

# Characteristics of the Patient's Internet Account (IKP) users in Poland between 2019 and 2021

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## Abstract

### Objective

This retrospective database analysis aimed to characterize Patient's Internet Account (IKP) users in Poland, before and after the COVID-19 pandemic onset.

### Methods

Data were received from the e-Health Centre – public administration office tasked with the digitization of healthcare in Poland. Data on the number of newly created Patient's Internet Accounts between January 2019 and December 2021 were collected. Moreover, data on the gender and age of the users were also analyzed.

### Results

Between January 2019 and December 2021, the cumulative number of Patient's Internet Account users increased from 32.6 thousand to 14.1 million. In 2021, December 2021, the cumulative number of Patient's Internet Account users more than doubled (from 5.6 million in January to 14.1 million in December). In 2019, the monthly number of newly created Patient's Internet Accounts varied from 17 thousand in February to 180 thousand in December. In the last quarter of 2020 (lifting major anti-epidemic restrictions), a significant increase in the monthly number of newly created Patient's Internet Accounts was observed (500 thousand accounts per month). The highest number of newly created Patient's Internet Accounts (over 1.25 million) was in April and July 2021. In December 2021, the highest number (3.3 million) of active Patient's Internet Accounts was among children aged 0-17 (parental access) and Individuals aged 31-40 years (2.7 million).

### Conclusions

This study revealed high interest in Patient's Internet Accounts during the COVID-19 pandemic. An increase in the number of Patient's Internet Account users was related to the new service functionalities such as COVID-19 test results and COVID-19 vaccination appointments.

## Introduction:

Information and communication technologies (ICT) are commonly used in healthcare.<sup>[1,2]</sup> The use of ICT in support of health-related fields is defined as e-Health.<sup>[3,4]</sup> Initially, the most developed area of e-health was telemedicine, including teleconsultations and diagnostics using ICT technologies (teleradiology, telepathology), developed mainly by private healthcare providers.<sup>[5]</sup> Nevertheless, in recent years there has been a dynamic development of e-health services offered by public healthcare providers, which are a form of digitization of healthcare systems.<sup>[5]</sup> The development of public eHealth services is mentioned by the World Health Organization as one of the priorities for national health systems.<sup>[4]</sup>

Poland is an example of a country that has significantly developed public eHealth services in the last 5 years.<sup>[6]</sup> The development and implementation of public eHealth services in Poland is the responsibility of the eHealth Center, a dedicated budgetary unit supervised by the Ministry of Health.<sup>[7]</sup> Nationwide public eHealth services, such as electronic sick leave (since December 2018), electronic prescription (since January 2020), and electronic referral (since January 2021) are mandatory forms of services in the healthcare system in Poland.<sup>[6]</sup> In addition to e-Health services, the use of which is required by law, there are also public eHealth services, the use of which depends on the will of the patient.<sup>[6,7]</sup>

Patient's Internet Account (IKP) is the most common voluntary public e-Health service available in Poland. IKP is a profile on a dedicated internet platform managed by the eHealth Center, enabling each patient to use certain digital services and collect some medical data.<sup>[6,7]</sup> Account access is free. Each person (a Polish citizen or a person legally residing in the country based on appropriate permits) registered in the Universal Electronic System of Population Records (PESEL database) has an automatically created IKP profile.<sup>[6,8]</sup> Account activation takes place after the first login. People who have logged in to the Patient's Internet Account at least once and activated the profile are considered IKP users.<sup>[6,8]</sup> Patents have access to the Patient's Internet Accounts assigned to their children. When a child turns 18 years of age, the parent will automatically lose access to the children's account.

The Patient's Internet Account user has access to medical history, including e-prescriptions, the dosage of the drug prescribed by the doctor, e-referrals, e-dismissals with the reason for sickness absence, vaccinations (including against COVID-19 and the European COVID-19 vaccination certificate), history of visits to healthcare facilities, treatment costs incurred by the health insurance institution (National Health Fund), history of paid health insur-

ance premiums under the mandatory health insurance system [6-8]. In addition, IKP allows its user to change the doctor, nurse, or midwife of primary health care, authorize other people to obtain the medical history and e-prescriptions, order e-prescriptions for selected chronic medications, obtain the European Health Insurance Card, use selected preventive programs financed from public funds.<sup>[8]</sup> During the COVID-19 pandemic, a new functionality such as COVID-19 testing appointment (autumn 2020) as well as COVID-19 vaccination appointment and confirmation (January-March 2021). There is a full web version and a shortened mobile version of Patient's Internet Account.

