

# Health-related Internet Use among Older People in Norway

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**Abstract:** Like in many developed countries, the aging population presents a major challenge for Norway. Life expectancy in the Norwegian population has increased, and the proportion of older people is expected to increase. Since the use of internet-based technologies in healthcare is increasing, it is very important for older adults to use the internet in order to benefit from these technologies. The main aim of this study is to explore health-related internet use among older people in Norway by using national survey results of ICT usage in households. Survey results show that general internet use and health-related internet use have been increased among older Norwegian population. The most common purpose for health-related internet use among older people was seeking health-related information and the least common purpose was other health services online. Even though the rate of internet use among older people in Norway is higher than in many developed countries, the results show that there exist age-based differences in health-related internet use.


## 1 INTRODUCTION

Today's modern societies are facing a significant transformation that is mainly characterized by two developments: an aging population and technological developments (Bujnowska-Fedak and Kurpas, 2015; König et al., 2018). In 2020, there were estimated to be 727 million people aged 65 and older worldwide and it is projected that this number will more than double by 2050, reaching over 1,5 billion people (UN, 2020). Populations around the world are steadily aging. In recent decades, average life expectancy has increased worldwide, and older adults have begun to comprise a growing proportion of the population, particularly in developed countries. According to the World Health Organization (WHO), it is projected that 22% of the world population will be over 60 years in 2050 (It was 12% in 2015). In many developed countries, an increasingly older population is more prominent. For example, 30% of the population is already over 60 years old in Japan (WHO, 2018). This demographic change presents significant challenges for governments and societies (Bloom et al., 2015; Olphert and Damodaran, 2013).

In addition to worldwide aging populations, many services started to be provided digitally, in parallel

with the developments in technology over the past decades (Rønning and Sølvsberg, 2017). Information and communication technologies (ICTs), especially the internet, have become an integral part of modern life and present a significant impact on many aspects of daily life. Today, the internet has become an invaluable medium for the health sector in providing health information and healthcare services. Technological developments using the internet promises to deliver healthcare services without time and space restrictions (Merkel and Hess, 2020). These developments in technology and population introduce new challenges to societies, such as the digital divide; some people risk being excluded from fully participating in the digital society (Rønning and Sølvsberg, 2017). In many countries around the world, certain groups in the population lag behind others in terms of accessing and using ICT, such as older adults, disabled people, and women. Older people are the most challenging group in society in this context because of their low adoption pace (Gerd and Christian, 2005). As societies become digitalized, older people are particularly vulnerable (Kania-Lundholm and Torres, 2015).

Digital inclusion, enabling everyone to have access and capability to use the internet and

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associated digital technologies, has wide-ranging benefits to the individual, the economy, and society (Olphert and Damodaran, 2013). Lower rates of computer and internet use among older people have critical social consequences (McDonough, 2016). Being digitally disengaged has essential social, health, and economic disadvantages (Siren and Knudsen, 2017). As healthcare systems increasingly depend on internet-based technologies to assist and support healthcare delivery, it is very important to engage older adults in using these technologies (Nguyen et al., 2017). The main aim of this study is to explore health-related internet use among older people in Norway, one of the highly digitalized European countries.

## 2 RELATED LITERATURE

### 2.1 Characteristics of Aging and Older People

Aging is a natural, inevitable, and normal process in human lifespans. There is no consensus in the definition of “old”, “old age” or “older adult” (Fox and Connolly, 2018). While the United Nations (UN) defines older people as those aged 60 years or more, in most developed countries older people are commonly defined as those aged 65 years or more (Eurostat, 2020). Even though chronological age is frequently used, the threshold where ‘old’ begins varies contextually and culturally (Rockmann et al., 2018).

Older age is an important level of life and can affect the person and people around them in significant ways. Older people may have considerably different needs and wants because of the life stage they have reached (Gregor et al., 2002). Some of the common health conditions related to aging include hearing loss, cataracts, and refractive errors, back and neck pain and osteoarthritis, chronic obstructive pulmonary disease, diabetes, depression, and dementia (WHO, 2018). Chronological age and perceived age have an important role in determining one’s beliefs, attitudes, and behaviours (Lagacé et al., 2016). Ageing is correlated with a decline in sensory, perceptual, motor and cognitive abilities (Chen, 2013). Older people can suffer variety of impairments such as reduced vision, hearing, memory, and mobility, and these impairments can lead to difficulty in learning and sometimes hinder the use of new technologies (Chen, 2013).

