question 15) and 30% agree for a total of 57% positive responses, 24% are neutral, 13% disagree, and 6% strongly disagree. Looking at the sub-samples of respondents who have used video consultations before and those who have not, in the former group 75% of respondents agree (32%) or strongly agree (43%) that they are likely to continue using video consultations and 9% disagree or

strongly disagree, while in the latter group, 55% agree (29%) or strongly agree (26%), 25% are neutral and 21% disagree (14%) or strongly disagree (7%).

Looking at the correlation matrix in Appendix E, Figure E.7, it can be observed that the intention to use telemedicine solutions in the future (question 15) question answers have correlation coefficients of 0.45 and above with questions in the Performance Expectancy (6_a, 6_b, 6_c), Perceived Product Advantage (questions 7_b, 7_d, 7_e), Habit (questions 9_a, 9_b, 9_d), and Hedonic Motivation (questions 13_a, 13_b, 13_c) sections. On the other hand, correlations with questions in Effort expectancy and Facilitating conditions, and Price value / financial incentives sections are considerably smaller (mostly below 0.35). It can be inferred that the cost of the consultation does not play a significant role in the choice to use video consultations. Furthermore, familiarity with digital solutions also does not play a significant role in whether or not respondents are willing to use video consultations, aligning with the perspective that most patients are familiar with technology and do not see it as an obstacle. The highest correlation coefficient (0.63) can be observed in relation to question 13_b. Thus we might infer that the enjoyment gained from time and cost savings is the most important factor for choosing to use video consultations.

We further investigate the relation between respondents' responses to question 15 and demographic factors. Running a simple Welch's t-test we determine that respondents in the female group provide more positively skewed answers (mean of 3.66, where 1-strongly disagree and 5-strongly agree) as opposed to male respondents (mean of 3.34), The result is statistically significant with a p-value under 5% (Appendix G, Figure G.2). The different results in male and female respondent groups are shown in Figure 9. and Figure 10. below.

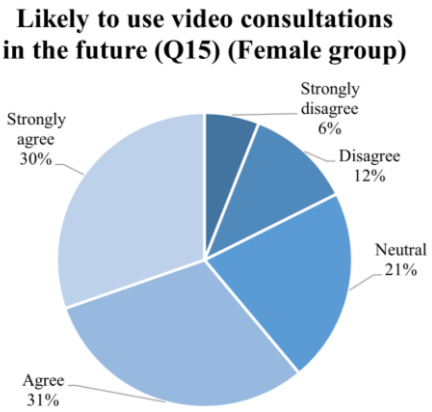

Figure 9. Percentage distribution of responses to Patient Survey Questionnaire question 15 by female respondents. (Graph created by the authors)

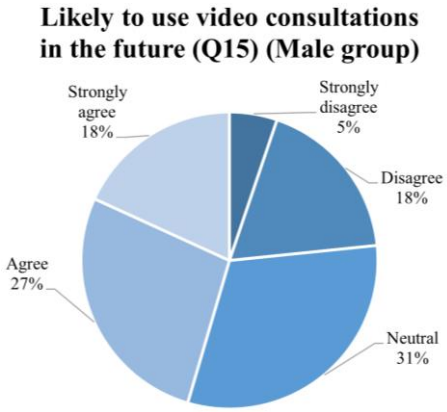

Figure 10. Percentage distribution of responses to Patient Survey Questionnaire question 15 by male respondents. (Graph created by the authors)

Finally, we analyse the results from our regression analysis (Appendix G, Figure G.1). We find that from the UTAUT2 factors *Performance expectancy*, *Perceived product advantage*, *Social influence*, *Hedonic motivation*, and *Perceived security* are statistically significant predictors for patients' intention to use video consultations in the future. The coefficients before the principal components for *Performance expectancy* (Q6) and H*edonic motivation* (Q13) are negative, however, this is due to the principal component having negative loadings for the underlying questions. Thus, overall, all of these factors are positively related to the intention to use, with Hedonic Motivation having the biggest effect, followed by Perceived security, Performance expectancy, and Social influence. Our results coincide with those of Schmitz et al. (2022), who apply a similar UTAUT2 modified model. From the demographic factors, we find age to be a significant predictor of intention to use. In this full regression specification, the demographic variables of gender, income, and region are not statistically significant predictors.

4.4 Other noteworthy insights

In addition to the modified UTAUT2 factor analysis, we highlight other noteworthy insights from both doctors and patients below.

No first-time visits. The majority of doctors mention that they would provide a video consultation only to patients they have met in person before. The majority (70%) of survey respondents, in response to question 10_d, also agree that they would feel more comfortable having a video consultation if they had met the respective doctor in person before. The data about remote visits in Latvia supports this preference, as only about 29% (26,186) of remote consultations in the first eight months of 2022 were first-time visits, the remaining (65,609) being repeat consultations (Ciekurs, 2022). Johnsen et al. (2021)

and Jiwa & Meng (2013) also indicate that video consultations are mostly suited in cases where the general practitioner is already familiar with the patient.

GP specifics in organisation of work. Some doctors had difficulty imagining how they could implement digital visits in their practice, taking into account the traditional live queues (*acute hours*) and thus the unpredictability of the patient flow and challenges in planning. Wherton et al. (2020) identify three parts of the workflow that will require adjustment — the scheduling of patients will have to accommodate both face-to-face and video consultations, communication templates will need to include information on connecting to the video consultation and, most relevant to our finding, the management of patient flow, especially in regards to dealing with edge cases such as when the queue of patients is running late. The unpredictable nature of the patient flow for GPs likely restricts the use of virtual visits relative to other specialists. Nonetheless, there are doctors among the ones interviewed who have implemented video visits successfully.

Risk of errors. One doctor emphasises that there is a higher risk of errors in a video consultation versus an in-person visit. In a video visit, the doctor has to be confident about their ability to make a diagnosis and recommend appropriate treatment, and if there is even a shadow of a doubt, it would be suitable to have an in-person visit.

Liability. Some doctors share their thoughts about the sense of responsibility/liability (also highlighted by Swanson et al. (2012)) in the context of virtual visits, but the points of view differ. One doctor says that since remote consultations are not fully "legal" and documented at the moment, the doctor has less responsibility, no legal liability about patient outcomes. Another view relates to the previous point — if the doctor has agreed to provide a remote visit, they must be confident that the quality of advice and care does not suffer. They may feel more responsible if something goes sub-optimally because they determined that a video consultation is enough and that there was no need for an in-person visit. A remote consultation may be inferior in some cases, and it was not always normalised:

> "*It used to be taboo, you could not consult anyone remotely at all. It was officially taught that you cannot consult a patient over the phone if you hadn't seen them. In principle, COVID normalised it; until then, among medics, if something had gone to sh*t and you had consulted the patient over the phone, the trouble was big.* " (Maira, 50)

Categorical opposition and distrust. A number of survey respondents state quite categorically that they do not consider video consultations a viable option in any situation. The reasons range from the respondent simply preferring to see people in-person and

appreciating the positive effect it has on their well-being to thinking that the "*doctor must see the patient in-person to be able to adequately evaluate his condition*". In addition to expressing distrust in virtual visits, some respondents criticise doctors ("*Doctors are not too smart anyway."*) and the current state of the health care system:

> *"There are no such factors. Medicine must change fundamentally. Doctors must be independent from farmacy monopolies, treatment must be individual and creative and not what WHO [World Health Organization] dictates it to be. Root-causes of illnesses must be treated rather than fighting consequences."*

Technological features. As Davis (1986) points out, perceived usefulness and ease of use depend on the design of the technology. Thus we ask doctors about the functionality that they would expect (or like to see) in a virtual consultation solution. Most respondents underline that the solution should be easy to use and intuitive. For example, the system should include payment functionality, so the patient is charged for the visit right away without a need for external solutions. Some doctors express the wish for one system where all kinds of products, including a video consultation solution, would be integrated:

> "*It would for sure reduce the workload if everything would be together — if when you write a referral to a medical test, the results would be visible in all systems at once. One platform, where you can sign in and see everything, diagnostics images, photos (of the state of skin etc.)*." (Līga, 34)

However, this integrated system (a common platform with access to patient data, *E-Health* functionality, and video consultations), the need for which is also mentioned by Majore et al. (2021), is described as more of a utopian dream, as the digital health infrastructure in Latvia at the State level is deemed sub-optimal by many of the interviewees. Nonetheless, the accessibility of patient examination results and other data in integrated systems for doctors is one of the features of the Digital health system that Daniels Pavļuts, the Minister for Health in 2022, described as the trajectory for Latvia (TVNET/LETA, 2022). Some private service providers, like Datamed, already are working towards a single digital platform for patients' examination results (Datamed, n.d.-a). Among the doctors interviewed, there is no consensus about the need of the video consultation solution to have integration with *E-Health* (*E-veselība*). Some doctors acknowledge that it would be a desirable and useful feature to have in a video consultation platform, but some think *E-Health's* functionality should be improved before it becomes a priority to integrate it into a video call solution.

