

# INHEAL: Innovation in Health Literacy

National Analysis in Czech Republic,  
English Version.



**INHEAL: Innovation in Health Literacy**

**DELIVERABLE 1: ANALYSIS**

**DESK RESEARCH: CZECH REPUBLIC, APRIL 2022**

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<b>INHEAL: Innovation in Health Literacy</b>	
<b>Deliverable 1: Analysis - Country desk research</b>	
<b>Identifier</b>	Ústav pro zdravotní gramotnost, z.ú. (UZG) Czech Republic
<b>Time horizon</b>	Specific focus on 2015-2022.
<b>Research objectives</b>	<p>Research objectives of national desk research performed in Czech Republic were the following:</p> <ul style="list-style-type: none"> <li>• To identify the real, relevant gaps and seniors' learning needs (knowledge and skills) of accessing health information and services including special focus on the use of ICT based methods;</li> <li>• To determine the current state of play measures and practices adopted at the national, regional or local levels to enhance accessing (digital) health information and services.</li> </ul>
<b>Research items</b>	<p><b>I. National Context of Health Literacy among Senior Citizens</b></p> <ul style="list-style-type: none"> <li>• Health Literacy definition, general characteristics</li> <li>• National Health Literacy studies overview: evolution of health literacy assessment tools and measuring methods, trends across years, and status quo, special focus on senior citizens</li> <li>• National Health Literacy statistics: health literacy levels among seniors across years and status quo; main gaps and issues identified by the latest studies (i.e. individual and system factors)</li> <li>• National Strategy Path on Diseases Prevention, Health Protection, and Health Promotion: Priority Areas and Strategic Objectives</li> <li>• Existing and Developing Public Policies for increasing Health Literacy, special focus on their scope of action and impact on senior citizens'</li> </ul> <p><b>II. National Context of Digital Health Literacy among Senior Citizens</b></p> <ul style="list-style-type: none"> <li>• Broad scope of Digital Health (categories of tools and services)</li> <li>• Digital Health Literacy definition, general characteristics</li> <li>• National statistics on ICT use: current number of households having access to the Internet, equipped with a computer, landlines, mobile lines, measured popularity of e-health resources, special focus on seniors</li> <li>• National Digital Health Literacy overview: health literacy levels among seniors across years and status quo; main gaps and issues identified by the latest studies (i.e. individual and system factors)</li> <li>• National promotion and use of ICT tools and techniques in accessing health information and services, general support policies</li> <li>• National current trends/methods/approaches targeting seniors in relation to improving their digital health literacy level, focus on good practices and transferable trends/current methods</li> </ul>

## I. National Context of Health Literacy among Senior Citizens

- **Health Literacy definition, general characteristics**

The relationship between health levels and its determinants has been repeatedly described. In the last decades, in addition to the level of health care, the environment, the effects of genetics and lifestyle, the level of health literacy of the population has also been promoted (Nutbeam, et al., 2018). It turns out that this is a ability that defines the actions of individuals in the health care system. To a large extent, this determines his health destiny.

The World Health Organization defines health literacy as a set of cognitive and social skills that determines the motivation and ability of individuals to access, understand and use information in a way that promotes and maintains good health (WHO: health promotion glossary, Geneva 1998, in Holčík)

*The level of health literacy undoubtedly depends on the overall literacy of the population and the level of education. Low literacy not only hinders the development of health literacy, but also limits personal social and cultural personality development (Holčík, 2010, p. 161).*

The literate population often shows a higher level of education, higher incomes, better health and, overall, a higher level of well-being. Health literate individuals are often successful in their profession. On the other hand, individuals with limited literacy often show insufficient participation in their own health, a higher affinity for risky behavior, often incapacity for work and general life dissatisfaction (Kickbusch, et al., 2020). According to Holčík, health literacy is needed in connection with three structures, which are the health system, the field of culture and society and the sphere of education.

The phenomenon of health literacy is not entirely easy to grasp. It is heterogeneous. The description of its content and the definition of the term is therefore the subject of discussion by the academic community. In her work Health Literacy and Public Health: A Systematic Overview and Integration of 2012 Definitions and Models, Sorensen described 17 definitions and defined 12 concepts (2012).

The number of definitions is likely to increase. In any case, health literacy is a term that can be described and measured. Based on its level, it is possible to determine the quality of health information provision and the quality of health care as such (Nutbeam, 2019).

Ultimately, health literacy is based on an observable set of skills that can be developed and improved through effective communication and education (Nutbeam, 2019). A health literate person is an individual who has the knowledge, skills and confidence to manage their health every day. This includes the ability to know when to start using the health system and how to navigate in it so that its services are used to the fullest (Kickbusch, et al., 2020).

Health literacy models are used to understand the individual dimensions of health literacy. These are thought constructions, thanks to which there will be an optimal definition of individual layers and also an understanding of the problem. Nutbeam introduced a health

literacy model that has three levels. The mentioned model includes three levels of health literacy: 1. functional, 2. interactive and 3. critical.

**Functional health literacy** is defined as a consequence of traditional health education. It uses information about health risks and how to behave in health care system. The intention is to raise people's awareness of health risks. Lead them to understand how to take action. Such procedures include, for example, participation in vaccinations, regular participation in preventive examinations. The goal of **interactive health literacy** is to develop citizens' competencies to behave independently. So behave confidently, responsibly and with respect. It is therefore not a matter of blind obedience to health regulations. It is an attempt at dialogue (Holčík, 2010, p. 159) Various self-help groups of patients belong to this area. **Critical health literacy** represents the highest level of health literacy. It is the individual behavior of individuals. How much are they able to act in context and participate in a favorable health and social environment (Holčík, 2010, p. 159; Sørensen, et al., 2012).

Health literacy is an important social determinant (WHO, 2021). It affects an individual's health much more than other predictors of health status such as education, income, ethnicity or employment (Kickbusch, et al., 2020, p. 7). It is a determinant that is controllable. It is well known that the level of health literacy in the population affects the use of health care and the burden on the health system in general (Peerson & Saunders, 2009). It can also be characterized as a form of social capital. A society with a high level of health literacy and the skills associated with it enjoys better health, a higher standard of living and greater well-being in general. In this context, there is talk of so-called empowerment (Nutbeam, et al., 2018; Van den Broucke, 2014). This can be characterized as the ability to affect one's own health. In contrast, countries where health literacy is problematic face poorer health. This is often associated with risky behavior. Social demand for the health literate population should be high (Kickbusch, et al., 2020).

It is therefore quite logical that society's attention is increasingly turning to the topic of health literacy. The fact that low health literacy affects an individual's health increases the use of health care and the associated financial costs are quite obvious. In this context, Hamplová even states that: it devastates the health care system, prevents the full use of new medical methods and degrades the efforts of health professionals (2019, p. 89). The demographic perspective is also crucial. The aging trend of the population is clear. It is quite evident that the health care system will face increasing numbers of chronically ill patients. Health literacy research has shown that the health literacy of the population is declining with age (Sørensen, et al., 2015; Kučera, et al., 2016; Visscher, et al., 2018). From the point of view of health literacy, we distinguish four fundamental periods (Hamplová, 2019 p. 91):

- child at the beginning of school (approx. 7 years)
  - young adult (approx. 15-25 years)
  - adult
  - adult on the threshold of old age - senior (approx. 65 years)
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- **National Health Literacy studies overview: evolution of health literacy assessment tools and measuring methods, trends across years, and status quo, special focus on senior citizens**

Research from around the world is rapidly deepening the understanding of the enormous potential that health literacy optimization has for improving health and well-being and reducing health inequalities (Kickbusch, et al., 2020, p. 3). Health literacy research dates back to the mid-1990s. Health literacy research and systematic monitoring of its fluctuations is an essential part of any program aimed at increasing citizens' health literacy (Kolektiv autorů, 2017). Initial surveys, which took place mainly in the United States, focused on the level of functional literacy. One of the research methods was the REALM (Rapid Estimate of Adult Literacy in Medicine) method. It was a simple test, based on the correct reading and utterance of medical terms. Another test was TOFHLA (Test of Functional Health Literacy in Adults). In the case of this type of test, it was a matter of measuring numerical skills and comprehension of the read text. Both tests measure only a portion of health literacy and are based on text interpretation. In contrast, the Health Activity Literacy Scale (HALS) measures five areas of health literacy: health promotion, health protection, disease prevention, health care and maintenance, and the ability to navigate a health facility. With its coverage of the content side of health literacy, it seemed like a suitable test for measurement. Its disadvantage was that it was too time consuming. During the North American National Health Literacy Survey (USA NAAL), a scaling tool was used for the first time: a text literacy scale, an unrelated text use scale, and a numerical literacy scale (Kučera, et al., 2016). The Newest Vital Sign (NVS) is a relatively new option for measuring functional literacy. This test is surprisingly based on understanding the information provided on ice cream packaging (Weiss, 2005; Kučera, et al., 2016; Peerson & Saunders, 2009).

