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FACULTY OF PUBLIC HEALTH

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MANAGEMENT OF HEALTH DURING PANDEMIC CIRCUMSTANCES – ECONOMIC AND MEDICO-SOCIAL CONSEQUENCES

SUMMARY OF DISSERTATION

for obtaining educational and scientific degree "Philosophy Doctor"
in the higher education field 7. Healthcare and Sport
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Dissertation supervisor:
Prof. Nikolay Popov, PhD

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The dissertation is 148 pages, including a table of contents, 47 figures and 11 tables. References include 185 sources of which 48 in Cyrillic and 137 in Latin.
4 publications were made related to the dissertation work.

The dissertation was discussed, accepted and directed for defense in front of a scientific jury by the Departmental Council of the Department of Health Economics, Faculty of Public Health "Prof. Tsekomir Vodenicharov, MD, DMSci" at the Medical University - Sofia.

Scientific jury composed of:

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The public defense of the dissertation will be held on April 23, 2024, in Hall 7 of the Faculty of Public Health "Prof. Tsekomir Vodenicharov, MD, DMSci" at Medical University - Sofia, UMBAL "Tsaritsa Yoana - ISUL" EAD, Sofia, 8 Byalo More Str.

The materials for the defense are available at sector "Science" of the Faculty of Public Health "Prof. Tsekomir Vodenicharov, MD, DMSci" at the Medical University - Sofia, UMBAL "Tsaritsa Yoana - ISUL" EAD, Sofia, 8 Byalo More Str. and on the website of the Medical University - Sofia.

Abbreviations used:

EU – European Union
IF – Insurance Funds
MH – Ministry of Health
NHIF – National Health Insurance Fund
NSI – National Statistical Institute
NCPHA – National Center of Public Health and Analyses
GP – General practitioner
RHI – Regional Health Inspectorates
WHO – World Health Organization
LE – Life expectancy
YLL – years of life lost

CONTENTS:

INTRODUCTION

Health is a multidimensional category. Keeping people active for longer and increasing life expectancy in good health is important to society. Because health is also defined as wealth, which guarantees the socio-economic development of the population. In this way, healthcare directly supports economic growth and contributes to sustainable economic and social development in the country.

The COVID-19 pandemic, declared by the World Health Organization (WHO) on 11/03/2020, is a global challenge not only to individual, families and countries, but also to the modern world as a whole. This is determined, on the one hand, by its rapid rate of spread, and on the other, by affecting and burdening all sectors of public life.

It significantly impacts people's lives. Every person in the world directly or indirectly faces the severe consequences of this disease. One of the serious consequences is the high morbidity and loss of life worldwide. According to WHO data, as of 12/24/2023, the incidence in the world is 773 million, in Europe - 278 million, and in Bulgaria - 1.3 million cases. Regarding the death rate, the data are also very alarming - 7 million globally, 2.3 million in Europe and 38.5 thousand in Bulgaria. But apart from medical, the crisis also led to many of social consequences – learning and working from home, absenteeism from the workplace, increasing unemployment, impact on the labor market, social isolation, etc. There were also economic consequences - deepening poverty, reducing production, increasing health care costs, change and loss of income, impaired economic well-being, etc.

The COVID-19 pandemic has affected all people and societies globally, but it has had the greatest impact on vulnerable populations. In this way, health, social and economic inequalities have deepened. It is very important to organize multiple studies and analyses to track direct and indirect, early and late outcomes. Their study will be of great importance for health management in emergency situations, where people, societies, countries and the world will be better prepared and able to respond adequately to specific situations to minimize the consequences.

AIM, TASKS AND METHODOLOGY OF THE STUDY

The aim of this dissertation is to investigate the impact of the COVID-19 pandemic, to determine the economic and medico-social consequences on the population, as well as to justify and propose measures for the development of guidelines to improve the management of health and the organization of healthcare to minimize the negative outcomes for people and society.

To achieve this aim, we set ourselves the following tasks:

1. To conduct an individual anonymous survey to establish the opinion of persons over the age of 20 on the impact of the COVID-19 pandemic.

2. To determine the medical consequences of the COVID-19 pandemic by investigating the prevention of the spread of the SARS-CoV-2 virus, health service usability, morbidity and self-rated health among the target group;

3. To identify the social consequences of the COVID-19 pandemic by examining social isolation, changes in the work environment (working from home, job shifting and loss, absenteeism), as well as to self-assess the social status of the respondents at the end of the pandemic;

4. To study the economic consequences by analyzing the costs of diagnosis and treatment of the disease COVID-19 and change in the income of the respondents, as well as to ascertain and specify their economic well-being at the end of the pandemic;

5. To conduct an analysis of public health assessment indicators and coefficients of national and global databases concerning the consequences of the COVID-19 pandemic;

6. To propose measures for developing guidelines for improving health management and the organization of healthcare to minimize the negative consequences for people and society.

Working hypothesis: It is assumed that the medico-social and economic consequences of the COVID-19 pandemic are directly related to the intensity and spread of the SARS-CoV-2 virus.

Subject of the study:

Exploring the medico-social and economic implications of the COVID-19 pandemic on health management.

Object of the study:

The subject of the study is health management in the context of the COVID-19 pandemic.

Logical unit of observation:

Health-insured persons over 20 years of age.

Indicators of monitoring logical units:

1. Medical consequences:
    1. Prevention of the spread of the SARS-CoV-2 virus and prevention of morbidity;
    2. Health service usability before and at the end of the COVID-19 pandemic;
    3. Study of morbidity among the surveyed persons;
    4. Self-assessment of health;
2. Social consequences:
    a. Impact of social isolation;
    a. Work from home;
    b. Labor change and job losses during the COVID-19 pandemic;
    c. Absenteeism due to illness from COVID-19;
    d. Self-assessment of the social status at the end of the pandemic;
3. Economic consequences:
    a. Medical expenses for diagnosis and treatment;
    b. Change in income during a pandemic;
    c. Exploring economic well-being at the end of the pandemic;
4. Consequences of the COVID-19 pandemic through the study of public health indicators and coefficients of national and global databases:
    a. Medical consequences – mortality, excess mortality, preventable death, LE, years of life lost;
    b. Social consequences - lockdown and quarantine, unemployment rate, social inequalities, social exclusion;
    c. Economic consequences - poverty line, economic inequalities.

Sample size estimation:

According to data from the National Statistical Institute, the population of the country over 20 years of age as of 31.12.2022 is 5 232 670. The sample size was calculated according to the following formula:

$$n = \frac{t^2 \,.p.(1-p).N}{\Delta^2.N.(t^2 \,.p.(1-p))},$$

of which

t – guarantee factor;
p – relative share of the evaluated parameter;
N – volume of the study population;
Δ – the maximum allowable error accepted for the study.

When calculating the sample volume, the maximum standard deviation is allowed, it is obtained at a relative share of the studied parameter p=50%. The maximum error is assumed to be 5% and the probability is assumed to be 95% (t=1.96). In this case, the sample size is $n = 384$. Our sample consists of a total of 645 respondents (382 women and 263 men) and this number exceeds the minimum calculated by the given formula.

Place and time of the survey:

The final survey was conducted during the period January - April 2023 on the Google Forms platform.

Organization of the survey:

A direct and anonymous survey was conducted among persons over 20 years of age through a specially developed questionnaire on the Google Forms platform. The survey consists of 42 questions, which are divided into sections with options to skip some of them, if respondents did not answer positively to specific key questions. The first part of the questionnaire includes questions that specify the socio-demographic characteristics of the respondents (gender, age, marital status, profession, specialty, work experience, work sector, etc.). The questions are then divided into several sections through which we have explored the usability of the health service before and during the COVID-19 pandemic, the methods used to prevent and limit the spread of the virus, morbidity, self-rated health and social status before and at the end of the pandemic, social restrictions, some economic costs and consequences for the individual, family and society. The survey aims to determine the medical, social and economic consequences of the impact of the SARS-CoV-2 virus on people and society.

Respondents were provided with information regarding the purpose and objectives of the study.

Scope of the study:

The research is based on a statistical sample, representatively formed according to the determined units and indicators of the observation. It includes health-insured persons over 20 years of age ($n = 645$), for whom there are no exclusion criteria from the study. The sample has improbability and accidental character, it involves random selection of the units of the population.

The respondents were divided into several groups: by gender (382 women and 263 men), place of residence (capital city, regional city, city and village), social status, monthly income, work experience, field of work (health care, education, production, trade, security, administration, law, services, etc.), by work sector (public, private, and a combination of both) and marital status.

Selection criteria

Criteria for the inclusion of persons - all adult insured persons who voluntarily gave their consent to participate in the study were included in the study. An anonymity is guaranteed to all participants.

Exclusion criteria - none.

Monitoring bodies:

For the most part, the research was done by the dissertation student. When distributing the questionnaire to the respondents, the purpose, tasks and the use of the study's results were explained. In the process of gathering information, the assistance and cooperation of the research contingent was sought.

Methods used:

1. Documentary method - documents on the activity and organization of the health system in the Republic of Bulgaria before and during the COVID-19 pandemic were studied and analyzed. These data from various institutions (Ministry of Health, National Health Insurance Fund, Regional Health Inspectorates, National Statistical Institute, National Center for Public Health and Analysis, etc.) and global databases (Eurostat, World Bank, WHO, etc.) were used.
2. Sociological method - a survey method for researching the opinion of persons over 20 years of age regarding the impact of COVID-19 and its medical, social and economic consequences on people's lives.
3. Economic method - to study the economic aspects and consequences of the effect of the SARS-CoV-2 virus on public health, to develop an economic analysis and evaluate the activity of health institutions during the COVID-19 pandemic and evaluate the economic efficiency of the measures taken to protect, treat and restore the health of people in the population.
4. Mathematical and statistical methods:
   - Frequency analysis of quantitative and qualitative variables. Absolute and relative frequencies are included.
   - Alternative analysis – comparing relative shares for statistical significance of differences.
   - Analysis of Variance – analysis was used to process the quantifiable units.

- Correlation analysis – correlation dependences were evaluated by Pearson's Phi correlation coefficient and Kramer's contingency coefficient.
- Non-parametric analysis - Chi-square method - this method evaluates the statistical reliability of differences. Differences are considered significant at the $p<0.05$ level. The chi-square statistic is used - Fisher's Exact Test, x^2 (Pearson Chi-Square). Kruskal-Wallis and Mann-Whitney non-parametric tests were also used.
- Graphical analysis - it is used to visualize the observed processes and phenomena, as well as to illustrate certain regularities and dependencies.

The statistical processing of the primary data was carried out with software packages Microsoft Office Excel and with a statistical package of application programs - SPSS, and the method of interpretation was consistent with the theoretical material adapted to the program package. The completed questionnaires were reviewed and the answers to the questions were coded and plotted in SPSS according to the system requirements. The predominant part of the information in the survey cards is in the form of qualitative variables. Statistics were calculated for quantitative and qualitative variables, and data were organized into appropriate univariate and multivariate tables. Graphical analysis was performed using Microsoft Office Excel, which provides better graphical presentation capabilities than SPSS.

Study research – results and discussion

I. Analysis and discussion of the survey results

Characteristics of the studied contingent

A total of 645 individuals participated in the final survey. The socio-demographic characteristics of the survey respondents are presented in Table 1:

Table 1. Socio-demographic characteristics of the participants

		N ($n = 645$)	%
Gender	women	382	59,2 %
	men	263	40,8 %
Age	20-30 y	60	9,3 %
	31-44 y	257	39,8 %
	45-54 y	197	30,5 %
	55-64 y	76	11,8 %
	65+ y	55	8,5 %
Marital status	married	372	57,7 %
	in a relationship	124	19,2 %
	divorced	39	6,0 %
	single	90	14,0 %
	widow / widower	20	3,1 %
Social status	working	518	80,3 %
	student	11	1,7 %
	working and studying	35	5,4 %
	unemployed	14	2,2 %
	pensioner	48	7,4 %
	working pensioner	19	2,9 %

When analyzing the sample by gender, it can be seen that a larger share of respondents are women ($n = 382$; 59.2%) in contrast to men ($n = 263$; 40.8%).

The average age of the respondents is 45.63±12.02 years, the minimum is 20 years, and the oldest is 86 years. The largest share of respondents ($n = 257$; 39.8%) are in the age group 31-44 year old group, followed by 45-55 years ($n = 197$; 30.5%). The share of participants over 65 is the smallest (8.5%).

Regarding the marital status of the studied contingent, the largest share is the married ($n = 372$; 57.7 %), followed by those in a relationship ($n = 124$; 19.2 %), single ($n = 90$; 14.0%) and divorced ($n = 39$; 6.0%). The relative share of widowers is small (3.1%).

80.3% of the respondents have working social status. 7.4% are pensioners, and 2.9% are working pensioners. A quarter ($n = 165$; 25.6%) of all have a monthly income between BGN 1,000 and BGN 1,500. 120 people from the sample (19.0%) have a monthly income of BGN 1,000.

Table 2 shows the distribution of respondents according to their professional direction.