Furthermore, considering the usability of a solution that would be implemented, one of the older doctors interviewed, Maija, 56, emphasises that it has to be

understandable and use simple language rather than overly technical or weirdly translated terms:

> "*[The issue with introducing telemedicine solutions] is that it [the computer] does not speak Latvian with me, and I do not understand English that well. Even if it comes in Latvian [...], that kind of Latvian… I do not know who understands it. [...] I need to know the computer language.*"

Doctors also mention potential artificial intelligence (AI) uses in video consultations, e.g., to aid diagnostics. However, they also admit that it is likely still far from wide implementation, considering the overall slow pace of innovation in Latvian health care due to legal constraints. Nonetheless, it is worth noting that there is some progress in the matter of AI in Latvian health care: the already mentioned company Datamed is also a distributor of AI software for radiology in the Baltic region, and the AI tools are being used in Latvian hospitals (Datamed, n.d.-b). When asked about the possibility of using diagnostic data that patients obtain through their smart watches and such, the doctors' response was dismissive, however.

5. Conclusions

Over the course of our research, we set out to explore what are the factors affecting the intention and readiness to use virtual visits among general practitioners and patients in Latvia. Our research builds on a vast collection of previous work on telemedicine applications and research on end-user technology acceptance. In our work, we attempt to go beyond understanding which factors are important and identify how and why they are important to doctors and patients alike, both generally and in the Latvian context.

Most GPs recognise the potential benefits of virtual consultations, like speed, saved time and resources, flexibility and accessibility (previously highlighted by Orruño et al. (2011) and Hjelm (2005)), and epidemiological safety (also highlighted by Bitar & Alismail (2021) in the context of the COVID-19 pandemic). However, a working substitute for video consultations currently used by a part of doctors is communication with patients via telephone and/or messaging apps (most often via WhatsApp), and most of these doctors see the usefulness of switching to video consultations as low. Nonetheless, they admit that these informal consultations create additional workload and often take place outside of working hours, and increases the risk of burnout (doctors interviewed as part of a study on the use of WeChat (Chinese equivalent of WhatsApp) in patient-provider communication by Ding et al. (2019) raise a similar concern). Some doctors see video consultations as a solution to this challenge via bringing back structure

and borders to remote consulting, with the added benefit of seeing the patient's reactions (and sometimes symptoms) in real-time, and one particularly digitised doctor who uses virtual consultations confirms that this solution does work. Oudshoorn (2009) has also distinguished this characteristic of remote consultations being more structured in a study of a telehealth-care centre's operations. Morris et al. (2021), however, propose that WhatsApp is a problematic method of communication, practised partly due to absence of clear guidelines regarding ensuring privacy and appropriate data storage. Notably, the expected usefulness of digital consultations is likely overall inversely related to age, i.e., both younger doctors and patients are expected to see virtual visits as more useful, linked with differences in effort expectancy (also highlighted by Cimperman et al. (2016). An interesting observation is that many doctors have a negative bias against digital solutions in health care in general due to the negative experiences in the use of *E-Health*, Latvia's digital health care portal.

Remarkably, especially relevant in the Latvian health care context, most doctors see the barriers to the use of virtual consultations as more powerful than the factors facilitating use, the key barriers being: a lack of financing of remote visits by the State, issues with State-level legislation, regulation, and Health Ministry guidelines (as also identified by Majore et al. (2021) and Ciekurs (2022)), where there is a lack of consideration of telemedicine, and a lack of time and resources for implementing new solutions (a concern also raised by Swanson et al. (2012)). This is most evidently reflected in the number of patients that general practitioners must accommodate in their practices, leaving no time or energy for innovation and the introduction of new solutions.

As for the patients, we find that performance expectancy, perceived product advantage, hedonic motivation, social influence, and perceived security are statistically significant predictors for patients' intention to use video consultations in the future in our modified UTAUT2 model (see Appendix G, Figure G.1 for regression results). These results mostly align with those of a previous study of a similar design (Schmitz et al., 2022). One of the key insights we obtain is that patients would be open to using video consultations if their doctor was to recommend it. Doctors are also open to using video consultations, however, they are more likely to do so if the patient requests it. This finding partly aligns with that of a previous study by Wade et al. (2014) who claim that patient demand is induced through clinicians' recommendations rather than the public interest, although they suggest that it is proof for patient demand not playing a significant role in adoption of telemedicine. Our findings provide an alternative perspective. The keenness

of patients to contact their doctors personally, outside of working hours through alternative communication channels like private messaging platforms further confirms that there is patient demand for quickly available telemedicine services. However, even though patients would like to use video consultations and doctors are ready to provide them, this possibility is not communicated by either party, and the benefits are not realised.

A key point of interest is the patient-doctor relationship. A range of psychological factors is mentioned by both doctors and survey participants. A sizable fraction of both doctors and patients find communication online to be more strenuous (effort expectancy) and doctors' attitudes to be perceived differently in a video consultation (perceived product advantage). Harst et al. (2019) and Sharma et al. (2010) have recognised similar concerns. Some doctors themselves express that the use of video consultations fundamentally contradicts the nature of the doctors' profession, as it essentially substitutes human contact with interactions that are transactional in nature. This same concern is reflected in the patients' feelings that an in-person visit offers a placebo effect of healing that is not replicated in video consultations (performance expectancy). Supposedly, the patients recognise or impose the concern about lost 'Nursing Intuition' that has been identified as a barrier on the providers' side by Sharma et al. (2010). On the positive side, however, the sense of privacy when receiving the consultation from the comfort of the patient's home (perceived security) is an added benefit of telemedicine. As noted by Pruitt et al. (2014), in specific contexts, e.g., with sensitive issues and public waiting rooms, privacy can be a concern to patients.

Overall, our findings suggest that the factors we identified relevant to the intention to use and use of video consultations go in line with previous literature. However, there are barriers that are specific to the situation in Latvia, namely:

(1) Related to State competencies (legal and financial): a lack of consideration of telemedicine in legislation, regulation, and guidelines, and no State financing for virtual visits;
(2) Related to the capacity of doctors to innovate: a lack of time and resources arising from most doctors already working at or beyond full capacity.

The current status quo of doctors providing free informal consultations through commonplace channels can be interpreted as arising from patients choosing the path of least resistance for receiving remote doctors' assistance to satisfy the demand for quickly accessible care via remote communication channels at the expense of doctors doing extra

unstructured work outside of formal, adequately compensated interactions, i.e., face-to-face consultations. In an environment where there is a lack of State financing and relevant legislation, it is understandable that doctors who provide public services do not see a great benefit in switching to virtual consultations, as they still would do extra work without compensation and would need to spend resources for testing and implementing a new solution. Our recommendation is for the policy decision-makers to develop a legal and compensation framework to help realise the benefits of virtual consultations, which are more suitable for structured and documented consultations than the status quo, furthermore resolving the questions about liability and enabling the future gains from innovations, such as the use of AI in remote diagnostics, at the same time satisfying the demand from patients in a way that does not put doctors at a disadvantage. Specifically, we recommend looking at work by Ciekurs (2022) and Timule (2021), who have evaluated the legal regulation of telemedicine in Latvia and formulated suggestions for improvements, and taking into account the viewpoints of practitioners when developing the frameworks.

6. Limitations and future research

We acknowledge that by conducting online interviews, we are unable to include a group of doctors with low digital skills or other reasons to never consider providing digital consultations. However, we also think that this type of doctor is not the likely target audience for digital telemedicine solutions such as virtual consultations. Upon receiving the invitation to participate in our study by being interviewed remotely, one doctor declined and said:

> "*I see this type of communication [online, remote] with a patient unacceptable. I am an old doctor and it is important to me to meet in person,*"

which illustrates that there is a group of doctors completely uninterested in virtual consultations. Some of the GPs interviewed also expressed that there is likely a group of doctors who will never use digital consultations, mostly older people and those who lack digital skills and do not feel comfortable with technology, do not want to use a computer at work; emotional and mindset reasons may also be in play. Due to the nature of our topic, we think that online interviews are an appropriate format to gather relevant information, as the people unwilling to participate in an online call are likely not target users.

While three of the 16 doctors interviewed work in larger medical institutions (as opposed to private practices), our analysis could have benefitted from a greater number of respondents who work at larger institutions for richer insights into the management leadership factor.

Furthermore, while we distributed our survey among a large group of seniors and people over the age of 50, the age distribution of our respondents is still heavily skewed towards younger people, and, given the methods of how the survey was distributed, we are most likely not capturing the concerns of those groups which doctors highlight as unlikely to adopt the solutions, such as those without access to the internet. The lack of inclusion of these groups likely underestimates the impact of facilitating conditions, particularly — the availability and accessibility of technology and effort expectancy in relation to the use of technology. This limitation could be addressed by future research focusing on conducting offline interviews with groups that are not accessible through online channels.

We identify three potential future research directions. First, conducting patient interviews for deeper qualitative insights into the viewpoints of patients regarding virtual consultations could complement our current insights obtained from doctors; looking at telemedicine legislation and regulation internationally may help identify the approaches that yield effective and efficient results in combination with a cost-benefit analysis of the introduction of virtual visits in outpatient care and chronic patient care in Latvia.

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Appendices

Appendix A. Experts for exploratory interviews.

