

# eHealth Patient Portal – Becoming an Indispensable Public Health Tool in the Time of Covid-19

Dalibor STANIMIROVIC<sup>a,1</sup>

<sup>a</sup>National Institute of Public Health, 1000 Ljubljana, Slovenia

**Abstract.** Patient Portal represents a connecting service for the Slovenian eHealth solutions and enables patients with effective and secure access to their medical documentation. Ever since its national roll-out in 2017 the number of visits of the Patient Portal has been constantly growing, however, during the time of Covid-19, the number of visits has increased dramatically to reach almost 1.9 million visits in 2020. This article initially presents the functionalities of the Patient Portal and the dynamics of the visits to the Patient Portal in the time of Covid-19. In the second part, the article outlines the most significant benefits to healthcare stakeholders provided by the Patient Portal in the period of Covid-19. The study applies a focus group methodology. Structured focus group discussions were carried out with prominent experts, who are in charge of the Patient Portal and other national eHealth solutions in Slovenia. Research results indicate that the Patient Portal has attracted enormous interest and has become one of the essential public health tools empowering patients and supporting the enactment of public health policies and measures during the Covid-19 crisis.

**Keywords.** Patient portal, Covid-19, visits, benefits, public health, Slovenia.

## 1. Introduction

Due to objective circumstances, European healthcare systems are confronted with important sustainability and developmental concerns. These are typically reflected in terms of health disparities, demographical changes, upswing of critical and chronic non-communicable diseases, rapid development of medical technologies, and the need to maintain quality and socially-oriented healthcare systems [1]. Additionally, the last year's outbreak of the Coronavirus disease 2019 (Covid-19) pandemic initiated an unimaginable global health crisis with devastating effects [2].

One of the essential measures, which should enable better coping with the above challenges, is the effective digitalization of the Slovenian healthcare system, as outlined in the Resolution on the National Health Care Plan [3]. The project for digitalization of the Slovenian healthcare system (named eHealth) specifically focuses on integrating fragmented and distributed information systems and ensuring timely data processing [4], which should contribute to better-quality treatment and evidence-based management on all levels of the healthcare system.

---

<sup>1</sup> Dalibor Stanimirovic, Centre for Healthcare Informatics, National Institute of Public Health, Trubarjeva Street 2, 1000 Ljubljana, Slovenia; E-mail: dalibor.stanimirovic@nijz.si.

The Patient Portal has undoubtedly become one of the most important national digital solutions during the Covid-19 pandemic. The daily actions of the Slovenian healthcare system have largely stalled during the pandemic, except for emergency cases. Due to strict protocols and the infection risks, the treatment procedures and the communication with healthcare professionals have been very difficult and limited. Despite the harsh conditions, the Patient Portal has been providing patients with crucial healthcare documents and information all along. Therefore, interest in the Patient Portal has been growing steadily on the part of all stakeholders, and at one point, the Patient Portal became an indispensable public health tool in the time of Covid-19. Subsequently, this article predominantly focuses on the following research goals: 1) the presentation and analysis of the Patient Portal single visits, and 2) the identification of the benefits provided by the Patient Portal in the time of Covid-19 in Slovenia.

## 2. Method

In order to achieve the research goals, this article applies a focus group methodology. A selection of the research approach was adjusted to the complexities of the research area [5], availability of the evidence, and the relative novelty of the Patient Portal concept.

Focus group participants were selected on the criteria of knowledge and long-term experience in the field. Expertise of the participants was essential for the general credibility of the research findings [6]. Using a non-random sampling approach, the sample of 20 experts was nominated. The sample was relatively equally distributed in terms of gender, as 60% of the sample was male (12 participants), and 40% was female (8 participants). The participants were aged between 40–65 years. The participating experts were affiliated with the National Institute of Public Health (NIPH), which governs the national eHealth solutions in Slovenia. The focus group participants together with the members of the national expert groups are in charge of operation of the eHealth solutions including Patient Portal. Accordingly, the participants in the focus groups have been well-informed about the functioning of the Patient Portal, and their opinions concerning its benefits in the time of Covid-19 pandemic have been based on the testimonies of other healthcare stakeholders, statistical data, and evidence from the field.