Table 2. Labor and professional characteristics of the participants

		N ($n = 645$)	%
Working sector	public	240	37,2 %
	private	331	51,3 %
	both of them	74	11,5 %
Working field	healthcare	130	20,2 %
	services	120	18,6 %
	education	112	17,4 %
	trade	98	15,2 %
	administration	77	11,9 %
	manufacture	46	7,1 %
	security	31	4,8 %
	jurisdiction	9	1,4 %
	other	22	3,4 %
Working experience	up to 1 year	12	1,9 %
	2-5 y	30	4,7 %
	6-10 y	68	10,5 %
	10+ y	532	82,5 %
Education	high school	118	18,3 %
	Professional bachelor	34	5,3 %
	Bachelor	94	14,6 %
	Master	353	54,7 %
	PhD	46	7,1 %

A little over the half of the respondents (51.3%) work in the private sector, 37.2% in the public sector and 11.5% in both of them.

The largest relative share of those who completed the survey work in the "health care" sector ($n = 130$; 20.2%), followed by "services" ($n = 120$; 18.6%), "education" ($n = 112$; 17.4 %) and "trade" ($n = 98$; 15.2 %). Less than 10% of the survey participants work in "manufacture", "security", "jurisdiction", etc.

82.5% of all respondents ($n = 532$) indicated a work experience of more than 10 years, and for 264 of them it also refers to the currently held position. The average length of work experience of the study participants was 21.91±10.94 years. The minimum was 1 year and the maximum was 54 years.

Regarding education, more than half of the representative sample ($n = 353$; 54.7%) have a higher education degree "Master". A little under 1/5 of the respondents (18.3%) have a high school education.

1. Analysis and discussion of the results on indicators that determine the medical consequences of the COVID-19 pandemic

The COVID-19 pandemic began as a crisis that affected the health of a huge portion of the world's population. Bulgaria is also influenced by these world trends. Therefore, we have included topical questions in our survey to explore respondents' opinions on:

a. Prevention of the spread of the SARS-CoV-2 virus and prevention of morbidity
b. Health service usability before and at the end of the COVID-19 pandemic
c. Study of morbidity among the surveyed persons
d. Self-assessment of health

a. Prevention of the spread of the SARS-CoV-2 virus and prevention of morbidity

At the beginning of the COVID-19 pandemic, information about the causative agent and the course of the disease itself was limited, and no specific drug treatment was applied. The virus is spread by airborne droplets from an infected or asymptomatic individual through speech, sneezing, coughing, or the production of aerosols. Many people likened the illness to a more serious flu, and others compared it to the Spanish flu pandemic of 1918-1920. According to a number of health institutions, the best initial solution to prevent and limit the spread of the SARS-CoV-2 virus is by implementing preventive measures. Prevention is a set of medical and non-medical measures that society carries out to achieve better health and quality of life by preventing diseases, reducing their consequences and premature mortality. Given the limited health resources of the health care system, prevention and health promotion will contribute much more to preserving life and improving its quality than traditional medical interventions. Preventive measures include hygiene, wearing a protective mask, keeping a distance, quarantine, etc.

By order of the Minister of Health, the first actions to prevent the spread of the SARS-CoV-2 virus are a national lockdown, closing a large part of social and commercial facilities, working and studying from home, hygiene measures, etc.

In our study, we have explored some of the most common preventive measures to reduce the spread of the disease from COVID-19. In fig. 1 we have presented a distribution of the responses of the respondents. As it can be seen, 91.9% of respondents confirm wearing a protective mask during the pandemic. This is one of the first measures that have been introduced.

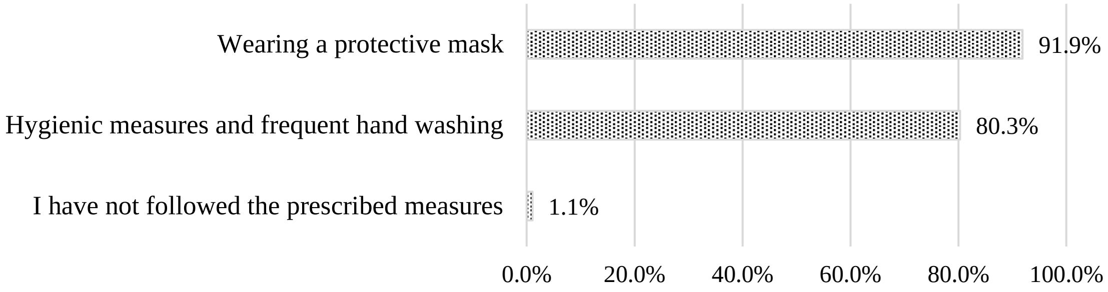

Fig. 1. Distribution of respondents' answers regarding compliance with preventive measures to reduce the spread of COVID-19

80.3% of respondents in our study reported that they followed hygiene measures and washed their hands frequently. It is essential and had influence on these results that there was a wide public activity to provide materials (applications, posters, leaflets, posts, etc.) on how to properly maintain hygiene to reduce the spread of the SARS-CoV-2 virus. Basic hygiene interventions such as hand washing with soap and water are the simplest and most effective means of preventing infectious diseases.

In the following figure, we have presented the answers of the respondents regarding the frequency of compliance with the restrictive measures:

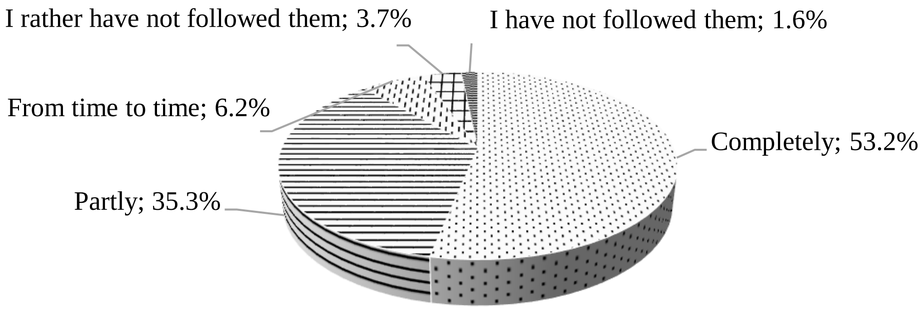

Fig. 2 Distribution of respondents' responses regarding compliance with measures to prevent the disease COVID-19

Figure 2 shows that 53.2% of the respondents fully complied with the measures, and 35.3% partially complied. The answer "from time to time" was given by 6.2%, as well as "I rather have not follow them" - 3.7%. Of all the participants, only 7 individuals (1.6%) did not strictly follow the prescribed measures to prevent and spread the SARS-CoV-2 virus. The so-called infodemic is of great importance here. According to the WHO, it is related to too much information, including false or misleading information, in the digital and/or physical environment during a disease outbreak.

Diagnosis is one of the first steps people can take. It will give information about the presence or absence of a disease from COVID-19. In the next figure, we have presented the types of testing among the respondents:

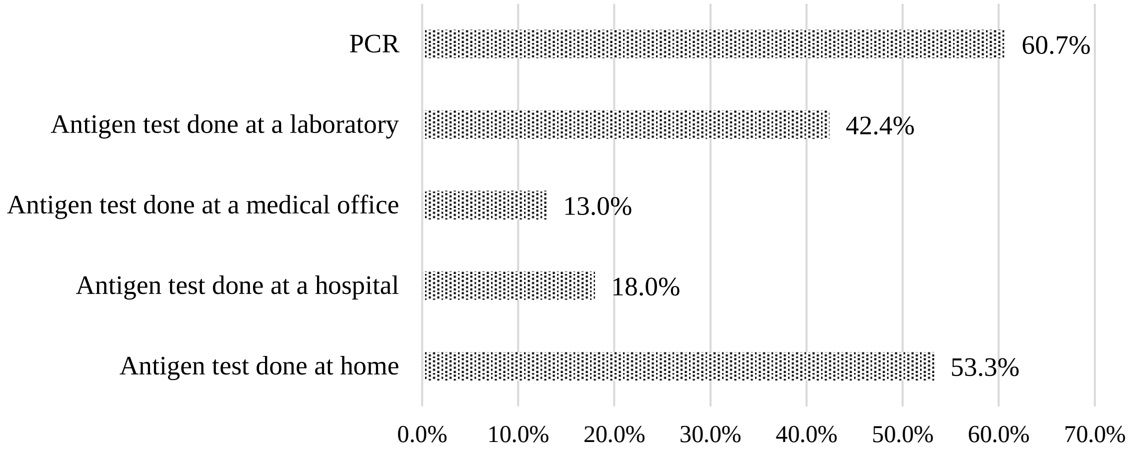

Fig. 3. Type of testing for the presence of the SARS-CoV-2 virus of the participants

A little over half of the respondents (53.3%) did an antigen test at home. The percentage of those who were tested by PCR was the highest (60.7%). Many respondents reported that they had been tested more than once, and that they had used both methods to detect viral RNA or viral antigen. The most common value of number of tests for the SARS-CoV-2 virus among respondents was 2 ($MODE = 2$). The average number of tests is $AVERAGE = 5.54$. And exactly in the middle between the minimum and the maximum is $MEDIAN = 3$.

The number of tests carried out increased slowly in 2021, which is partly explained by the inclusion of antigen tests in the official data in December 2020. Another factor in the increase is that from December 2020 GPs have the possibility to issue referrals for carrying out PCR tests, whereas previously only RHIs had the right to do so.

Regarding the vaccination for COVID-19, half of the respondents answered positively (50.2%). Without vaccines are 49.8%. No statistically significant gender difference was observed. The highest percentage of unvaccinated people is in the 31-44 age group (23.3%). In general, Bulgaria is one of the countries in Europe with the lowest vaccination rate.

b. Health service usability before and at the end of the COVID-19 pandemic

The patient's first contact with the healthcare system in our country is the general practitioner (GP). He/she is the main figure in primary medical care, which provides continuous, high-quality and adequate medical care to people's health needs. In this way, approximately 80-90% of the patient's health problems are solved. GPs have health-organizational, social and economic commitments that are related to implement access to medical/dental care, as well as improving the timeliness of this care. Primary health care is focused on patients and their needs.

Access to health care refers to the ease with which people can get the medical and health care they need. It is generally defined as the ability to use appropriate services commensurate with health needs. According to the European Charter of Patients' Rights, every person has the right to access health services in accordance with their health needs.

Before the COVID-19 pandemic, the largest percentage of respondents visited their GP twice per year (30.1%). 27.9% of them did it once. Almost the same percentage answered "three or more times" (27.0%). 81 individuals did not meet with a GP. There are various studies according to which more than 50% of health-insured persons do not go through a mandatory annual preventive examination.

In fig. 4 we have presented the distribution of respondents' responses regarding a change in their visits after the start of the COVID-19 pandemic.

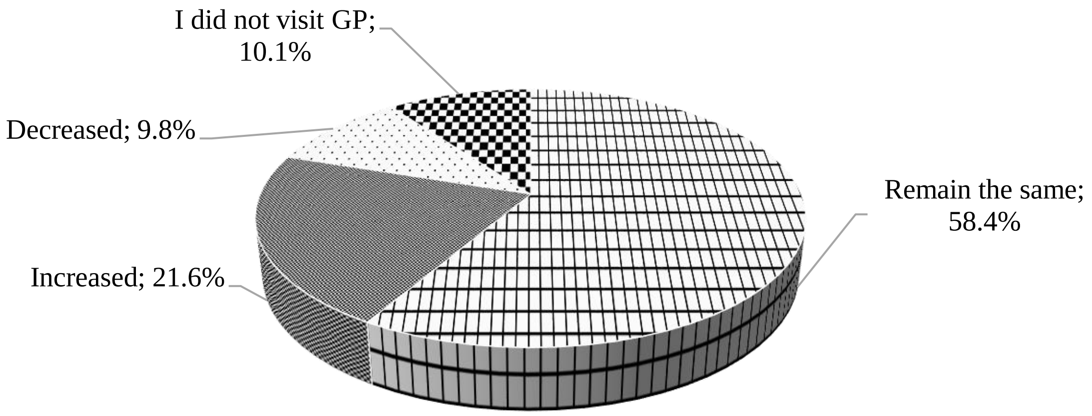

Fig. 4. Distribution of respondents' answers regarding GP visits after the start of the pandemic

As a result of the pandemic, 21.6% of respondents reported that their visits had increased, while 9.8% reported that they had decreased. Of great importance to these responses were the different constraints during the peaks of the SARS-CoV-2 virus transmission waves. Another reason we can look for was a certain amount of worry and fear on the part of patients about visiting any health facilities. From figure 4, it can be seen that in the largest percentage the visits of the respondents to their doctor remained the same (58.4%). This could be related to an established relationship, adequate communication and mutual trust between the patient and the doctor.

One of the instructions of the health authorities in the country was that in case of need for health services and care, patients should first contact their GP by phone and only then take concrete action. This was a result of high virulence of the causative agent, efforts to limit the spread of the virus, reduction of contact persons in health and medical facilities, and last but not least concern for the health status of the medical staff.