### Health literacy of the population of the Czech Republic 2014 HLS-EU

In 2014, the first systematic study of health literacy in selected European countries (HLS-EU) was published (Sørensen, et al., 2015). It was prepared based on the model (see Table 1) reported in WHO Health Literacy: The Solid Facts, published in 2013 (Kickbusch, et al., 2013). A set of 47 questions was created from the mentioned model, which were part of the standardized questionnaire (HLSQ-EU).

**Table 1 - Health literacy model**

<b>Health Literacy</b>	<b>Access health information</b>	<b>Understand health information</b>	<b>Evaluate health information</b>	<b>Apply health information</b>
<b>Health care</b>	1. Know how to find information on illness and treatment	2 Understand information on illness and treatment	3. Know how to interpret and critically evaluate information on illness and treatment	4. Know how to make informed decisions on illness and treatment
<b>Disease prevention and health protection</b>	5. Know how to find information on health risks	6. Understand information on health risks	7. Know how to interpret and critically evaluate information on health risks	8. Know how to make informed decisions on health risks

<b>Health promotion</b>	9. Know how to find information on health determinants	10. Understand information on health determinants	11. Know how to interpret and critically evaluate information on health determinants	12. Know how to make informed decisions on health determinants
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(taken from: Kučera, et al., 2016, p. 235)

Eight European countries (Austria, Bulgaria, Germany, Greece, Spain, Ireland, the Netherlands and Poland) were involved in the study. The possibility of using the same methodology for research in the Czech Republic was very valuable. Thanks to this, a study could take place in the Czech Republic in 2014, which could be confronted with European results. The research was carried out by the State Institute of Public Health in cooperation with the Ministry of Health of the Czech Republic and the WHO Office in the Czech Republic. A total of 1,037 respondents from all regions were included in the representative sample of the population of the Czech Republic older than 15 years.

### **Health literacy in selected groups of the population of the South Bohemian Region HLSQ - EU (47 questions) and abbreviated (16 questions) EU Health literacy**

In the years 2016 to 2018, a comprehensive research of selected population groups was carried out under the auspices of the Faculty of Health and Social Studies of the University of South Bohemia. The scientific work focused on the level of health literacy of the inhabitants of the South Bohemian Region. How its level changes with respect to age, gender, socioeconomic status. The standardized HLSQ - EU - 47 questionnaire and the abbreviated EU Health Literacy (16 questions) were used. Part of the research dealt with the health literacy of seniors (criteria for selection age : over 65 years). Permanent residence in the South Bohemian Region, absence of cognitive impairment and living with an independent household (Bártlová, 2018). Sample: 326 respondents.

### **International comparative research M-POHL 19 in the Czech Republic**

Between 2019 and 2021, health literacy surveys were conducted in 17 European countries (Czech Republic, Austria, Belgium, Switzerland, Germany, Denmark, France, Hungary, Ireland, Israel, Norway, Poland, Russia, Slovenia, Slovakia). A total of 42,445 respondents participated in the study. In the Czech Republic, the sample was 1650 respondents over the age of 18. The HLS19 project used a standardized questionnaire HLS19-Q47 and two short forms, HLS19-Q16 and HLS19-Q12, based on the relevant HLS-EU tools, to measure general health literacy. HLS19-Q12 has been validated in 17 countries. In addition, new measurement tools have been developed and validated. The study focused on general health literacy as well as specific types of health literacy, such as navigational health literacy, communicative health literacy in relation to doctors, digital health literacy and vaccination health literacy. Furthermore, health-related health literacy and quality of life in relation to health expenditures were analyzed. (M-POHL).

Regular health literacy monitoring is important for effective health policy planning, health promotion and disease prevention in the Czech Republic. Only on the basis of empirical data is it possible to work effectively with the phenomenon of the level of health literacy of the

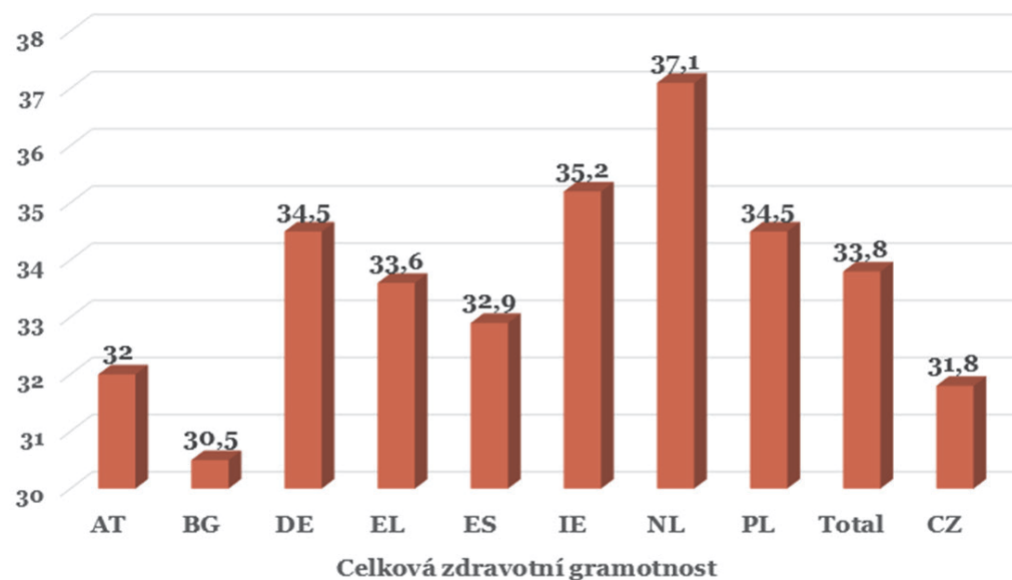
population. Measurements must be set so that data can be compared and systemic biases do not occur (Kickbusch, et al., 2020).

- **National Health Literacy statistics: health literacy levels among seniors across years and status quo; main gaps and issues identified by the latest studies (i.e. individual and system factors)**

### Health literacy of the population of the Czech Republic 2014 HLS-EU

The first systematic study showed that the health literacy of the population of the Czech Republic is surprisingly low. The findings revealed that almost 60% of the adult population had inadequate or problematic health literacy. A comparison with European countries revealed that the Czech Republic ranked penultimate, ahead of Bulgaria (Kučera, et al., 2016; Sørensen, et al., 2015).

**Graph 1 - Total health literacy of 8 EU countries and the Czech Republic**



(taken from: Kučera, et al., 2016, p. 235)

The most favorable results were shown by literacy in the field of health care, ie the area of literacy that relates to orientation in the health care and health care system. Less than half of the respondents fall into the area of reduced literacy, exactly 49.5% of the population. The situation is worse in the field of disease prevention, ie the ability to obtain adequate information, evaluate and use it in terms of disease prevention, a total of 54.1% of the population showed limited literacy in this area (Kučera et al., 2016).

### Health literacy in selected groups of the population of the South Bohemian Region HLSQ - EU (47 questions) and abbreviated (16 questions) EU Health literacy

The results of this study correlated to a large extent with the results of the previously mentioned national survey (Kučera, et al., 2016; Bártlová, 2018). A significant benefit of this



research was the focus on the specifics of individual populations (children and adolescents, adults, seniors, citizens on the brink of poverty, Roma and health professionals). It has become a valuable and clear basis for working with the level of health literacy in the Czech Republic. Part of the research described health literacy in seniors in the South Bohemian region. Inadequate health literacy was observed in 23.1% of respondents, problematic health literacy was found in 37.8%, and sufficient health literacy in 39.1% of seniors.

According to Bártlová (2018), a statistically significant connection between health literacy and the age of the respondents was proved. The group of seniors over the age of 80 showed significantly higher inadequate health literacy. There was also a statistically significant connection with the level of education attained in the sample of seniors. Sufficient health literacy was significantly higher among respondents with a high school diploma, high school and university. Problematic and inadequate health literacy was especially for apprentices or without a high school diploma. An association between health literacy and the family status of individuals has been observed. Health literacy was significantly higher in seniors living in seclusion than in married seniors.