The COVID-19 pandemic has significantly affected the implementation of public eHealth services in Poland.<sup>[9]</sup> Electronic prescriptions and referrals are well-perceived by doctors. Moreover, teleconsultations are commonly used even after the COVID-19 pandemic burden has decreased.<sup>[10]</sup> However, data on the voluntary use of public e-health services by patients in Poland is limited. The Patient's Internet Account is an example of the best-known eHealth services aimed at patients. There is little data on the use of Patient's Internet Accounts by different demographic groups, especially older individuals. Moreover, the impact of the COVID-19 pandemic on interest in using IKP has not been studied in detail.

Therefore, this study aimed to characterize Patient's Internet Account users in Poland, before and after the COVID-19 pandemic onset.

## Material and Methods:

This is a retrospective data analysis. Data were received from the e-Health Centre – public administration office tasked with the digitization of healthcare and health services in Poland.<sup>[7]</sup> Data on the number of individual Patient's Internet Account (users, including newly created Patient's Internet Accounts each month, gender, and age were obtained based on a request for public information used for scientific purposes. Data on all Patient's Internet Accounts created between January 2019 and December 2021 were included. Anonymized and aggregated datasets received from the e-Health Centre were analyzed using MS Excel and SPSS v. 28. Descriptive statistics were used. The study protocol was reviewed and approved (decision number 41/2022) by the Ethics Committee at the Central Clinical Hospital of the Ministry of the Interior and Administration in Warsaw, Poland.

## Results:

### Cumulative number of Patient's Internet Account users

Between January 2019 and December 2021, the cumulative number of Patient's Internet Account users increased from 32.6 thousand to 14.1 million (Figure 1). By December 2019, the cumulative number of Patient's Internet Account users was lower than 1 million. Between December 2019 and January 2020, the cumulative number of Patient's Internet Account users increased by half. On March 2020 (the COVID-19 pandemic onset in Poland), the cumulative number of Patient's Internet Account users reached 2 million, wherein the highest increase in the number of Patient's Internet Account in 2020, was observed between September and October (an increase by 0.5 million users). By the end of 2020, the cumulative number of Patient's Internet Account users exceeded 4.6 million. In 2021, a dynamic increase in the number of Patient's Internet accounts was observed. Between January and December 2021, the cumulative number of Patient's Internet Account users more than doubled (from 5.6 million to 14.1 million).

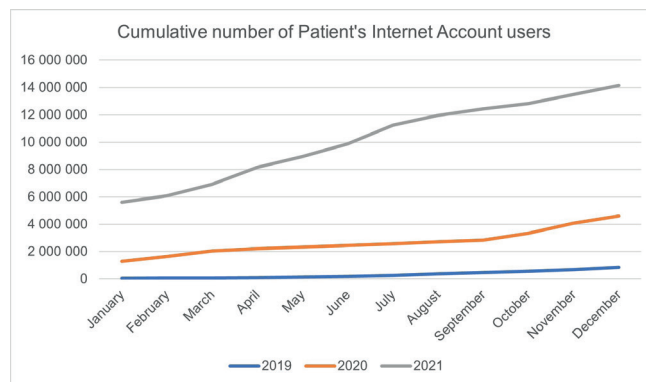


Figure 1. The cumulative number of Patient Internet Account users.

### Newly created Patient's Internet Accounts

In 2019, the monthly number of newly created Patient's Internet Accounts (Figure 2) in the first two quarters remained constant (<100 thousand). In August 2019, the monthly number of newly created Patient's Internet Accounts exceeded 100 thousand. In 2019, the highest number of newly created Patient's Internet Accounts was observed in December (180 thousand). In the first quarter of 2020, the monthly number of newly created Patient's Internet Accounts was 400 thousand. Between March and April 2020 (the first month of the COVID-19 pandemic in Poland), a drop in the number of newly created Patient's Internet Accounts was observed (from 400 thousand to 165 thousand). Between April and Septem-

ber 2020 (the first lockdown caused by the pandemic), the monthly number of newly created Patient's Internet Accounts was lower than 150 thousand. In the last quarter of 2020 (lifting major anti-epidemic restrictions), a significant increase in the monthly number of newly created Patient's Internet Accounts was observed, with more than 500 thousand accounts activated every month (Figure 2). In 2021, significant variations in the monthly number of newly created Patient's Internet Accounts were observed. In April and July, the monthly number of newly created Patient's Internet Accounts exceeded 1.25 million, contrary to September and October when the monthly number of newly created accounts was lower than 0.5 million (Figure 2).

