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FACTORS INFLUENCING HEALTH SERVICE UTILISATION IN BULGARIA

DISSERTATION SUMMARY

for the educational and scientific degree “Doctor”
Professional field 3.7. Administration and Management
Doctoral programme "Organisation and management outside the sphere of material production (in healthcare)"

Research supervisor:
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Varna, 2023

The dissertation has a total length of 207 pages and is structured in: introduction (12 pages), main text in four chapters (142 pages), conclusion (2 pages), list of references (12 pages) and appendices (30 pages). The main text contains 29 tables and 27 figures. 159 titles are cited, of which 117 in English and 42 in Bulgarian.

The dissertation was discussed at a meeting of the departmental council of the Department of Health Economics and Management at the Medical University - Varna, held on 23.10.2023.

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The public defense of the dissertation will take place on .....2024 at ..... at Medical University - Varna at an open meeting of the Scientific Jury.

The defense materials are available at the Doctoral School at of the Medical University of Varna and are published on the website of the university.

CONTENTS

I. GENERAL CHARACTERISTICS OF THE DISSERTATION

1.1. Relevance and significance of the topic

Studying the utilisation of health services and recognising the factors that influence it, provides an opportunity to predict and manage health care utilisation and associated costs. The understanding of utilisation determinants is critical to the process of identifying reasons behind differences in access, customer satisfaction, and health outcomes. This research can serve as a foundation for policies and programs promoting appropriate utilisation, reducing inappropriate and excessive use of medical care, and enhancing cost-effectiveness and financial stability in the health sector.

Conceptual models to analyse and forecast how people will use health services have been developed since the middle of the 20th century in different social science fields. The models cover a wide range of variables, including demographic, economic, organisational, and social characteristics, attitudes, and psychological and culturally-based beliefs. Utilisation models with greater predictive power produce more effective planning and delivery of services. Health care utilisation studies are expected to contribute both to a better understanding of the processes by which medical services are distributed, and to the development of new policies that will alleviate the health sector crisis.

1.2. Study of the topic in our country

Upon searching for research by Bulgarian authors that analysed the determinants of health service use, no studies applying a particular model to examine the factors influencing utilisation were found.

The European Health Interview[1] collects data at the national level on a number of variables that are assumed to be determinants of health service utilisation in the literature reviewed. The aim of the Health Interview is to assess the health status, lifestyle (health determinants) and health service utilisation of the European Union (EU) population, using a harmonised instrument that ensures a high degree of comparability of data across EU countries. The data are used to calculate key indicators characterising the health status of the population (subjective health assessment, prevalence of chronic diseases, use of medical services, use of medicines, preventive health care, prevalence of smoking and alcohol use), but the impact of the indicators on the use of health services is not analysed.

1.3. Object and subject of the study

The object of this study is the utilisation of health services by the population in Bulgaria. Utilisation is examined from two aspects - contact with the health care system and number of services used by individuals over a certain period of time. The utilisation of three main types of health services is studied - examination by a general practitioner (GP), examination by a specialist (with health insurance referral or self-paid), and hospital treatment.

[1] National Statistical Institute/NSI. (2019). European Health Interview | Third wave - 2019. National Statistical Institute. (https://nsi.bg/bg, accessed 01.09.2022).

The subject of the study are the factors influencing the utilisation of health services, the direction and extent of their influence.

1.4. Aim and objectives of the dissertation

The aim of the dissertation is to study and analyse the factors influencing the utilisation of health care services in outpatient and inpatient care in the country based on a model for utilisation research and to assess the applicability of the model in health care in Bulgaria.

In order to achieve this goal, the following tasks have been formulated:

(1) To analyse and systematize the existing concepts and models for health services utilisation research and to derive the basic and most commonly applied model.

(2) To identify the main and most commonly studied factors influencing the use of health services.

(3) To examine and analyse the contextual factors that influence health service utilisation.

(4) To study and evaluate the impact of individual characteristics (demographic, social, economic, organisational), personal health practices, health status, attitudes and beliefs of the population on the utilisation of primary, specialized, and hospital medical care in our country.

(5) To evaluate the applicability of the selected model in our practice and make recommendations for utilisation studies.

1.5. Research approach, research methods and materials used

The research methodology combines various qualitative and quantitative research methods from the socio-economic and health sciences.

1.5.1. Study, systematise and summarise the available scientific literature in the field of health service utilisation research.

To explore the existing theoretical concepts and models and to derive the main factors influencing the utilisation of health services, the following stages were passed:

- Conducted an initial search of PubMed, ScienceDirect, and Google Scholar databases, with a coverage period of 2010 to September 2022. An additional manual search of relevant reference lists was conducted using the "snowball" method to identify secondary sources that analysed and discussed the research topic. In this way, the scope of the time period has been expanded to include the first publications on this topic from the mid-20th century. Leading approaches, concepts, and models for health services utilisation research are outlined.
- Conducted a content analysis of the literature presenting the main theories and the most commonly applied models to derive the main factors influencing the consumption of healthcare services. As a result of the analysis, Ronald Andersen's Behavioral Model of Health Services Use (hereafter referred to as the Behavioral Model or Andersen Model for short) emerged as the leading model[2], which has been the basis for numerous studies focusing on the determinants of health care utilisation. The judgment that the model is applicable to our health care system and practice warrants its selection for the present study.
- Conducted a further search of systematic reviews based on the Behavioral Model to

[2] Andersen, R. (1995). Revisiting the behavioral model and access to medical care: does it matter? Journal of Health and Social Behavior, 36(1), 1–10.

identify the main and most commonly studied determinants of utilisation.

1.5.2. Analysis of contextual environmental factors influencing health service utilisation

Based on the Contextual component of the Behavioral Model, the main characteristics of the environment were analysed - demographic and social characteristics, health policies, financing and organisation of the health system, environmental factors and basic health indicators of the population. Strategic documents in the field of health care, current legislation, health information databases and data from previous studies were studied.

1.5.3. Population survey

A cross-sectional survey was conducted to collect primary information related to individual characteristics and use of medical care by participants in the country over the previous 12 months. The survey was conducted using a standardized online questionnaire completed in person by respondents. The questionnaire was made available for completion through the online platform Survs.com and was distributed via email and social networks (Facebook). Respondents were recruited using the respondent-driven sampling method.

The questionnaire was developed based on the research literature related to the study of determinants of health service utilisation and applying the Behavioral Model (Appendix 1 of the dissertation).

1.5.4. Statistical methods for presentation and analysis of the survey data

After processing the data obtained from the survey, a series of statistical analyses were performed to examine the influence of individual factors on the utilisation of health services. Specialized software (IBM SPSS Statistics 19, Microsoft Excel 2016) was used for statistical processing and data analysis.

- Descriptive statistics and graphical methods were used for presentation of the studied sample, survey results analysis and summary - frequency distribution of the sample participants (Frequencies), mean values of the sample parameters (Means).
- To investigate differences in utilisation between different groups of respondents, crosstabs were constructed for two variables, one variable being the use of the relevant type of health service (yes/no), and the other variable being the individual characteristics represented by the relevant categories (levels). Differences in utilisation by respondent category were confirmed by statistical analysis for significance (χ^2-test for independence). Statistical significance was determined at $p<0.05$.
- Independent samples t-test for factors with two categories (dichotomous independent variables) and one-factor analysis of variance (ANOVA) for factors with more than two categories were applied to analyse the mean utilisation across respondent groups.
- Two variants of multivariate regression analysis were applied to investigate the influence of individual characteristics of respondents on health service utilisation. In the first variant, the study defines utilisation as a contact with the health system, and the second variant, it defines utilisation as number of services individuals used over a period of time. A separate examination of the two dimensions of utilisation was conducted from the perspective that the likelihood of service use and the volume of health care received may be affected differently by

the characteristics of the study sample.

Binary logistic regression was applied to identify the variables that affect the likelihood of utilisation and to predict the use of a health service (doctor's visit/hospital admission). This type of analysis was chosen because of the type of variables - one categorical dependent variable (doctor's visit/hospital admission) with two categories (yes/no) and multiple independent variables (individual characteristics) that are represented by nominal, ordinal and interval data. The logistic regression results are used to identify factors that significantly and independently affect utilisation and to predict the likelihood of utilisation of a health service.

Negative binomial regression was used to examine the relationships between individual characteristics and the volume of health services used. It analyses the impact of multiple independent variables (individual characteristics), represented by nominal, ordinal and interval data, on a single interval dependent variable (number of services used). The results of this regression analysis identify the individual characteristics that statistically significantly affect the quantity of health services used, the direction and the magnitude of their influence.

1.6. Limitations of the study

The present study has certain limitations, some of which are implied by the choice of approach and methods, and others result from its implementation:

- For the purpose of the dissertation, information concerning primary health care services (examination by a general practitioner), specialist health care (examination by a specialist doctor and laboratory tests), and hospital care (admission to hospital) was studied.
- The period covered by the population survey includes the last two months of the epidemic emergency as well as the subsequent months. During the period under review, there were no formal COVID-19 restrictions or other counter-epidemic measures that affected the provision and use of health services. However it is possible that restrictions from the previous pandemic period had an impact that was not examined.
- Due to the survey conducting method (online questionnaire and recruitment of respondents by the "respondents-driven sampling method"), the sample is not representative of the general population - there are clusters of respondents by certain characteristics such as gender, age, ethnicity, education, place of residence.
- The online survey relies on self-reported data. In this method of primary data collection, it is difficult to control the reliability of the data obtained, which creates a data accuracy risk.
- Factors from the individual and behavioral components of Andersen's model were included in the statistical analysis; contextual characteristics, genetic factors, factors related to the process of medical care, and health service utilisation outcomes were not included.
- The selected research design implies identifying the determinants of health service utilisation at a particular point in time and in a particular context, without tracking their change over time.
- Possible interactions between factors influencing health service utilisation were not explored.

II. STRUCTURE AND CONTENT OF THE DISSERTATION

2.1. Structure of the dissertation

The dissertation is 212 pages long and includes an introduction, four chapters and a conclusion, a list of references and six appendices. The main text contains 29 tables and 27 figures.