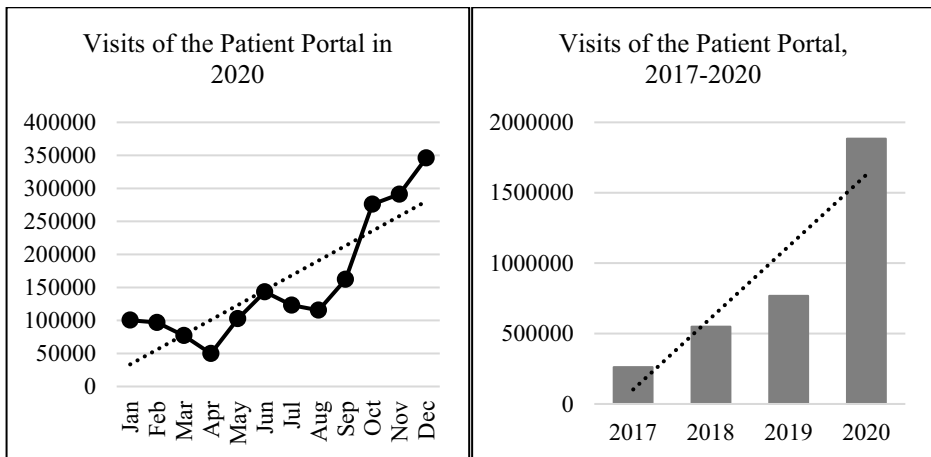
Ten focus group sessions were carried out at the premises of the NIPH in the period from May to December 2020. Structured focus group discussions lasted around 90 minutes and were aptly documented. Following the extensive literature review and other sources containing the related contents, the current state of affairs concerning the Patient Portal and its visits (usage) were meticulously analyzed. After the first step, focus group discussions on the benefits of the Patient Portal in the time of Covid-19 and its implications for the public health in Slovenia were conducted. Interpretative analysis of the data obtained was carried by means of conventional content analysis. The content analysis was based on codifying the key statements related to each construct highlighting the *visits* and *benefits* of the Patient Portal. In order to ensure credibility and eliminate bias, content analysis has been repeated several times independently.

## 3. Results

The Digital Economy and Society Index Report 2019 of the European Commission ranks Slovenia in 6th place among the European Union countries concerning the development

and usage of eHealth solutions [7]. One of the most important digital solution in the Slovenian eHealth architecture is the national Patient Portal (<https://zvem.ezdrav.si>). It represents the only official Patient Portal in the country and was rolled out in 2017 as a connecting service for all essential eHealth solutions (Central Registry of Patient Data, ePrescription, eAppointment, Patient Summary, clinical registries). It enables patients with secure and efficient access to their medical documentation (specialist reports, microbiology reports, discharge letters, vaccinations, e-referrals, e-prescriptions).

The first case of Covid-19 in Slovenia was confirmed at the beginning of March 2020 and the pandemic was declared a few weeks later. This caused a number of limitations to the functioning of the healthcare system, either due to fear of infection or due to epidemiological protocols concerning the patient treatment practices. The Patient Portal unexpectedly became the only way to securely and effectively access specific healthcare services and communicate among healthcare professionals as well as between healthcare professionals and patients. Accordingly, the Patient Portal in Slovenia faced a remarkable upsurge in the number of visits in the time of Covid-19 (Figure 1). Business intelligence and statistics modules show that the number of monthly visits increased from 100,365 to 346,100 in the period from January 2020 to December 2020. This high growth has also affected the annual dynamics of the Patient Portal visits between 2017 (262,012 visits) and 2020 (1,883,854 visits). Another interesting fact that confirms the enormous growth is that the number of visits to the Patient Portal in 2020 is almost 2.5 times higher than the number of visits in 2019.