We organised exploratory interviews to verify the selected model for analysis (modified UTAUT2) and explore whether adjustments should be made. The experts participating in the interviews had a health care or technology innovation background:

- Gita Gaņģe, family doctor (general practitioner), anthroposophic physician, with leadership experience in different medical institutions, consults at a telemedicine platform;
- Dārta Geižāne, family doctor, Acting Assistant at Department of Family Medicine (Riga Stradiņš University), consults at a telemedicine clinic;
- Ainis Dzalbs, family doctor, internist, head of unit for Young General Practitioners and board member at Latvian Rural Family Doctors' Association, actively participates in student/resident training;
- Santa Zalyalova (ex. Batuhtina), telemedicine enthusiast, ex-business development director at a telemedicine platform;
- Viesturs Sosārs, serial entrepreneur, innovation advisor, currently participating in Open Health Labs (health care innovation laboratory by Helve in collaboration with the Latvian NHS) as a mentor, lecturer at the Stockholm School of Economics in Riga;
- Baiba Ziemele, president of Latvian Alliance of Rare Diseases, board member of World Federation of Hemophilia.

Appendix B. Insights from exploratory interviews with experts.

Below is a summary of the insights gained over the course of expert interviews relevant to each factor of our model.

(1) Performance expectancy: This is a factor relevant to both doctors and patients. The key aspects of expected performance are integration with other systems, accessibility of care, and time savings (more relevant to patients than doctors). Another aspect of performance expectancy, coming from the patient side, is the ease of making payments for the medical services.

(2) Effort expectancy: This factor is relevant for both doctors and patients. The consensus is that effort expectancy in a technical sense is a factor that is most likely insignificant to most doctors (as they have had to learn how to use troublesome systems such as E-Health), however, the more challenging aspect may be the adjustment of they way doctors think about providing care (a mindset shift) required to effectively provide telemedicine services. It is, however, important that the user interface of the solution is intuitive to use to facilitate usage.

For doctors, a difficult aspect is the workload — if they are expected to provide telemedicine care in addition to their current workload (without any reductions in the amount of in-person care), a significant factor is a lack of time and energy resources which may lead to burnout.

For patients it may be a bigger challenge, as not all patients (especially seniors and people with special needs) are equipped with technological skills and abilities (required for video consultations via a computer), and here family members or care providers may provide assistance. The effort of adjusting one's mindset to receiving care remotely is relevant here as well. However, most doctors and patients already have experience in a form of telemedicine — telephone consultations — for this form of telemedicine, effort expectancy is likely an insignificant factor.

Additionally, one needs to put in effort to evaluate which of the telemedicine solutions is secure (relevant to both patients and doctors).

(3) Social influence: Most doctors interact with their colleagues, visit conferences, and are willing to try new solutions if they have heard good feedback from colleagues. As one of our interviewees mentions, medical diagnosis is a field that is always in development and requires doctors to familiarise themselves with new methods. We are yet to explore the significance of this factor to more conservative doctors, used to sticking to the ways they know, thus it remains a question to be explored throughout further interviews with practitioners.

For patients, positive feedback about a solution from the people in their environment, such as friends, family, and colleagues, is likely a good facilitator for trying out the solution themselves.

(4) Facilitating conditions: As the key facilitating conditions for telemedicine, our experts identified the technical capacity (high-speed internet and computer for video consultations) and government support both in terms of favourable legislation and financing. The COVID-19 pandemic was an external shock, introducing a burning need for telemedicine, and this condition lingers on.

Furthermore, it is likely that a facilitating condition for the use of telemedicine is an already established contact (face-to-face) between the doctor and the patient before a virtual consultation takes place.

(5) Price value / financial incentives: The key aspect of price value for patients is that telemedicine visits should not cost more than traditional visits. Additionally, there should be State-paid telemedicine visits available.

From the doctors' perspective, too low a price may create excess demand, overburdening the care providers (there would be a decrease in the prerequisites for seeking doctor's help), and the consensus is that the price should be about the same.

(6) Habit: Habit is likely to be a relevant factor for patients: on one hand, there is the habit of visiting the doctor face-to-face, especially relevant to older patients, and the satisfaction with this current solution hinders trying out telemedicine (in Latvia there is the practice of bringing the doctor flowers and candy or just having a face-to face conversation — personal contact — to establish and develop the relationship with the doctor). On the other hand, younger people and those who are used to meetings and calls in the online environment have more developed technological habits — this group of patients is used to digital solutions in all aspects of their life, which may facilitate the use of digital solutions in receiving medical care as well.

As for the doctors, the situation is similar: on one hand, doctors who are conservative and still use paper-based documentation in their practices are likely to have a harder time moving away from the habits related to this format of delivering care and trying out new solutions, but, on the other hand, the COVID-19 pandemic has facilitated the adoption of various telemedicine solutions in many practices (and created digital habits), and experience in the digital environment has helped to shape their perception and behaviour in the direction of willingness to integrate virtual care into their practice.

(7) Hedonic motivation: Hedonic motivation seems more relevant to patients than doctors when thinking about telehealth — the key aspects are time and cost savings (no need to make the journey to the doctor's office), ability to receive a consultation from the comfort of one's own home or job (no need to take a day off for a doctor's consultation and flexibility). For chronic patients, a key benefit is not having to go to the doctor's office regularly by replacing the regular check-up visits with virtual consultations.

However, a key aspect highlighted by doctors is the *pleasure* of using an easy-to-use system, relating back to an aspect of performance expectancy — an intuitive solution with some automated aspects may reduce the workload or effort needed to navigate difficult systems and do work-intensive (administrative) processes they have in their practice. Some doctors also mentioned the ability to work from home as a relevant factor that helps them to have more personal time to spend with their family, for example, improving emotional satisfaction.

(8) Management leadership: As we found out over the course of interviews, most (or a significant part of) family doctors in Latvia have their own private practices, thus management leadership is not a significant factor in implementing a new solution. Thus, the doctors' own initiative is often the driver of the implementation of new solutions — it is an entrepreneurial matter (as one of our interviewees mentions, more than 10 years ago, the digitisation of medical prescriptions was initially mainly driven by these independent doctors).

However, for those doctors working for hospitals as employees, they are often given directions by the institution leadership they have to follow. There is a risk of the opposite effect — medical institutions creating obstacles for the introduction of new solutions.

Overall, we heard that management leadership is useful, but not integral. This factor is not relevant for patients.

(9) Perceived security: From the interviews, we found out that with current solutions, security is not the patients' first priority — receiving medical care is (i.e., patients sending their doctors unencrypted medical analysis results to their doctor via email or WhatsApp to receive feedback as soon as possible is a common practice). However, when considering trying out a new solution, perceived security does matter, especially when thinking about sensitive health issues related to, e.g., reproductive health.

As for the doctors, they care a lot about the perceived security, as they have a legal liability. Most of our interviewees express their stress and frustration in situations, when they are unsure how to manage digitally provided patients' data.

(10) Perceived product advantage: From the patient perspective, perceived advantages (relative to the traditional solution — onsite visits) matter; with telemedicine, the advantages identified are time and cost savings (not having to take a day off and travel expenses), flexibility, and opportunity to receive care from abroad or just regions further away from big cities. In addition, there is increased safety from avoiding visiting medical institutions where there is exposure to viruses and bacterias. Some of these advantages are especially important to specific patient groups (chronic patients, those who value their time highly). Additional relevant advantages include having the opportunity to easily get a second or third opinion on an issue by consulting with different (geographically and experience-wise) specialists.

Appendix C. Doctors' interview guide (LV)

Introductory questions (Ievadjautājumi):

- Kāds ir Jūsu vecums?
- Cik ilgi jau darbojaties ārstniecības nozarē?
- Kādā tieši specialitātē un kur (Rīgā/Pierīgā/*Reģionos*)?
- Vai vadāt savu privātpraksi vai esat darbinieks kādā ārstniecības iestādē?

Knowledge, familiarity with telemedicine, including use behaviour (Priekšzināšanas par telemedicīnu).

- Iespējams, ka esat jau sastapies ar telemedicīnas risinājumiem, it īpaši COVID laikā, konsultējot pacientus attālināti caur Zoom vai tamlīdzīgi. Kāds ir Jūsu iespaids, pārdomas par attālināto konsultēšanu, izmantojot virtuālās vizītes?
- Kādus digitālos risinājumus, rīkus izmantojat komunikācijā, darbā ar pacientiem?

Performance expectancy (Sagaidītā veiktspēja/funkcionalitāte):

- Kādi, Jūsuprāt, ir ieguvumi vai priekšrocības, konsultējot pacientus attālināti, izmantojot dažādus digitālos risinājumus? Tieši no Jūsu kā ārsta perspektīvas.
- Kādas priekšrocības digitālo vizīšu risinājumam vajadzētu piedāvāt, lai Jūs vēlētos to lietot? Cik svarīga ir katra no šīm priekšrocībām/funkcijām?
- Kas pašlaik ir lietas Jūsu praksē/darbā, ko, iespējams, varētu uzlabot ar telemedicīnas risinājumiem?
- Vai neverbālās komunikācijas trūkums, konsultējot pacientus attālināti, ietekmē sniegtā pakalpojuma kvalitāti?

Effort expectancy (Sagaidītā piepūle):

- Vai, Jūsuprāt, ārstiem ir/būtu viegli ieviest telemedicīnas risinājumus savā praksē? Kas ir galvenie izaicinājumi?
- Cik lielā mērā vēlme apgūt un ieviest jaunas tehnoloģijas savā darbā varētu būt atkarīga no faktoriem kā vecums, dzimums, ģeogrāfiskā lokācija?
- Kā Jums šķiet, vai, uzzinot par iespēju ārstniecībā izmantot telemedicīnas risinājumus, teiksim, regulāri veikt konsultācijas attālināti, ārsti un pacienti var nebūt optimistiski sagaidāmās piepūles un nepieciešamo prasmju dēļ?
- Vai attālinātās vizītes prasa vairāk vai mazāk laika salīdzinot ar klātienes vizītēm? Kādēļ?
- Vai attālinātās vizītes pieprasa lielāku piepūli, salīdzinot ar klātienes vizītēm? Kādēļ?