A statistically significant relationship between health literacy and the financial situation of seniors was also observed. A link between health literacy and the social status of seniors has been observed. In contrast, no link was observed between health literacy levels and gender. There was also no difference in health literacy between seniors living in the city or village. Whether or not he had senior children was also irrelevant to the level of health literacy. There was no connection between whether the senior worked or received a retirement pension.

However, the study showed that seniors with inadequate health literacy reported the presence of one or more chronic diseases much more often and sought emergency medical services much more often. Seniors with sufficient health literacy did not contact it at all. The number of visits to primary care providers was higher among seniors with inadequate health literacy.

An important impact of the health restrictions of seniors is the consequent reduction of personal activities. In connection with the health problems of seniors and the lack of support from loved ones, the community, but also society as a whole, we are talking about the threat of social exclusion of this vulnerable group. Wilkinson and Marmot point out that an inadequate network of social contacts leads to a deterioration in the health of vulnerable groups, including the elderly (1998).

The authors of the mentioned study recommend focusing on (Bártlová, 2018):

- adequate physical activity of the elderly (related problems: obesity, malnutrition, dehydration, insomnia,
- qualitatively and quantitatively balanced nutrition,
- sleep hygiene,
- adequate physical activity with regard to the individual's state of health,
- awareness of seniors about healthy lifestyle issues,
- educational programs and activities dealing with health promotion,
- free preventive examinations focused on diseases of civilization and screening examinations,

- prevention of injuries and poisonings in old age,
- memory exercises and cognitive training.

### **International comparative research M-POHL 19 in the Czech Republic**

The main results of the European study are as follows (M-POHL: The HLS19 Consortium of the WHO Action Network M-POHL): Between 25% and 72% of respondents have problems with health literacy, the level of health literacy varied from country to country and could also be affected by differences in the methodologies used. It was difficult for many respondents to assess different treatment options, use media information to prevent disease, and find information on how to manage mental health problems.

This international comparative study distinguished between navigation, communication, digital and vaccination health literacy.

**Navigational health literacy:** participants found it most difficult to understand information on health care reforms, assess the suitability of different health services, ascertain patients' rights and assess the extent of health insurance coverage.

**Communicative health literacy:** the most difficult thing was to get enough time from doctors and express personal opinions and preferences. In addition, respondents with lower health literacy were found to have more contacts with GPs or family doctors and emergency services.

services.

**Digital health literacy:** it has been found that the most difficult is to assess the reliability of information, to assess whether information is offered with commercial interests, and to use information to address a health problem.

**Vaccination health literacy:** was perceived as the most difficult to assess what vaccinations a person needed and to find out information about recommended vaccinations. In addition, better 1 In the Czech Republic, the HLS study of vaccination health literacy in 2015, together with confidence in vaccination and risk perception, had a positive effect on vaccination.

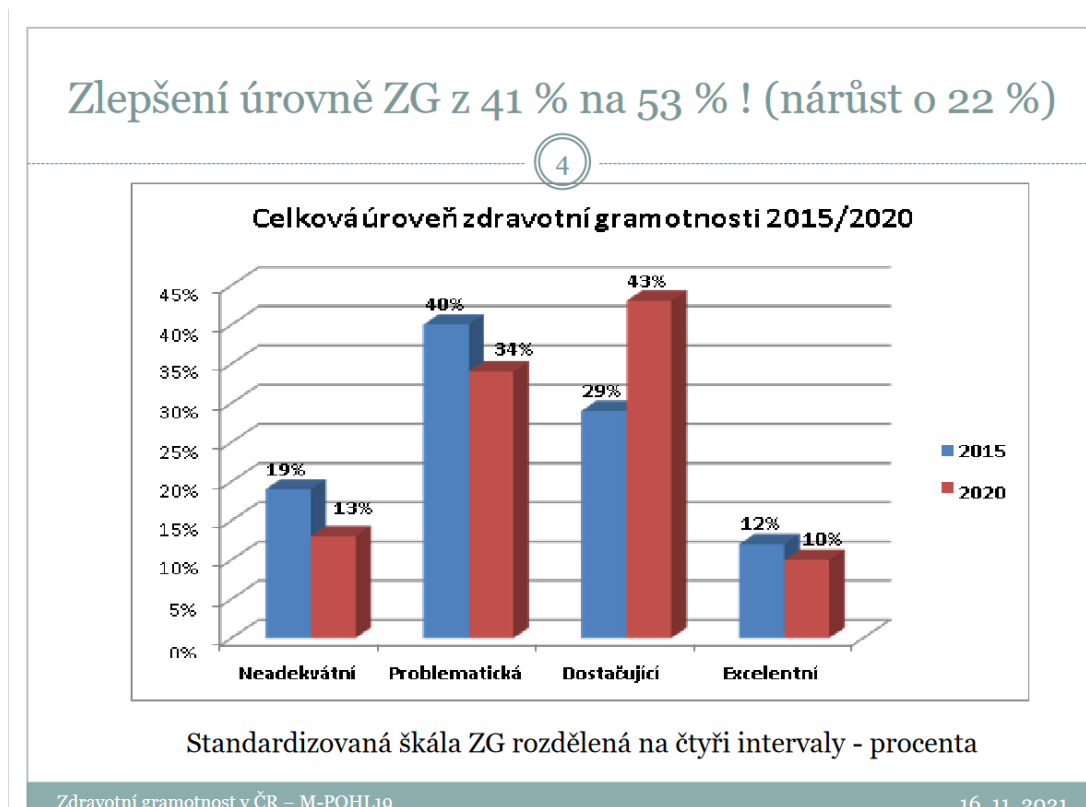
Negative assessments of one's own health status, low socioeconomic status and financial deprivation are associated with lower general and specific health literacy. Low education was also linked to general, digital and vaccine health literacy. The social gradient was demonstrated in all countries, although its extent varied from country to country. Financial deprivation and the low level of perceived position in society were important predictors of lower health literacy. Low health literacy leads to less physical activity and less fruit and vegetable consumption, poorer self-esteem, greater activity constraints due to health problems, and more long-term illnesses or health problems.

The authors of this study present a list of recommendations on how to improve policy, research and practice, including:

- **make efforts to enable people to better access, understand, evaluate and apply information in order to strengthen health care, disease prevention and health promotion,**
- **regular measurement of health literacy status and progress,**
- **systematic introduction of health literacy in schools, adult education, media, etc.**

- targeting at-risk groups in order to reduce health literacy inequalities, eg in mental health,
- strengthening communication and interaction in health and healthcare-related environments,
- developing health literacy capacity, the workforce to improve health and well-being,
- strengthening systems and organizations to make them more health-literate, eg easier for them to find their way around, and
- increasing the credibility of vaccination information and communication.

Graph No. 2 Comparison of health literacy levels between studies in 2015 and 2020



(taken from Kučera, 2021)

Another European health literacy survey is planned for 2024.

- **National strategies on disease prevention, health and health promotion: priority areas and strategic objectives:**

**Health 2020 - National Strategy for Health Protection and Promotion and Disease Prevention**

On the basis of the European Health 21 program and in connection with the Health 2020 program, **the National Strategy for the Protection and Promotion of Health and Disease Prevention** (hereinafter referred to as the National Strategy) was created. This is a text

created by a team of experts to reflect the needs of the population of the Czech Republic as much as possible. These are the stabilization of the system of disease prevention and health protection and support, and the launch of effective and long-term sustainable mechanisms to improve the health status of the population (Health 2020 - National Strategy for Protection and Support, 2014, p. 11). In a broader context, it can be considered a tool for the implementation of the Health 2020 program and at the same time follows up on the Long-Term Program for Improving the Health Status of the Czech Republic - Health 21. The National Strategy develops the idea of an inter-ministerial approach.