2.2. Contents of the dissertation

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III. OUTLINE OF THE DISSERTATION

Chapter 1. Theoretical foundations of utilisation research in healthcare

The first chapter of the dissertation analyses and summarises the main concepts and definitions, theoretical approaches, concepts and models for utilisation research in healthcare. This chapter consists of three sections some of which contain paragraphs.

Section 1.1 analyses the key concepts and definitions related to the research topic - utilisation, health services, determinants of utilisation, and the relationships of utilisation to demand, access to health services and health outcomes.

In this study, health service utilisation is considered as the consumption of services provided to patients to restore, maintain and improve their health. Health services refers to health care including medical care (medical services) and the overall health care process. We define factor (determinant) as any individual characteristic or feature of the environment that demonstrates a relationship and determines both the likelihood of using medical care and the volume of services used. Utilisation of health services does not equate to demand because it does not account for unmet need due to limitations in access to services. Utilisation alone is not sufficiently indicative of the presence or absence of equitable access to health services, as it does not account for unmet needs. The aim of healthcare utilisation research is to achieve optimal utilisation of health services and cost-effectiveness. We can define optimal as that level of utilisation at which the best health outcomes are achieved. Utilisation efficiency can be assessed by analysing health outcomes, but this is beyond the scope of this study.

Section 1.2 analyses and systematises the main approaches, concepts and models for utilisation research in the health sector. This section includes three paragraphs.

Paragraph 1.2.1 discusses the stages in the evolution of understandings of health service utilisation in the fields of medical sociology, psychology and health economics, as well as the main directions of research in these fields.

Paragraph 1.2.2 presents the development of Health Service Research (HSR) as a distinct scientific and applied field and the results achieved in the field.

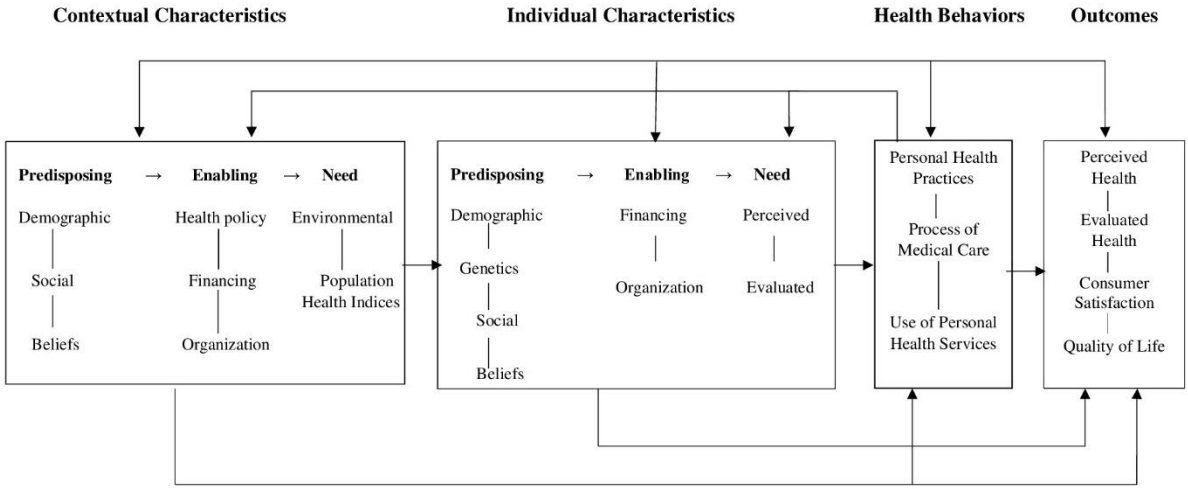
Paragraph 1.2.3 systematises the theoretical approaches, concepts and models for healthcare utilisation research. The theories and models are summarised under the following key approaches: social-psychological, socio-cultural, socio-demographic, economic, geographical and organisational approaches. Studies by a number of authors are presented that analyse and systematise the utilisation models, making them key tools in health services research. Particular attention is paid to the Behavioral Model of the American sociologist Ronald Andersen, which provides a theoretical framework explaining how and why people use health services. According to this model, individuals' use of health services is a function of their predisposition to use such services (predisposing characteristics), of factors that enable or impede use of services (enabling resources), and of their need for health services (need

characteristics)[3] .

Section 1.3 presents the structure, evolution and application of the Behavioral Model.

Paragraph 1.3.1 describes the evolution of the model in six phases, from its development in the 1960s to the present day. Over the years, the Behavioral Model has had significant advancements and improvements. New components have been added, as well as feedback loops. Revisions to the model have been in response to new challenges in health policy and service delivery, criticisms and recommendations of earlier versions, and new developments in health services research. The most current and comprehensive version of the Andersen Behavioral Model is the 2013 version (Figure 1)**.**

Figure 1.* Behavioral Model of Health Services Use, 2013[4]



**The numbering of the tables and figures in the abstract follows their sequence and does not correspond to their numbering in the dissertation.*

Paragraph 1.3.2 discusses the application of the Behavioral Model in the design and conduct of international, national and local studies related to health service utilisation. It is one of the most often used models for examining the factors that influence health service use, according to several systematic reviews of the literature in this field, and it is used to organise the findings (Appendix 2 to the dissertation).

The review and analysis of approaches and models for health service utilisation research led to the selection of Andersen's Behavioral Model as the most appropriate conceptual framework for this study. The arguments for such a choice can be synthesized as follows:

[3] Andersen, R. (1968). A behavioral model of families' use of health services. Center for Health Administration Studies University of Chicago. https://docs.lib.purdue.edu/dissertations/AAI6902884
[4] Andersen, R., Davidson, P., & Baumeister, S. (2013). Improving Access to Care. In G. Kominski (Ed.), Changing the U.S. health care system: key issues in health services policy and management (4th edn., pp. 33-69). Jossey-Bass.

- The Behavioral Model integrates elements of the main theoretical approaches to the study of health service utilisation and makes it feasible to get the most complete picture of the variables affecting healthcare use.
- The model is comprehensive and complex. It incorporates both individual and contextual characteristics and provides a framework for gathering evidence on the weight of different determinants of health service use and for establishing correlations between factors.
- The model has some flexibility and allows modification by adding or omitting variables.
- The model has been validated many times and has gone through several stages of development, which shows that in addition to being appropriate for explaining utilisation and its determinants, it also reflects current changes in the understanding of health service utilisation.
- The definitions of predisposing, enabling and need-related factors can be applied to any country context, and the model allows variables to be adapted to be contextually relevant.
- There are a large number of empirical studies that use the Andersen Model to conceptualize their research. These studies are based on different country contexts and the large number of studies allows for comparison of results.

In accordance with the structure of the Behavioral Model, the following chapters of the dissertation analyse the contextual characteristics of the environment, the individual characteristics of the study sample and their influence on the utilisation of health services.

Chapter 2. Contextual characteristics influencing the utilisation of health services

This chapter presents and analyses the contextual characteristics that shape the environment in which health service use takes place. These outline the first component of the Behavioral Model and are key to utilisation, as they have both a direct impact on health behaviour and an indirect influence through relevant individual characteristics. Contextual variables are measured at an aggregate level and represent country and population-wide data.

The chapter is divided into three sections, each with separate paragraphs.

Section 2.1 discusses the contextual predisposing characteristics of the population in Bulgaria - demographic, social characteristics and some community beliefs regarding health and health behaviour.

Paragraph 2.1.1 presents demographic contextual characteristics such as *age, gender and marital status of the population in the country*. The process of demographic ageing is expected to lead to a deterioration in overall health status, a continuous increase in the utilisation of health services, and a corresponding increase in health expenditure. An ageing population implies increased utilisation of health services for the elderly and an increasing need for long-term health care.

Paragraph 2.1.2 discusses social characteristics at the contextual level that determine the extent to which the communities in which people live and work support their health and their access to health services. Relevant measures include *place of residence, educational level, ethnic composition, employment level*, etc. The higher proportion of the adult population in rural areas makes it necessary to ensure adequate access to appropriate health services in these places. The difference in self-assessed health status among groups with different educational levels, as well as the positive trends towards a decrease in the proportion of Bulgarians with primary and lower education and an increase in the proportion of people with higher education in the country, give reason to expect a decrease in the proportion of people with "poor" self-assessed health. Employment status is a factor that influences the utilisation of health services both directly - through the social environment formed in relation to employment activity - and indirectly - through its impact on the income level of the population.

Paragraph 2.1.3 presents *community beliefs related to health and health services* - community values, attitudes and cultural norms. Health beliefs underpin health behaviour and have both a direct impact on the use of health services and an indirect impact through their influence on behavioural risk factors. Health beliefs and public attitudes in the country are characterised by low levels of responsibility for one's own health and a high prevalence of behavioural risk factors[5] , as well as low levels of trust in the health system[6] .

[5] OECD & European Observatory on Health Systems and Policies (2021). Bulgaria: Country Health Profile 2021, State of Health in the EU. OECD Publishing, Paris / European Observatory on Health Systems and Policies, Brussels. https://health.ec.europa.eu/system/files/2022-01/2021_chp_bulgaria_bulgarian.pdf.

[6] Eurofound. (2021). Democracy and trust during COVID-19. https://www.eurofound.europa.eu/bg/data/covid-19/democracy-trust

Section 2.2 discusses enabling factors at the contextual level, which include specific features of the macro-environment that help or hinder health utilisation, such as health policies, financial factors and factors related to the organisation of the health system and its resourcing.

Paragraph 2.2.1 is devoted to *public health policies*. Strategic documents such as national programmes, plans, and strategies are analysed, including:

- National Development Programme BULGARIA 2030
- National Health Strategy 2030 (draft)
- National Recovery and Resilience Plan
- National map of long-term health service needs
- National Health Map.