In our study, we investigated whether respondents had difficulty contacting their GP. 43.3% of them had no obstacles to contact by phone and 45.7% had no obstacle to visit her/him in person. 11.8% reported experiencing such difficulties related to visiting a specialist regarding their chronic diseases.

c. Study of morbidity among the surveyed persons

COVID-19 is an infectious disease that is transmitted by airborne droplets. Since the start of the pandemic on March 11, 2020, there have been several sub-variants of the virus, each of which has a different virulence and increases morbidity and mortality among the population to varying degrees.

From our survey results, we found that 64.5% were sick with COVID-19.

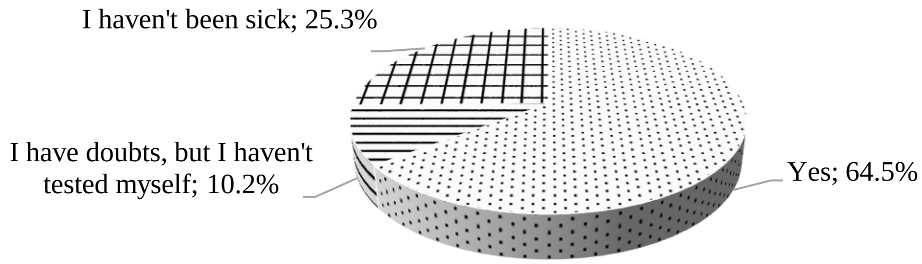

Fig. 5. Distribution of respondents' responses regarding their illness from COVID-19

10.2% had doubts, but did not get tested. No statistically significant gender differences were observed. And a quarter of the participants hadn’t been sick, which represented the health index among the studied population. It should usually be above 40%.

As it can be seen from figure 6, we have also analyzed the number of illnesses that the participants in the questionnaire noted. Some individuals had reported four cases of COVID-19. The largest share of respondents (172) were ill only once and registered in the Regional Health Inspectorates. A total of 122 persons from the respondents were infected twice, of which 43 were registered. A total of 23 people were ill three and four times, of which only 5 were registered as sick. Thus, the registered morbidity is 52.9%.

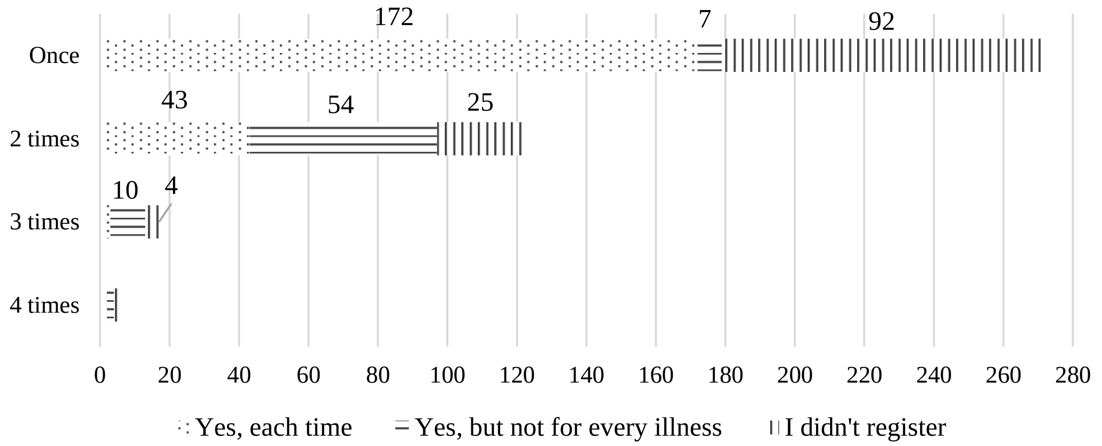

Fig. 6. Registered and hidden incidence of COVID-19 in absolute value from the study population

According to our study, the hidden morbidity was 47.1% (this includes the unregistered and those who did not register each time).

Visually, morbidity is illustrated as an iceberg, the visible part of which represents the registered morbidity, and the hidden part – the unregistered (hidden) one. In some health conditions the ratio between the visible and invisible part of the iceberg is 1:1, unfortunately it is often 1:2, meaning that the hidden morbidity is over 50% of the documented.

The coronavirus infection is highly contagious, and as such, its mandatory reporting was regulated by law. Because of the enormous public health importance of COVID-19, data on morbidity, hospitalizations, intensive care unit beds, and deaths were produced and reported daily. But still there were many cases that were not registered which we also found out through the survey conducted. The reason for the hidden morbidity might be due to the fact that not all patients had the typical symptoms of the disease. For some, they had been in the form of very mild symptoms that people tend to deny due to various fears. Another reason for this was the need for individuals to pay for laboratory tests themselves, and there were periods when GPs were not allowed to issue referrals for PCR tests. The consequences of the hidden morbidity were very serious and led to the deepening of the epidemic situation and the uncontrolled spread of the SARS-Cov-2 virus.

Regarding the place of disease treatment, we found out that 95.2% of the respondents were sick at home. As for the morbidity rate, the largest share answered "medium" (47.8%), followed by "mild" (43.3%) and "severe" (8.9%). These results had no statistically significant difference in the studied groups.

We have also investigated the duration of illness of the respondents. The average duration of illness was 13 days. The largest percentage of them were sick for one week (36.3%). Only 3.4% were ill for more than a month. No normal distribution was observed in the gender groups when examining the quantitative variables. However there was a statistically significant difference that was found by non-parametric analysis. In women, the most common value was 10 days ($MODE = 10$) and in men it was 7 days ($MODE = 7$).

Viral infection proceeds differently in each individual. In some it is without any symptoms, in others - only as a mild malaise for 1-2 days, in others - like the flu, but unfortunately there are also people in whom it is severe and with complications. According to the study population from our survey, 68.3% denied having complications after COVID-19. 31.7% gave a positive answer.

We've also looked at the results by gender:

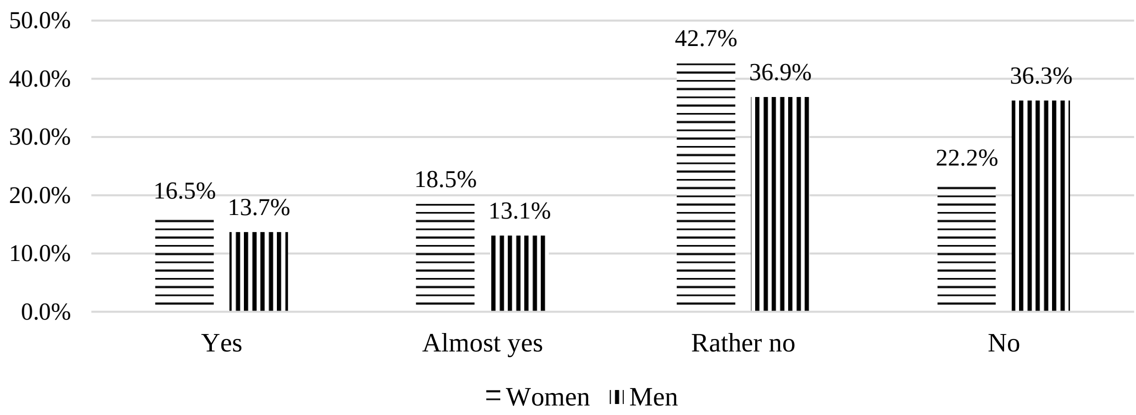

Fig. 7. Distribution of respondents' answers by gender regarding complications after having passed COVID-19, $p<0.05$

As it can be seen from the figure, the most significant difference was the categorical denial of the examined persons for the presence of complications after an illness caused by SARS-CoV-2. The share of men to a much greater extent denied such complications (36.3%) in contrast to women (22.2%). In the remaining categories "rather no", "almost yes" and "yes" women had a larger relative share. The reason for this may be due to the fact that males were more inclined to neglect not only the disease, its course, but also the consequences that could remain after it.

The statistically significant difference between women and men for the need for additional days to recover after recovering from COVID-19 is clearly visible in Figure 8:

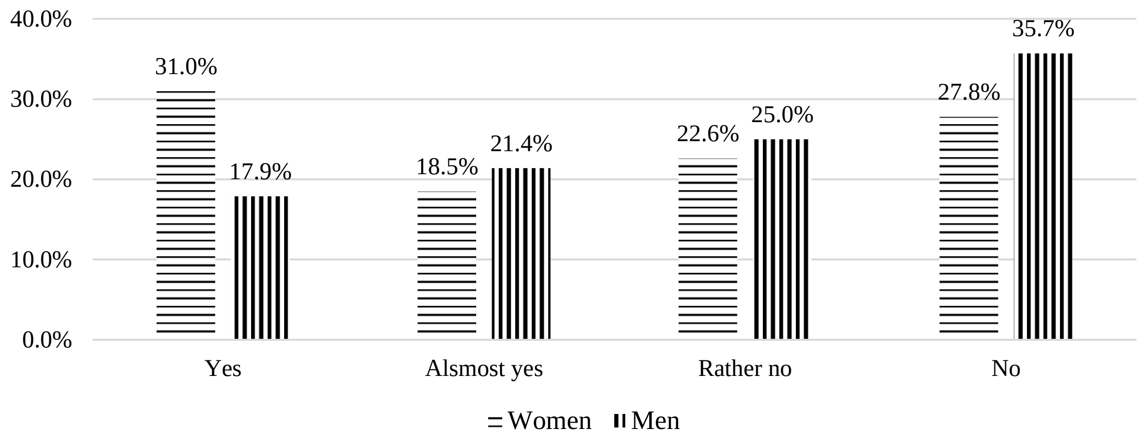

Fig. 8. Distribution of respondents' answers by gender regarding the need for additional days for recovery after having passed COVID-19, $p<0.05$

31.0% of women strongly confirmed the need for additional recovery days after being sick with COVID-19, compared to only 17.9% of men. When looking at a categorical negative answer "no", it had a larger share among men (35.7%) in contrast to women, where it was 27.8%.

The largest percentage of respondents (38.2%) answered that it took them up to a month to feel well again. 28.6% of them indicated one week for this. Here, no significant differences were observed by gender, but only by age groups, work sector and work experience.

It was interesting to investigate how the respondents felt after being sick from COVID-19 and what was their readiness to return to their usual duties and work (see Fig. 9). As it could be seen from the figure, 45.4% of the respondents felt heathty and ready to return to their usual duties and work process. Unfortunately, a significant percentage of the study population reported that they did not feel well, but returned to work. The reason for this might be the so-called prolonged COVID-19 or post-covid syndrome. It is most often characterized by persistent signs, symptoms, and conditions that persist or develop after the acute form of infection caused by the SARS-CoV-2 virus.

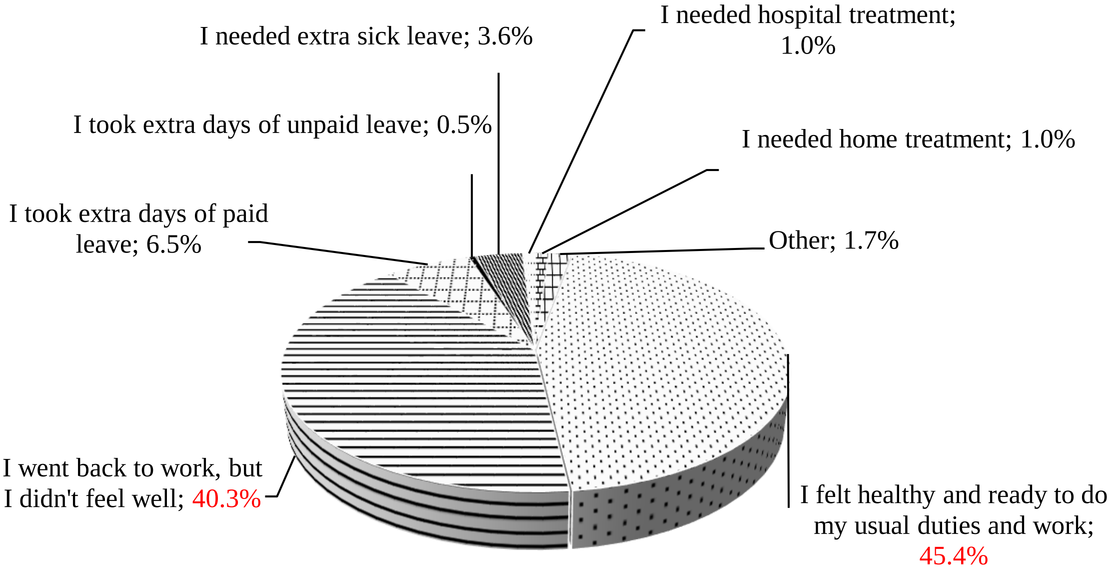

Fig. 9. Distribution of respondents' answers regarding their readiness to return to their usual duties and work

The beginning of a long COVID-19 is considered the continuation of complaints of the sick after the end of the fourth week. These complaints can last for weeks, months or years. According to various studies, it has been found to occur in people with "severe" or repeated course of the disease. Unfortunately, there is no insurance against post-COVID-19 syndrome, anyone can experience it. Vulnerable groups of the population are particularly prone to its manifestation and development. The COVID-19 pandemic has exacerbated health disparities and reinforced the importance of addressing health disparities that result from social and economic inequalities among different population groups.

d. Self-assessment of health

Self-assessment of health is one of the main and basic indicators. WHO researchers accept that when defining their health, people generally make a comprehensive assessment of the presence /or absence/ of diseases, functional limitations and problems in performing health-related activities of daily living. The level of subjective health is analyzed using the indicator "relative share of persons with poor health", i.e. the share of persons who defined their health as "fair", "poor" or "very poor", taken together.

