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Citizens' Use of eHealth Services During COVID-19 in Relation to National Policy Goals

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Abstract. The main goals of the Swedish eHealth strategy are to enable citizens to achieve good and equal health and welfare, and to support self-determination and increased participation in society. We analyzed the relationship between these goals and the use of eHealth services offered for citizens prior to and during the COVID-19 pandemic. Data was collected through a national citizen survey issued in 2019 and 2021 to a sample size of 15.000 representative individuals each. Results showed that the use of eHealth services was highest in the 30-49 years age group and among respondents with high education. There were no major differences between respondents with high, medium, or low income, and neither between respondents with different degrees of self-perceived health, nor between native Swedish and non-Swedish respondents. Changes in use of different eHealth services over time were most probably related to the pandemic and are not significant. All age groups showed a similar relative increase regarding their use of eHealth services, except when searching the Internet for diagnosis and treatment where persons above 75 years of age had the largest increase. Most significant were the increase in online visits and the decrease in maintaining health, training, or food diaries. Strategic goals related to equity seem to be partly met as eHealth services are used to the same degree by different socio-economic groups. However, the older population uses eHealth services less than other age groups and a deeper understanding of the relationship between specific services and their impact on strategic goals is needed.

Keywords. Citizen services, consumer informatics, digital health, eHealth strategy

1. Introduction

Countries around the world have developed strategies with the aim to increase citizens' use of eHealth services, and thereby facilitate access to health and social care. Implementation and use of eHealth services has varied greatly in different parts of the world until the COVID-19 pandemic accelerated their adoption globally [1]. Several publications highlight, however, that inequalities in the access to connectivity or the lack of digital literacy may prevent certain social groups from taking advantage of eHealth services, thus risking increasing stigma or isolation for certain social groups [2-4].

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To enable citizens to achieve good and equal health and welfare, but also to support self-determination and increased participation in society, are the main goals of the current Swedish eHealth strategy "Vision for eHealth 2025" [5]. This shall be achieved through a series of strategic action plans. The most recent one for 2020-2022 outlines four objectives, whereof one, "The individual as co-creator" targets citizens, addressing specifically digital services to increase security and participation, guarantee ubiquitous access to health and social care services, and provide a seamless national infrastructure for frontline care [6].

In this paper, we analyze the relationship between the use of eHealth services offered for citizens prior to and during the COVID-19 pandemic, and the main goals identified in the Swedish eHealth strategy.

2. Methods

This study is based on data collected through a national citizen survey performed in 2019 and in 2021 with the aim to capture citizens' use of and opinion about eHealth services, and to follow up on Sweden's strategic aims regarding eHealth. Data collection was conducted by Statistics Sweden on behalf of the Swedish e-Health Agency (SeHA). For both data collections, Statistics Sweden delivered a summary of the survey responses to SeHA at an aggregated level. Both surveys were sent out to random, representative samples of the Swedish population consisting of roughly 15.000 individuals. Response rates were similar in both years, with 31.4% in 2019 and 32.5% in 2021. Demographics of the respondents are described in table 1.

Table 1. Respondents' demographics and socio-economic variables

		Respondents 2019 N(%)	Respondents 2021 N(%)
Sample		14 963	15 126
Number of respondents		4 701 (31.4)	4 903 (32.5)
Gender	male	2 352 (50.0)	2 486 (50.7)
	female	2 349 (50.0)	2 417 (49.3)
Age	16 – 29	819 (17.4)	736 (15.0)
	30 – 49	1 059 (22.5)	1 043 (21.3)
	50 – 74	1 843 (39.2)	2 020 (41.2)
	>= 75	980 (20.9)	1 104 (22.5)
Education	School	933 (19.9)	941 (19.2)
	College	1 842 (39.2)	1 934 (39.4)
	University	1 926 (40.9)	2 028 (41.4)
Income	Low	908 (19.3)	904 (18.5)
	Medium	2 624 (55.8)	2 689 (54.8)
	High	1 169 (24.9)	1 310 (26.7)
Background	Native Swedish	4 071 (86.6)	4 209 (85.5)
	Non-Swedish	630 (13.4)	694 (14.2)

3. Results

Internet use in Sweden is very high with 90% of the entire population using it daily. One in five retirees, however, does not use the internet, and among the oldest, not even half have used various public e-services [7].