This paragraph, as well as Appendix 3 in more detail, reflects current health policies and priorities relevant to the utilisation of outpatient and inpatient health services in the country. In the area of outpatient care, the main policies and priorities are aimed at reorienting the health system towards disease prevention, improving access and developing the capacity of outpatient care, updating the package of health activities guaranteed by the budget of the National Health Insurance Fund (NHIF) and increasing the activities that can be carried out in outpatient settings. In the area of hospital care, the main policies and priorities are aimed at increasing its efficiency, restructuring and technological development of the hospital sector.

Paragraph 2.2.2 presents contextual financial factors that are particularly relevant to access and utilisation in healthcare - the resources potentially available to pay for health services, including *per capita income, proportion of the population at risk of poverty, health insurance coverage, health service costs*. Nearly a fifth of households in Bulgaria report having incurred catastrophic health expenditure - the highest level in the European Union (EU27) in recent years and almost three times the average for EU countries. Approximately two-thirds of all catastrophic spending in Bulgaria is concentrated among the poorest households[7]. The share of the population living below the poverty line in Bulgaria has remained around 23% in recent years, and the share of Bulgarians living at risk of poverty or social exclusion is around 33%[8]. The lowest income group is on the one hand at risk of catastrophic health costs and on the other hand is characterised by a worse self-rated health status and this poses major challenges for policies to ensure equity in access to health services. The high rate of uninsured people additionally indicates severe issues with health care access, puts the system at risk for financial instability, and goes against the fundamental ideals of solidarity and universality.

In 2020, Bulgaria spends 8.5% of its Gross Domestic Product (GDP) on healthcare, which is below the EU27 average of 10.9%, and per capita health spending in the country is among

[7] OECD & European Observatory on Health Systems and Policies (2021). Bulgaria: Country Health Profile 2021, State of Health in the EU. OECD Publishing, Paris / European Observatory on Health Systems and Policies, Brussels. https://health.ec.europa.eu/system/files/2022-01/2021_chp_bulgaria_bulgarian.pdf.

[8] National Statistical Institute/NSI. (2023). Poverty and social inclusion indicators. National Statistical Institute. (https://nsi.bg/bg, accessed 16.08.2023).

the lowest in the EU. Health financing in the country is characterised by a high share of out-of-pocket payments, which account for 35.5% of total health expenditure in 2020 - the highest share in the EU27 and approximately 2.5 times higher than the EU average (14.45%)[9] . The bulk of direct payments are made for services outside the scope of the health insurance package and co-payments for some of the services included in the package, especially medicines.

Policies and priorities should concentrate on increasing financial resources and investment in outpatient care and prevention, which would in turn lead to a reduction in hospital costs and drug costs. This would help manage financial resources more effectively and achieve better health outcomes.

In **paragraph 2.2.3**, the organisation of the health system is viewed as a contextual factor and the *amount and distribution of resources, structure, and organisation of the health service delivery system* are considered determinants of utilisation. To assess the impact of these factors on service utilisation, a brief overview of *unmet need for health services* is provided.

The analysis of the health sector's resource endowment leads to the general conclusion that, while there is a good national endowment of medical specialists (apart from nurses) and hospital capacity, there is also an inefficient structure and inefficient use of the equipment that is available. These problems result from the unequal allocation of resources throughout the country, with an excessive concentration in the largest cities and inadequate resources to meet the basic medical needs of less developed and more remote areas. These characteristics of the health system imply inequities and disparities in access to and utilisation of health services among the population in different parts of the country.

The other element of contextual factors that has a bearing on access to and utilisation of health services is the organisation of the health system - how it is structured and organised to deliver health services. This section briefly introduces the social health insurance system and the health services under study - outpatient (primary and specialised) and inpatient care - and the impact of their structure and organisation on service utilisation. A key problem in the organisation of medical care in the country is the dominance of the hospital sector as a place for solving most of the population's health problems. At the root of the problem are the lack of appropriate incentives for the development of outpatient activities in outpatient care facilities and the active policy of the hospital sector to realize a greater number of hospitalizations[10].

To assess the impact of organisational contextual factors on access to and utilisation of health services, data on the unmet need of the population for health services are used. Overall, the proportion of people with unmet health needs in Bulgaria is below the EU average. The main reason for unmet health needs is high cost; however, the percentage of people for whom

[9] Eurostat. (2023). Eurostat Database. https://ec.europa.eu/eurostat/data/database
[10] Ministry of Health/MH. (2022). Draft National Health Strategy 2030. Sofia, Ministry of Health. https://www.mh.government.bg/media/filer_public/2022/07/26/proekt_nzs_2030_.pdf

a check-up is too expensive has noticeably decreased in recent years[11].

In **Section 2.3**, the contextual factors related to the need for health services are examined - *environmental factors* affecting health status and *key health indicators* of the population. The COVID-19 pandemic's significance and effect on the use of health services have led to the addition of the *epidemic setting* to this Behavioral Model subcomponent.

In **paragraph 2.3.1,** health-related measures of the physical environment, including *ambient air quality,* are presented as factors of the living environment. Other environmental factors considered in relation to health and the use of health services are *occupational injuries, occupational diseases, and road traffic injury and death rates*.

Population health indicators are summarized in **paragraph 2.3.2 and** include *life expectancy at birth*, general and state-specific *morbidity and mortality rates*.

The data show that both preventable and treatable mortality are significantly higher in the country than in the EU27. Bulgaria has one of the lowest rates of COVID-19 vaccination coverage in Europe (17% in Bulgaria and 54% in the EU27 for 2021), and one of the lowest rates of cancer survival in Europe for the most common forms of cancer[12]. These statistics highlight the need for better primary prevention and health promotion strategies as well as the need for enhanced diagnosis and treatment protocols for the main causes of death.

According to the conclusions of a number of analyses, the reasons for higher preventable mortality can be found in the functioning of the health system as well as in the high morbidity and mortality from socially significant diseases (such as cardiovascular diseases, oncologic diseases, etc.)[12,13]. Elevated rates of avoidable death lead to an increase in overall mortality as well as a decline in national life expectancy.

In **paragraph 2.3.3, the** *epidemic setting* - the COVID-19 pandemic and its impact on health service utilisation - is added to the Behavioral Model. Andersen's original model does not include epidemic setting in the set of determinants of health service utilisation, but the COVID-19 pandemic shows its key importance as a contextual factor influencing all domains of human activity.

Factors influencing people's health and health behaviours (such as using medical services) during an epidemic are partly related to the virus's effects and partly related to the anti-epidemic measures implemented by the nation's relevant authorities and institutions.

[11] Eurostat. (2023). Eurostat Database. https://ec.europa.eu/eurostat/data/database
[12] OECD & European Observatory on Health Systems and Policies (2021). Bulgaria: Country Health Profile 2021, State of Health in the EU. OECD Publishing, Paris / European Observatory on Health Systems and Policies, Brussels. https://health.ec.europa.eu/system/files/2022-01/2021_chp_bulgaria_bulgarian.pdf.
[13] Institute for Market Economics/IPI. (2022). Health care access and efficiency brief. Institute for Market Economics. https://ime.bg/var/images/Report-Patients-29_April-2022_final-1.pdf

Impact of the virus on the utilisation of health services

The spread of the virus is associated with a sharp increase in the population's need for outpatient and inpatient care. The infection is affecting medical staff to a greater extent and this is leading to a shortage of specialists to provide the relevant health services, reduced capacity of health facilities due to illness and absence of some staff and a relative shortage of hospital beds due to increased morbidity[14]. A part of individuals infected with the COVID-19 virus experience long-term infection-related symptoms, also referred to as post-COVID or prolonged COVID conditions.

Impact of anti-epidemic measures on the utilisation of health services

The main objective of pandemic counter-measures is to limit as much as possible the possibilities for the spread of the pandemic agent in society, thus slowing down the course of the pandemic and reducing its intensity[15]. Directing all health system efforts to fighting the virus as a result leads to reduced screening, prevention and poorer disease control in chronically ill patients. Measures are being taken to restructure hospital structures, reorganise the available bed stock and increase beds for the treatment of COVID-19 cases. One of the effects of the COVID-19 pandemic has been an increase in the use of telemedicine and remote consultations (consultations by telephone, e-mail, Viber and other electronic applications). The network of laboratories has grown throughout the pandemic to handle a growing volume of clinical samples.

A population-wide vaccination campaign that is successful and attains the required vaccination coverage to ensure collective immunity—a goal that has not been accomplished in our country—will set the standard for counter-epidemic measures.

[14] National Center for Public Health and Health Analysis/NCHA. (2021). Analytical report on population health activities in response to the COVID-19 pandemic for the period 01 March 2020 - 31 May 2021. Sofia, NCPHA.
https://ncpha.government.bg/uploads/pages/103/AnalyticalReport_COVID_19.pdf

[15] Council of Ministers. (2022). National Operational Plan of the Republic of Bulgaria to address pandemic COVID-19. Sofia, Council of Ministers.
https://www.mh.government.bg/media/filer_public/2022/07/15/nacionalen_operativen_plan_za_spraviane_s_pandemiata_ot_covid-19.pdf

Chapter 3. Individual characteristics influencing health service utilisation

This chapter of the dissertation is devoted to the next two components of the Behavioral Model - the individual characteristics of the study sample and their influence on health behavior and health service utilisation. The outcomes of the citizen survey are presented, along with statistical analyses of the data.

The chapter consists of three sections, each with separate paragraphs and sub-paragraphs.

The time frame and circumstances surrounding the population survey are described in **Section 3.1.** The final two months of the epidemic emergency and the months that followed its lifting are covered by the survey. There were no official COVID-19 restrictions or counterepidemic measures in place during this time that might have an impact on the availability and utilisation of healthcare services.