Self-assessment of one's own health is an assessment of the individual's physical and mental state as sensations. This indicator is difficult to determine with only one definition, because a number of components, different for all individuals, are included in its formation. This assessment depends in a complex way on physical health, psychological state, degree of independence and relationships with the environment. The presence or absence of a clinical diagnosis is not sufficient to determine an individual's overall health status.

Fig. 10 presents the results comparing the answers of the participants' self-assessments before and after the COVID-19 pandemic.

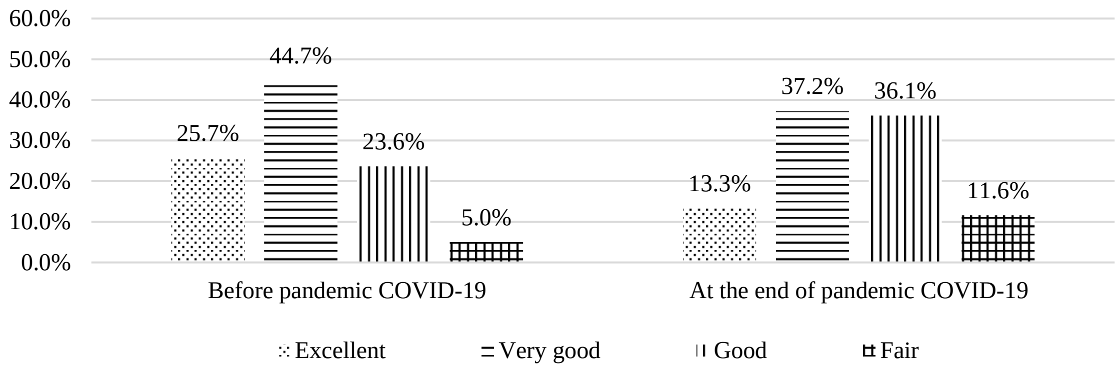

Fig. 10. Distribution of respondents' answers regarding self-assessment of their own health status before and after the COVID-19 pandemic

From figure 10, it could be seen that respondents self-defined their health as "excellent" and "very good" before the pandemic to a higher degree, 25.7% and 44.7%, respectively. However after the pandemic, both categories had lower percentages. "Excellent" health decreased to 13.3%, and "very good" to 37.2%. At the same time, there was an increase in self-defined health "good" - before the pandemic it was 23.6%, and after - 36.1%. This is also observed for the "fair" category from 5% to 11.6%. 0.5% of respondents indicated a "poor" state of health before the onset of the coronavirus, and 1.2% at the end.

In the next figure, we have also presented the results by gender, where there are statistically significant differences. 38.2% of the surveyed women self-defined their health at the time of the survey as "very good" (Fig. 11).

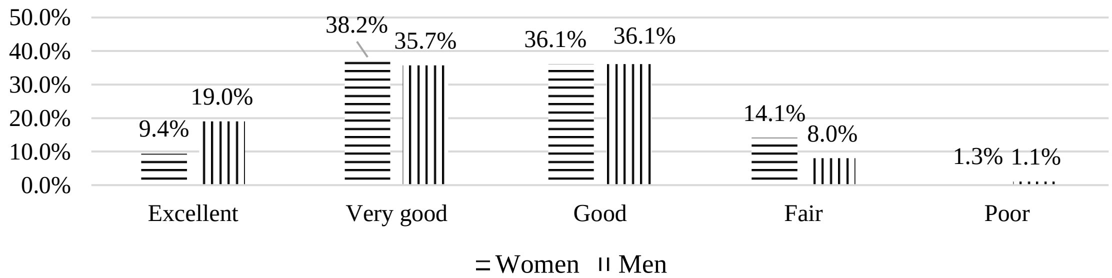

Fig. 11 Distribution of respondents' responses by gender regarding self-assessment of their health status at the end of the COVID-19 pandemic, $p<0.05$

Among men, the percentage of those who self-defined it as "good" was the highest (36.1%). There were greater differences in the category "excellent", which was indicated by 19.0% of men and 9.4% of women. These results could be explained by the fact that usually men do not pay attention in detail to all their sensations. Unlike women, who look much more into different symptoms and feelings. Usually, women more often seek medical help and make consultations with relevant specialists. There were also differences when noting the category of "fair" state of health - only 8% of men indicate this answer, in contrast to 14.1% of women.

Statistically dependent differences also exist in the distribution of responses by age group.

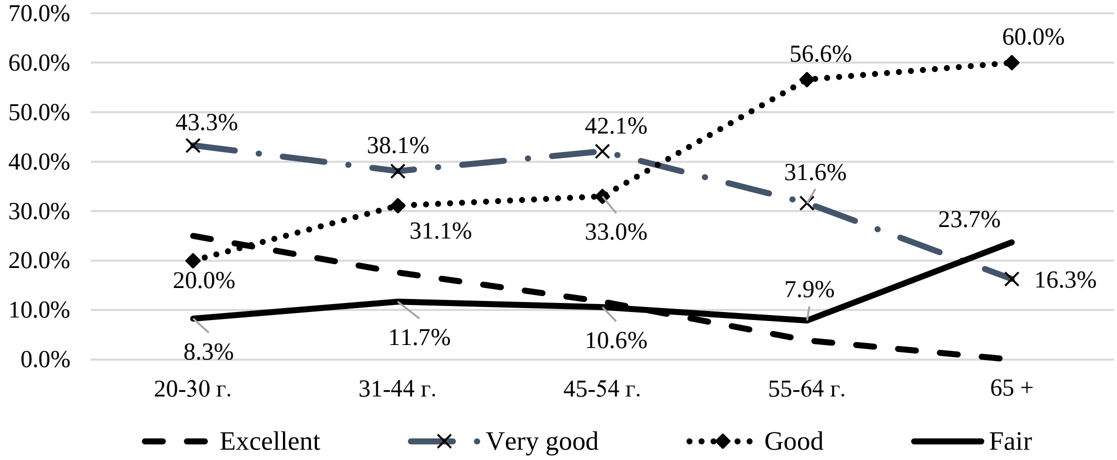

Fig. 12. Distribution of respondents' answers regarding self-determination of their health status by age group, $p<0.05$

As it could be seen from the figure, with increasing age, the categories "excellent" and "very good" health status decreased, while "good" and "fair" increased.

It is important not to forget that self-esteem is a subjective feeling of the individual and is influenced by many factors. Often health practitioners are more critical of themselves and/or ignore certain symptoms concerning their own health.

2. Analysis and discussion of the results of the survey on the indicators that determine the social consequences of the COVID-19 pandemic

The COVID-19 pandemic has in different ways challenged not only the health, but also the social systems in many countries around the world. The reason for this is the introduced prescriptions and restrictions on social life, as well as periodic lockdowns. All this led to periods of social isolation, changes in the labor process, disruptions in transport, travel, organization of cultural and sports events, etc. We have investigated the social consequences of the impact of the SARS-Cov-2 virus on the population by:

a. Impact of social isolation;
b. Work from home;
c. Labor change and job losses during the COVID-19 pandemic;

d. Absenteeism due to illness from COVID-19;

e. Self-assessment of the social state at the end of the pandemic.

a. Impact of social isolation

Social restrictions during the COVID-19 pandemic were particularly pronounced by the government and the institutions. Within a few days after the official announcement of the pandemic by the WHO in Bulgaria, a number of measures were also announced that were mandatory for individuals, families/households, workers, employers and society as a whole. These limitations were associated with isolation, loneliness, and individuals feeling alone. It happens that these three concepts are used interchangeably, but a distinction must be made between them.

It is good to distinguish between social and emotional loneliness as two qualitatively different types of loneliness. Social occurs when the number of social ties is too few, while emotional refers to the lack of an attachment figure or intimate relationship as a partner.

Any individual at a certain stage of his/her life could find himself/herself in a situation of social isolation. In some cases it may be voluntary and in others not. One can be lonely in a room full of people. Sometimes there are situations in which the individual is alone, but he/she does not always feel lonely.

In the following figure, we have presented the results of the survey regarding the social isolation of the respondents. As it could be seen, just under half of the respondents avoided crowded places (45.0%), maintained a social distance of 2m in public places (44.3%) and avoided leaving home without an important reason for this (43.7%). These results could be explained by the measures introduced by the governing institutions in relation to limiting the spread of COVID-19.

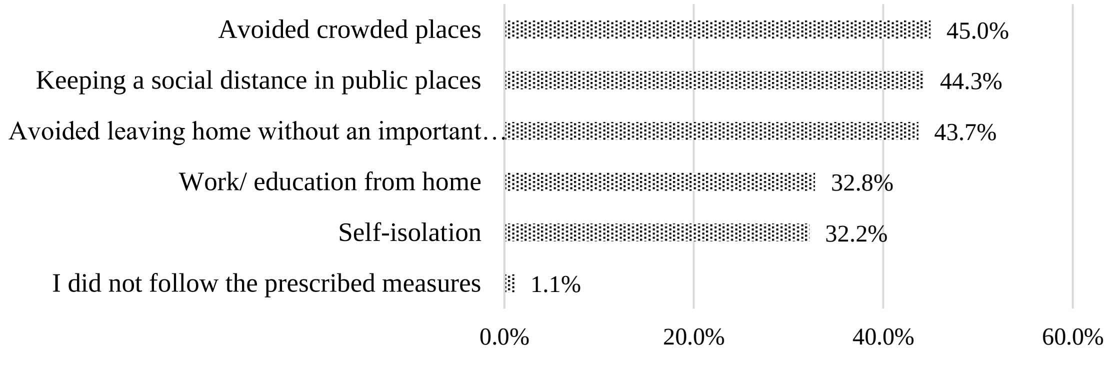

Fig. 13. Distribution of respondents' answers regarding different forms of social isolation during the COVID-19 pandemic

We have also looked at the results by age group, because we think that some of the differences show some peculiarities, as well as behavior characteristics of the respective groups (see fig. 14). To the greatest extent, people over 65 avoided leaving their homes (67.3%), but at the same time, only 38.2% of them kept the distance of 2 m in public places. The same age group was also characterized by self-isolation in the highest relative proportion (45.5%). This behavior could be explained by the fact that most of them were retired, followed the various information channels strictly, often had at least one accompanying illness and were afraid of getting sick.

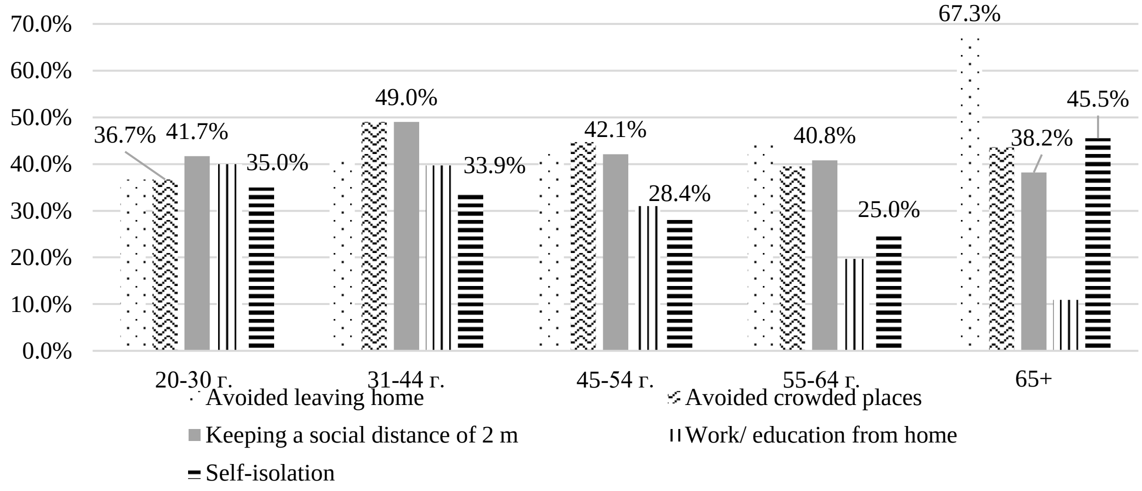

Fig. 14 Distribution of respondents' responses on social isolation during the COVID-19 pandemic

In the smallest percentage (36.7%) of all respondents, persons aged between 20 and 30, avoided places where it was assumed that there could be a gathering of people. This age group had the highest share (40.0%) of individuals who worked and/or studied from home during the COVID-19 pandemic.

As it could be seen from the figure, the representatives in the age group 31-44 years observed the social distance of 2 m to the highest degree and avoided places where there was a gathering of people (49.0%). We could explain these results by the fact that most often it concerned people who had families, small children and/or elderly parents. They were responsible enough to themselves and to society and followed the prescribed measures to reduce the spread of the infection.