The aging process can be different from person to person. While some older people have physical and

mental capacities similar to younger people, some people experience significant declines in physical and mental capacities at much younger ages (WHO, 2018). Online older people are not a monolithic group, and they have different health attitudes and behaviours (McMillan and Macias, 2008). Today, there are some radical changes that are influencing the lives of older people in direct and indirect ways, such as globalization, technological developments (e.g., in transport and communication), urbanization, migration, and changing gender norms (WHO, 2018).

### 2.2 Older People and Health-Related Internet Use

The internet has become an important source of health information and e-health channel (Bujnowska-Fedak et al., 2019; Kummervold and Wynn, 2012). The internet is an invaluable tool for enabling access to health information, communication, attract the attention of the public, and disseminating health information (Paige et al., 2017). As an essential source of health information, the internet provides worldwide accessible resources on topics ranging from specific diseases and treatment options to healthcare providers and insurance plans, healthy lifestyle choices and health products (Zulman et al., 2011). Information seeking is the most common activity in health-related internet use (Ghenai et al., 2020; Hone et al., 2016; Wong et al., 2014). In 2019, Google received more than one billion health-related searches (About 70.000 searches every minute and 7 per cent of Google’s daily searches) worldwide in a day (Murphy, 2019).

Today, physicians have less control over health-related information that is transmitted to patients (Tonsaker et al., 2014). People take a more active approach to managing their health with digital access to health information (Hall et al., 2015). Before the internet, people relied on other health information such as books, newspapers, magazines, and information given by their doctors, family, and friends (Kummervold and Wynn, 2012), but today the internet has become the main source for health-related information. The internet offers an enormous quantity of online news and information on diseases, treatment, and prevention in multiple formats ranging from text articles to videos and podcasts (Crabb et al., 2012). The internet provides an opportunity for patients to explore sensitive conditions with privacy and online support networks that patients can share their personal health and illness experiences which might not be provided by physicians (Hone et al., 2016; Tonsaker et al., 2014). The internet offers

various ways to share and disseminate health-related information, ranging from static websites to blogs, social media sites, and video sharing sites.

Studies show that age, gender, education level, income and health condition are the most important common predictors of health-related internet use (Alvarez-Galvez et al., 2020; Calixte et al., 2020; Merkel and Hess, 2020; Nguyen et al., 2017). Older individuals are less likely to use the internet for health-related purposes (Calixte et al., 2020; Merkel and Hess, 2020; Nguyen et al., 2017). Females are more likely than males to use the internet for health-related reasons (Alvarez-Galvez et al., 2020; Escoffery, 2018). Education levels are positively associated with health-related internet use (Alvarez-Galvez et al., 2020; Calixte et al., 2020; Merkel and Hess, 2020; Nguyen et al., 2017). People with low socioeconomic status are less likely to use the internet for health-related reasons (Calixte et al., 2020; Merkel and Hess, 2020). People who live in rural areas are less likely to have access to and use the internet for health-related use (Bujnowska-Fedak et al., 2019; Merkel and Hess, 2020; Nguyen et al., 2017). Individuals with chronic health conditions (diseases) or a significant number of health problems are more likely to use the internet for health-related reasons (Alvarez-Galvez et al., 2020). There are some studies that also reported racial/ethnic disparities in health-related internet use (Calixte et al., 2020; Gordon and Hornbrook, 2018; Nguyen et al., 2017).