Social influence (Sociālā ietekme):

- Vai Jūsu kolēģi lieto telemedicīnas risinājumus, kāds ir viņu viedoklis par tiem?
- Ja Jūsu kolēģi/citi ārsti praksē ievieš kādu jaunu "inovāciju", vai Jūs tas varētu ieinteresēt arī to pamēģināt? Vai, piemēram, dzirdot par kādu jaunu tehnoloģiju / video konsultāciju platformu, Jums nāk prātā, ka varētu to izmantot savā darbā pēc savas iniciatīvas?
- Cik lielā mērā pacients var veicināt ārsta telemedicīnas izmantošanu?

Facilitating conditions (Veicinošie apstākļi):

- Kas Jums vajadzīgs, lai varētu pilnvērtīgi veikt piem. attālināto konsultēšanu? (domājot par tehniku, resursiem, arī likumdošanu, valsts atbalstu) Respektīvi, kādi apstākļi, Jūsuprāt, veicina telemedicīnas izmantošanu?
    - Kā Jūs vērtētu savu apstākļu piemērotību attālinātajai konsultēšanai?

Price value / Financial incentives (Finansiālie aspekti):

- Domājot par pacienta perspektīvu un atalgojumu, vai Jūsuprāt attālinātām vizītēm būtu jābūt dārgākām vai lētākām salīdzinot ar klātienes vizītēm?
- Vai telemedicīnas risinājumu, proti, virtuālo vizīšu ieviešana no Jums prasa papildu līdzekļus?
    - Vai finansējuma trūkums šīm vajadzībām var būt šķērslis?

Habit (Ieradumi):

- Cik liela, Jūsuprāt, ir iespēja, ka ārsts, izmēģinājis telemedicīnas risinājumus, ievieš to savā praksē kā standarta procedūru?

- Vai tagad, kad COVID laikā Jums bija iespēja konsultēt cilvēkus attālināti, vai iespējams, ka piedāvāsiet pacientiem attālinātas vizītes arī turpmāk?
- Cik lielā mērā, Jūsuprāt, apmierinātība ar tradicionālo risinājumu apmeklēt ārstu / pieņemt pacientu klātienē un pieradums pie šādas prakses varētu kavēt virtuālo vizīšu izmēģināšanu?

Hedonic motivation (Hēdoniskā motivācija):

- Kādu lomu telemedicīnas risinājumu lietošanā spēlē Jūsu labsajūtas uzlabošana?
- Vai Jūs gūstat gandarījumu, izmēģinot/atklājot jaunus risinājumus/metodes, kā strādāt ar pacientiem? Varbūt ieviest kādus telemedicīnas risinājumus savā ziņā ir 'jautrs' izaicinājums?
- Vai pats aktīvi meklējat iespējas kā savā darbā uzlabot efektivitāti, sniegto pakalpojumu kvalitāti?

Management leadership (Vadības ietekme):

- Cik svarīga ir ārstniecības iestāžu vadības iesaiste telemedicīnas risinājumu plašākā ieviešanā?
    - Cik ticams ir scenārijs, ka bez ārstniecības iestādes (ārsta darba vietas) atbalsta vai aicinājuma ārsts pats pieņem lēmumu un sāk izmantot telemedicīnas risinājumus?
- Kā ārstniecības iestāžu vadība varētu palīdzēt veicināt virutālo vizīšu izmantošanu ārstiem un pacientiem?

Perceived security (Uztvertais drošums):

- Kādi datu drošības apsvērumi būtu svarīgi ārstiem un pacientiem, lai izmantotu telemedicīnas risinājumus?
- Cik lielā mērā ārstiem un pacientiem ir svarīga medicīnisko datu drošība un privātums?
    - Vai Jums ir kādas raizes par šo aspektu digitālajā vidē?
    - Vai ir pieļaujama situācija, ka nešifrēti analīžu rezultāti pacientam tiek nosūtīti e-pastā / īsziņā)?

Perceived product advantage (Uztvertās risinājuma priekšrocības):

- Ja jāsalīdzina, kādas, Jūsuprāt, ir galvenās telemedicīnas priekšrocības pār tradicionāliem risinājumiem?
- Kādās situācijās, Jūsuprāt, telemedicīnas risinājums ir laba alternatīva klātienes vizītei?
- Vai ir kādas pacientu (vai ārstu) grupas, kurām telemedicīnas risinājumi visdrīzāk būtu īpaši noderīgi? (vecāki/jaunāki/konkrētas problēmas)
- Kādus ieguvumus vajadzētu nodrošināt telemedicīnas risinājumiem, lai ārsti un pacienti gribētu tos izmantot?

Behavioural intention

- Cik liela ir iespēja, ka Jūs izmantosiet virtuālās vizītes savā praksē turpmāk?

Open-ended reflection:

- Vai Jums sarunas laikā ienācis prātā vēl kāds telemedicīnas, virtuālo vizīšu izmantošanas vai ieceres tās izmantot aspekts, ko neesam pieminējuši?

Appendix D. Patient survey questionnaire

1. Gender
    a. Male
    b. Female
    c. Other (please indicate) [input answer]
2. Age (in years)
    a. [input answer]
3. Geographical location (multiple choice)
    a. Riga
    b. Riga suburbs
    c. Vidzeme
    d. Kurzeme
    e. Zemgale
    f. Latgale
    g. Other (please indicate) [input answer]
4. Net income per month
    a. < EUR 100
    b. EUR 100-600
    c. EUR 601-1000
    d. EUR 1001-1500
    e. EUR 1501-2500
    f. EUR 2500+

Use behaviour

5. Please select which telemedicine solutions you have used
    a. Virtual doctor visits (video consultations)
    b. Telephone consultations
    c. Other (please indicate) [input answer]
    d. I have never used telemedicine solutions

Performance expectancy

6. Please read the following statements and rate the extent to which you agree on a scale 1-5, 1 being strongly disagree and 5 — strongly agree
    a. Using video consultations could help me improve my health outcomes [1-5]
    b. Video consultations could help me save time [1-5]
    c. Video consultations could make medical care more accessible to me [1-5]

Perceived product advantage

7. Please read the following statements and rate the extent to which you agree on a scale 1-5, 1 being strongly disagree and 5 — strongly agree
    a. The benefit of avoiding the exposure to germs (while visiting a hospital) by receiving a remote consultation is significant to me [1-5]
    b. I see the flexibility enabled by digital visits (not having to spend time on transit, being able to have a consultation from any place, including from abroad) as a great advantage [1-5]
    c. I would appreciate the opportunity of getting a second opinion on a health issue by another doctor virtually [1-5]
    d. I think that there are significant benefits in using a video consultation solution instead of visiting a doctor in person [1-5]
    e. I think that the quality of communication with my doctor is not negatively impacted by opting for a virtual visit solution as opposed to a face-to-face consultation

Effort expectancy

8. Please read the following statements and rate the extent to which you agree on a scale 1-5, 1 being strongly disagree and 5 — strongly agree
    a. In general, using digital solutions is easy to me [1-5]

b. I think that it would be easy to use a virtual consultation solution from a technical perspective [1-5]
c. It would not take me long to learn how to do virtual consultations [1-5]
d. I see the digital skills required to have a video consultation as an obstacle for trying out virtual consultations [1-5]

Social influence

9. Please read the following statements and rate the extent to which you agree on a scale 1-5, 1 being strongly disagree and 5 — strongly agree
    a. I would try out virtual medical visits if people who are important to me (such as family and friends) recommended this solution [1-5]
    b. I am more likely to try out virtual medical visits if my colleague recommended this solution [1-5]
    c. I am more likely to try out virtual medical consultations if people who I look up to thought I should use this solution [1-5]
    d. I would use a virtual visit solution if my doctor recommended it [1-5]

Facilitating conditions

10. Please read the following statements and rate the extent to which you agree on a scale 1-5, 1 being strongly disagree and 5 — strongly agree
    a. I have the resources necessary to communicate with my doctor digitally (computer/tablet/smartphone, stable internet connection, microphone, and web camera) [1-5]
    b. I have several ways of digitally authenticating myself, such as an internet bank, Smart-ID, eParaksts, eID card, other [1-5]
    c. I could get help from others if needed to conduct a virtual visit with a doctor [1-5]
    d. I would feel more comfortable with a virtual doctor's visit if I had a face-to-face consultation with the same doctor prior to it [1-5]

Price value / financial incentives

11. Please read the following statements and rate the extent to which you agree on a scale 1-5, 1 being strongly disagree and 5 — strongly agree
    a. I would use digital consultations only if the costs would be fully or partially covered by the State [1-5]
    b. I would consider using a virtual consultation solution if the cost to me would be the same or lower as for a face-to-face visit [1-5]
    c. If virtual visit costs were the same as face-to-face consultation costs, virtual visit would be a good value for my money [1-5]
    d. I would consider using a virtual consultation solution if the cost was slightly higher compared to an equivalent length face-to-face visit [1-5]