We have also investigated the exact limitations of the social relationships of our survey participants. The highest share of them (34.7%) answered that during the pandemic they lost their usual social contacts. This was due to the restrictions imposed to reduce the spread of the virus. Only 13.1% experienced a feeling of loneliness.

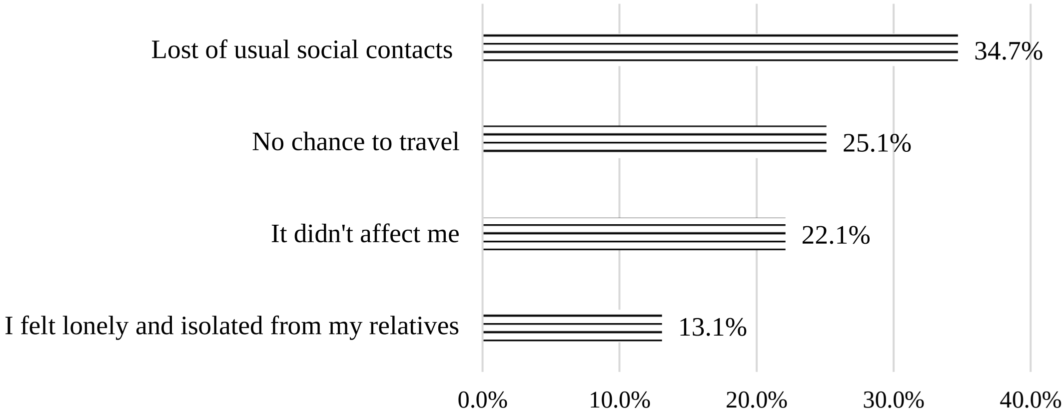

Fig. 15. Distribution of respondents' answers regarding reflection of social isolation

Social isolation often leads to other conditions such as depression, apathy, and anxiety. It can also lead to problems and loss of sleep, panic attacks, etc. In our study, we found out that 25.3% of respondents experienced anxiety and 16.7% had sleep problems. Some form of depression was experienced by 7.2% of the respondents.

Other commonly experienced sensations, especially at the beginning of the pandemic in 2020, when information about the cause, the disease and the consequences are still unknown, were different types of fears. In our survey, 21.7% of the participants experienced the fear of a family member falling ill.

b. Work from home

The pandemic has significantly changed the way people live globally. A number of industries and their activity were affected. Thus, there was a health, social, psychological and economic impact on the family. People complied with the anti-epidemic measures, a large part of them worked from their homes, the students/pupils were trained online, a large part of the commercial establishments were closed, etc.

One of the biggest changes from the pandemic was the sudden shift to working from home. Whether they were prepared or not, within a day organizations had to switch to perform from a distance. Working from home became the new normal, but we had also witnessed a change in working hours.

Figure 16 presents the results of the survey on how participants worked during the COVID-19 pandemic:

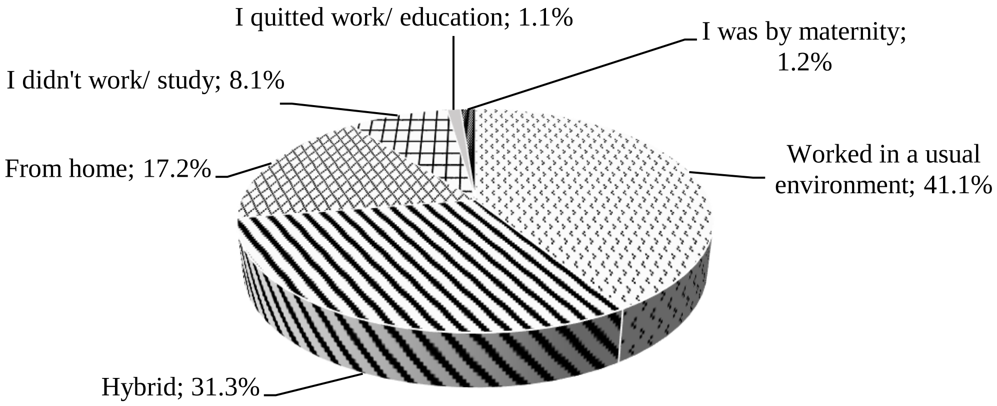

Fig. 16 Distribution of respondents' answers regarding work/study during the COVID-19 pandemic

As you can see from the figure, the largest percentage of respondents answered that during the pandemic they continued to work/study in a usual environment ($n = 265; 41.1\%$). Approximately one-third indicated that they were in a hybrid environment, working/studying in a usual setting for a part of the time and online ($n = 202$; 31.3%). 17.2% of the respondents worked (studied) entirely from home.

In Figure 17, we have presented the results of the respondents' answers by gender to show the statistically significant differences ($p<0.05$).

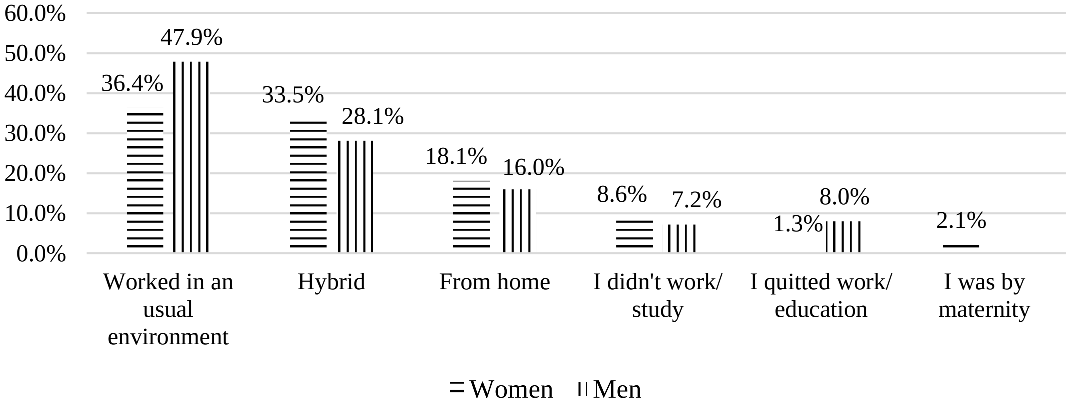

Fig. 17. Distribution by gender of respondents' answers regarding the form of the labor process during the COVID-19 pandemic, $p<0.05$

This may also explain the results of our research, that almost half of men (47.9%) continued to work in their usual work settings compared to 36.4% of women. The result for women was probably a consequence of their commitment to childcare in the family, because during the pandemic there were restrictions on visits to kindergartens and schools. Nearly 1/3 of respondents of both sexes were in a hybrid environment. Of interest were the 8% of men who had left work or stopped their education.

We also investigated the duration of working from home among the respondents. On average, about a year was the time during which 47.3% (in a total of 305 persons; women -192, and men - 113) of the respondents worked/studied from home at some stage since the start of the pandemic. No statistically significant gender difference was observed and there was no normal distribution in the two gender groups. The minimum period for working from home was one month, and the maximum was 36 months, and these periods were taken into account until the survey was carried out in April 2023.

From the start, the pandemic has shown the importance of remote work and online collaboration technologies. This has accelerated the introduction of various innovations in the workplace as organizations have become dependent on them to continue their work in a new environment. There was a heavy reliance on various communication platforms.

While working from home, employees had to work for their monthly salary, communicate effectively with their colleagues, and also take care of their children. In general, one of the serious challenges related to the pandemic is to balance between work and personal life.

c. Labor change and job losses during the COVID-19 pandemic

Keeping a job, especially in unforeseen circumstances, is of utmost importance to people. It gives them the confidence that they can face and get through these uncertain times in their lives. In fig. 18 we have presented the responses of the respondents regarding their concerns about keeping their jobs.

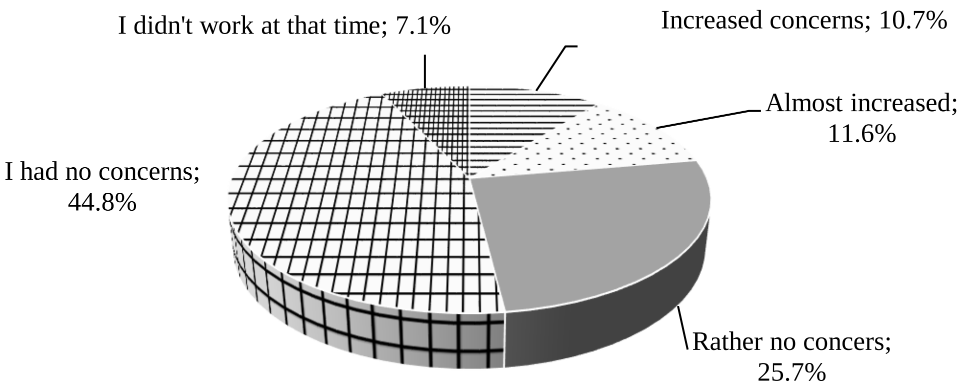

Fig. 18. Distribution of respondents' answers regarding their concerns about their job

As it can be seen from the figure, 44.8% of the respondents had no concerns about the security of their working position. A firm positive answer was given by 10.7%, and "almost increased" by 11.6%. As a result of the pandemic, different subjective sensations were observed in people, with some being more pronounced and others less so. Much of the literature has examined the subjective well-being, anxiety, and depression that could occur due to work-related uncertainty.

When looking at the results by group, we found that there was a statistically significant difference between the respondents depending on the work sector (p<0.05). Private sector employees had greater concerns about their jobs compared to those in the public sector.

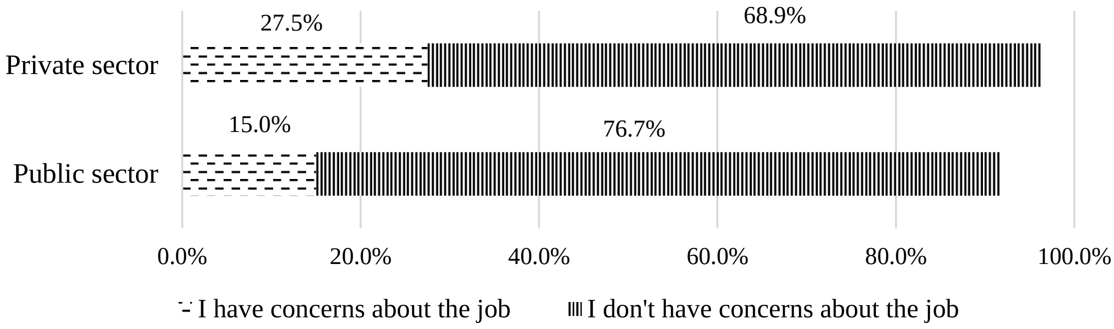

Fig. 19 Distribution of respondents' answers regarding their concerns about their job, depending on their work sector, p<0.05

During financial or economic crises, it is not uncommon to see a change in job position, employer, and sometimes even profession. In the following figure, we have presented the relative share of respondents who reported a change in their work activity during the COVID-19 pandemic:

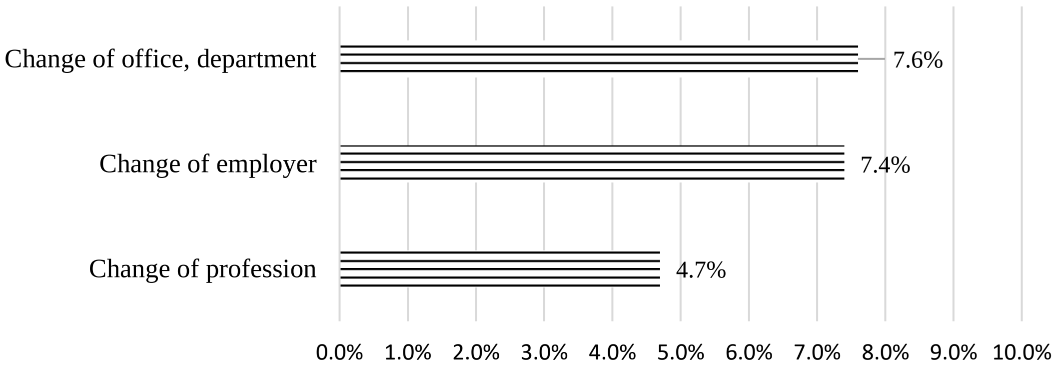

Fig. 20. Change of office, employer and profession during the COVID-19 pandemic

7.6% of respondents indicated that they had changed offices or departments during the COVID-19 pandemic. 7.4% of them reported a change of employer. Unfortunately, some indicated that they had to change their profession as well. This was understandable, because many organizations vacated leased offices, redeployed some of their workers, releasing some of them to the labor market.

Of the 645 individuals surveyed, 5.1% ($n = 33$) reported losing their job after the start of the COVID-19 pandemic. Our results match and confirm the national data in

Bulgaria. During the corona virus crisis, the labor market was relatively resistant to negative processes. In principle, unemployment on the territory of our country was unevenly distributed. Well-educated people living in urban regions had good prospects. Difficulties were observed in smaller settlements, due to a decrease in job opportunities in these areas.