**Figure 1.** Growth in the number of visits of the Patient Portal in 2020 (left) and annual dynamics of the visits of the Patient Portal in the period 2017-2020 (right).

As pointed out in the focus group discussions, the Patient Portal undoubtedly provides many benefits to all stakeholders in the Slovenian healthcare system in the time of Covid-19. In addition to the already outlined general benefits in terms of access to eHealth solutions and medical documentation, the Patient Portal at this critical time also provides a very important tool for patient empowerment and directing public health actions and communication with the public. In this regard, the focus group participants revealed that patients particularly emphasize the importance of a sense of power and control, due to the continuous availability of their health data and taking an active role in the entire treatment process. Concerning the role of the Patient Portal in the light of public health measures, the Patient Portal has proven to be a very powerful tool with high

penetration in the population and significant mobilization potential, as trust in information and epidemiological guidelines published on the Patient Portal is relatively high among the public. On the other hand, Patient Portal enables the exchange of necessary medical documents between healthcare providers, informs healthcare professionals about potential infections of patients and thus significantly contributes to limiting the number of infections in hospitals, nursing homes, and the general population.

According to participating experts, other systemic benefits provided by the Patient Portal, which have been often unjustly marginalized during the Covid-19, however, relate to significant financial savings, simplified and more effective procedures in terms of prescribing and dispensing medications and making appointments for patients, better quality, security and standardization of processed health data, shorter time for consultations between general practitioners and specialists, lower administrative and opportunity costs, real-time availability of medical documentation, etc.

#### 4. Discussion

The steady growth and cumulative number of visits in 2020 indicate that the Patient Portal provided beneficial services to patients (and other stakeholders) during the Covid-19, and that it was an important public health tool during this period. Competent state authorities and health institutions have often used the Patient Portal as a means of communicating with the public and guiding the conduct of citizens in pandemic circumstances. The large number of visits also confirms the reputation of the national eHealth solutions and the confidence of citizens in the security and quality of data collected in eHealth databases, which could represent a significant incentive for further adoption of digital solutions by the public. It should also be noted that the Covid-19 pandemic has revealed how modest the gains of some digital solutions actually were in the pre-Covid-19 period, and that digital solutions in healthcare still have many untapped potentials that will need serious consideration in the future.

In spite of the increasing interest in patient portals, the volume of compelling studies in the field, sustained by the facts and figures, remains fairly limited [8]. Available studies typically address: technological development, adoption, and use of patient portals [9, 10], electronic health records and other health documents available through patient portals [11, 12], patient engagement and communication [13, 14], eHealth literacy [15, 16], as well as different medical conditions that can be managed through patient portals [17, 18]. However, these studies touch upon one or more features of patient portals under *normal circumstances*, so their findings are only partially applicable in the present pandemic situation. The latter findings reveal that some aspects of patient portals have not been comprehensively addressed, as the role and implications of patient portals as part of public health measures in pandemic situations have remained almost completely unexplored. The evident lack of such research represents a serious shortcoming, as it indicates that ever since the development of the eHealth concept, we have not been able to gain relevant and objective insights about the usability and benefits of patient portals in severe pandemic circumstances and other health crises. On the one hand, this makes it difficult to explore the further potentials of patient portals and their subsequent use in health crises, and on the other hand, it makes it more challenging to plan further in this area and develop additional functionalities that could be beneficial in the wider public health context. The main restrictions of the study most likely concern the identification of benefits without pertaining quantification and a more detailed analysis of their broader

implications for healthcare stakeholders. Future research should focus on usage of patient portals primarily in terms of user needs, unexploited potentials and wider implications of such portals for all stakeholders in different public health circumstances.