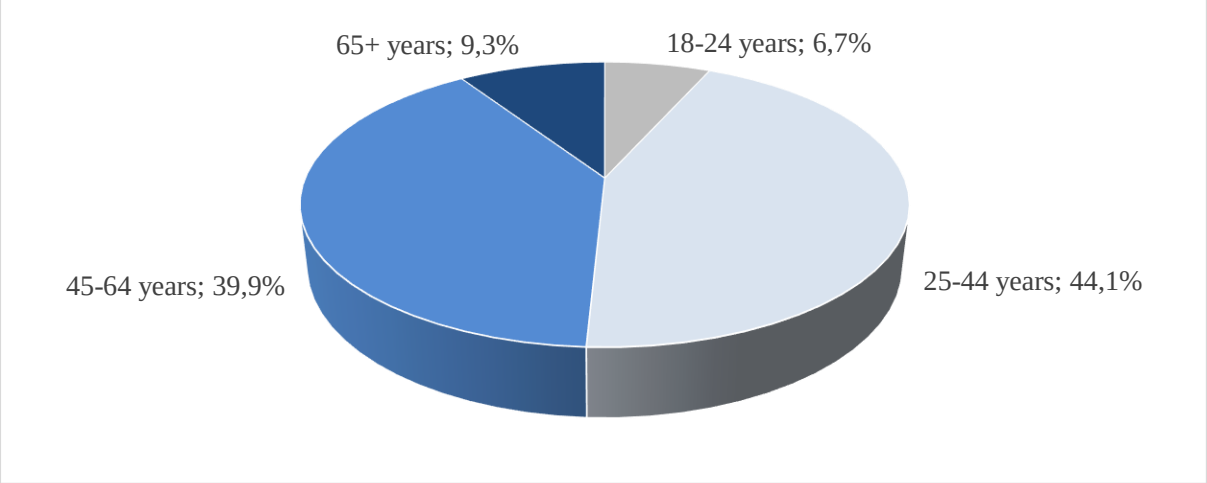
The survey results are presented in **Section 3.2** and are organised in line with the next two components of the Behavioral Model — individual characteristics and health behaviors. A more detailed description of the study sample is provided in Appendix 4 of the dissertation.

Paragraph 3.2.1. presents the individual characteristics of respondents - predisposing, enabling and need factors.

Individual predisposing characteristics of survey participants (**sub-paragraph 3.2.1.1**) include demographic factors, social factors and health beliefs of respondents.

The total number of respondents who agreed to participate in the survey was 1,748, with 1,292 (74%) completing the survey in full. The majority of respondents fell into the 25-44 age group (44.1%) (Figure 2).

Figure 2. Age structure of respondents



The higher percentage of women (77.3%) can be attributed to the "respondent-driven sampling" method that was employed. Of all respondents, 53.3% are married, while 21.3% of respondents live with a partner but are not married. The average household size in the sample is 2.92, with two people (30.3%) or three people (29.9%) making up the majority of

households.

The vast majority of respondents—67.6%—live in a regional city, followed by small towns (15.2%), rural areas (9.8%), and the capital (7.4%). The greatest percentage of respondents have completed higher education - Master's degree (41.7%). Most of the participants have a full-time job (67%).

In order to look into respondents' health beliefs, the trust that they had in health care providers was assessed. Of those surveyed, 82.3% trusted (largely and rather trusted) specialist doctors (Table 1). Forty-seven percent of respondents said they trusted general practitioners, and fifty-seven percent said they trusted hospitals. The specialists had the highest average trust score (4.11), followed by general practitioners (3.92) and hospitals (3.31) on a five-point scale (1 - being not trusted at all to 5 - being very much trusted).

Table 1. Level of trust in providers (GP, specialists, hospitals) (n=1292)

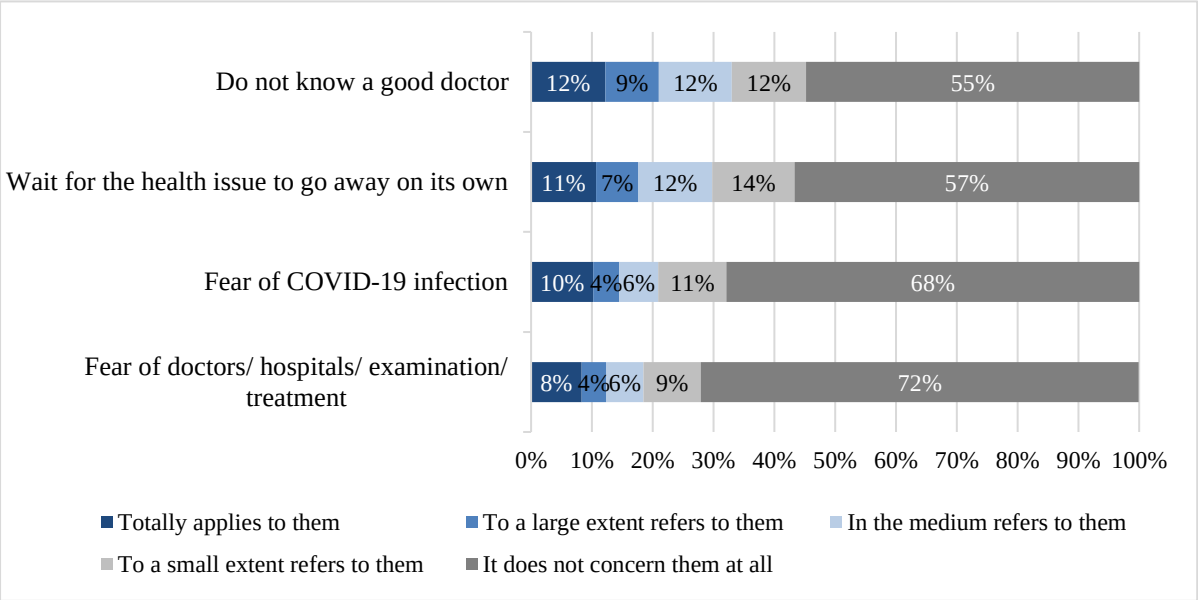
Trust in ...	Trust very much (5)		Rather trust (4)		Undecided (3)		Rather distrust (2)		Don't trust at all (1)		Average score
	N	%	N	%	N	%	N	%	N	%	
General Practitioner	491	**38.0%**	477	**36.9%**	127	9.8%	125	9.7%	72	5.6%	**3.92**
Specialist Doctors	495	**38.3%**	569	**44.0%**	131	10.1%	64	5.0%	33	2.6%	**4.11**
Hospitals	235	**18.2%**	420	**32.5%**	293	22.7%	198	15.3%	146	11.3%	**3.31**

N - number of respondents with the respective level of trust in the provider

% - share of respondents with the corresponding level of trust in the provider

Some of the difficulties in utilising health services were examined in an effort to better understand health beliefs. These included waiting for the health issue to go away on its own, being afraid of the doctor, and not knowing of a good doctor. This component of the model was expanded to include attitudes towards coronavirus infection and fear of infection because the study was done in the aftermath of the COVID-19 pandemic. Response variations to seasonal influenza infections and COVID-19 were also compared. The prevalence of coronavirus infection causes 36.9% of the respondents to abstain from the use of health care services (to a moderate or complete extent). This percentage was slightly higher—37.2%—for seasonal influenza viruses. Twenty percent of respondents said that they had trouble accessing services because of their fear of COVID-19 (medium to full extent). The majority of respondents (33%) cited their inability to find a trustworthy physician as a barrier, while 29.8% admitted to putting off seeking medical attention for their health issue until it went away on its own (Figure 3).

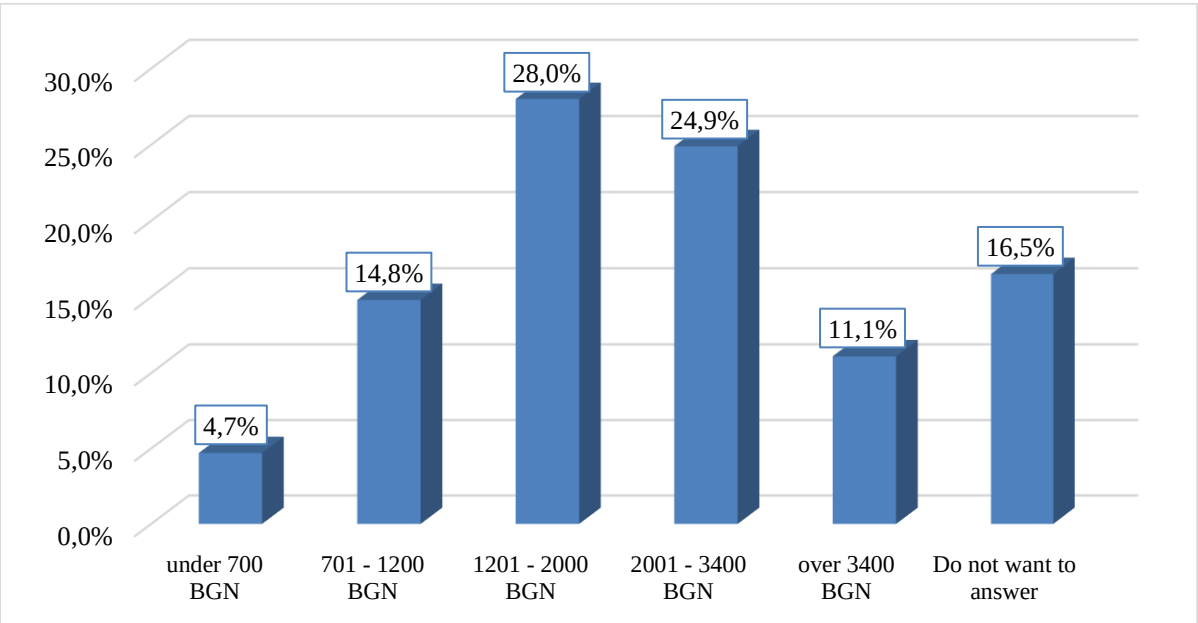
Figure 3. Difficulties related to personal health beliefs and attitudes



Sub-paragraph 3.2.1.2 presents the *individual enabling factors related* to the financing and organisation of health services for the individual. The income and wealth that a person has available to pay for medical services, as well as the patient's effective cost of care as established by consumer payments and health insurance status, are examples of individual financial characteristics.

The largest proportion of respondents had a household income of BGN 1,201 to 2,000 (28%) and BGN 2,001 to 3,400 (24.9%) (Figure 4).