We observed a similar pattern in our data. The results of the two surveys that were analyzed in this study show that 61% (2019) and 74% (2021) used the Internet to search for information about disease or treatment. Internet use was highest in the population below 50 years of age and lowest in the oldest age group, but the increase was largest in the oldest age group, increasing from 19% (2019) to 41% (2021).

Table 2 illustrates the relative increase or decrease in the use of different eHealth services prior to or during the COVID-19 pandemic. Some effects can certainly be related to the pandemic, such as the 21% increase in Internet search, the 50% increase in written communication with healthcare providers, and partly the 87% increase in online visits. During the pandemic, public healthcare providers increasingly offered online visits. This service was previously only offered by private providers. The 150% increase in sending own measurements is most probably related to increased offering of this kind of service. The 65% decrease in maintaining a health, training or food diary might also be related to the pandemic as sedentary behavior has become an unfortunate side-effect of the pandemic. In both years, most persons maintaining such a diary were below 50 years of age. The use of digital services to compare healthcare providers dropped slightly and was predominantly used by persons with foreign backgrounds, 24% (2019)/27% (2021) compared to 13% (2019)/12% (2021) with Swedish backgrounds.

Table 2: Use of digital services as expressed by the respondents

Have you during the last 12 months used Internet or a digital service to…	**2019 Yes (%)**	**2021 Yes (%)**	**Relative change (%)**
…search for information about disease or treatment?	61%	74%	+21.3%
…compare primary care centres, hospitals or other care providing institutions?	16%	14%	-12.5%
…to communicate with healthcare personnel in written (e.g. sms, chat)?	22%	33%	+50%
…have an online visit with your healthcare provider?	8%	15%	+87.5%
…to maintain a health, training or food diary?	20%	7%	-65%
…to perform a self-test (e.g.alcohol consumption, heart failure, diabetes, mental health)?	13%	11%	-15.4%
…to send own measurements (e.g. blood pressure, blood glucose) to your healthcare provider?	2%	5%	+150%
…to participate in Internet based therapy?	2%	3%	+50%

4. Discussion and Conclusions

In both 2019 and 2021 the percentage of women using the available eHealth services was higher than the percentage of men. In general, use of eHealth services was highest in the 30-49 age group and amongst people with high education. There were no major differences between people with high, medium, or low income, and neither between people with different degrees of perceived health, nor between native Swedish and non-Swedish people. An interesting outcome is the fact that the oldest age group showed the

largest increase in searching the Internet for diagnosis and treatment. In general, the changes in use of the different eHealth services over time remained largely non-significant and can be contributed to the pandemic. Most significant were the increase in online visits and the decrease in maintaining health, training, or food diaries. The relative increase in online visits was the same in all age groups with the highest absolute figures in the 30-49 years age group in large cities. Whereas the increase of online visits was predominant in other countries [8], in contrary to Sweden, Canada for example reports the largest increase in the elderly population [9].

In relation to the eHealth strategy, it can be said that the increased use of some eHealth services by the elderly population and an even use of most services among different socio-economic groups suggests that some of the main equality goals of the strategy have been partly achieved. Nevertheless, the older population uses the services to a lower degree and a deeper understanding of the relationship between specific services and their impact on strategic goals is needed. A limitation of the study were the highly educated, mostly native Swedish participants.

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Conflict of interest

The authors were contracted by the Swedish e-Health Agency (SeHA) to develop the questionnaire for the 2019 survey and analyzing the data. They were also consulted by SeHA during the 2021 survey.

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