## 5. Conclusion

It appears that ongoing Covid-19 pandemic has contributed more to the promotion of the Patient Portal in Slovenia than any other government initiative before. Nevertheless, it is now imperative to redefine the systemic approaches for successful exploitation of patient portals in the future. It seems that the global success of dealing with the forthcoming public health challenges will largely depend on the effectiveness of patient portals. As such, they evidently have a great potential to transform the existing healthcare business models and contribute to greater effects of public health policies.

## References

- [1] Steurs L, Van de Pas R, Delputte S, Orbie J. The Global Health Policies of the EU and its Member States: A Common Vision? *Int J Health Policy Manag.* 2018 May;7(5):433-442.
- [2] Fauci AS, Lane HC, Redfield RR. Covid-19 - Navigating the Uncharted. *N Engl J Med.* 2020 Mar;382(13):1268-1269.
- [3] Ministry of Health. Resolution on the National Health Care Plan 2016-2025. Ljubljana, 2016.
- [4] Warth LL, Dyb K. eHealth initiatives; the relationship between project work and institutional practice. *BMC Health Serv Res.* 2019 Jul;19(1):520.
- [5] Yin RK. Case study research and applications: Design and methods. 6<sup>th</sup> Edition. Thousand Oaks, CA: Sage publications, 2017.
- [6] Sim J, Waterfield J. Focus group methodology: some ethical challenges. *Quality & Quantity.* 2019 Jul;53(6):3003-3022.
- [7] Digital Economy and Society Index Report 2019. Brussels: European Commission, 2019.
- [8] Van den Bulck SA, Hermens R, Slegers K, Vandenberghe B, Goderis G, Vankrunkelsven P. Designing a Patient Portal for Patient-Centered Care: Cross-Sectional Survey. *J Med Internet Res.* 2018 Oct;20(10):e269.
- [9] Hulter P, Pluut B, Leenen-Brinkhuis C, de Mul M, Ahaus K, Weggelaar-Jansen AM. Adopting patient portals in hospitals: qualitative study. *J Med Internet Res.* 2020;22(5):e16921.
- [10] Kildea J, Battista J, Cabral B, Hendren L, Herrera D, Hijal T, Joseph A. Design and development of a person-centered patient portal using participatory stakeholder co-design. *J Med Internet Res.* 2019;21(2):e11371.
- [11] Wildenbos GA, Peute L, Jaspers M. Facilitators and barriers of electronic health record patient portal adoption by older adults: a literature study. *Stud Health Technol Inform.* 2017 Jan 1;235:308-12.
- [12] Turner K, Hong YR, Yadav S, Huo J, Mainous AG. Patient portal utilization: before and after stage 2 electronic health record meaningful use. *J Am Med Inform Assn.* 2019 Oct 1;26(10):960-7.
- [13] Wildenbos GA, Jaspers M, Peute L. The equity paradox: Older patients' participation in patient portal development. *Int J Qual Health C.* 2019 Dec 31;31(10):793-7.
- [14] Ammenwerth E. From eHealth to ePatient: the role of patient portals in fostering patient empowerment. *European Journal of Biomedical Informatics.* 2018 Apr 30;14(2):20-23.
- [15] Alpert JM, Desens L, Krist AH, Aycock RA, Kreps GL. Measuring health literacy levels of a patient portal using the CDC's clear communication index. *Health promotion practice.* 2017 Jan;18(1):140-9.
- [16] Price-Haywood EG, Harden-Barrios J, Ulep R, Luo Q. eHealth literacy: patient engagement in identifying strategies to encourage use of patient portals among older adults. *Popul Health Manag.* 2017 Dec 1;20(6):486-94.
- [17] Voigt I, Benedict M, Susky M, Scheplitz T, Frankowitz S, Kern R, Müller O, Schlieter H, Ziemssen T. A digital patient portal for patients with multiple sclerosis. *Front Neurol.* 2020 May 22;11:400.
- [18] Groen WG, Kuijpers W, Oldenburg HS, Wouters MW, Aaronson NK, van Harten WH. Supporting lung cancer patients with an interactive patient portal: feasibility study. *JMIR cancer.* 2017;3(2):e10.