Habit

12. Please read the following statements and rate the extent to which you agree on a scale 1-5, 1 being strongly disagree and 5 — strongly agree
    a. The habit of visiting a doctor in person hinders me from trying out virtual consultations [1-5]
    b. Being used to using digital technologies in everyday life (e.g digital banking) is likely to make the experience of virtual consultations seamless [1-5]
    c. I can imagine virtual consultations becoming my preferred form of contact with the doctor [1-5]

Hedonic motivation

13. Please read the following statements and rate the extent to which you agree on a scale 1-5, 1 being strongly disagree and 5 — strongly agree
    a. Using virtual consultations could prove enjoyable [1-5]
    b. The benefits of virtual consultations, such as no need to spend time and money on transit to the doctor and flexibility, are likely to bring me enjoyment [1-5]
    c. The ability to get a doctor's consultation from my home/work would positively contribute to my well-being [1-5]

Perceived security

14. Please read the following statements and rate the extent to which you agree on a scale 1-5, 1 being strongly disagree and 5 — strongly agree
    a. I think that my medical information is as secure in a virtual visit as in an in-person visit [1-5]
    b. My selection of a virtual visit provider would be strongly influenced by how secure I perceive the specific solution to be (in terms of data privacy) [1-5]

Behavioural intention

15. How likely are you to try out medical video consultations? [1-5]
16. [Optional] What matters most to your readiness to use a virtual visit solution? [input answer]
17. In which situations do you consider a video consultation with a doctor to be a useful solution? (you can choose more than one)

Appendix E. Summary statistics of patient survey results.

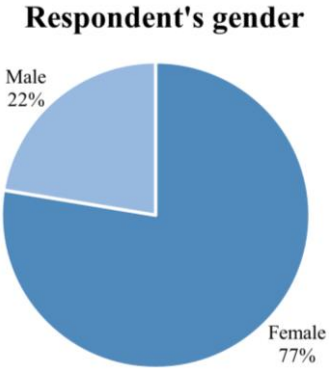


Figure E.1. Gender distribution of patient survey respondents. (Created by the authors)

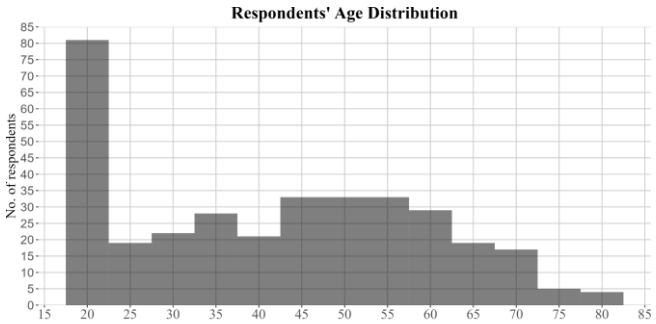


Figure E.2. Age distribution of patient survey respondents. (Created by the authors)

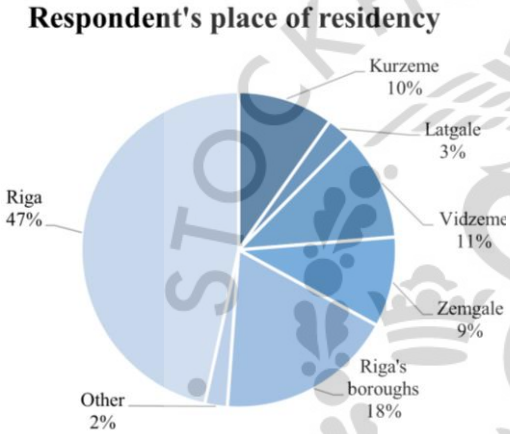


Figure E.3. Geographical location distribution of patient survey respondents. (Created by the authors)

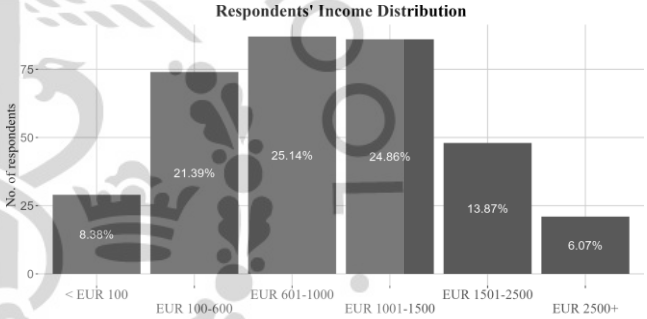
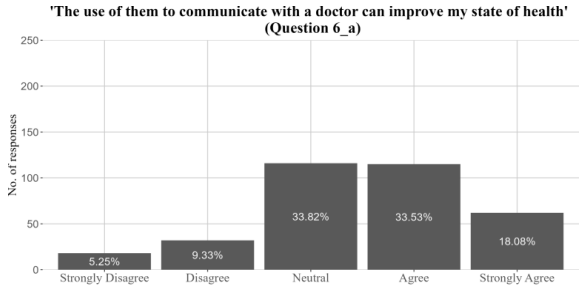


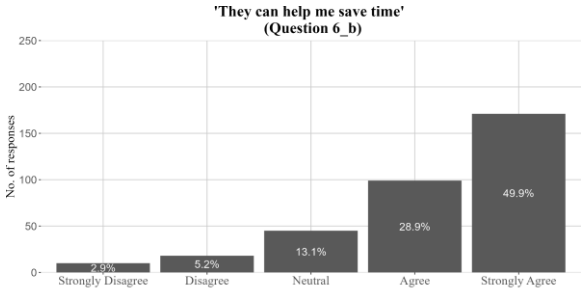
Figure E.4. Income group distribution of patient survey respondents. (Created by the authors)

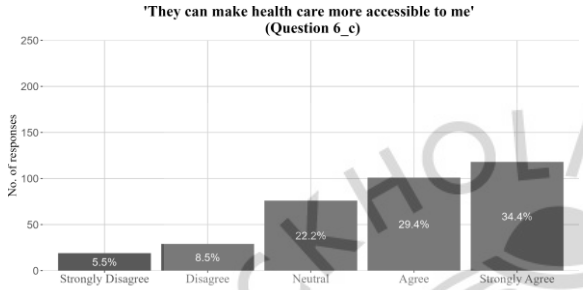
Summary statistics of Likert-scale based questions (1='Strongly disagree' and 5='Strongly agree')

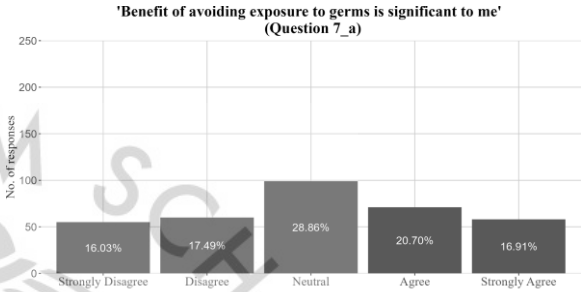
Statistic	N	Mean	St. Dev.	Min	Max	Statistic	N	Mean	St. Dev.	Min	Max
6_a	343	3.50	1.06	1	5	10_b	343	4.68	0.85	1	5
6_b	343	4.18	1.04	1	5	10_c	343	3.91	1.25	1	5
6_c	343	3.79	1.17	1	5	10_d	343	3.98	1.11	1	5
7_a	343	3.05	1.31	1	5	11_a	343	3.02	1.30	1	5
7_b	343	4.05	1.08	1	5	11_b	343	3.78	1.17	1	5
7_c	343	3.67	1.05	1	5	11_c	343	2.08	1.10	1	5
7_d	343	2.82	1.25	1	5	11_d	343	3.01	1.16	1	5
7_e	343	2.88	1.23	1	5	12_a	343	2.94	1.28	1	5
8_a	343	4.40	0.97	1	5	12_b	343	3.19	1.14	1	5
8_b	343	4.42	0.98	1	5	12_c	343	2.97	1.32	1	5
8_c	343	4.34	0.96	1	5	14_a	343	3.50	1.30	1	5
9_a	343	3.33	1.18	1	5	14_b	343	3.75	1.19	1	5
9_b	343	3.11	1.15	1	5	13_a	343	3.07	1.16	1	5
9_c	343	2.57	1.19	1	5	13_b	343	3.69	1.21	1	5
9_d	343	3.97	1.10	1	5	13_c	343	3.33	1.19	1	5
10_a	343	4.69	0.80	1	5	15	343	3.59	1.19	1	5

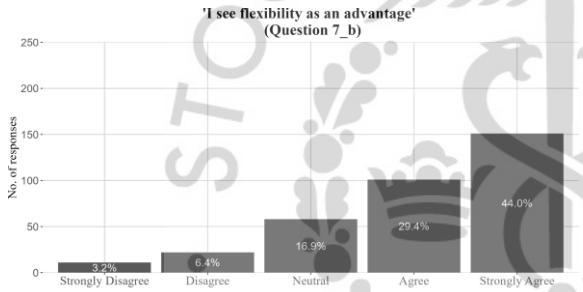
Figure E.5. Summary statistics of all Likert-scale based questions, where 1='Strongly disagree' and 5='Strongly agree'. (Created by the authors)