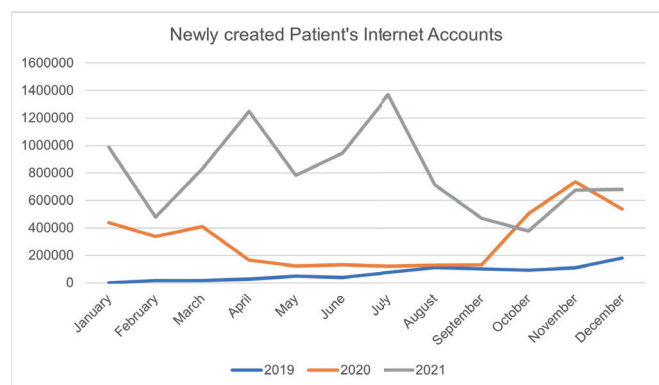


Figure 2. The number of newly created Patient's Internet Accounts.

### Demographic characteristics of Patient Internet Account users

The cumulative number of Patient's Internet Account users by age group is presented in Figure 3. Since September 2020, significant differences in the cumulative number of Patient's Internet Account users between age groups were observed (Figure 3). The highest number of active Patient's Internet Accounts was among children aged 0-17 (parental access). Individuals aged 31-40 years were the second most numerous group of Patient Internet Account users. A relatively low number of Patient's Internet Accounts users was observed among individuals aged 18-30 years. A significant drop in the number of Patient's Internet Accounts users was observed after 50 years of age (Figure 3).

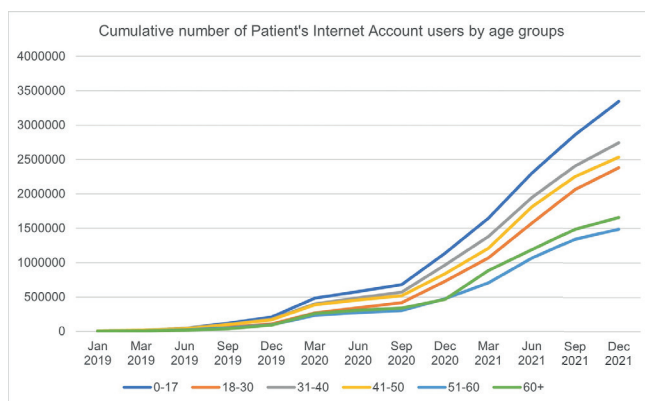


Figure 3. Cumulative number of Patient's Internet Account users by age groups.

In 2019, the number of adult Patient's Internet Account users in all age groups was higher among males (Table 1). Since December 2020, the number of adult Patient's Internet Account users was higher among females. Both among males and females, the cumulative number of Patient's Internet Account users was higher among those aged 51-60 years than among those aged 60 years and over (Table 1).

In this study, demographic characteristics of the Patient's Internet Account users were presented. Since September 2020, a rapid increase in the number of Patient's Internet Account users was observed. New functionalities such as COVID-19 testing appointments and COVID-19 vaccination appointments and certification led to a significant increase in the number of Patient's Internet Account users. Most of the active Patient's Internet Accounts are assigned to children and adults aged 31-40 years. A significant gap in the use of Patient's Internet Accounts among young adults (18-30) and older adults (60 and over) was observed. Previously published data on public eHealth services in Poland were focused on the attitudes of healthcare workers towards the use of teleconsultations, e-prescriptions, or electronic health records.<sup>[10,11]</sup> There is limited data on public perception of eHealth services in Poland.<sup>[9]</sup> Findings from the nationwide cross-sectional survey carried out among 1,092 adults in Poland in September 2022 showed, that individuals with higher education, living in cities above 100 thousand inhabitants, and those having good financial status are more likely to declare that they use Patient's Internet Accounts.<sup>[9]</sup> In this study, only basic demographic

Table 1. Cumulative number of Patient's Internet Account users by gender and age.