The team of strategy authors set priorities. It was based on statistics on the health status of the population of the Czech Republic, demographic data and the overall social situation. The main goal of the program was and is to improve the health of the population and reduce the incidence of preventable diseases and premature deaths. Above all, it is important to prevent rising healthcare costs and to prolong healthy life expectancy. The main goal was to be achieved through two strategic goals, which were (Health 2020 - National Strategy for Protection and Support, 2014, p. 11):

- **Improve the health of the population and reduce health inequalities.**
- **Strengthen the role of public administration in the field of health and invite the establishment and decision-making of all sections of society, social groups and individuals.**

The above-mentioned objectives were to be achieved through **four priority areas**, which were (Health 2020 - National Strategy for Protection and Support, 2014, p. 21):

- Implement lifelong investments in health and disease prevention, strengthening the role of the citizen and his or her health potential.
- To face serious health problems in the area of non-infectious and infectious diseases and to continuously monitor the health status of the population.
- Strengthen people-centered health systems, ensure access to health services, focus on health protection and promotion and disease prevention, develop public health capacity, ensure crisis preparedness, continuous health monitoring, appropriate emergency response.
- Participate in creating conditions for the development of resilient social groups.

At the same time, the strategy distinguished between horizontal and vertical topics (table 2), which should serve for the further development of activities in the field of health promotion and disease prevention. These topics were elaborated into individual implementation documents - action plans and other strategic documents. However, it should be noted that Health 2020 - National Strategy for Health Protection and Promotion and Disease Prevention was not prepared on the basis of an active strategic decision of the Ministry of Health of the Czech Republic, but as a pragmatic fulfillment of the European Parliament's resolute requirement 17 December 2013 (EU, 2013).

**Table 2 – Topics for the development of activities within the NS Health 2020**

Horizontal	Vertical
1. Sufficient physical activity of the population	1 1 1 1 2 3 4 5
2. Proper nutrition and eating habits of the population	. . . . 16. Health H R E L economics e e v i

3. Stress management and mental health

4. Limitation of health risk behavior

5. Reducing health risks from the living and working environment

6. Management of infectious diseases, in particular emerging and healthcare-associated infections, healthcare associated infections, antimicrobial resistance measures and vaccination programs

7. Screening programs, their monitoring and evaluation of their effectiveness, identification of new possibilities

8. Screening programs, their monitoring and evaluation of their effectiveness, identification of new possibilities

9. Ensuring the quality and safety of health services provided

10. Lifelong learning of health professionals

11. E-health

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(Zdraví 2020 - národní strategie ochrany a podpory, 2014, p. 22)

## Health 2030 - Strategic framework for the development of health care in the Czech Republic until 2030

The Health 2030 Program is actually a strategic framework for the development of health care in the Czech Republic until 2030. It is part of the Czech Republic 2030 Strategic Framework. It is also based on the National eHealth Strategy and the Psychiatric Care Reform Strategy. At the international level, it is based on the Agenda 2030 and the Sustainable Development Goals (SDGs) (WHO, 2016). Objective No. 3 - Health and quality of life (Health 2030, 2019) deals specifically with the topic of health. The program includes an analytical part that explains the reasons for including key topics. The analysis is based on international and national statistical data (NZIS) on the health status of the population, as well as on demographic data (CSU).

The basic overarching goal of the program is **"The health of all citizens is improving"**.

The program further defined 3 strategic goals:

**1) Improving the health of the population,**

**2) Health system optimization**

**3) Support for science and research.**

Proposals for their implementation are explained in 7 specific objectives, which will be implemented in 6 consecutive implementation plans.

The issue of population health literacy has an irreplaceable place in the program. It is devoted to a section called 1.2 Specific objective - Primary and secondary disease prevention, literacy and responsibility of citizens for their own health (Health 2030, 2019).

**Table 3 – Specific objectives Health 2030**

Specific objectives no. 1	Specific objectives no. 2	Specific objectives no. 3
1.1 Primary care reform	2.1 Implementation of integrated care models, integration of health and social care, mental health care reform	3.1 Involvement of science and research in solving priority tasks of health care
	2.2 Personnel stabilization of the health sector	
1.2 Primary and secondary disease prevention, increasing health literacy and citizens' responsibility for their own health	2.3 Digitization of healthcare	
	2.4 Optimization of the system of reimbursements in healthcare	

(Zdraví 2030, p. 48)

### **Specific objective 1.2**

Despite all previous activities, the health literacy of the Czech population is still low and lags behind most European countries (Kučera, et al., 2016). The community is aging and its health is still very much affected by lifestyle risk factors such as tobacco use, alcohol consumption, unhealthy lifestyle and associated obesity (WHO, 2020). Problematic health literacy is also evident in the current pandemic, when many citizens behave irresponsibly in these difficult times.

This specific goal seeks to methodically address the issues of primary and secondary prevention, so as to contribute to increasing the health literacy of the population. Part of the program is the establishment of an interdisciplinary platform that would participate in the implementation of defined objectives. An important prerequisite is close cooperation with health care providers, especially at the level of primary care (Zdraví 2030, 2019, p. 56).

### **Implementation plan No. 1.2**

In connection with the implementation of the goal described above, an implementation plan was created, which specifies the individual procedures within the implementation. It is a living document that has undergone certain changes since its inception in connection with the current pandemic.

The implementation activities were specified on the basis of the following conclusions (Implementation Plan 1.2, 2020):

- flexibility of the health care system in connection with current threats - infectious diseases,
- non-infectious diseases are the most common cause of death in the Czech Republic - the need for a conceptual solution to primary, secondary and tertiary prevention,
- exposure to air pollutants,
- declining immunization and antimicrobial resistance,
- high prevalence of obesity, including the child population,
- inappropriate behavioral aspects of health,

- unhealthy lifestyle
- substance abuse,
- optimization of screening programs

From the mentioned conclusions and in connection with the COVID - 19 pandemic, a fundamental focus on the area of health promotion and protection and disease prevention is evident. Within the implementation plan, sub-objectives are defined (see Table 4).

**Table 4 – Sub-objectives**

1 . 2 . 1 .	Prevention of the emergence and spread of infectious diseases and setting up supporting information measures for the crisis management system.
1 . 2 . 2 .	Protection of the health of the population of the Czech Republic in the context of environmental risks (chemical substances, excessive noise pollution, manifestations of climate change, etc.).
1 . 2 . 3 .	Prevention of substance abuse, screening, early diagnosis and brief interventions in the field of addictive behavior.
1 . 2 . 4 .	Creation of the National Program for Increasing the Level of Health Literacy, Implementation of Sub-Programs and Monitoring of Health Literacy
1 . 2 . 5 .	Construction and development of prevention centers in medical facilities.
1 . 2 . 6 .	Construction and development of the National Health Information Portal
1 . 2 . 7 .	Strengthening early detection of diseases and risk factors in all segments of care and introduction of new early detection programs.
1 . 2 . 8 .	Development of institutional background for optimizing secondary prevention and improving the quality of existing population screening programs.

(Implementační plán, Zdraví 2030, p. 11)

- **Existing and Developing Public Policies for increasing Health Literacy, special focus on their scope of action and impact on senior citizens**

*The share of older people in the population of the Czech Republic will continue to grow significantly. At the macro level, the consequences of increasing the number and share of seniors affect all spheres of social and economic development. People live to be older. Prolonging human life is the result of increasing the quality of human life and living standards and the overall improvement of the health of the population. Life expectancy is a complex process that affects both the lives of individual seniors and society as a whole, affects intergenerational relations and includes all areas of life (MLSA: National Action Plan Supporting Positive Aging for the period 2013-2017, 2014).*

According to current data from the Czech Statistical Office, the number of seniors aged 65 and over increased in 2020 – despite the effects of the COVID 19 pandemic. According to statistical data, it decreased by one year for men and by 0.7 years for women (to 75.3 years and 81.4 years, respectively). The average life expectancy at the age of 65 developed similarly, which fell to values of 10 resp. 7 years back (Seniors in the Czech Republic in dates, 2022).

The World Health Organization's documenting Active Aging: A Policy Framework introduced the concept of so-called active aging, describes it as... “the process of optimizing the conditions and opportunities for maintaining health, active involvement and life security in order to improve people's quality of life as they age” (WHO, 2002). The European Commission describes active aging as a combination of several features (European Commission: The EU's contribution to active aging and intergenerational solidarity, 2012):

- prolonging working careers,
- promotion of active citizenship,
- maintaining good health and independence of life.