Our study confirmed the impact of unemployment as a result of the COVID-19 pandemic. It is important to study and analyze it, because in this way it will be possible to support health policy and practice to develop mechanisms to reduce its consequences. Unemployment is associated with reduced income, which leads to lower consumption by people because they lack economic capacity, and this is associated with an increase in social inequalities. State-provided unemployment benefits are increased, generating a larger payout of public money.

d. Absenteeism due to illness from COVID-19

The morbidity of COVID-19 is significant among the global population during the pandemic, especially depending on its periodicity (peak waves). It spreads among all ages of the population. A large proportion of absences from the workplace after March 2020 were due to illness of the worker himself or a member of his family/household. The social losses from this were serious - in terms of the individual himself, his colleagues, the work, the employer and the production of goods or services. We have analyzed the data from the conducted research among 645 individuals. Of all respondents, 64.5% ($n = 416$) reported that they suffered from COVID-19. Of these, 76.7% were absent from work and 23.3% were not, which could be explained by the fact that they were working online or on paid leave at the same time.

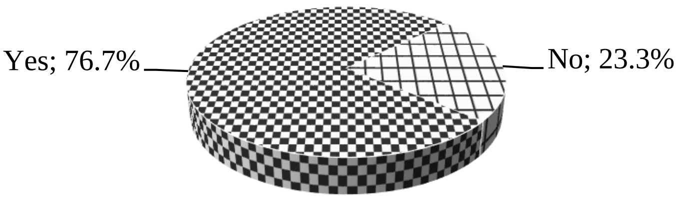

Fig. 21. Distribution of respondents' answers to work/study absences due to COVID-19 Illness

In the next figure, we have presented the distribution of the number of days on which the respondents were absent, divided into several groups:

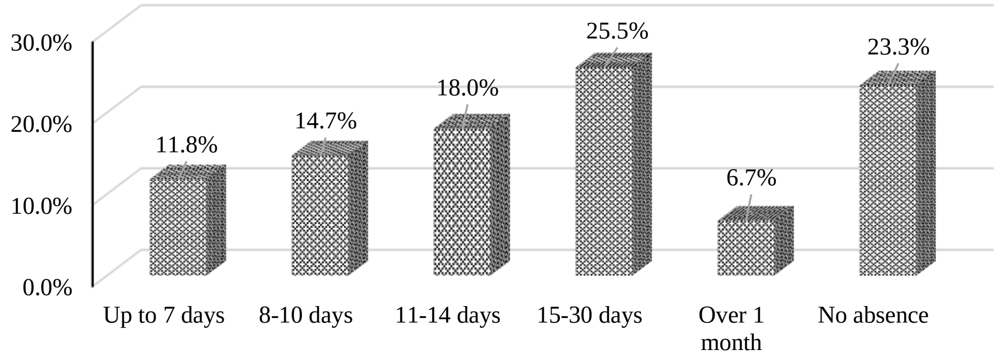

Fig. 22. Distribution of respondents, regarding the number of days they were absent from work

The relative percentage of respondents (25.5%) who were absent between 15 and 30 days was the largest. In second place was the period between 11 and 14 days, it occurred in 18% of the survey participants. The average number of absenteeism days was 18±13.9. The most common value was 14 days.

In our research, we found that 82.2% of the respondents were under quarantine due to a disease of COVID-19. The average period of quarantine was 16 days (minimum 7 days and maximum 67 days). The most common value was 14 days.

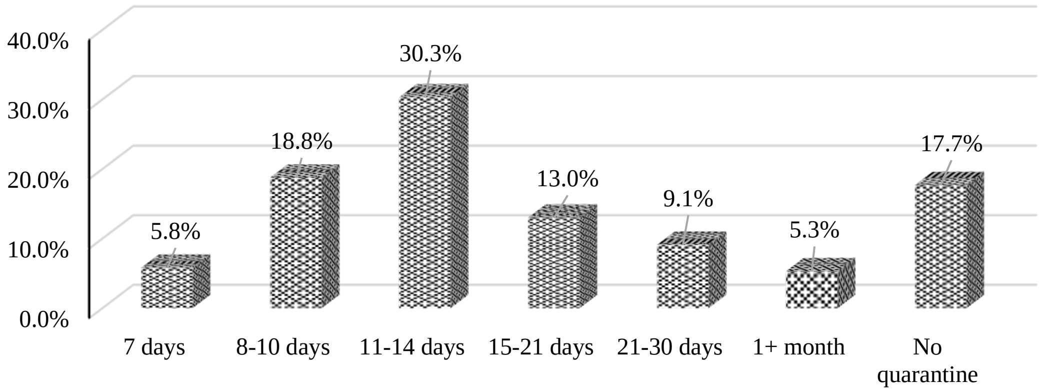

Fig. 23. Distribution of respondents' answers regarding the duration of the quarantine

As it can be seen from the figure, just under a third of the respondents were quarantined for 14 days. 18.8% reported staying at home for 10 days. There were almost the same number of individuals who were not under quarantine. This could be explained by the fact that some of the respondents worked from home.

In many of the studies done, it has been found that COVID-19 can lead to a high economic burden through reduced productivity due to absenteeism, especially among those working in health and medical facilities.

e. Self-assessment of the social status at the end of the pandemic

Good health invariably includes social relationships within the family and beyond (at the workplace, in various formal and informal groups, etc.). In our study, we found that at the end of the pandemic, the social status of the respondents was in the highest percentage of "very good" ($n = 237$; 36.7%).

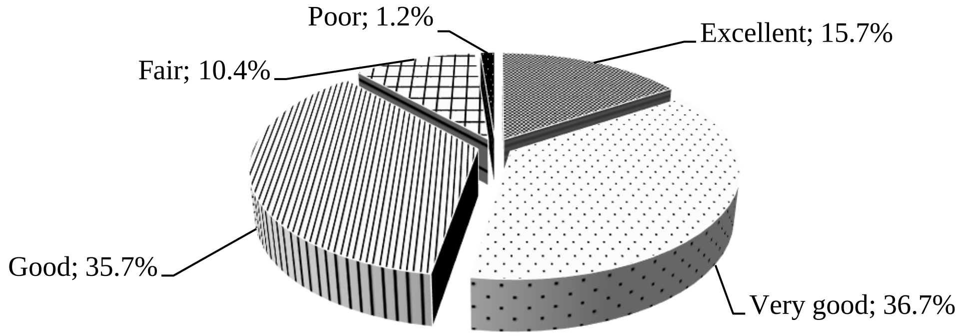

Fig. 24. Distribution of respondents' answers regarding their social status at the end of the COVID-19 pandemic

The figure shows that 10.4% of the survey participants indicated a "fair" response ($n = 67$; 10.4%). Only 15.7% of all self-identified their social status as "excellent".

COVID-19 has caused severe stress to all of humanity and no one has been able to control it. From a historical point of view, every pandemic has a beginning and an end, but the main problems are its intensity and duration. One of the big challenges with social consequences is the new real environment we have to get used to living with, isolation from our loved ones and acquaintances, etc.

Because of the regulations and arrangements, many people have experienced social isolation, and some vulnerable groups – such as older people and people with disabilities – have been particularly hard hit. As loneliness has consequences for people's long-term mental and physical health, the consequences of the pandemic are significant for health and social care in general.

3. Analysis and discussion of survey results on indicators that determine economic consequences of the COVID-19 pandemic

In our survey, we have also explored some economic implications for individuals related to the COVID-19 pandemic. Here we have included:

a. Medical expenses for diagnosis and treatment;

b. Change in income during the pandemic;

c. Exploring economic well-being at the end of the pandemic

a. Medical expenses for diagnosis and treatment

During the COVID-19 pandemic, people had additional costs for the prevention of the virus, diagnosis for the presence/absence and subsequent treatment of the infectious disease. Much of these costs are paid directly out of the patient's pocket, which we will investigate and analyze here.

The diagnosis of the disease is carried out by tests (at a health settings or at home). In connection with the study of economic consequences, we are interested in how much the respondents paid to make them:

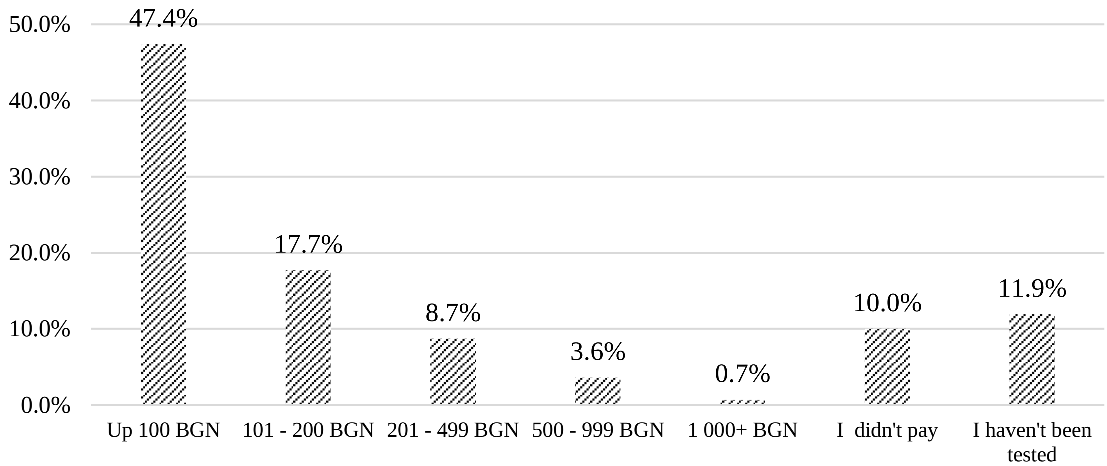

Fig. 25 Distribution of respondents regarding the amount they paid for SARS-CoV-2 virus diagnostics

As could be seen from the figure, the largest share of the respondents (47.4%) indicated that they spent up to BGN 100 of their income for testing for the presence or absence of the virus that causes COVID-19. A little under a fifth was allocated up to BGN 200. Under 5% gave over BGN 500 for tests. In certain periods, additional funds were allocated from the budget of the health insurance fund, and this explained the 10% of respondents who did not pay for laboratory tests. The organization was very easy for people – after calling the general practitioner based on suspicions of infection, each individual, through a provided code, visited a selected laboratory in which he/she would be tested. This became possible thanks to developed software improvements in the used electronic platforms (programs) in the field of healthcare. We could say that this is one of the great advantages and achievements during the COVID-19 pandemic.

The minimum amount allocated for establishing the presence of the SARS-CoV-2 virus was BGN 15. And the maximum amount was BGN 2,000. The average value among the studied group was BGN 141. The most common value was BGN 100 ($MODE = 100$). So was the amount that was exactly in the middle between the minimum and the maximum ($MEDIAN = 100$).

In figure 26, we have presented the results of the survey regarding the respondents' ability to purchase all the necessary medications for the treatment of the disease caused by the SARS-CoV-2 virus:

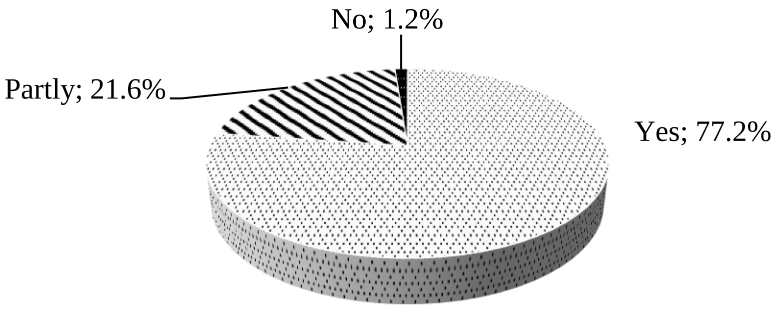

Fig. 26 Distribution of respondents' answers regarding their ability to purchase all necessary medications for the treatment of COVID-19

77.2% of survey participants confirm their ability to purchase all necessary medications (medicines) for the treatment of the disease COVID-19. In most cases, patients followed the recommendations of doctors regarding the treatment of this infectious disease. WHO has also made numerous recommendations and provides guidelines for its management. Just over a fifth (21.6%) indicated that they had a partial opportunity purchasing them. The socio-economic status of individuals could be cited as a reason for this. A categorical negative answer was given by just over 1% of the respondents. No statistically significant group differences were observed.

We have also investigated the possibility of the respondents to purchase an additional medical device for monitoring the condition during the illness itself. Almost half of the target group did not have to take one (49.4%). 32.7% of them bought a pulse oximeter to monitor blood oxygen saturation. About 5% bought a blood pressure monitor and an inhaler. No statistically significant group differences were observed.