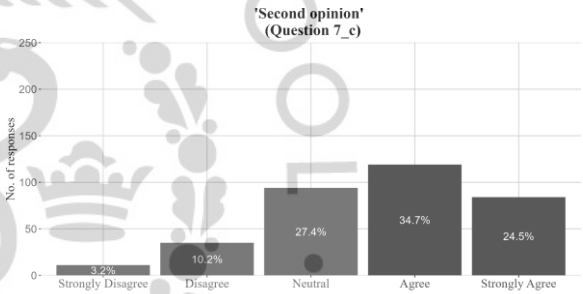


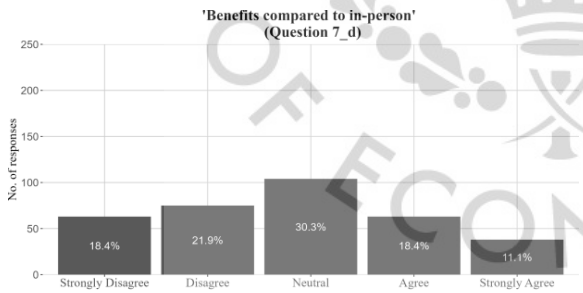


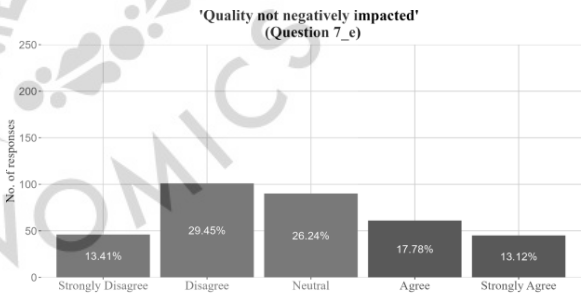


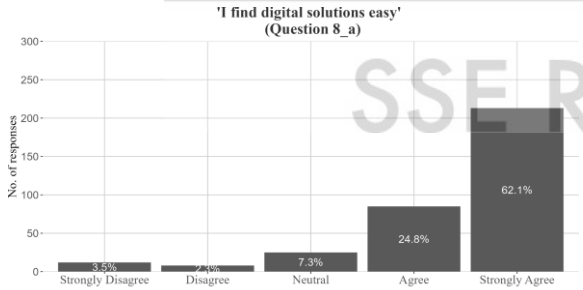


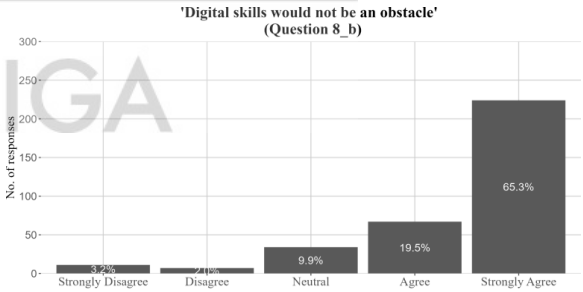


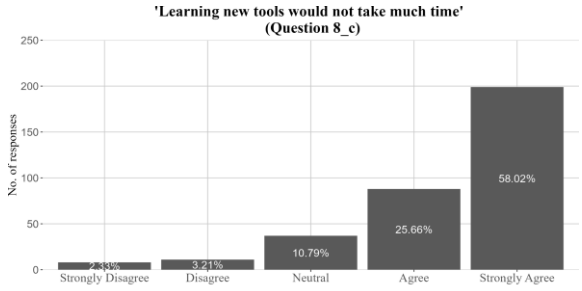


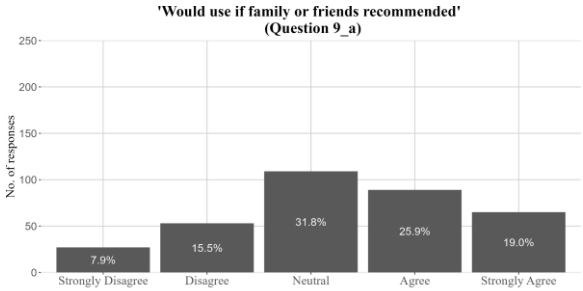


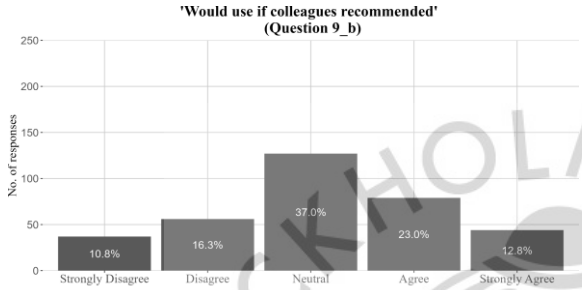


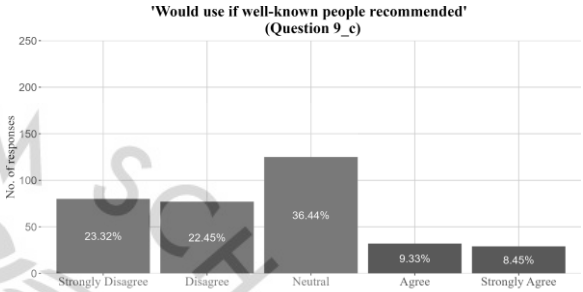


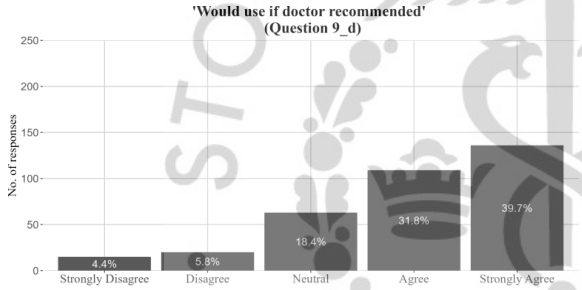


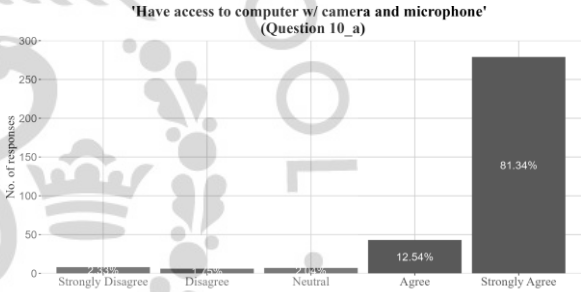


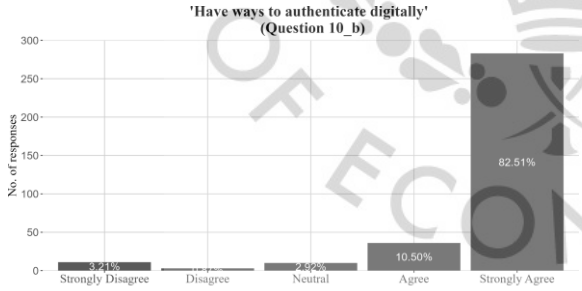


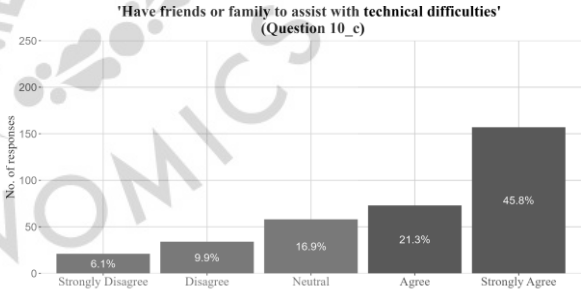


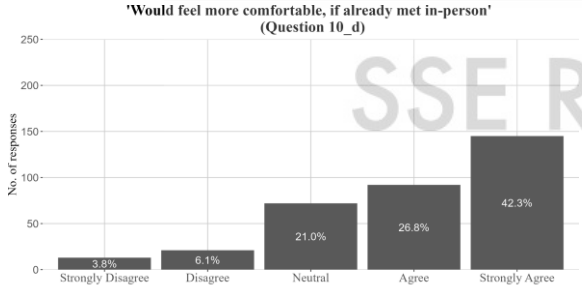


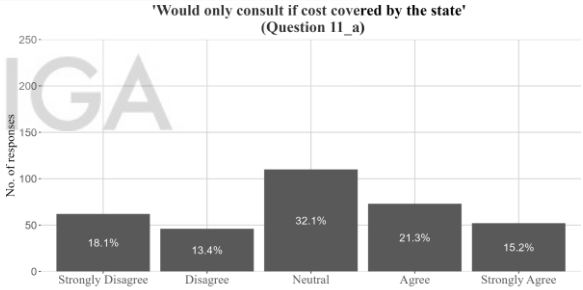


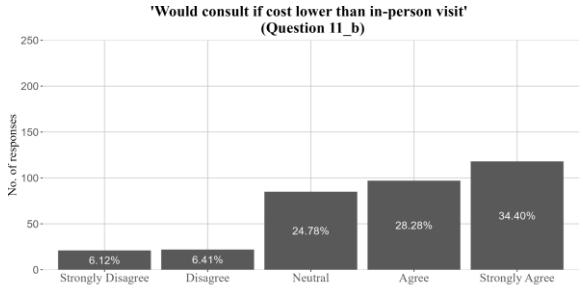


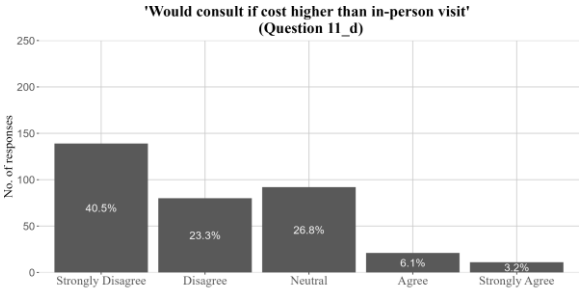