In addition to having an information source about health, the internet can be used for an alternative medium to face-to-face healthcare services for older adults (Berner et al., 2015). The internet not only provides users with a platform for information exchange but also helps promote healthcare, such as service delivery, in-home monitoring, interactive communication, and support (Wong et al., 2014). Computers and the internet can become powerful assistive technologies for older people, helping them to maintain and enhance their level of independence, maintain their psychological well-being, social connectedness, and sense of worth in the face of declining health or limited capabilities, as well as also offering new opportunities to improve their quality of life (Lee et al., 2014; Olphert and Damodaran, 2013). The internet and e-health services have significant potential to support efficient and effective care for older people (Bujnowska-Fedak and Mastalerz-Migas, 2015). Accessing health information and health-management tools by using the internet can have a positive impact on the many dimensions of healthy aging (Cresci et al., 2012). Also, living in remote areas or far from a hospital, healthcare

centers, and towns can become less of a problem for older internet users (Berner et al., 2015). Since healthcare systems increasingly rely on internet-based technologies, it is crucial to engage older individuals in using the internet and these technologies (Nguyen et al., 2017).

Since it is possible to carry out an increasingly diverse array of tasks online, older adults who have health problems and feel socially isolated are especially likely to benefit from using internet technology, especially when they lack family, friends, and health and social service providers who can help with these tasks (Choi and DiNitto, 2013).

As the internet is a main source for health-related information, healthcare providers, governments and other healthcare-related parties are concerned that it is important to be accessed by everyone. In particular, older people with less internet experience face the risk of being excluded as healthcare becomes more dependent on the internet (Merkel and Hess, 2020). Even though the internet has an important potential in supporting their health with providing information, communication, assistance, and services, studies show that older adults are less likely to use the internet, both overall and for health-related purposes (Calixte et al., 2020; Choi and DiNitto, 2013; Gordon and Hornbrook, 2018; Merkel and Hess, 2020; Miller and Bell, 2012; Zulman et al., 2011). Studies show that age is an important factor for technology adoption and health-related internet use. Age is one of the important demographic variables in digital divide research and has been included in many studies about digital inequalities (Acilar, 2021).

There are various reasons why older people have less health-related internet use compared to the younger generations, such as inexperience with technology or physical limitations, preferring traditional sources of health information, and distrust of the internet as a source of health information (Zulman et al., 2011). (Bujnowska-Fedak and Mastalerz-Migas, 2015) found that the factors influencing the use of the internet among older people for health purposes included age, higher education, living with family, and mobile phone use. (Sheng and Simpson, 2015) explored internet use among seniors for health purposes and found that demographics, trust in health information websites, perceived usefulness of the internet, and internal locus of control each significantly impact seniors' use of the internet to seek health information. Besides, (Merkel and Hess, 2020) found that young age, high education, high social class, and living in an urban area were positively associated with a high

probability of using internet-based health and social services.

Older people are more likely to develop one or more physical disabilities that could affect their use of computers and the internet, such as visual problems, motor problems, or musculoskeletal problems (Olphert and Damodaran, 2013). Factors related to the aging process can be important barriers to older adults using the internet for health-related activities (Choi, 2011). For seniors, internet search and understanding health information can be difficult and demanding (Miller and Bell, 2012) with the declining cognitive ability that comes with age. Age-related changes in visual, perceptual, motor and cognitive abilities make it more difficult for older adults to learn and use new technologies (Xie, 2003). Chung et al., (2011) found that too much information was the prime barrier to using online health information by older adult internet users. Too much health information on the internet can be confusing for older people.

Trust is an important predictor of health-related internet use among older adults. Zulman et al. (2011), Miller and Bell (2012), and Marinescu (2017) reported that older individuals are less trusting the internet as a health resource, and that older adults' distrust can hinder their optimal usage of the internet for their health. Instead of the internet, traditional sources of health information, such as physicians and pharmacists, may be preferred by older people (Miller and Bell, 2012).

Even though older people in particular could benefit from eHealth, they often show resistance and anxiety towards new technologies (Rockmann and Gewald, 2015). Choi and DiNitto (2013) found that symptoms of anxiety and depression were negatively associated with internet use among older adults, and having a diagnosis of dementia or Alzheimer's disease significantly lowered the odds of internet use. "Feeling too old" is also recognized as a barrier to using the internet as people become older (Morris, 2007).

### 3 METHODOLOGY

This research was based on two data sources: the Norwegian Statistics Bureau, Statistics Norway (SSB) and European Statistical Office (Eurostat). The statistics were drawn from Statistics Norway ICT Usage in Households database and Eurostat ICT Usage in Households and Individuals database. In addition, Statistics Norway population projections were used. In this study, descriptive methodology and

simple statistical analysis were used to explore health-related internet use among older people in Norway. Health-related internet use among older people in Norway was explored among different age groups and between genders. In addition, Norway and EU statistics were presented in comparison.