In the following figure (Fig. 27), we have presented the distribution based on the amounts allocated for the treatment of COVID-19, sorting them into five groups:

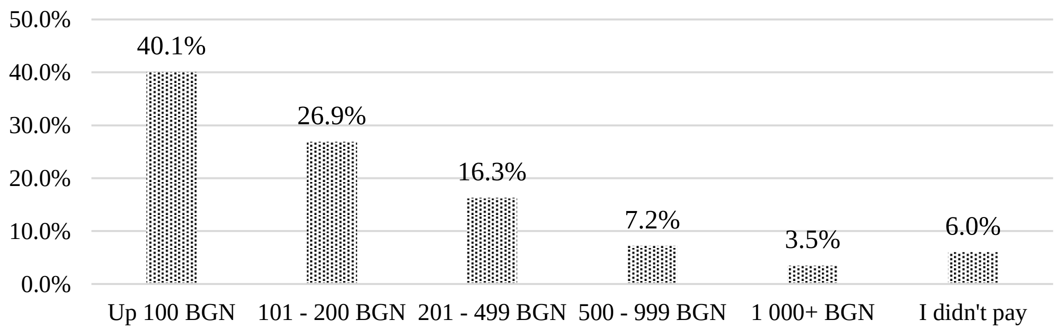

Fig. 27. Distribution of respondents' answers regarding the amount allocated for the treatment of COVID-19

The average value of the amount allocated for the treatment of the disease COVID-19 was BGN 238. The most common amount was BGN 200 ($MODE = 200$). And the amount that was exactly in the middle between the minimum and the maximum was 150 (MEDIAN=150). We also established the minimum amount (BGN 20) and the maximum (BGN 5,000). The largest share of respondents who spent up to BGN 100 for their treatment for the coronavirus infection (40.1%). A little over a quarter of them paid between BGN 101 and 200. 16.3% gave between BGN 201 and 499. Over BGN 500 was indicated by 7.2%, and over BGN 1,000 by 3.5%. The difference between the groups was determined by the severity of the course of the disease. 6% of all did not pay for their treatment, because most likely the disease occurred without specific symptoms at home. There were no statistically significant differences by gender, age group, place of residence, etc.

It should be noted that 229 individuals from the study group did not have COVID-19 and this 35.5% of the overall sample was excluded from the data presented in the figure.

Voluntary health insurance contributes to reducing direct payments by individuals. We believe that its role in the future will be significant because more and more organizations and private structures will offer this extra to their employees. Currently, the share of voluntary insurance is quite insignificant compared to mandatory health insurance.

In some insurance companies, basic and additional covers include death due to illness from COVID-19 and its complications, hospital and home treatment benefits, temporary disability benefits, as well as offers for permanently reduced or lost working capacity. Some insurers offer products that include the costs of medication, examinations and tests (including a test for the coronavirus). There are also specific products for certain groups - Accident insurance for students, children and staff in educational and childcare facilities with cover for COVID-19.

In our survey, 73.3% of all respondents did not have voluntary health insurance. Only 26.7% of them gave a positive answer.

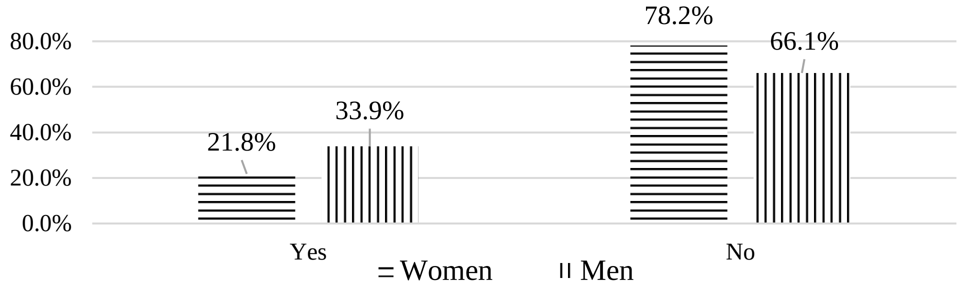

Fig. 28. Distribution of respondents' answers by gender regarding the availability of voluntary health insurance, $p<0.05$

When looking at the results by gender, statistically significant differences were observed (Fig. 28). 33.9% of men reported having voluntary health insurance against 21.8% of women.

Differences by age groups are also statistically significant. The percentage of respondents in the age group 31-44 who have additional voluntary health insurance was the highest (33.8%). The relative share in the 45-54 age group was slightly lower (29.0%). These results could be explained by the fact that these were people in active working age and often organizations took out such corporate insurance for their employees in order to maintain a healthy society and desire for better labor achievements. As well as with the fact that on the part of insurance companies in health insurance, it came to the appearance of new products, as well as the expansion of existing ones. For those traveling abroad – insurance companies include the risk of illness from COVID-19, covering medical expenses related to the diagnosis and treatment of the disease abroad.

The respondents from the group 20-30 years old (18.9%) and those 55-64 years old (14.6%) follow. For the representatives of the age group over 65, we found out that only 3.3% had voluntary insurance, which could be explained and related to the termination of their work and retirement of the individuals.

People's work sector was also of great importance:

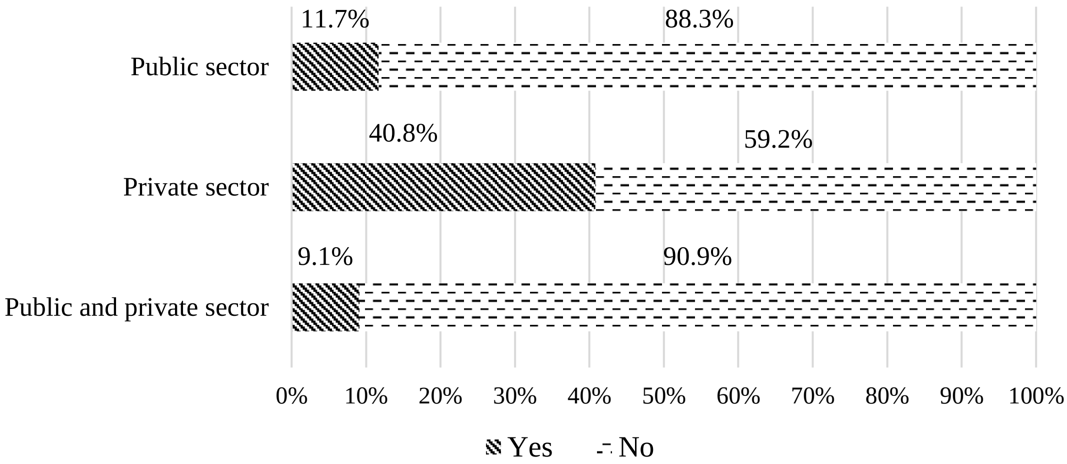

Fig. 29. Distribution of respondents' answers by work sector regarding additional voluntary health insurance, $p< 0.05$

As it can be seen from figure 29, 40.8% of respondents who worked in the private sector had additional voluntary health insurance. This once again confirmed the claims that organizations took out such corporate insurance for their employees intending to maintain a healthy society and a desire for better work performance.

Only 11.7% had additional insurance in the public sector.

Regarding reimbursement, the average amount was BGN 147.30 among only 3.5% of the studied sample. The minimum amount was BGN 40, and the maximum was BGN 400. The most common amount, as well as the one in the middle, was BGN 100 ($MODE = 100, MEDIAN = 100$).

Unfortunately, the data from our study is confirmed by other research, according to which voluntary health insurance has not fulfilled its potential to provide health services and care for the benefit of those in need. As well as we cannot point out that it is upgrading the mandatory health insurance in the country.

b. Change in income during the pandemic

Every individual over the age of 20 performs a certain type of activity (work) that provides him/her with a monthly income to cover expenses and maintain a certain standard of living. An exception is made for those who are students and are in full-time study at higher education institutions. Some students are enrolled part-time and combine work and education.

Individual income includes regular income from wage and non-wage sources, self-employment, property, pensions, social benefits and benefits, regular transfers from other households, as well as non-recurring income from sales and others.

The change in monthly income is important for meeting individual expenses, including for the management of one's own health.

In the next figure (Fig. 30), we have presented the results of the survey regarding the change in the income of the studied sample during the pandemic. 58.1% of respondents reported that their income remained the same at the end of the COVID-19 pandemic (survey ended April 2023).

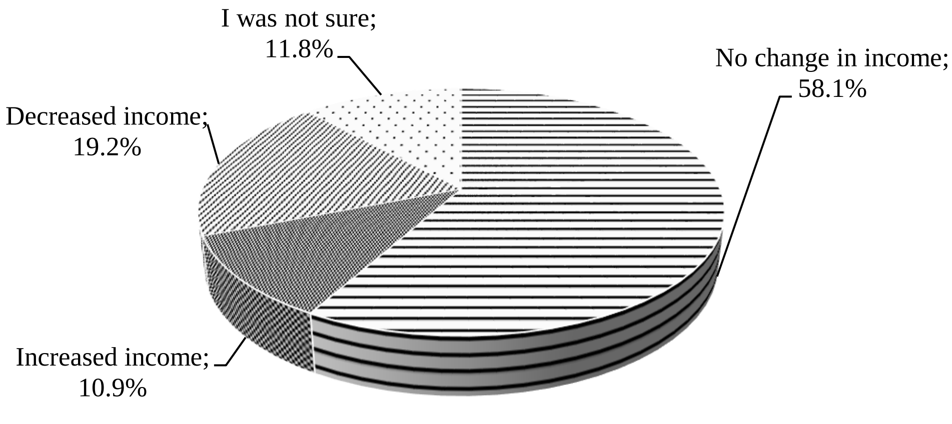

Fig. 30. Distribution of respondents' answers regarding change in their income as a result of the COVID-19 pandemic

But for almost 1/5 of them, their income had decreased (19.2%). The answers of the respondents might be due to the circumstances that the health crisis turned into an economic one. The compensations that were paid during the pandemic partially covered the subsequent inflation in the country.

It is interesting to discuss the results by gender as well. Men (13.3%) were more likely to report an increase in income during the COVID-19 pandemic than women (9.2%).

A statistically significant difference is observed in age groups, income and work sector.

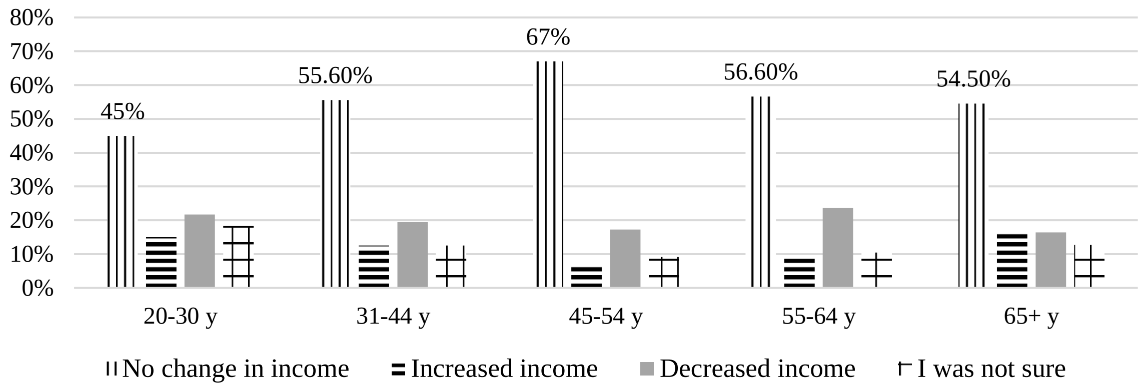

Fig. 31 Distribution of respondents' responses by age group regarding change in income during the COVID-19 pandemic, $p < 0.05$

As can be seen from the figure, the 45-54 age group had the largest percentage of those who indicated that their income during the COVID-19 pandemic was preserved (67%). Only between 7% and 16% reported an increase in income. Between 16% and 23% of the respondents of different age groups indicated a decrease in income, with the least for the group over 65 years old. It should be noted that just under 20% of respondents in the 20-30 age group noted that they were not sure about their income.

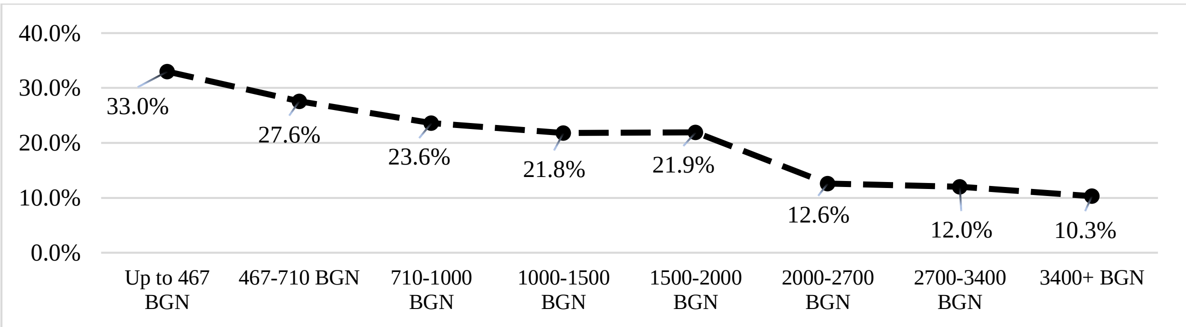

Fig. 32. Distribution of respondents' answers by monthly income according to income reduction during the COVID-19 pandemic, $p < 0.05$

As it can be seen from fig. 32 the smallest decrease in income was observed among respondents whose income was over BGN 3,400 (10.3%). A slightly higher percentage was indicated by those with an income over BGN 2,000. One-fifth (21.8%) of the respondents from the group with an income of BGN 1,000-1,500 also reported a reduction in their monthly income. The percentage (33%) was highest among people with the lowest income (below BGN 467). They had felt the economic consequences of the pandemic most strongly and significantly.