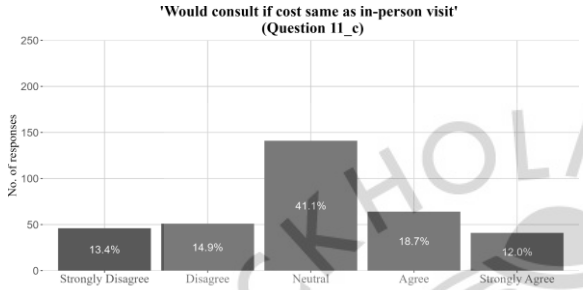


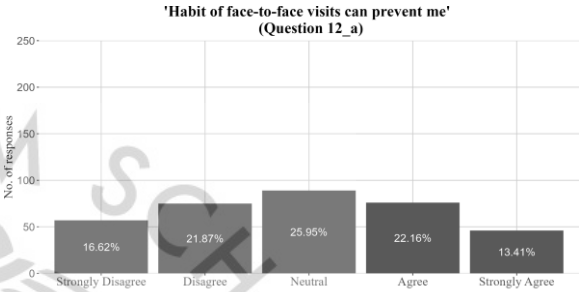


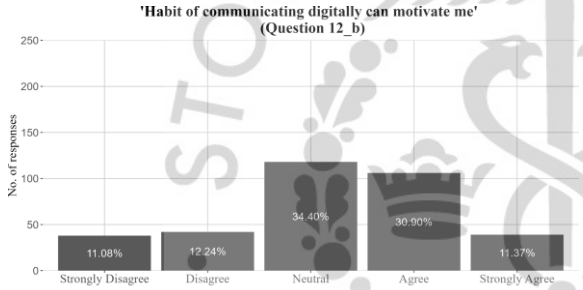


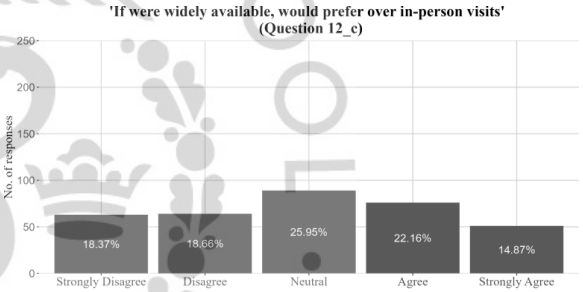


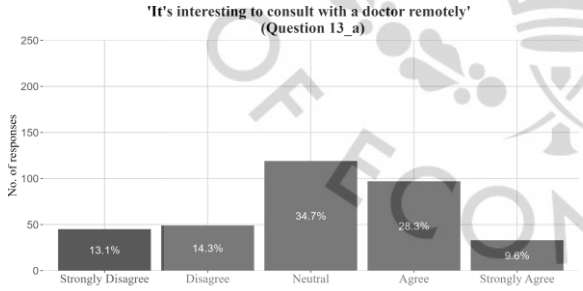


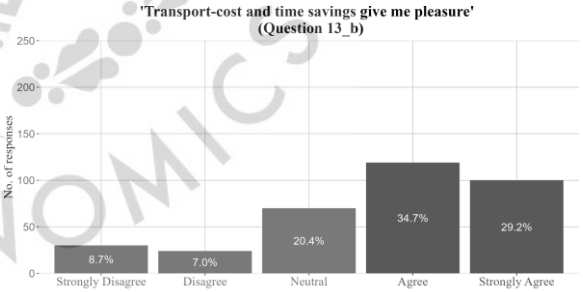


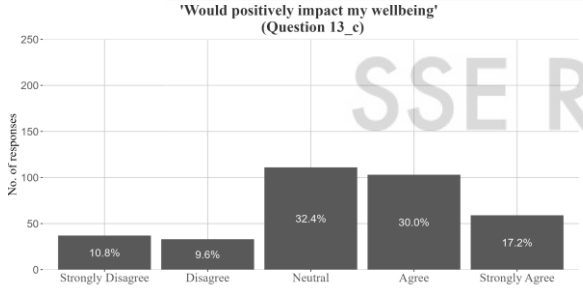


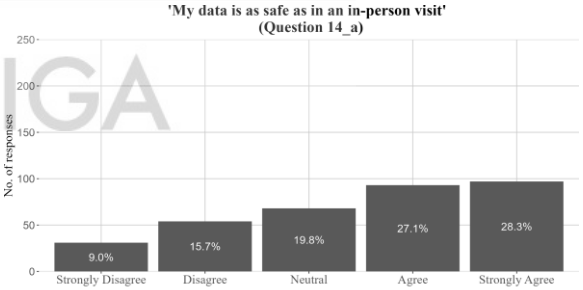












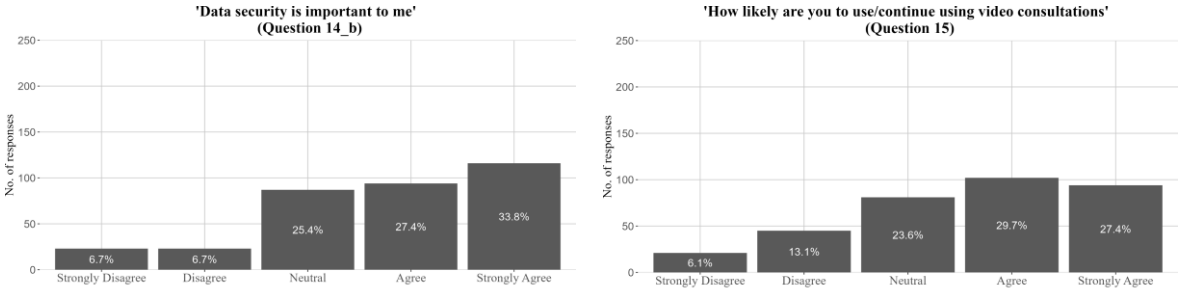


Figure E.6. Graphs of response distribution of all Likert-scale based questions, where 1='Strongly disagree' and 5='Strongly agree'. (Created by the authors)

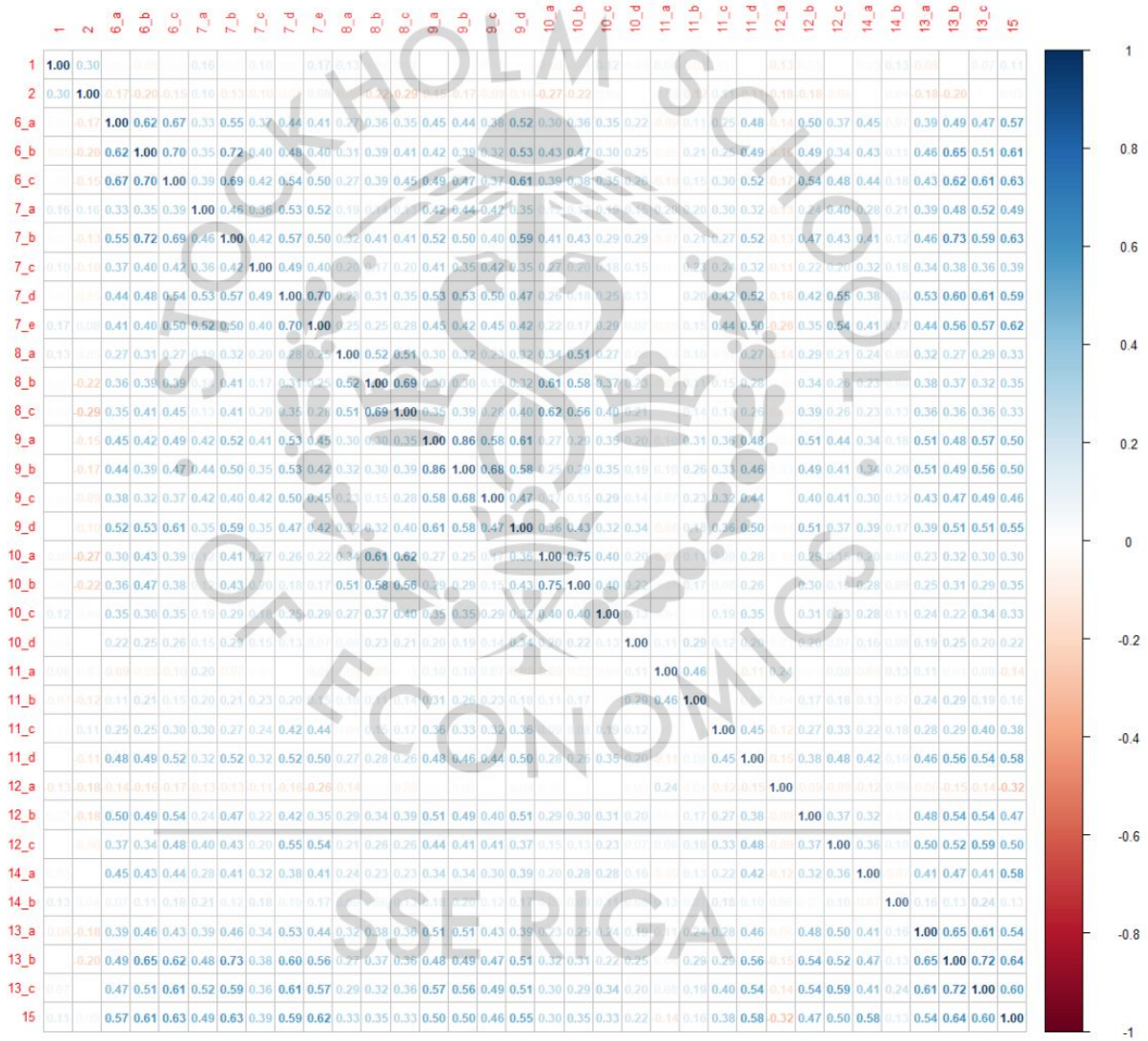


Figure E.7. Correlation matrix of all Likert-scale based questions, gender, and age. (Created by the authors)

Appendix F. Summary of doctor interview insights.