It is necessary to focus on the knowledge and skills of older individuals, not to highlight their potential shortcomings. The whole approach is based on an awareness of the rights of older adults and seniors in terms of their independence, participation, dignity, care and personal fulfillment and an effort to integrate them into a society in which they are considered full citizens (Kalache & Kickbusch in Šerák, 2019)

The main sponsor of the previously mentioned strategic programs **Health 2020 - National Strategy for Health Protection and Promotion and Disease Prevention** (Health 2020: National Strategy for Health Protection and Promotion and Disease Prevention, 2014) and **Health 2030 - Strategic Framework for Health Care Development in the Czech Republic until 2030** (Health 2030, 2019) is the Ministry of Health of the Czech Republic. An integral part of these strategies was the effort to increase the health literacy of the population.

The policy of preparation for aging in the Czech Republic is coordinated by the Ministry of Labor and Social Affairs (hereinafter referred to as the MLSA). Its main activities include the



preparation of strategies (MLSA): **National Action Plan Supporting Positive Aging** (MLSA: National Action Plan Supporting Positive Aging, 2014)

The action plan has been developed in the areas it will address in detail, along with specific strategic goals (16 in total). Health literacy was mainly addressed in the **Healthy Aging** chapter and the strategic goals mentioned below. The action plan drew attention to the fact that prevention programs are often aimed only at the elderly and do not sufficiently reflect the diverse needs of citizens over the age of 50 and over. On the other hand, a frequent barrier is their insufficient interest and motivation to participate in preventive actions. Local governments are of great importance in the development of healthy conditions, which, within their independent competence, should also deal with the all-round development of their territory and the needs of their citizens. It is the creation of local communities and the implementation of specific programs within them that is the most effective tool leading to changes or the promotion of a healthy lifestyle (MLSA: National Action Plan supporting positive aging for the period from 2013 to 2017, 2014).

- Strategic goal G1: To increase the awareness not only of seniors about a healthy lifestyle and to motivate them to take responsibility for their health
- Strategic goal G2: To create a sufficient offer of prevention programs in the community and in a society that emphasizes a holistic approach
- Strategic goal H1: To set scales of health and social services that meet the different needs and specific life situations of seniors
- Strategic goal H2: To increase the awareness of informal carers who use their maximum potential both in their job and in the care of their loved ones

**Strategic framework for preparation for the aging of society 2021-2025** (MLSA: Strategic framework for preparation for the aging of society 2021-2025, 2019)

The aging of society and demographic change affect all areas of human life. It should also be borne in mind that the above-mentioned trends will have an even greater impact on the functioning of society as a whole in the future, as the senior population expands over the long term as a result of aging. This trend will continue throughout the first half of the 21st century. In 2018, 19.2% of the population was in the age group 65+ (in 2019 it was 19.9%), in 2025 it will be 22.3% and in 2050 it will be 29% (almost every third) (MLSA: Strategic framework of preparation for the aging of society 2021-2025, 2019).

Part of the document deals with health and prevention. In this context, it deals with quality of life, access to health care as well as the issue of integration of health and social care, and the need for a comprehensive solution for geriatric care. The specific forms of implementation of the strategic framework is not yet specified in more detail. In the document, are also included educational activities (i.e. the preparation of round tables or senior days).

To be noted : the MLSA also participates in the project from the European Social Fund "Aging Policy in the Regions".

In connection with awareness-raising activities, it is necessary to mention the key role of the non-profit sector and community projects that deal with the senior generation. Communities

are a key environment for health literacy. People make daily decisions that relate to health in their homes and communities. Families, peers, and communities are usually the primary sources of health information (Kickbusch, et al., 2020, p. 40). Strengthening population awareness and health literacy at the community level has been a long-term trend since the publication of the Ottawa Charter (Guzys, et al., 2015). At this level, preventive measures have the potential to improve the health of the population. In this context, the organization **Life 90**, which has a 30-year history in the field of education of seniors, their support and support provides a very diverse range of educational activities. Another example is the non-profit company **Elpida**, which aims to help seniors become a natural, confident and respected part of society.

The elderly population is exposed to a number of risks. It is more likely to suffer from various illnesses, is more prone to injury, especially at home, is more vulnerable to poverty and is more likely to be a victim of crime. It is in this population that the Covid-19 epidemic has had the strongest impact. At the same time, however, it is good to realize that despite these risks, many seniors live a full active life. These people are still active in the labor market, playing sports, studying and using modern information and communication technologies (Seniors in the Czech Republic in data, 2022).

## II. National Context of Digital Health Literacy among Senior Citizens

- **Broad scope of Digital Health, (categories of tools and services)**

Digital health care can be broadly separated into two categories: eHealth and mHealth (Chan J., 2021).

- eHealth, “the use of information and communication technologies for health”
- mHealth, the “medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices”

The European Union (EU)<sup>1</sup> specifies that eHealth (Electronic Health) :

1. Comprises the provision of healthcare products and services using ICT. It includes the use of digital products, services or processes and is combined with an organizational change in healthcare systems, to improve public health, as well as accessibility, efficiency and productivity in healthcare delivery.

« eHealth (including mHealth and Telehealth) services and products » topic focuses on the following aspects:

1. Approval, certification, authorization, and reimbursement rules
2. Interoperability
3. Privacy and liability rule
4. Professional qualifications
5. Online sales of pharmaceutical products

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<sup>1</sup> European Commission, Directorate-General for Health and Food Safety, Lupiáñez-Villanueva, F., Gunderson, L., Vitiello, S., et al., *Study on health data, digital health and artificial intelligence in healthcare*, 2022, <https://data.europa.eu/doi/10.2875/702007>

2. Includes Telemedicine/Telemedicine, or the use of innovative technologies (especially ICT) to provide health services and medical information in situations where the health professional and the patient (or two health professionals) are not in the same location. This includes all remote interactions between patients and healthcare professionals, and between healthcare professionals, whether synchronous or asynchronous.

The main user of electronic healthcare is a citizen whose strengthening of the position is the strategy's task. Around the citizen, in the role of the patient, all the other key participants of the healthcare system led by physicians, pharmacists, and other health professionals and healthcare workers are concentrated. Manufacturers, suppliers, and distributors of medicines, medical devices and technologies, professional, professional, and lay organizations, providers and payers of health services, medical equipment owners, academia, state and local government institutions, and other entities also belong to those users of electronic healthcare.

From mobile medical apps, computing platforms, and software that support clinical decisions, digital approaches help in the implementation of digital health services.

Electronic health instruments provide new options for facilitating prevention, early diagnosis of life-threatening diseases, and management of chronic conditions outside of traditional health care settings. More precisely, the use of information and communication technologies (ICTs) provides innovative ways for patients and consumers to better manage and monitor their health and wellness-related activities. As for providers and other stakeholders, they are using digital health technologies in their efforts to reduce inefficiencies, improve access, reduce costs, increase quality, and make medicine more personalized for patients by benefiting from a more holistic view of patient health through access to data.

Accordingly, digital health technologies can support the continuity of care across borders and can support the transition to new care models, centered on people's needs while enabling a shift from hospital-centered systems to more community-based and integrated care structures.

- **Digital Health Literacy definition, general characteristics**

Digital health literacy, or Electronic Health (eHealth) is an extension of health literacy and uses the same operational definition, but in the context of technology (Patrick Dunn, Eric Hazzard, 2019). eHealth was conceptualized in 2006 as the ability of internet users to locate, evaluate, and act upon web-based health information. Now, advances in eHealth technology have cultivated transactional opportunities for patients to access, share, and monitor health information (Paige SR, Stollefson M, Krieger JL, Anderson-Lewis C, Cheong J, Stopka C, 2018). In the same vein, the World Health Organisation defines digital health literacy as the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem. In a more general sense, digital health literacy, or e-Health literacy, describes the extent to which digital tools are applied and used by the healthcare service providers and the patients to deliver and access affordable quality healthcare services to the patients.

Digital health and care enable meaningful integration of knowledge and information to accompany citizens in preventing, diagnosing, monitoring, and solving their health-related issues, and lifestyle habits that impact health and to effectively strengthen the capabilities and capacities of medical workers in these situations (European Commission).

Digital literacy in health requires skills complementary to general literacy and health literacy (Smith, 2019). Unlike other distinct forms of literacy, eHealth literacy combines facets of literacy skills and applies them to eHealth promotion and care. At its heart are six core skills (or types of literacy) (Levin-Zamir, D.; Bertschi, I. , 2018):

- traditional literacy
- health literacy
- information literacy
- scientific literacy
- media literacy
- computer literacy.

Populations at risk for limited health literacy are similarly vulnerable to having challenges with digital health literacy (Smith, 2019). Digitally health-literate individuals can indeed use ICTS and devices to find and benefit from health services and information and communicate effectively with health professionals. Hence, digital health services are to no purpose if health care consumers, or providers, do not have the skills or understanding to use them or don't have access to the equipment needed.