Figure 4. Household income groups

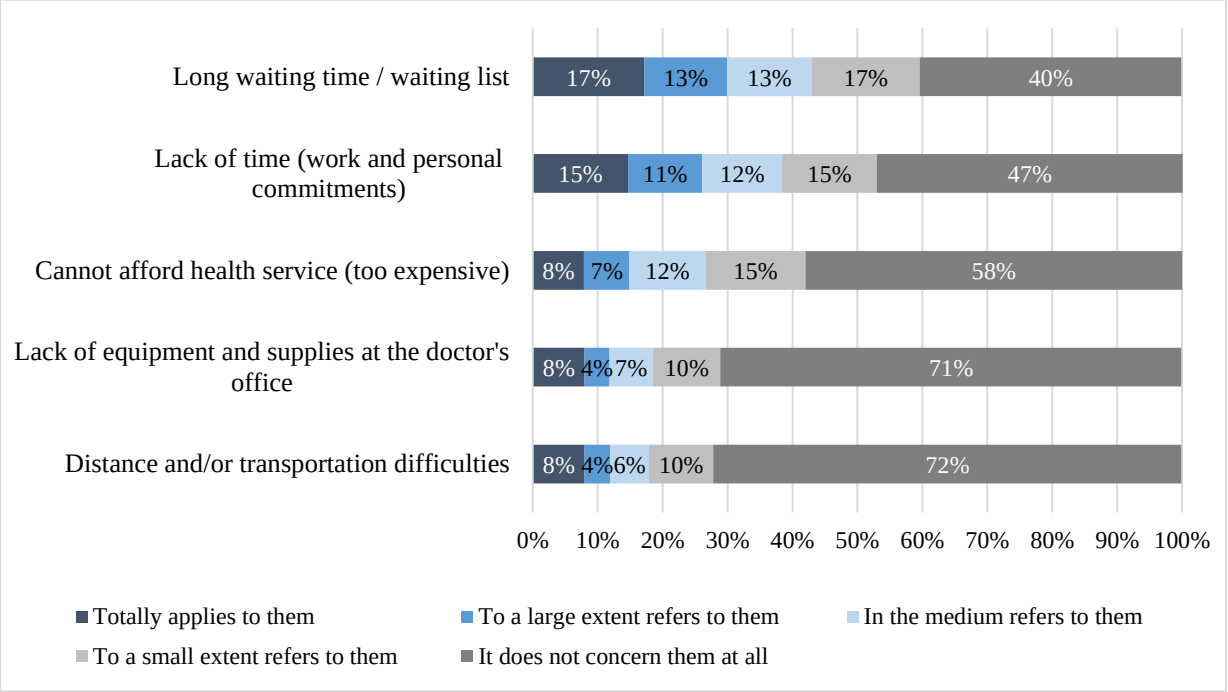


The majority of respondents (94.2%) indicated that they had continuous health

insurance coverage in the past 12 months, and 21.8% stated that they had voluntary health insurance coverage funded by an employer or themselves. Examining out-of-pocket payments in outpatient care, it was found that the majority of respondents made formal payments for services not covered by the health insurance fund (14.7% in primary care and 28.4% in specialised medical care) in addition to user fees, which are required for most patients. When it came to hospital care, the majority of respondents paid out-of-pocket for their choice of doctor or medical team (20.6%) as well as medical supplies (21.3%).

A few aspects of access to health services and obstacles to their use are looked at in terms of individual factors related to the organisation of health care. The survey's findings indicate that 14% of participants experienced at least one instance in the past year of needing a medical examination or treatment but going without it. The obstacles faced by participants in need of medical care were investigated; these included medical cost, waiting time, distance and transportation difficulties, availability of equipment and supplies at the doctor's office. The majority of respondents reported moderate to full inconvenience from having to wait for the service (43%), as well as lack of time because of work and personal commitments (38.4%) (Figure 5).

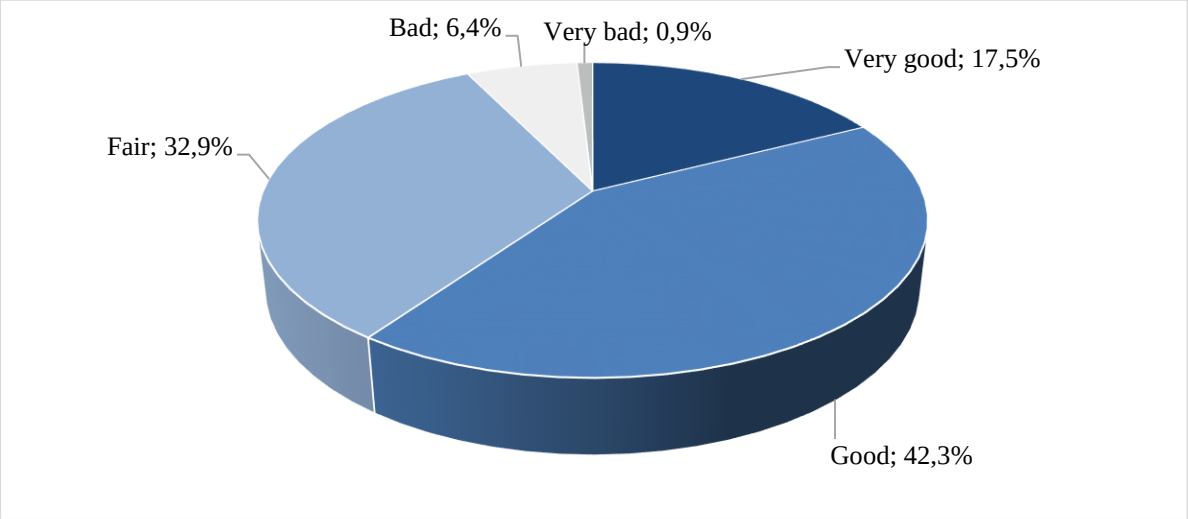
Figure 5. Difficulties related to access barriers



Sub-paragraph 3.2.1.3. presents the individual characteristics associated with the *perceived and evaluated need for health services*.

Perceived need (self-rated health status) indicates how people view their own general health and functional status. The majority of respondents rated their health as good (42.3%) or fair (32.9%) (Figure 6).

Figure 6: Respondents' self-rated health



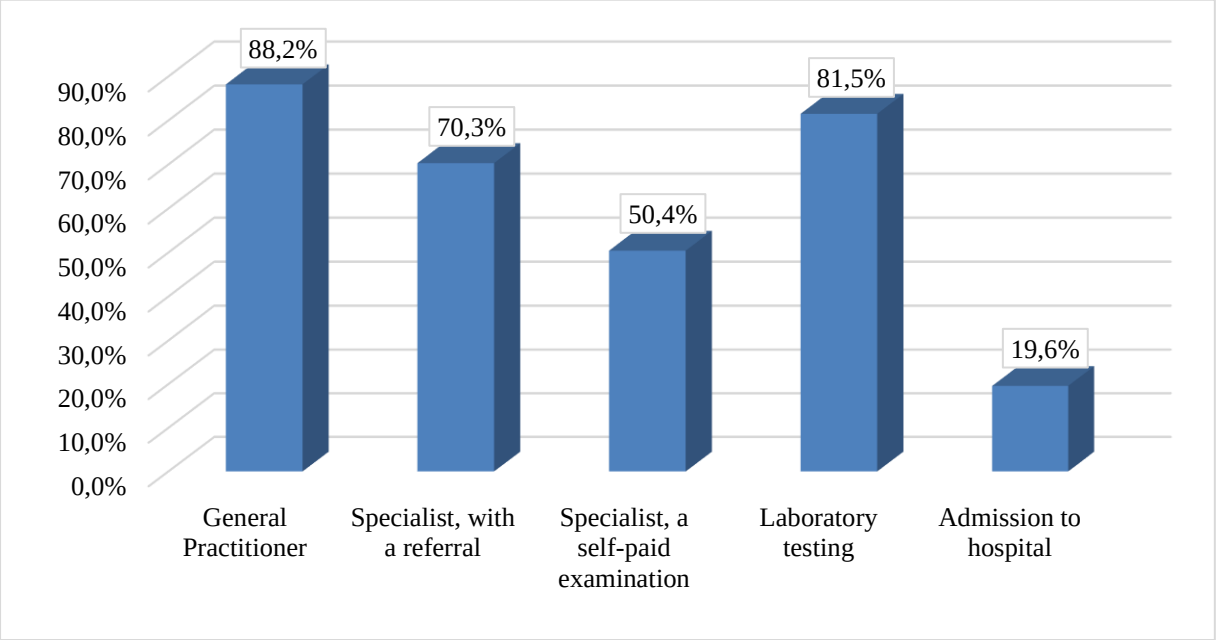
Evaluated need is the professional judgment and objective measurement of the patient's physical condition and need for medical care (vital signs as well as diagnoses for specific conditions). Nearly half of all study participants (43.7%) acknowledged having one or more chronic conditions that had been diagnosed. Cardiovascular disease accounted for the largest percentage of respondents (18.3% of all respondents, or 41.9% of those with chronic illnesses).

Results regarding people's health-related behaviours are given in **paragraph 3.2.2.** Personal health practises and health service utilisation are examined from this component of the Behavioral Model.

With regard to *personal health practices*, **sub-paragraph 3.2.2.1.** describes the results on physical activity, smoking and alcohol use by respondents. Over 65% of participants do not engage in any form of physical activity, while 23.8% engage in it one to three days per week, 5.3% four to six times per week, and 5.4% daily. Of the sample, 11% smoked occasionally, while 55.3% of the respondents did not smoke. Of the individuals who smoked, the majority (16% of all responders) smoked between 10 and 20 cigarettes daily, followed by 14.1% who smoked up to 10 cigarettes and 3.4% who smoked more than 20 cigarettes. Just 24.3% of respondents said they never drink, 40.5% said they only drink twice or three times a month, 25.6% said they drink twice to five times a week, and 9.5% said they drink alcohol every day.