Performance expectancy:

- Some doctors see video consultations as a way to bring back structure/borders to remote consultations of patients. Other useful gains are flexibility, accessibility, saved resources (time, money), and epidemiological safety;
- Overall, younger people, both doctors and patients, are expected to perceive the video consultation solution as more useful than older individuals;
- Practically, the functionality of video consultations is being substituted by phone calls and WhatsApp: synchronous audio function plus asynchronous text/images function. This is very convenient to patients but increases the doctors' likelihood of consulting outside of working hours and burnout;
- When asked about specific functionality they would like to see in a video consultation solution, the doctors' mention that it must be easy to use and intuitive, in an understandable language, and feature a payment solution; there is no consensus about the need of the video consultation solution to have integration with E-health, but most doctors would eventually like to see a centralised solution: a common platform with access to patient data, E-Health functionality and video consultations;
- The expected usefulness of video consultations is limited by the inability to do a physical examination remotely, potential lack of digital skills on the other end of the call, and a lack of physical human contact or inability to read non-verbal communication during the consultation.

Effort expectancy:

- The doctors indicate that using video consultations — operating with a computer and applying digital skills — is likely much easier for younger doctors, for whom digitisation is more familiar, compared to older practitioners (with exceptions). There is no consensus as to when the user is considered old (the threshold could be a little above 50 years old). For older doctors, supporting staff (nurses, registrars) is integral for effectively utilising a computer;
- There are also some concerns about the patients' ability to use virtual visits — especially for older patients. For people with poor digital literacy, video consultations would not be seen as easy-to-use in most cases, and this is an important factor in hindering their use by this group;
- Some doctors highlight that spending more time by the computer is in itself difficult, as it reduces human contact — a traditionally central element of the medical profession;
- The negative experience of using Latvia's E-Health could have created a negative bias around digital solutions in health care — the expectation that they will not be convenient for the user, that they may create more problems than offer gains.

Social influence:

- A positive review from peers — other doctors — is a strong facilitator for trying out a technological solution or innovation, given that the doctor sees a potential benefit for themselves in their own situation;
- Patient demand can facilitate the doctors' use of telemedicine.

Facilitating conditions:

- The GPs we interviewed have the necessary equipment to provide video consultations. Due to the online format of the interviews, this finding may not apply to all family doctors in Latvia, nonetheless, several doctors indicate that there is a computer in every medical institution;
- Remote consultations are seen as more useful if remote monitoring devices are available.
- The availability of training and IT support is significant in the introduction of virtual visits, especially for older doctors;
- From the point of view of a GP with a very digitised practice who is already offering video consultations, the key facilitating conditions of video visits are a manageable number of registered patients (1500-1600) and a radical reorganisation of work;
- The main anti-facilitating conditions — hindering factors — for video consultations are a lack of time and resources (for testing and implementing new processes), lack of financing of remote visits by the State, and issues with State-level guidelines and legislation. There is a lot of unclarity about the legal aspects of remote consultations, and a lack of consideration of telemedicine in legislation and Ministry of Health guidelines;
- Another hindering factor is that the number of GPs in Latvia is falling every month, relating back to the issue of overburdening, a lack of time and resources to introduce innovations.

Price value / Financial incentives:

- At the moment, the Latvian NHS does not provide doctors compensation for virtual visits, thus, the doctors can a) provide them for free, or b) provide them as a private service (the patient covers all the costs). This is a key hindering factor for virtual consultations;
- Regarding the compensation / visit price amount, most doctors think that the compensation and price for remote visits should be the same as for in-person visits.

Habit:

- Most doctors estimate the probability of video consultations becoming a standard practice for a doctor who has tried them out to be quite high. Some relate this estimation with the normalisation and increase in popularity over time of telephone consultations, drawing parallels between the two forms of telemedicine. Furthermore, the COVID-19 pandemic has made people more comfortable with services in the remote format;

- A key challenge for forming a habit of video consultations is that a change in the organisation of work would be needed (which demands resources). Limited digital literacy would also likely hinder habitual use of video consultations;
- For some, the habit of conducting visits in-person (and the wish/need for in-person contact with the doctor) could act as a hindering factor for trying out video consultations, mostly older people.

Hedonic motivation:

- For most family doctors, the key gains from remote consultations that bring them positive feelings is the ability to help the patient flexibly, both in terms of time and place, and time savings;
- The discovery and use of new solutions/methods in work with patients can definitely bring satisfaction, and this can be a great motivator for innovation;
- A few doctors highlighted the potential displeasure of using video consultations that arises due to the reduction of in-person human contact with an increase in remote visits;
- Most doctors emphasise that the patients likely enjoy video consultations more than doctors.

Management leadership:

- Most family doctors have their own practice and thus are their own managers — they are both the initiators (in most cases) and the decision makers when it comes to introducing new solutions;
- The leadership of medical institutions plays an important role in driving the implementation of innovations, such as virtual consultations, and it is not possible without their support.

Perceived security:

- Doctors expect that a virtual visit solution that is certified and registered, and approved by their peers, will have the security standard suitable to transmitting sensitive information, and the solution provider is the one who has to think about the necessary safety measures and standards;
- In reality, in most doctors' daily work unencrypted, sensitive information gets transmitted over the internet / commonplace channels (WhatsApp, SMS, or email) all the time by the patients;
- Mental sense of security: the ability to receive a consultation from the comfort of one's own home may provide a sense of security and enable one to share sensitive information with the doctor over the video call.

Perceived product advantage:

- Overall, a benefit enabled by video consultations that multiple doctors name is more effective and efficient planning and use of time and saved resources;
- When looking at the advantages of a video consultation relative to an in-person visit, one of the key gains doctors mention is speed;

- The doctors mention different situations and patient types where a video consultation could effectively replace an in-person visit: anything related to known issues, blood test results, corrections/adjustments, chronic patients, long distances, limited mobility patients or ones who need home care, infectious patients, as well as non-life-threatening acute issues;
- The obvious advantage video consultations have over audio and written consultations is the visual aspect, the ability to see the patient's face, which improves both communication and information. Furthermore, virtual visits may be more suitable for recording information and consulting in a more structured way.

Appendix G. Statistical analysis of patient survey results.

OLS with manually created 1st principal components

	Dependent variable:		*Dependent variable:*
	Q15		Q15
Q1Male	-0.122	Q4EUR 1001-1500	-0.114
	-0.109		-0.184
Q225-34 years old	0.609***	Q4EUR 1501-2500	-0.277
	-0.162		-0.203
Q235-44 years old	0.431***	Q4EUR 2500+	0.132
	-0.163		-0.252
Q245-54 years old	0.618***	Q4EUR 601-1000	-0.194
	-0.151		-0.177
Q255-64 years old	0.894***	pc1.Q6	-0.119***
	-0.159		-0.042
Q265 and older	0.505***	pc1.Q7	0.102**
	-0.169		-0.042
Q2Under 18 years old	-0.379	pc1.Q8	-0.047
	-0.75		-0.039
Q3Latgale	0.071	pc1.Q9	0.066*
	-0.29		-0.034
Q3Other	0.184	pc1.Q10	-0.047
	-0.32		-0.042
Q3Riga	0.228	pc1.Q11	-0.015
	-0.154		-0.04
Q3Riga suburbs	0.157	pc1.Q12	-0.058
	-0.167		-0.053
Q3Vidzeme	-0.184	pc1.Q13	-0.236***
	-0.176		-0.05
Q3Zemgale	0.163	pc1.Q14	0.160***
	-0.187		-0.048
Q4EUR 100-600	-0.111	Constant	3.167***
	-0.172		-0.208
Observations	343		
R^2	0.656		
Adjusted R^2	0.626		
Residual Std. Error	0.729 (df = 315)		
F Statistic	22.233*** (df = 27; 315)		
Note:	*p<0.1; **p<0.05; ***p<0.01		

Figure G.1. Results of Ordinary Least Squares (OLS) regression analysis with Q15 as the dependent variable and all Likert-scale questions as well as demographic variables (gender, age, location, income) as independent variables. (Created by the authors)

```
        Welch Two Sample t-test

data:  Q15 by Q1
t = 2.1417, df = 126.52, p-value = 0.01707
alternative hypothesis: true difference in means between group Female and group Male is greater than 0
95 percent confidence interval:
 0.07261054        Inf
sample estimates:
mean in group Female   mean in group Male
            3.662921             3.342105
```

Figure G.2. Results of Welch's t-test performed on questions 1 and 15 in the dataset in R. (Created by the authors)