Digital solutions can provide multimedia education for different reading levels in multiple languages, such as video, audio, and print, using formal and informal teaching methods. By giving patients a greater voice and empowering them to actively participate in treatment, they can develop their decision-making and shared decision-making skills. Rather than being passive participants, digital solutions offer individuals the opportunity to become active players in health (Conard, 2019).

Consequently, digital health offers real opportunities to enable better use of increasing volumes of health data in research and innovation to support policymaking, personalized healthcare, better health interventions, and more effective, accessible, and resilient healthcare systems.

- **National statistics on ICT use: current number of households having access to the Internet, equipped with a computer, landlines, mobile lines, measured popularity of e-health resources, special focus on seniors:**

Browsing the internet or using ICT as a whole, is no longer the domain of the younger generation. The number of ICT users among the elderly has also been increasing for a long time in the Czech Republic (Czech Statistical Office, 2021). However, it is important to precise that the elderly do not form a heterogeneous population because they have different needs as they age, dividing the elderly into three distinct groups: 55-64 years old, 65-74 years old, 75 and more years old. (Klimova et al., 2016; Klimova, 2017). In the Czech

Republic, the age of 55 is the starting seniors' age (Czech Statistical Office, 2017).

### Internet and computer in households & Internet usage

By 2021, almost four-fifths of Czech households (79%) already have a computer (including tablets), and a similar proportion has access to the internet (83%), of which only 44% of senior households are concerned.

Computers and the internet have become a common feature of households over the last few years - by comparison, in 2010, 59% of households had a computer and 56% had an internet connection. In the case of computers, the trend is moving from desktop to laptop computers. 35% of households now own a desktop computer, 65% a laptop, and 31% a tablet. While the share of households with a desktop computer has been more or less declining in recent years, the share of households with a laptop is increasing, although the increase is no longer dynamic.

In households that use a Wi-Fi router or modem - the share of such households have reached 70% in 2021. By comparison, only 16% of households used a Wi-Fi router in 2010.

There is a strong correlation between internet access and household income levels.

	Computer	Internet	Wi-Fi router
	in %	in %	in %
<b>Households without children altogether</b>	72,9	77,3	62,4
<b>Households of people older than 65</b>	41,3	44,4	27,9

### Internet usage

In 2021, the share of internet users in the Czech Republic have reached 83%. The proportion of people aged 65+ using the internet has risen from 13% in 2010 to 43% in 2021. Among those of pre-retirement and early retirement age (55-64), 42% used the internet in 2010, while 84% are now online.

	Daily or almost daily	At least once in last three months	At least once in your lifetime	Never used
	in %	in %	in %	in %
<b>65 - 74 years old</b>	37,9	55,6	69,3	30,7
<b>75 + years old</b>	14,8	22,6	38,6	61,4

### Mobile phone information

The mobile phone has dominated information and communication technologies for many years. In the Czech Republic, even among the elderly the figure is high : 96% of the category is using it. However, disabled pensioners use mobile phones less than seniors, with 90% of them using them. While in 2010 only 4% of individuals used a mobile phone to connect to the internet, the figure has risen to 72% in the following years. Only 30% of individuals aged 65-74 use a mobile phone – the score is lower for those aged 75+ . Of this group, 8% access the internet on the phone. The low proportion of mobile internet users among the elderly is due, among other things, to the fact that most elderly people do not have a smartphone.

	<b>Mobile phone overall</b>	<b>Smartphone</b>	<b>Classic Phone</b>	<b>Internet usage via phone</b>
	in %	in %	in %	in %
<b>65-74 years old</b>	98,5	40	59,8	30,4
<b>75 + years old</b>	92,7	14,5	79,1	8,4

### **Computer and other devices usage to access internet**

In 2021, 41% of Czechs aged 16 and over is connected to the internet on a desktop computer. Most people connecting from a desktop computer are in the 35-54 age group, with one in two of this age group connecting to the internet via a desktop computer. Two years ago, the desktop computer was the most common device used by pensioners to access the internet. However, by 2021, access via a laptop and a smartphone will have overtaken the desktop computer for this group as well.

	<b>Desk computer</b>	<b>Notebook</b>	<b>Tablet</b>	<b>Smart TV</b>	<b>Small smart devices (watches, ebook)</b>
	in %	in %	in %	in %	in %
<b>65-74 years old</b>	24,7	30,4	10,4	12	4
<b>75 + years old</b>	10,2	10,4	2,5	2,2	0,3

### **Internet use by the Older Adults in the Czech Republic - Survey**

In 2018, a study that was released in the Czech Republic has resulted in the collection of interesting figures. All 432 respondents were residents of Hradec Kralove district and both seniors with an active and passive approach to the ICT competence development were represented in the sample. All respondents were physically and mentally healthy and were structured into three groups:

- (1) the so-called 'passive' seniors, i.e., those who do not want to pay attention to acquiring any knowledge of the latest ICT and their exploitation, were represented by respondents living in senior houses (group DD);
- (2) the so-called 'active seniors' interested in their further education, particularly in the ICT field and who attended ICT courses held by the Hradec Kralove municipality (group HK);
- (3) the so-called 'active seniors' interested in their further education in general who attended courses of the University of the Third Age (group U3V).

For the purpose of this research, respondents were structured into the three aforementioned age groups, which is a rather common approach, cf. (Benáčová & Valenta, 2009; Slavik, 2012).

Overall, the findings of this study suggest that age (as well as respondents' previous experience with the Internet, such as at work) is a key factor in older adults' Internet use. In fact, internet use decreases with age, but the breakout age appears to be above 75. The results also suggest that older adults should receive training on how to use the Internet, as training can help them overcome psychological and social barriers that limit their use of the Internet. Additionally, older adults can be divided into three basic age groups based on their specific needs, which should be taken into account when developing new technological devices or services for these older populations to help them improve cognitive function. Similar studies have not been conducted in the same or very similar study samples in the Czech Republic.

- **National Digital Health Literacy overview: digital health literacy levels among seniors across years and status quo; main gaps and issues identified by the latest studies (i.e. individual and system factors):**

#### **Main gaps and issues identified by the latest studies – (individual factors)**

The main gaps in seniors' digital literacy can be found in the European Citizens' Digital Health Literacy survey released in 2014, which provides a satisfying overview of the level of Internet usage among Europeans, their health and other health-related issues.

#### **Use of the internet to search for health-related information**

With regards to the use and frequency of the internet to search for health-related information, the survey shows that in the 28 Member States, around six out of ten people have used the Internet to search for health-related information within the last 12 months (64% in the Czech Republic). Conversely, roughly four out of ten people (41%) have never used the internet for this purpose. For all countries, the socio-demographic results also show that unsurprisingly, young people are more likely to have used the Internet to search for health-related information : 77% of 15-24 year olds have done so, compared. With 34% of people aged 55 and over.

#### **Main type of health-related information searched for on the internet**

When asked what type of information the respondents had looked for (*general information on health-related topics or ways to improve their health ; information on a specific injury,*

*disease, illness or condition ; second opinion after visiting their doctor*), Czech Republic is among the highest portions of respondents (14%) who have mentioned having looked for information to get a second opinion after visiting their doctor. With 60%, the proportion of respondents in the CZ who looked for general information on health-related topics or ways to improve your health ranks 5th out of 28. For all countries, respondents aged 55 and over were more likely than 15-24-year-old to look for specific information on medical treatment or procedure (27% vs 16%)

Among the 28 EU countries, around three quarters (74%) of respondents who previously answered they had used the Internet to search for general information on health-related topics or ways to improve their health mentioned that they were looking for information on lifestyle choices, such as diet, nutrition, physical activity, smoking, alcohol, etc. This was by far the most commonly sought type of information. Over a third (35%) of people looked for information on pharmaceuticals, while around three out of ten (29%) looked for information on healthcare professionals or centers. Around a quarter of respondents say that they looked for testimonials or experiences from other patients (26%) or for information on mental well-being.) On this matter, 40-54 year-olds are the most likely to have looked for information about pharmaceuticals and healthcare professionals.

### **Satisfaction with the information found on the internet**

Overall, 16% of Czech respondents are satisfied with the health-related information found on the Internet (minimum being 7% with Latvia, and maximum being 31% with Cyprus, the UK, Ireland.)