	Jan2019		Dec2019		Dec2020		Dec2021	
	Female	Male	Female	Male	Female	Male	Female	Male
0-17	2 864	2 937	101 421	107 439	552 742	583 044	1 629 901	1 716 178
18-30	1 115	1 389	53 902	54 532	410 598	317 989	1 300 218	1 082 933
31-40	3 060	3 321	77 829	98 879	514 527	452 550	1 469 926	1 278 818
41-50	3 869	4 013	66 305	104 572	421 840	418 970	1 328 509	1 206 435
51-60	2 721	2 345	37 845	57 208	238 479	234 896	787 644	705 254
60+	2 857	2 168	36 666	52 417	229 746	235 156	907 785	753 337

data were collected. The number of Patient's Internet Account users was slightly higher among females, which is in line with the demographic data on the population (52% of Poles are females).<sup>[12]</sup> Out of 14.1 million Patient's Internet Account users, 1.49 million were adults aged 51-61 years, and 1.66 million were those aged 60 years and over. Almost 10 million Poles are aged 60 years and over,<sup>[12]</sup> so only 17% of them were Patient Internet Account users. This observation indicates the low level of adoption of Patient Internet Accounts among older adults in Poland.

Parents have access to the Patient's Internet Accounts assigned to their children.<sup>[7]</sup> Out of 14.1 million accounts, 3.3 million were assigned to children. In this study, the second most populous group of Patient Internet Accounts users were adults aged 31-40 years. We can hypothesize, that adults aged 31-40 years are mostly parents of school-aged children, so they use their own Patient's Internet Accounts as well as actively supervise accounts assigned to their children.

The finding from this study showed that the first peak in the number of newly created Patient Internet Accounts users was observed in September 2020. We can hypothesize that this increase was related to the new functionality of the Patient's Internet Account – information on COVID-19 testing. From the autumn of 2020, people who were tested for COVID-19 could check their results in a dedicated tab on the Patient's Internet Account.<sup>[8]</sup> In January 2021, the National COVID-19 vaccination program was started.<sup>[13]</sup> Individuals who wanted to be vaccinated against COVID-19 could choose the date and place of vaccination through the dedicated functionality of the Patient's Internet Account. The general public could schedule a vaccination appointment in March 2021.<sup>[14]</sup> We can hypothesize that the second peak in the number of Patient's Internet Accounts observed in March 2021, may result from this new functionality. Moreover, a significant increase in the number of newly created Patient Internet Accounts was observed in June and July 2021. The European COVID-19 vaccination certificate was available in the Patient's Internet Account (including the printed version), so we can hypothesize that a significant part of Poles decided to download the vaccination certificate before the summer holidays, as the certificate was mandatory for foreign travel.

This study provided scientific data on changes in the Patient's Internet Account (IKP) users in Poland between 2019 and 2021. Age differences in the use of Patient's Internet Account points need to promote eHealth services among individuals aged 60 years and over. Moreover, data presented in this study confirmed that adding new functionalities that provide benefits for the users (e.g., shortening the time from testing to results, and access to medical documents) was the major trigger of the growing popularity of Patient's

Internet Account use among adults in Poland.

The development of e-health services is one of the current trends in healthcare.<sup>[15,16]</sup> E-health solutions are commonly used to promote physical activity and a healthy diet in numerous countries.<sup>[17]</sup> E-health solutions can be targeted both healthy adults as well as those with chronic diseases.<sup>[18,19]</sup> E-Health interventions can be also used to promote patient engagement.<sup>[19]</sup> The Patient's Internet Account may be used as an effective tool in health education, including personalized communication. E-health services are well-perceived by healthcare workers,<sup>[20]</sup> so further development of Patient's Internet Account should also include the perspective of healthcare workers.

This study is a retrospective database analysis which is a major limitation of the study. Data on educational level and place of residence were not collected, so demographic analyzes were based on gender and age (the only available data). Moreover, the frequency of the use of the Patient's Internet Account was not assessed. Nevertheless, this is the first study on the demographic characteristics of Patient's Internet Account users before and during the COVID-19 pandemic in Poland.

## Conclusion:

This study revealed high interest in Patient's Internet Accounts during the COVID-19 pandemic. Women opened Patient's Internet Accounts more often. The highest number of active Patient's Internet Accounts was observed in the youngest age group (0-17) and related to parent-managed child accounts. An increase in the number of Patient's Internet Account users was related to the new service functionalities such as COVID-19 test results and COVID-19 vaccination appointments. There is a need to promote eHealth services such as Patient Internet Accounts among older adults in Poland.

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### Conflict of interest:

The Authors declare no conflict of interest.

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