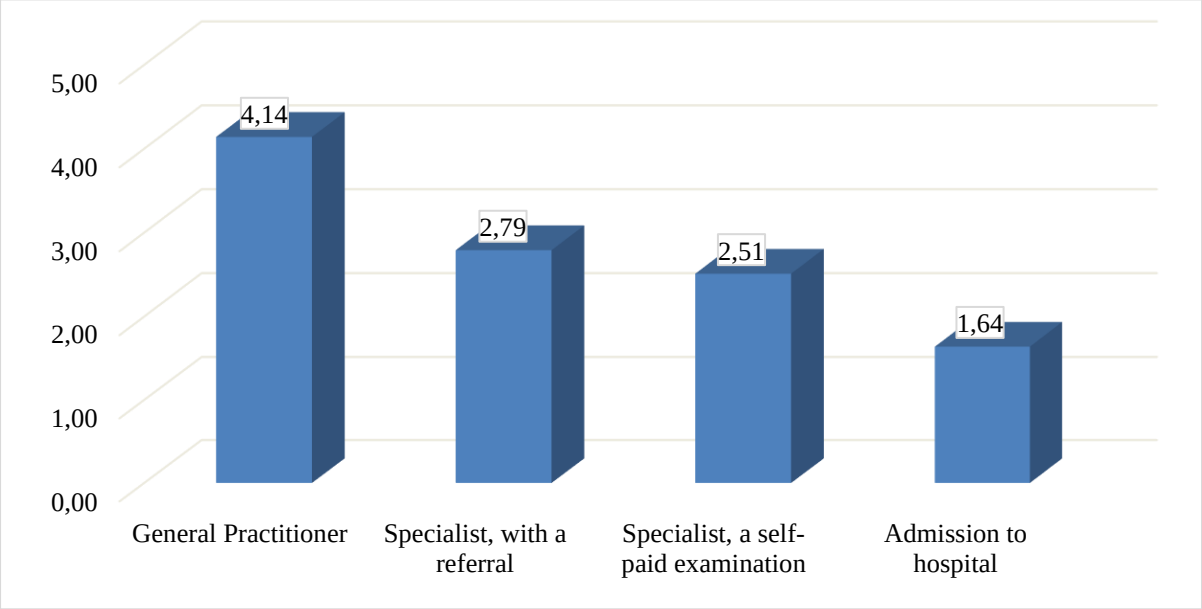
The findings regarding the respondents' use of health services are shown in **sub-paragraph 3.2.2.2.** Utilisation is presented using descriptive statistics as the percentage of respondents who used the relevant health service (Figure 7) and as the average utilisation by service type (Figure 8).

Figure 7: Proportion of respondents who used the relevant health service (n=1292)



Investigations were also conducted into the reasons behind patients' use of a specialist doctor's services without health insurance referral — a practise known as "self-paid examination". The main motivators were shorter waiting time for a self-paid examination (23.8%), demand for a second or additional medical opinion (23.5%), and the fact that the preferred doctor or health facility is not contracted with the NHIF (44.2% of participants). Due to a lack of health insurance referrals from the general practitioner and a long waiting for a referral, 36.1% of the respondents sought a self-paid examination.

Figure 8: Average utilisation (number of services) by service type for the last 12 months



Section 3.3 examines the impact of individual characteristics on health service utilisation. Utilisation is presented in several aspects: proportion of those who used the respective health service, average utilisation, likelihood of using the services, number of health services used. A separate paragraph presents the impact of the individual factors on each aspect of utilisation.

Paragraph 3.3.1 analyses *differences in utilisation by respondent group*. The purpose of the analysis is to confirm statistically significant differences in the proportion of respondents who used health services across respondent groups classified according to their individual characteristics.

Hypothesis 1: There are statistically significant differences in utilisation of health services in terms of individual characteristics of the respondents.

The χ^2-test for independence was used to test for statistically significant differences in health service utilisation among respondents grouped according to the individual factor categories of the Behavioral Model. Statistical significance was found for all types of variables examined, with the exception of ethnicity. The full results are presented in Appendix 6 of the dissertation. The analysis rejected the null hypothesis of no statistically significant differences in the use of health services between respondents in terms of individual characteristics from the Behavioral Model.

Paragraph 3.3.2 presents an analysis of *average utilisation by respondent group*. The purpose of the analysis is to confirm the existence of statistically significant differences in the average utilisation of health services across respondent groups classified according to their individual characteristics.

Hypothesis 2: There are statistically significant differences in the mean utilisation of health services among respondents according to their individual characteristics.

The following analyses were conducted to compare the average utilisation across respondent groups:

- Independent samples t-test for factors with two categories (dichotomous independent variables) such as sex, having a compulsory health insurance, having a voluntary health insurance and having a chronic disease;

- one factor analysis of variance (ANOVA) for factors with more than two categories (all other individual characteristics).

The null hypothesis was rejected using independent samples t-test and one-factor analysis of variance (ANOVA), and the presence of statistically significant differences in mean health service utilisation across respondent groups classified according to individual characteristics from the Behavioral Model was confirmed.

Paragraph 3.3.3 analyses the *impact of individual characteristics on the likelihood of using health services*. The purpose of the analysis is to identify the factors that influence the likelihood of using health services and the extent to which individual characteristics determine the likelihood of use.

Hypothesis 3: Individual characteristics from the Behavioral Model statistically significantly determine the likelihood of health service use.

Logistic regression analysis - binary logistic regression - was used to test the hypothesis. This type of regression analysis examines the influence of one or more independent variables on a dichotomous dependent variable and estimates the probability of an event having occurred. The dependent variable in the analysis is the use of the relevant health service and is represented by two categories, yes/no (used/not used). Individual characteristics of respondents (predisposing, enabling, need characteristics) were defined as independent variables and included in the statistical analysis as nominal, ordinal and interval data.

Four logistic regressions were constructed, examining the influence of individual characteristics from the Behavioral Model on the likelihood of using each of the four types of health services - GP check-up, specialist check-up with NHS referral, specialist check-up without referral (self-paid check-up) and hospital treatment.

The three components of individual characteristics from the Behavioral Model (predisposing, enabling and need-related characteristics) were entered sequentially in the regression and so three regression models were constructed for each type of service:

-Model 1 - includes predisposing characteristics;

-Model 2 - includes predisposing and enabling characteristics;

-Model 3 - includes predisposing, enabling and need characteristics.

The sequential introduction of each of the three components allows the additional influence of each individual group of factors on the utilisation of the service to be assessed. The sequence of introduction of the components follows the structure of the Behavioral Model and established practice in the literature reviewed.

The analysis's findings enable the prediction of a health service's likelihood of use as well as the identification of factors that significantly and independently impact utilisation.

Based on the values of the Nadelkerkes R^2 coefficient, it is determined what percentage of the variation in utilisation (the dependent variable) is explained by the combined effect of the independent variables of the model under consideration.

For all types of health services examined, the model including all three components of individual factors (predisposing, enabling, and need characteristics) explained the largest percentage of the variance of the dependent variable.

Using logistic regression analysis, the null hypothesis was rejected and it was confirmed that the three components of individual characteristics from the Behavioral Model statistically significantly determined the likelihood of using health services.

The *influence of individual characteristics on the volume of health services used* is analysed in **paragraph 3.3.4**. The purpose of the analysis is to identify the factors that influence the quantity of health services used and the extent of their influence.

Hypothesis 4: Individual characteristics from the Behavioral Model statistically significantly determine the amount of health services used.

Negative binomial regression was used to test the hypothesis. This method was chosen because the data obtained for the dependent variable did not meet the requirements for a normal distribution. The dependent variable in the regression analysis is the amount of the respective health service used in the last one year (number of GP visits, number of specialist examinations with a referral, number of self-paid examinations, number of hospital admissions). Individual characteristics from the Behavioral Model were included as independent variables in the analysis. The definition of the independent variables is similar to that of logistic regression, and they are represented by nominal, ordinal, and interval data.

In conducting the regression analysis, the three components of the Behavioral Model (predisposing, enabling, and need characteristics) were entered sequentially and thus three regression models were formed for each type of service.

Using negative binomial regression, the null hypothesis was rejected and it was confirmed that the three components of individual characteristics from the Behavioral Model statistically significantly determined the quantity of health services used.

In **paragraph 3.3.5, the** *impact of personal health practices on health service utilisation* is analysed. Utilisation is presented in terms of the likelihood of using services and the number of services used.

Hypothesis 5: Personal health practices influence the likelihood of health service use.

Binary logistic regression was used to test the hypothesis. The dependent variable in the analysis is the use of health services (examination by a doctor / admission to hospital) and is represented by two categories - yes/no (used/not used). The independent variables in the analysis are personal health practices - sports practice, smoking and alcohol consumption.

The logistic regression analyses conducted reject the null hypothesis and confirm that personal health practices influence the likelihood of health service use, although the low values of the Nadelkerkes R^2 coefficient suggest that their overall significance is not large.

Hypothesis 6: Personal health practices influence the number of health services used.

Negative binomial regression was used to test the hypothesis. The dependent variable is the number of health services used - doctor visits / number of hospital admissions. The independent variables in the analysis were personal health practices (smoking, alcohol consumption, sports practice).

Regression analyses confirmed a statistically significant correlation between personal health practices (active sports and alcohol consumption) and the number of GP and specialist appointments used. Regarding the influence of personal health practices on the number of hospitalizations, the null hypothesis cannot be rejected and such a relationship cannot be confirmed with the available data.

Chapter 4. Discussion, conclusions and recommendations

Chapter four of the dissertation draws the main conclusions from the analyses of the factors influencing health services utilisation. The results of this study are compared with the findings from the literature reviewed. Summary conclusions are drawn and some recommendations related to the application of the Behavioral Model in our country are given. This chapter consists of six sections.

In **section 4.1** the expected impact of the **contextual factors** presented in Chapter 2 is summarised. The analyses conducted give us reason to expect an increase in the utilisation of health services in the country due to an aging population and high morbidity. In particular, it is anticipated that there will be an increasing need for long-term care, services for patients with chronic conditions, and prevention and management of socially significant diseases (cardiovascular diseases, cancer, diabetes, mental disorders).