Among the reasons for dissatisfaction (*not reliable, not detailed enough, commercial oriented,-not tailored to their specific needs, lacked illustrations or visual elements, difficulty to understand, could not find the information they were looking for, not available in a language they speak*), a majority of respondents in the Czech Republic rank among the highest portions for the following reasons:

- commercially oriented (74%), major reason for 55+ in all EU
- not tailored to their specific needs (64%)
- not available in a language they speak (32%)

### **Main gaps and issues identified by the latest studies – (system factors)**

The Czech health care system is doing well in terms of health outcomes compared to other Central Eastern European economies that inherited similar health systems after the transition and has been converging to OECD averages. However, benchmarking the Czech health system to countries with comparable institutional settings points to the potential for efficiency gains. Local or regional systems to support the provision of health services through information and communication technologies (telemedicine) are developed in many European regions, including the Czech Republic; however, nationwide expansion of these systems remains limited.

Despite the Czech health system having undergone over the last 20 years a major development towards modern electronic information systems – healthcare facilities are equipped with a number of information solutions and with the necessary communication and



information technologies – knowledge of the influences of the adoption of internet-based health and care services by elderly people are still insufficient, so does the share of information about the patient's condition and the course of their treatment. Accordingly, digital health care is becoming increasingly important, but it has the risk of further increasing the digital divide, as not all individuals have the opportunity, skills, and knowledge to fully benefit from potential advantages. While one European study<sup>2</sup> conducted in 2020 showed that the Czech Republic has a medium rate of elderly people using internet-based health care services among European countries, elderly people remain in overall less experienced with the internet, and hence, in danger of being excluded.

The following analysis shows the need to help to develop and promote strategies for decreasing the digital divide avoiding inadequate communication between providers, a situation affecting mainly children, elderly patients, and patients with mental illnesses, or other forms of disadvantage. According to the Euro Health Consumer Index for 2015, processed by the Health Consumer Powerhouse, the health system in the Czech Republic won the lowest rating in the area of patient rights and information among the six areas evaluated the performance of the health system. Electronic prescribing, access to electronic medical records, online health service ordering, registering of healthcare providers with the evaluation of quality, and the like were evaluated. Sharing information among providers is only limited and in many cases does not take place at all or in a totally insufficient scope. Therefore, the issue of management and sharing of medical records is a major theme of the whole National strategy<sup>3</sup>. In the follow-up health and social care, the tools for sharing information have not been constructed at all, respectively an involvement of providers into existing communication network is at its minimum. To say it differently, the use of new technologies to improve the efficiency of communication between doctors and health insurance companies has not yet been implemented. In fact, the study "Overview of the National Laws on Electronic Health Records in the EU Member States and Their Interaction with the Provision of Cross-border Electronic Healthcare Services" (Milieu Ltd - time.lex, July 2014)<sup>3</sup>, which included 29 countries indicate that only the Czech Republic, Germany, Ireland and Slovenia do not have a functional system for sharing electronic medical records introduced at least in pilot scale<sup>4</sup>. The study also looked at the specific rules for the explicit consent of a patient with storing and processing the data within electronic health records. The Czech Republic was among the countries where a patient must explicitly agree with the management and processing of data apart from healthcare providers. Hence, the National Strategy for eHealth has been conceived to assert the principle of opt-out.

The current setting of the system should facilitate its introduction as it is already heavily centralized and health providers' remuneration already depends on transmitting certain information. However, the development of digital systems is focusing on security issues. As in many countries, shared private health data through electronic health records faces

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<sup>2</sup> *"The Use of Internet-Based Health and Care Services by Elderly People in Europe and the Importance of the Country Context: Multilevel Study", 2020*

<sup>3</sup> *The National eHealth Strategy of the Czech Republic 2016-2020.*

<sup>4</sup> *Such systems are of the countries surveyed fully in service in Bulgaria, Denmark, Estonia, Finland, Hungary, Malta, the Netherlands, the United Kingdom and in Sweden. Belgium, Estonia, Finland, France, Croatia, Luxembourg, Lithuania, Norway, Portugal, Poland, Austria, Slovakia, Spain and Sweden of the countries surveyed have specific legislation on electronic medical records; in other countries, such legislation is either prepared or electronic health records follow the legislation on medical records in general.*

resistance due to data privacy issues. On this matter, the Expert Group on Quality Indicators (HCQI) OECD authorized by Ministerial Council mandate conducted in March 2016 the second survey on the use of data from a patient's lifetime health record (EHR) for purposes other than the original purpose of data acquisition (secondary data use). The two main directions of the research were :

1. technical and operational readiness of national systems supporting the further use of data from the EHR
2. level of data quality management (e.g. minimum data set, standards and terminology, good practice of data acquisition).

The countries in the third quadrant, along with the Czech Republic at the beginning of building a nationwide use of data from EHR for other purposes, or those which do not have EHR at all. Monitoring population health, monitoring the quality of care, searching for candidates for clinical studies and the general solution of scientific research tasks falls within the other purposes of using data. A voluntary policy is needed to subsidize the equipment of health providers or raise remuneration, train the users, and put in place judicial rules that reassure people on the use of the information. "ITU Publications Filling the Gap: Legal and Regulatory Challenges of Mobile Health (mHealth) in Europe"<sup>5</sup> consider the inadequacy of the legislative system as one of the causes of the current situation, which is according to ITU analysis of mHealth in the EU only in the experimental phase.

- **National promotion and use of ICT tools and techniques in accessing health information and services, general support policies;**

Generally, there are three main prerequisites that are effective for the raising use and promotion of ICT by the elderly (Blanka Klímová, Petra Poulová, Ivana Šimonová, Pavel Pražák, Anna Cierniak-Emerych, 2018). These include:

- Rising elderly population worldwide;
- ICT as a tool for caring for the elderly with the commitment to greater independence;
- Individuals from the "baby boomer" generation approaching retirement are more comfortable using ICT; they will bring many technology-related skills during their retirement. (Virginia, 2011; Klimova, 2016)

The next section of this analysis gathers all eHealth surveys executed in 2015 (last updated in 2017) by the World Health Organization:

<p>National universal health coverage policy or strategy refers to the use of information and communication technology (ICT) or eHealth</p> <p><i>HEALTH 2020 - National Strategy for Health Protection and Promotion and Disease Prevention - <a href="#">Link</a></i></p>	<p>YES</p>
<p>National eHealth policy or strategy exists</p> <p><i>The National eHealth Strategy of the Czech Republic 2016-2020 <a href="#">Exists now</a></i></p>	<p>YES</p>

<sup>5</sup> ITU-D Discussion Paper on Regulatory Challenges of Mobile Health (mHealth) in Europe, June 2014.

National eHealth policy or strategy refers to the objectives or key elements of universal health coverage	NO RESPONSE
National health information system policy or strategy exists <i>National Health Information System - <a href="#">Link</a></i>	YES
National policy to govern the use of social media in the health professions exists	YES
National telehealth policy or strategy includes objectives that address telehealth's contribution to universal health coverage	YES
National policy or strategy on the use of social media by government organisations exists	NO
National policy or strategy on the use of social media by government organisations makes specific reference to its use in the health domain	NO RESPONSE
National policy or strategy regulating the use of Big Data in the health sector or private companies exists	NO
Public funding is available for eHealth programmes	YES
Private or commercial funding is available for eHealth programmes	UNKNOWN
Donor/non-public development funding is available for eHealth programmes	UNKNOWN
Public-private partnership funding is available for eHealth programmes	YES
Special funding is allocated for the implementation of the national eHealth policy or strategy	NO
Proportion of funding contribution for eHealth programmes provided by public funding sources and public-private partnership funding sources over the previous two years	LOW (<25%)
Proportion of funding contribution for eHealth programmes provided by private funding sources over the previous two years	NO FUNDING
Proportion of funding contribution for eHealth programmes provided by donor/non-public development funding sources over the previous two years	NO FUNDING
The importance of capacity and infrastructure as a barrier to mHealth supporting universal health coverage	NOT A BARRIER
The importance of demand as a barrier to mHealth supporting universal health coverage	MODERATELY IMPORTANT BARRIER
The importance of effectiveness and cost-effectiveness as a barrier to mHealth supporting universal health coverage	VERY IMPORTANT BARRIER