#### 3.1 The Aging Population in Norway

As in other developed countries, Norway has an aging population, and the increase in life expectancy of Norwegian people is projected to continue. Life expectancy at birth is expected to rise from around 81,2 years for men and 84,7 years for women in 2020, to 89 and 91 years in 2060, according to Statistics Norway. The Norwegian population was 5.391.369 in 2021 (January) and projected to be 6.001.759 in 2050. 67,4% population growth is expected between 2020 and 2060 in the over 60 age group, an increase from about 1,25 million (23,3%) to 2,09 million people (34,4%). In the same period, a decrease is projected for the under 30 age group, from 1,96 million (36,5%) in 2020 to 1,86 million (30,6%) in 2060. The age structure of the Norwegian population is changing with the aging population. The proportion of older people in the general Norwegian population is increasing. This aging trend in the population underlines the need to focus on older people's inclusion in the information society.

In 2021, there were 965.742 people (17,9%) aged 65 and over in Norway. According to Norway's population projections by Statistics Norway, there will be more older people (65+ years) than children and teenagers (0-19 years) living in Norway in approximately ten years. In 2050, it is projected that there will be about 1,5 million people (26,2%) aged 65 years and over.

#### 3.2 Internet Use among Older People in Norway

Norway is among the most digitalized countries in Europe, according to the Digital Economy and Society Index (DESI) reports in 2021. In 2020, Norway was ranked as 13rd in the United Nation's E-Government Development Index and 18th in E-Participation Index out of 193 countries. The rate of Internet users in Norway rose from 79% in 2006 to 99% in 2021 among those aged 16-79 years in the population (Statistics Norway). The majority of the Norwegian population is well equipped with today's technologies such as smartphones, computers and tablets to use digital platforms (Rønning and Sølvsberg, 2017).



The rate of internet use among older people in Norway is much higher than in other European countries. According to the results of 2021 ICT usage in households survey in Norway, the rate of internet use (in the last 3 months) is 97% among 65-74 years old and 92% among 75-79 years old, while 99% of those aged 55-64 and 100% of those aged 16-54 years are internet users. The rate of internet use has increased from 28% among 65-74 years old and 16% among 75-79 years old in 2006 to 97% and 92% respectively in 2021. Eurostat estimated the rate of internet use (in the last 3 months) in 2021 among 65-74 years old as 64% in the EU.

Older Norwegians actively use the internet for various purposes. According to results of 2021 ICT usage in households survey in Norway, older adults (aged 65-74 and 75-79) reported that they used the internet for e-mail (92% and 84%), finding information about goods and services (82% and 72%), banking (91% and 82%), making calls or videocalls (58% and 44%) and participation in social networks (69% and 53%).

### 3.3 Health-related Internet Use among Older People in Norway

The survey on ICT usage in households by Statistics Norway includes four variables about health-related internet use: “seeking health-related information”, “making an appointment with a medical doctor”, “getting access to personal health record” and “other health services online”. Norwegian national statistics are available for “seeking health-related information” from 2005 (except for 2012 and 2014), for “making an appointment with a medical doctor” for 2016, 2018 and 2020. Internet use statistics for variables “getting access to personal health record” and “other health services online” are collected from 2020.

Internet use for seeking health-related information among older people in Norway has increased significantly, from 6 percent in 2005 to 52% in 2020 among 65-74 years old and 38% among 75-79 years old and increased even more in 2021. Internet use for seeking health-related information was reported as 62% among 65-74 years old and 55% among 75-79 years old in 2021.

Health-related internet use in the Norwegian population is higher than in the European Union for all age groups (Table 1). In general, the rate of internet use for health purposes in Norway is less among the youngest (16-24 years) and the oldest people (75-79 years) compared to middle age groups. In 2020, 65-74 years old people reported using the internet for seeking health-related information (52%), getting access to their personal health record (36%), making an appointment with a medical doctor (33%) and using other health services online (23%). These rates are even lower for those aged 75-79, seeking health-related information (38%), getting access to personal health record (23%), making an appointment with a medical doctor (25%) and using other health services online (16%) (Statistics Norway).