Increases in the GDP share of health spending and public health spending show that the health sector is prioritised, and expanding covered services can result in higher health service utilisation. These expectations might be warranted if the trend towards a decline in the percentage of direct out-of-pocket expenses—which serve as a barrier to access and use of healthcare services—permanently holds.

Overall, there is a good supply of healthcare resources (people and facilities), and since patients have more options and can consult with multiple providers, we anticipate a higher use of health services. However, regional imbalances in the distribution of resources in the health system and shortages of certain types of specialists (general practitioners, certain types of specialist doctors and nurses) do not allow the health care needs of the population in remote and small settlements to be met.

A high prevalence of behavioural risk factors causes health status to deteriorate, which increases the need for health services and, consequently, their utilisation. Achieving healthier lifestyles with long-term positive effects on individual and public health requires targeted influence on health behaviours and personal health practises.

Conversely, a barrier that lowers service utilisation is the public's lack of trust in medical professionals and the healthcare system. People who have mistrust for doctors are less likely to seek medical attention when necessary, to postpone or forego preventive care, refuse to follow prescriptions, and to look for alternative sources of information and care.

Because of these contextual characteristics, a number of measures should be put in place to optimise the organisation and delivery of health services in order to meet the needs of the general population.:

- directing resources to the supply of long-term health care;
- ensuring adequate access to appropriate health services in remote and rural areas;
- increasing the population's awareness of the impact of behavioural risk factors;
- redirecting resources from treatment to prevention and from inpatient to outpatient care;

- increasing the efficiency of hospital care by improving resource planning;
- implementing quality standards to increase confidence in contractors;
- implementing measures to reduce the number of uninsured;
- reducing the share of out-of-pocket payments, mainly by reducing co-payments for medicines and medical devices;
- better cost control through accelerated introduction of eHealth.

The effects of **individual factors** on healthcare utilisation are examined in **Section 4.2**, and the results of the analysis in Chapter 3 are compared with those of other research looking into the factors influencing healthcare utilisation.

Evidence from the reviewed literature and analysis of systematic reviews confirm the influence of individual **predisposing characteristics** on health service utilisation[16,17,18].

Demographic and social factors have been investigated in the majority of studies, but the results obtained do not lead to a clear conclusion about of influence of these characteristics on service utilisation. It was also established that beliefs about health and confidence in the provider determined utilisation. Although the relationship is usually clear-cut—lower levels of trust are linked to lower utilisation—a lack of trust can also result in excessive use of medical services, such as more tests, consultations, and other procedures[19].

Nearly all utilisation studies take into consideration the impact of **enabling resources** and the economic characteristics of the respondents, primarily focusing on income levels. According to certain sources, the relationship between income and service utilisation is determined by the type of services, while in other cases, the relationship is explained by presuming an association between income and people's health. A large body of research finds that health insurance coverage significantly increases the likelihood of service use or decreases health care delays for different population groups. The results also indicate that service utilisation varies by type of health insurance (public, private), its continuity, and the extent of coverage.

In nearly all of the studies that were analysed, the presence of one or more **chronic conditions and self-reported health status** were significant predictors of utilisation,

[16] Babitsch, B., Gohl, D., & Von Lengerke, T. (2012). Revisiting Andersen's Behavioral Model of Health Services Use: a systematic review of studies from 1998-2011. In GMS Psycho-Social-Medicine (Vol. 9).
[17] SoleimanvandiAzar, N., Mohaqeqi Kamal, S. H., Sajjadi, H., Ghaedamini Harouni, G., Karimi, S. E., Djalalinia, S., & Setareh Forouzan, A. (2020). Determinants of Outpatient Health Service Utilization according to Andersen's Behavioral Model: A Systematic Scoping Review. Iranian Journal of Medical Sciences, 45(6), 405-424. https://doi.org/10.30476/ijms.2020.85028.1481
[18] Hajek, A., Kretzler, B., & König, H. H. (2021). Determinants of Healthcare Use Based on the Andersen Model: A Systematic Review of Longitudinal Studies. Healthcare 2021, Vol. 9, Page 1354, 9(10), 1354. https://doi.org/10.3390/HEALTHCARE9101354
[19] Warda, E., Taye, A., Perskin, M., & Taylor, L. (2023). Does Missing Trust Lead to Overuse or Underuse of Health Care Services? The American Journal of Managed Care, 29(8), 388-392. https://doi.org/10.37765/ajmc.2023.89404

providing unambiguous evidence of a relationship between these variables. The confirmed negative correlation between health status and health service utilisation leads to the conclusion that needs are a leading factor, and this is one of the fundamental requirements for equitable access in health care.

The significance of individual health care practises as determinants of health service utilisation is covered in **Section 4.3**. The relationship between behavioural risk factors and health service utilisation needs to be examined in greater detail, with a focus on examining the interactions between health practises and other individual characteristics like health status. Using longitudinal research, causal relationships between variables can be investigated.

In **Section 4.4**, data from studies conducted in the country both before and during the COVID-19 pandemic are compared with the health service utilisation in this study. In the post-pandemic era, there was an increase in utilisation as evidenced by data on the average number of hospitalisations and examinations as well as the percentage of individuals using services. The delayed and postponed exams during the pandemic, the worsening health status due to delayed care, and the rebound in activity volume following the removal of any restrictions may all contribute to the increased utilisation in the post-pandemic period.

Research is presented demonstrating that, even though a health issue is the root cause of the crisis, there is typically less use of health services during an epidemic. Beyond the COVID-19 pandemic, further instances are provided where the epidemic environment significantly affects health service utilisation in the direction of decreased consumption.

The study's summary results and conclusions are given in **Section 4.5.**

Based on an examination of health care utilisation research concepts and models, a contextual analysis, and the findings of the population survey, it is determined that a variety of factors, some of which are specific to the environment in which health care services are used, and others of which are connected to the individual characteristics and health behaviours, affect the use of health services. These variables can affect the likelihood of entering the healthcare system and utilising its services, as well as the amount of medical care that is received (Table 2).

Table 2. Factors influencing the utilisation of health services

Individual characteristics/factors	General Practitioner		Specialist, with a referral		Specialist, a self-paid examination		Admission to hospital	
	probability of use	number of examinations	probability of use	number of examinations	probability of use	number of examinations	probability of use	number of hospitalizations
Predisposing characteristics								
Age	⊗	⊗	⊗	⊗	⊗	⊖	⊗	⊗
Gender - women (ref. group: men)	⊗	⊗	⊕	⊗	⊕	⊗	⊗	⊗
Number of household members	⊗	⊕	⊗	⊗	⊗	⊗	⊗	⊗
Location: Capital (ref.)								
Regional city	⊗	⊗	⊕	⊗	⊗	⊗	⊗	⊗
Small town	⊗	⊗	⊕	⊗	⊗	⊗	⊗	⊕
Village	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Level of education	⊗	⊗	⊗	⊗	⊕	⊖	⊗	⊗
Employment status: full-time (ref.)								
Underemployed/inactive person	⊗	⊗	⊗	⊗	⊗	⊖	⊗	⊗
Retired/disabled	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Fear of doctors/hospitals	⊗	⊗	⊗	⊗	⊖	⊗	⊗	⊗
Trust in provider	⊕	⊕	⊗	⊗	⊗	⊗	⊕	⊗
Enabling characteristics								
Household income	⊗	⊖	⊗	⊖	⊕	⊗	⊗	⊗
Social health insurance (ref.: uninsured)	⊗	⊕	⊕	⊗	⊖	⊗	⊗	⊗

Individual characteristics/factors	General Practitioner		Specialist, with a referral		Specialist, a self-paid examination		Admission to hospital	
	probability of use	number of examinations	probability of use	number of examinations	probability of use	number of examinations	probability of use	number of hospitalizations
Too expensive treatment	⊗	⊗	⊕	⊗	⊗	⊗	⊗	⊗
Long waiting/waiting list	⊗	⊗	⊗	⊗	⊕	⊕	⊗	⊗
Lack of time (other commitments)	⊗	⊗	⊗	⊖	⊗	⊗	⊖	⊗
Distance/lack of transport	⊗	⊗	⊗	⊗	⊗	⊕	⊗	⊗
Lack of equipment/ supplies	⊗	⊖	⊗	⊗	⊗	⊗	⊗	⊗
Need characteristics								
Self-rated health status	⊗	⊖	⊖	⊖	⊖	⊖	⊖	⊗
Presence of chronic disease	⊗	⊕	⊕	⊕	⊗	⊗	⊕	⊕
Personal health practices								
Practicing sports	⊗	⊖	⊖	⊗	⊗	⊗	⊖	⊗
Smoking	⊖	⊗	⊖	⊗	⊗	⊗	⊗	⊗
Use of alcohol	⊗	⊖	⊗	⊖	⊖	⊖	⊖	⊗

⊗ - no statistically significant relationship is proven
⊕ - positive dependence
⊖ - negative dependence

Patients who have greater faith in their **general practitioner** are more likely to visit them. The most important factor influencing the use of primary care was trust in the general practitioner (GP), which also showed a positive relationship with the likelihood of seeing a doctor and the frequency of visits. It makes sense that patients with chronic diseases and those with ongoing insurance would visit more frequently. People with lower incomes are also more likely to see a general practitioner (GP) on a regular basis, which may be related to the worse health outcomes of socially disadvantaged groups.

Those who regularly participate in sports and those who rate their own health higher are less likely to see a general practitioner. These findings are in line with knowledge of the beneficial effects of physical activity on people's health and the corresponding decline in the use of medical services. Conversely, those who smoke more frequently are less likely to visit their GP, which may be explained by the assumption that smokers place insufficient value on preventive check-ups and behavioural risk factors.

There are concerns and a need for more research regarding the association between regular alcohol and tobacco use and lower use of health services. This includes a more thorough examination of behavioural risk factors and the influence of personal health practises on health and, consequently, health service utilisation.