The importance of funding, policy, legal issues, and priorities as a barrier to mHealth supporting universal health coverage	EXTREMELY IMPORTANT BARRIER
Tertiary institutions provide training to students of health sciences on the use of ICT for health (eHealth)	YES
Proportion of tertiary institutions (public and private) that offer ICT for health (eHealth) courses	MEDIUM (>=25% and <50%)
Tertiary institutions teach students of health sciences about the use of social media for health	UNKNOWN
Proportion of tertiary institutions (public and private) that teach students of health sciences about the use of social media for health	NO RESPONSE
Institutions or associations offer in-service training in the use of ICT for health as part of the continuing education of health professionals	UNKNOWN
Proportion of institutions or associations offering in-service training in the use of ICT for health as part of the continuing education of health professionals	NO RESPONSE
Institutions or associations offer in-service training in the use of social media for health as part of the continuing education of health professionals	NO RESPONSE
Government-sponsored mHealth programmes exist	UNKNOWN
An entity responsible for the regulatory oversight of mobile health apps for quality, safety and reliability exists	NO
An entity providing incentives and guidance for innovation, research and evaluation of health apps exists	YES
The importance of capacity, policy as a barrier to telehealth supporting universal health coverage The importance of infrastructure as a barrier to telehealth and eLearning supporting universal health coverage The importance of demand, cost-effectiveness, effectiveness as a barrier to eLearning supporting universal health coverage	NOT A BARRIER
The importance of demand, capacity, availability as a barrier to telehealth supporting universal health coverage	MODERATELY IMPORTANT BARRIER
The importance of effectiveness, cost-effectiveness, priorities, funding, policy as a barrier to telehealth supporting universal health coverage	VERY IMPORTANT BARRIER
The importance of funding, legal issues, limitation, priorities as a barrier to telehealth supporting universal health coverage	EXTREMELY IMPORTANT BARRIER

eLearning used to help teach health sciences students in pre-service education eLearning is used for the in-service training of health professionals eLearning courses are accredited by continuing medical education (CME) or professional licensing bodies	YES
Universities offer a health sciences degree that can be gained entirely online	NO
Universities offer certification in specific health sciences subjects that can be gained entirely online	UNKNOWN
Specific legislation governing the use of the national electronic health record (EHR) system exists	NO RESPONSE
Policies or legislation exist to address patient safety and quality of care based on data quality, data transmission standards or clinical competency criteria	NO
National policies or legislation to define medical jurisdiction, liability or reimbursement of eHealth services exist	NO
Legislation exists to protect the privacy of personally identifiable data of individuals, irrespective of paper or digital formats  <i>Data Protection overview in Czech Republic - <a href="#">Link</a></i>	YES
Legislation exists to protect the privacy of individuals' health-related data held in an EHR	NO
Legislation exists that governs the national sharing of digital data between health professionals in other health services through the use of an EHR	NO
Legislation exists that governs the international sharing of digital data between health professionals in health services through the use of an EHR	NO
Legislation exists that allows for the sharing of personal and health data between research entities	YES
Legislation exists that allows individuals electronic access to their own health-related data when held in an EHR	NO
Legislation exists that allows individuals to demand their own health-related data be corrected when held in an EHR if it is known to be inaccurate	NO
Legislation exists that allows individuals to demand the deletion of health-related data from their EHR	NO
Individuals have the legal right to specify which health-related data from their EHR can be shared with health professionals of their choice  <i>The strategy includes the aforementioned rights of the individuals, recent data could not be found. Since data protection, in general, is regulated by GDPR, EHR could fall under its regulation as well. <a href="#">Strategy</a> ; <a href="#">Data protection</a>; <a href="#">GDPR</a></i>	NO

The importance of effectiveness and cost effectiveness as a barrier to EHR programmes	SLIGHTLY IMPORTANT BARRIER
The importance of infrastructure, demand, legal issues, standards, priorities as a barrier to EHR programmes	VERY IMPORTANT BARRIER
The importance of funding and capacity as a barrier to EHR programmes	EXTREMELY IMPORTANT BARRIER
The importance of policy as a barrier to EHR programmes	NOT A BARRIER
The importance of other barriers to EHR programmes	NO RESPONSE
The importance of privacy security and new analytical methods as a barrier to Big Data supporting universal health coverage	SLIGHTLY IMPORTANT BARRIER
The importance of standards as a barrier to Big Data supporting universal health coverage The importance of building capacity as a barrier to Big Data supporting universal health coverage	MODERATELY IMPORTANT BARRIER
The importance of information sharing as a barrier to Big Data supporting universal health coverage	VERY IMPORTANT BARRIER
The importance of lack of integration as a barrier to Big Data supporting universal health coverage	EXTREMELY IMPORTANT BARRIER
National EHR system exists <i>Electronic health records - should exist now - <a href="#">Link</a></i>	YES
Use of national EHR system by primary/secondary/tertiary/other care facilities, and proportion using it	NO RESPONSE
Electronic medical billing systems used in the health sector	YES
Supply chain management information systems for health used in the health sector	UNKNOWN
Human resources for health information systems used in the health sector	NO
Health care organisations use social media to promote health messages as a part of health promotion campaigns	UNKNOWN

Health care organisations use social media to : -make emergency announcements -seek feedback on services - help manage patient appointments	NO
Individuals and communities use social media to : - learn about health issues - provide feedback to health facilities or health professionals - participate in community-based health forums	YES
Individuals and communities use social media to : - help decide on what health services to use - run community-based health campaigns	UNKNOWN

- **National current trends/methods/approaches targeting seniors in relation to improving their digital health literacy level, focus on good practices and transferable trends/current methods;**

The role of the state in defining the concept and priorities of electronic healthcare, particularly in the coordination of its development, is indispensable. Establishing and promoting a national plan/strategy for electronic healthcare in the Czech Republic at the national level took a lot of effort.

**The National Strategy for eHealth (2016-2020)** – The preference aim of the strategy is the maximum use of existing information systems, provided that they meet quality, safety and other requirements for interoperable electronic healthcare systems, namely the requirements for input/output data format and modularity, i.e. the individual information systems can be developed independently, but they will be able to mutually transmit the data, as their structure will be defined. Achieving mutual interoperability of existing electronic healthcare solutions is the investment protection as well and it is the use of the current potential operating applications.

The strategy also opens up ample scope to all researchers of existing and future projects of electronic healthcare. Only such projects can apply for state aid.

Examples of key projects are the National Register of health professionals and providers, ePreskripce, ePreskripce (electronic prescription), eNeschopenka (electronic sick certificate), or Patient Summaryetc.

NB : ePrescription in the Czech Republic is a long-discussed topic. In the past, a number of attempts to implement electronic prescription emerged: a module within IZIP, a project of an electronic prescription under the VZP Akord, and the like. Local solutions of electronic prescriptions (within a medical facility or a group of healthcare facilities) are a normal part of hospital information systems. All the target groups (government, doctors, pharmacists) are aware of the benefits of electronic prescription and of the fact that the electronic prescription is a current trend promoted within the EU and its mandatory use is now enshrined in existing legislation in the CZ since 2018. An adequate national system has finally managed to be introduced when

digitalization of health records and the creation of a national health information portal was viewed as a solution.

The strategy is systematically linked to the construction and development of public administration computerization and is related to government programs. The overall objective of the strategy is to develop support in the provision of healthcare services using information technology, which brings growth in the availability, quality, safety, and efficiency of the Czech healthcare. A significant specialization of electronic healthcare is also the introduction of instruments enhancing the overall effectiveness, efficiency, and sustainability of the health system in particular which is now threatened by demographic prospects. The National Strategy for eHealth considers ICT to be supporting tools which allow solving problems of health systems and the healthcare system as a whole.

In agreement with the Action Plan Computerisation of Healthcare Health 2020, the strategy formulates four strategic objectives:

1. Increase citizen involvement in the care of their own health, prevention
2. Increase the efficiency of the health system
3. Increase the quality and accessibility of healthcare services
4. **Creation and development of information infrastructure and electronic healthcare management.**

**Strategic Framework 2030** – Every citizen is expected to have an electronic health record by 2030, in a digital environment enabling the sharing of health records – notably thanks to the new act on digital healthcare to which the Ministry of Health commits itself. All interaction between patients, medical professionals, and insurance companies will become more efficient and faster, whereby emphasis will be placed on cyber security and data protection. Since 2016, the Ministry of Health has been focusing on the reliable identification of patients, healthcare workers and providers, and other entities as well as the sharing of information about health care across the whole sector.

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