Table 2 and Figure 1 presents health-related internet use by age. As shown in the table, for all age groups and genders, the most common purpose for health-related internet use was seeking health-related information, and the least common purpose was other health services online. Among 65-74 years old, the rates of internet use among females were higher than males for seeking health-related information and other health services online. Health-related internet use among the 75-79 years old was less than those aged 65-74. Among the 75-79 years old, the rates of health-related internet use for men were higher than for women for seeking health-related information, getting access to personal health record and other health services online.

Table 1: Health-related internet use in Norway and the EU, 2020, by age (%)

	16-24 years		25-34 years		35-44 years		45-54 years		55-64 years		65-74 years		75-79 years	
	NOR	EU	NOR	EU	NOR	EU	NOR	EU	NOR	EU	NOR	EU	NOR	EU
Used the internet to seek for health-related information	78	52	79	65	84	63	76	58	65	50	52	37	38	--
Used the internet to get access to personal health record	33	8	46	13	48	13	45	11	40	9	36	7	23	--
Used the internet to make an appointment with a medical doctor	21	15	33	26	36	26	40	22	35	18	33	12	25	--
Used the internet to use other health services online	19	10	31	14	31	16	32	15	33	12	23	10	16	--

Data source: Statistics Norway and Eurostat

Table 2: Health-related internet use in Norway, 2020, by age and gender (%).

	16-24 years		25-34 years		35-44 years		45-54 years		55-64 years		65-74 years		75-79 years	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Used the internet to seek for health-related information	72	84	79	80	81	88	65	88	62	68	43	61	46	30
Used the internet to get access to personal health record	22	45	38	54	42	54	42	49	40	39	41	32	29	19
Used the internet to make an appointment with a medical doctor	7	36	30	37	33	40	41	39	32	38	37	29	25	26
Used the internet to use other health services online	9	30	28	35	33	29	29	35	31	34	21	26	18	15

Data source: Statistics Norway

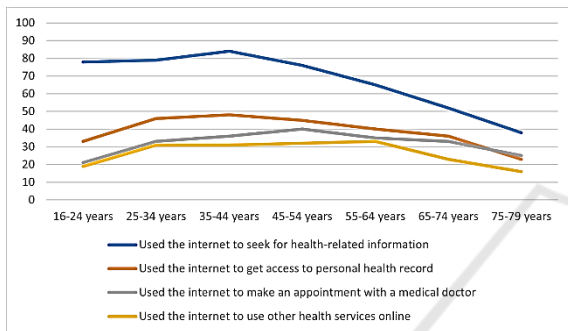


Figure 1: Health-related internet use by age (%), 2020. Data source: Statistics Norway

## 4 CONCLUSIONS

Like in other developed countries, Norway has an aging population, and life expectancy is projected to increase further in the coming decades. The aging trend in the Norwegian population is an important threat to achieving a completely inclusive digital society, as an increasing number of public and private services are being provided digitally.

This study has attempted to explore health-related internet use among older people in Norway using national ICT usage in households survey results. Survey results indicate an increased internet use among older adults in Norway. Even though the rates of internet use and health-related internet use among older Norwegians are higher than in many developed countries, the age-based divide is still apparent. Internet use among older people (65+) is less than younger generations.

The most common purpose for health-related internet use was seeking health-related information, and the least common purpose was other health services online. There are also some differences observed between genders in terms of health-related internet use.

This study highlights the digital gap in health-related internet use among older people in Norway, an increasingly digitalized and aging country. The digital divide is not just a problem for developing countries but also for developed nations. In order not to be excluded from increasingly digital health services, necessary measures should be taken into consideration to bridge the digital gap among older people.

The Covid-19 pandemic has significantly affected our lives all over the world, and older people are among the most dramatically affected by the coronavirus. The pandemic has highlighted the importance of information technologies in our lives, especially during lockdowns. There is a need to research how the Covid-19 pandemic has affected older people in terms of using the internet for general purposes and health-related use. Future research should continue to explore affecting factors in health-related internet use among older people and how to increase it. Comparative studies between different countries can also be considered in future research.

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