Women were more likely to consult a **specialist with a referral**. The higher uptake among women is confirmed by several studies and can be explained by the increased medical needs associated with childbirth and childrearing. Compared to people who live in the capital, residents of regional cities or small towns are more likely to visit a specialist with a referral. It makes sense that patients with social health insurance and those facing financial challenges for medical care are more likely to use the service with a health insurance referral. Because they see their general practitioner more frequently, chronically ill individuals are also more likely to consult a specialist through the health fund. This higher frequency of examinations is further explained by their illness.

It is not surprising that the likelihood of seeing a specialist with a referral decreases as self-rated health improves and as people exercise more regularly, as these two factors are associated with fewer GP visits and therefore a lower likelihood of being referred to a specialist. People are less likely to be referred to a specialist if they have a higher income, do not have time due to other commitments, or are in better health. The lower number of referrals for those with higher incomes could be related to their greater propensity to use a self-paid examination, which is supported by our data commented on below. One could also look for an association between income and lack of time due to other commitments, but this would be a subject for further research.

Women, people with higher levels of education, higher incomes, and those having waiting list difficulties are more likely to use a **self-paid examination by a specialist**. Higher educated people are more likely to pay for an exam; however, they don't use the self-paid option as frequently. We can conclude that education helps to address the health problem more successfully, with fewer consultations. A self-paid checkup is more likely to be used by those with higher incomes because they can more easily afford the service. So they can visit the preferred specialist and get a second or additional medical opinion, even if the doctor or health facility is not contracted with the NHIF. Long waiting times and waiting lists are linked to a higher likelihood of self-paying for an examination, indicating that people are willing to pay more out-of-pocket to get a necessary service sooner.

Further research on the relationships between the factors would shed light on the existence of a correlation between education, income and difficulties with long waiting times.

The increased use of self-paid check-ups by people who have difficulties with long waiting times or with distance and lack of transportation could be explained by insufficient numbers of referrals leading to delays in check-ups or the lack of GPs in some remote and hard-to-reach areas. Due to these problems of access to services under compulsory health insurance, patients have to look for alternatives, such as self-paid services.

It makes sense that patients who are afraid of doctors or hospitals, those with interrupted or missing compulsory health insurance, or those in better health are less likely to have a self-paid examination. Fewer self-paid services were found in older patients, people with higher education, not employed, and in good health. Further research on the relationships between older age, unemployment, and low income is needed.

Our hypotheses that having voluntary health insurance would be associated with a greater likelihood of use and a greater number of self-paid examinations were not confirmed.

The positive relationship between the presence of a chronic disease and the use of **hospital services** (likelihood of hospital admission and number of hospital admissions) indicates that hospital care is used by those who actually need it. Trust in hospitals also emerges as a factor with positive influence. The higher number of hospital admissions among residents of small towns could be explained by the shortage of certain types of specialist doctors in these localities and, as a result, the difficulty of solving the health problem in outpatient settings. And for hospital services, utilisation is expected to decline as health status improves.

Although studies often confirm a positive relationship between respondents' age and health services utilisation, both in terms of the likelihood of examinations or hospitalisations and their frequency, our expectation of finding such a relationship in this study was not met. The existence of a correlation between individuals' marital status and health service utilisation was also not confirmed. Although the study period covers the last two months of the COVID-19 pandemic, fear of contracting the virus also did not show a statistically significant influence on health service utilisation.

The dissertation's **Section 4.6** offers some recommendations regarding the application of the Behavioral Model in our practise, which is supported by the research done, the analysis of the factors influencing the use of healthcare services, and the conclusions reached:

- There is a need for representative surveys to investigate the utilisation of health services in the country based on Andersen's Behavioral Model. These surveys could analyse primary data obtained in subsequent waves of the European Health Interview by including additional questions in the survey covering each component of the Behavioral Model. To explore individual predisposing characteristics, questions related to trust in health care providers could be added, and to explore enabling factors, consumer payments, respondents' health insurance status, difficulties related to the organisation of medical care, and availability of specialists and health care services could be explored.

- Studies applying the Behavioral Model need to adequately incorporate its complexity

and use additional statistical analysis to reflect its complexity, such as path analysis. This analysis is an extension of regression analysis and is used to estimate the causal model. Such studies would make it possible to go beyond the examination and description of individual indicators and to better understand the relationships between the factors of the model as well as the feedback loops in its structure. The study of feedback loops would allow us to assess the impact of health service use outcomes (health status, consumer satisfaction, and quality of life) on subsequent service use.

- In order to conduct a more comprehensive examination of the correlation between individual health practises and health service utilisation, it is necessary to investigate the interaction between behavioural risk factors such as alcohol abuse, smoking, and low physical activity, and individual characteristics like health status..

- This study's results confirm that trust in providers—physicians and hospitals—is a highly significant factor in determining the use of health services. Further research in this area could concentrate on the effects of mistrusting medical professionals on the use of other kinds of health services or the implications of mistrust and underuse of medical care on the health status of patients.

- Causal relationships between variables in the model can be explored by conducting longitudinal studies.

- By incorporating qualitative methods into the research design, some contradictory or inconclusive results from quantitative data can be made clear..

To analyse the factors influencing access to and utilisation of health services during a pandemic, more qualitative research would be useful, involving health service users, health professionals, managers, and other actors in decision-making processes when implementing measures related to a complex epidemic situation.

Managing the use of health care can be accomplished through identifying the factors that influence the utilisation of healthcare services, as well as the direction and extent of that influence. Towards this aim, it is crucial to evaluate the degree to which each component of the Behavioural Model can be impacted by appropriate policies, consequently resulting in modifications in behaviour and health services utilisation. In order to ensure equitable access and optimise the use of health services, policy decisions can be made by taking into account the overall potential for intervention of each of the established determinants of utilisation. Analysing health outcomes can help determine the optimal level of service utilisation and appropriateness.

Conclusion

This study analyses the factors influencing the utilisation of health services in outpatient and inpatient care in Bulgaria. In the course of the study, the main objectives of the dissertation have been consistently met by using different qualitative and quantitative research methods:

(1) An analysis and systematisation of existing theoretical concepts and models for health services utilisation research is conducted. Based on the analysis, the main and most commonly applied model, Ronald Andersen's Behavioral Model, is derived, which has been the basis for many studies focusing on the determinants of healthcare utilisation. The judgement that the model is applicable to our healthcare system and practice warrants its selection as the most appropriate conceptual framework for this study.

(2) Through a review and analysis of the literature and studies applying the Behavioral Model, the main and most commonly studied factors influencing the utilisation of healthcare services were identified. Based on the main components of the model, a study of contextual and individual characteristics and health behaviours associated with health care utilisation in the country was planned and organised.

(3) The contextual factors influencing health service utilisation are examined. Based on the contextual component of the Behavioral Model, the main characteristics of the environment are analysed, such as demographic and social characteristics, health policies, financing and organisation of the health system, environmental factors, and basic health indicators of the population.

(4) The influence of individual characteristics, personal health practices, health status, attitudes, and beliefs on the use of primary, specialist, and hospital care has been studied and evaluated. A sociological survey was conducted to collect the necessary primary information related to population characteristics and health service use. In the course of the study, differences in utilisation with respect to individual characteristics were confirmed. By applying statistical analyses, the direction and extent of the influence of individual factors on the utilisation of medical care were demonstrated. These factors have a stronger or weaker manifestation and influence, on the one hand, the likelihood of contacting the health system and using the services, and on the other hand, the volume of medical care received.

(5) This study confirms that the Behavioral Model is applicable to our practice and demonstrates that health service utilisation is influenced by the factors included in the model components. This provides a rationale for proposing nationally representative surveys to investigate health service utilisation in the country based on the conceptual framework of the model.

In conclusion, we can summarise that the stated aim of the dissertation has been achieved by setting guidelines and recommendations for future research that would contribute to achieving optimal utilisation of health services and the cost effectiveness of the health sector in the country.

IV. REFERENCE TO THE DISSERTATION CONTRIBUTIONS

Theoretical contributions

1. The main theoretical approaches, concepts and models for health services utilisation research are explored and systematised. A comprehensive review of the different theoretical perspectives is provided, approaches to health behaviour research are classified, and the most comprehensive and widely applied model in research focusing on the determinants of utilisation is derived.

Theoretical and applied contributions

2. Based on the selected model, the contextual factors influencing the utilisation of health services in Bulgaria are studied and analysed. An additional contextual factor is added to the applied model, related to the study of the impact of the epidemic situation on health care utilisation.

3. A methodological toolkit was developed to study the individual factors influencing the utilisation of health services in Bulgaria, adapted for the application of the Behavioral Model.

4. Individual factors influencing health care consumption have been studied. Through statistical analyses, the influence of Behavioral Model factors on service utilisation was determined, and the applicability of the model to our practice was confirmed.

5. The study applies for the first time in our country one of the most widely used models for studying the determinants of health service consumption, and the large number of empirical studies conducted in different countries allows for comparative analyses.

6. On the basis of the conducted research and the obtained results, recommendations related to the application of the selected model in studies in our country are formulated.

V. PUBLICATIONS RELATED TO THE **DISSERTATION**

Panayotova, S. (2022). Health services utilization models. *Varna Medical Forum*, 11, Supplement 2.

Panayotova, S. (2023). Determinants of inpatient healthcare utilization in Bulgaria. *Varna Medical Forum*, 12, 2.

Panayotova, S. (2023). Trust in provider as a factor influencing health services utilization in Bulgaria. *Social Medicine*, 1.

Panayotova, S. (2023). Outpatient health services utilization in Bulgaria. *Journal of Biomedical and Clinical Research*, 16, 2.

ACKNOWLEDGEMENTS

I express my deep gratitude to my supervisor, Assoc. Prof. Elka Atanasova, PhD, for her trust, dedicated support, and valuable guidance in the process of working on the dissertation.

Sincere gratitude is extended to Ch. Assist. Prof. Nikolay Mihaylov, PhD, for his knowledgeable guidance and helpful assistance throughout the course of the study.

I would like to thank my colleagues at the Department of Health Economics and Management for their assistance, support, and positive working atmosphere.

I thank my family for their love, patience, and support.