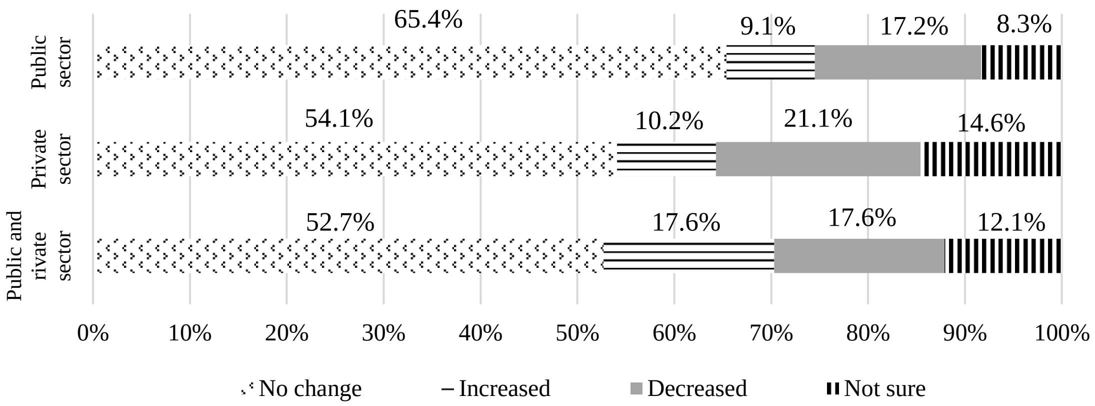

Fig. 33. Distribution of respondents' answers by work sector regarding change in their income during the COVID-19 pandemic, $p<0.05$

When analyzing the results according to the work sector, 21.1% of respondents in the private sector reported a decrease in income. 65.4% of the respondents from the public sector had preserved monthly incomes, in contrast to the private sector (54.1%). Data have statistically significant differences.

c. Exploaring the economic well-being at the end of the pandemic

In this dissertation, we have investigated how respondents define their economic well-being, which is also a subjective concept, because each individual has different needs. People often compare their condition to the lifestyles of other people and communities. In this way, they compose their needs and satisfactions. In the following figure, we have presented the responses of the investigated group regarding self-determination of their economic status.

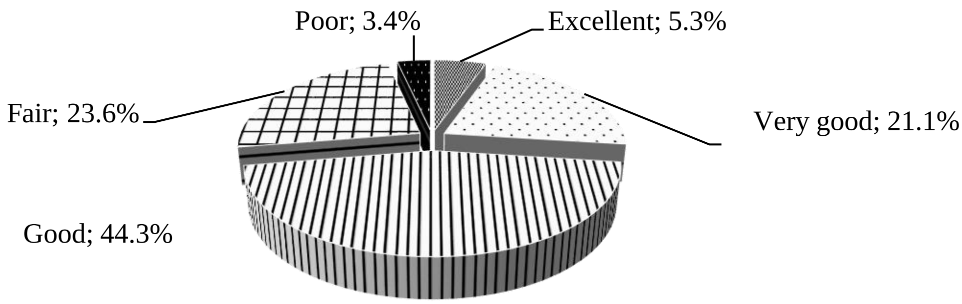

Fig. 34. Distribution of respondents' answers regarding their economic situation at the end of the COVID-19 pandemic

As it could be seen from the figure, the largest share answered "good" economic well-being ($n = 286$; 44.3 %). But the answers "fair" and "poor" should not be ignored, together they represented just over a quarter of the respondents ($n = 174$; 27%).

In our research, we have found out that there are statistically significant differences by gender, age groups, place of residence, field of work and monthly income. The results are presented in the following figures.

As it can be seen from fig. 35, the highest percentage among men defined their economic well-being as "good" (47.9%) in contrast to women (41.9%).

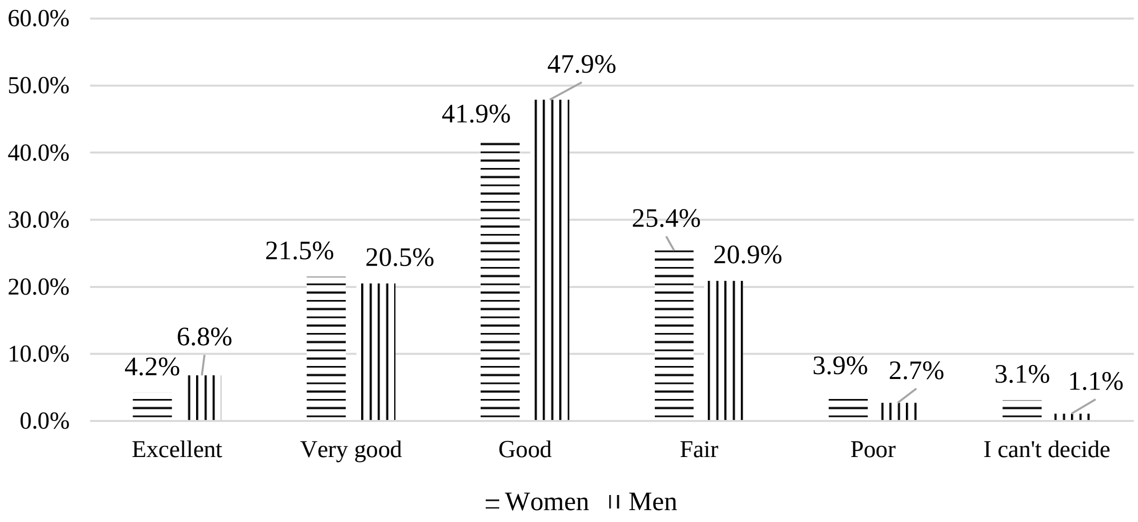

Fig. 35. Distribution of respondents' answers by gender regarding their economic well-being, p<0.05

Approximately a quarter of women indicated "fair" (25.4%). The distribution of the categories "very good" and "fair" among men was almost the same. Only 4.2% of women and 6.8% of men indicated "excellent" economic well-being. The data had statistically significant differences by gender.

Fig. 36 represents the results for self-assessment of the economic well-being of the respondents by age group. When examining and analyzing these results, we found that for all groups, the percentage of self-identification in the "good" category was the highest. It could be seen that 60.5% of respondents aged 55-64 indicated it to the greatest extent. With increasing in years, a characteristic dependence was observed - "excellent" and "very good" economic well-being decreased and "good" and "fair" increased. This could be explained by the fact that most individuals over 65 were already retired and their income was mainly determined by their monthly pensions.

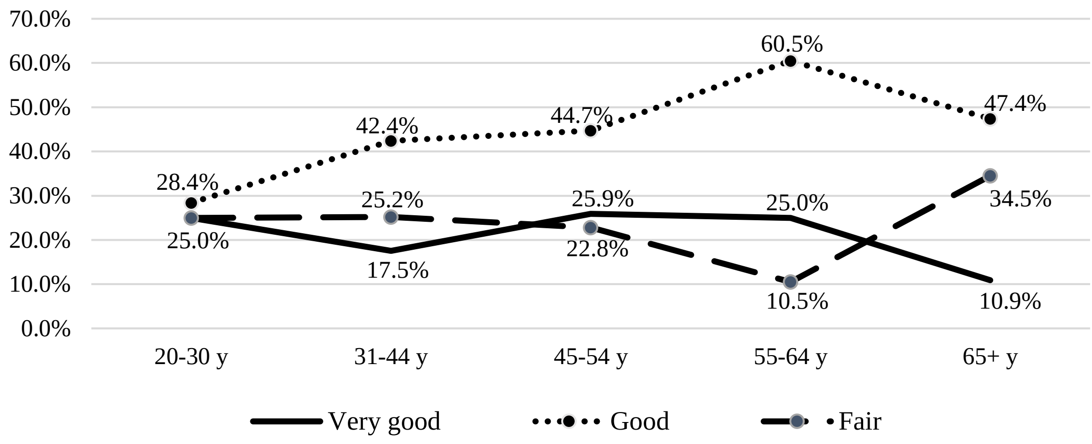

Fig. 36 Distribution of respondents' answers by age group regarding self-determination of their economic well-being as "very good", "good" and "fair", $p < 0.05$

People in their 20s and 30s also score relatively lower, because a large number were still students and/or working, but had not developed the skills and practical knowledge to rate their financial satisfaction higher. Between 1.6% and 3.3% of respondents couldn’t determine their own economic well-being. The presented data had statistically significant differences ($p < 0.05$).

It is important to consider the different aspects of economic well-being. It is immensely related to well-being in social, psychological, spiritual and medical (health) aspects. It can be achieved by individuals, families and communities through public policies that ensure the ability to build financial knowledge and skills, access to safe and affordable financial products and economic resources and opportunities to generate income and build assets. This occurs in a context of economic justice in which labor markets provide opportunities for secure full employment with adequate pay and benefits for all.

II. Analysis and discussion of the results on indicators that determine the consequences of the COVID-19 pandemic through the study of public health indicators and coefficients of national and global databases

The current global health crisis caused by SARS-CoV-2 has shown how health problems can cause serious social and economic crises. COVID-19 is having a devastating and multifaceted effect on the global economy. We have examined the data of national and global sources and have analyzed the main consequences not only in terms of medical, but also of some social and economic indicators, characteristic of the studied period in Bulgaria and EU countries:

a. Medical consequences – mortality, excess mortality, preventable death, LE, years of life lost (YLL);

b. Social consequences - lockdown and quarantine, unemployment rate, social inequalities, social exclusion;
c. Economic consequences - poverty line and economic inequalities.

a. Medical consequences

The most important resource in a country is the people who live, work, study and want to develop it. COVID-19 has affected this very irreplaceable resource in a way we have not experienced in the modern development of civilization.

The natural increase of the population in Bulgaria has been negative since 1990, which is a serious sign of unfavorable demographic processes. In fig. 37 we have shown the trend for recent years. In 2010 it was -4.6 ‰, in 2019 it was -6.7 ‰. A sharp increase was observed in 2020 and reached -9.5 ‰. In 2021, it also reached the lowest value (-13.2 ‰), data in the rural areas was -20.2 ‰. Natural increase is determined by birth and death rates. COVID-19 has a strong impact on increasing mortality in the population.

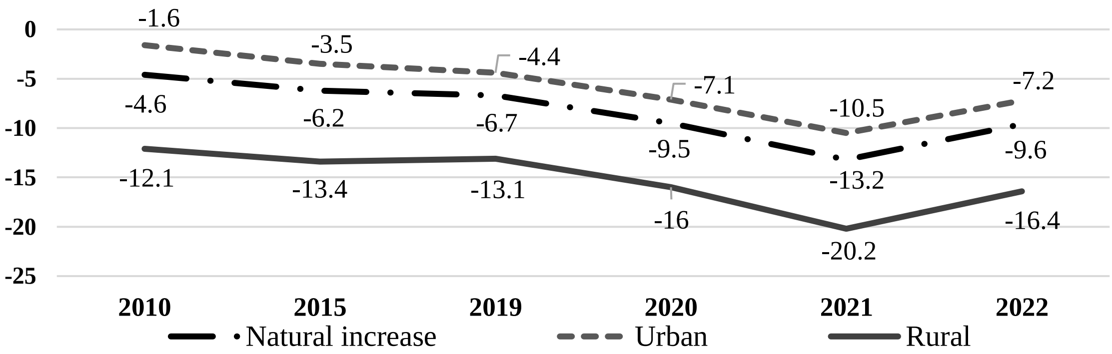

Fig. 37. Natural increase of the population of Bulgaria for the period 2010-2022

It is clear from the figure that in 2022 the natural increase was a little bit higher and reached -9.6 ‰. This was valid both in urban (-7.2‰) and rural areas (-16.4%). We could explain this data with the crude death rate, which in 2022 was 15.3‰ compared to 2021, when it was 21.7‰.

In table 3 we have shown the data on birth and death rates of the EU member states. The birth rate in our country is 8.5 ‰ for 2021. According to this indicator, Bulgaria is not in the last place. Greece, Spain, Italy, Latvia and Portugal have lower values. But they do not cause alarm, because the total mortality is low and, in general, the natural increase has better values than the one in Bulgaria.

Table 3 Indicators of birth rate, death rate and natural increase as of 31.12.2021.

EU countries	Crude birth rate per 1 000 population	Crude death rate per 1 000 population	Natural increase per 1 000 population
Austria	9,6	10,3	-0,7
Belgium	10,2	9,7	0,5

Bulgaria	**8,5**	**21,7**	**-13,2**
Germany	9,6	12,3	-2,7
Greece	8,0	13,5	-5,5
Denmark	10,8	9,8	1,1
Estonia	10,0	14,0	-4,0
Irland	11,6	6,6	5,0
Spain	7,1	9,5	-2,4
Italy	6,8	12,0	-5,2
Republic of Cyprus	11,3	7,9	3,4
Latvia	8,3	18,4	-9,1
Lithuania	9,2	17,0	-8,7
Luxembourg	10,5	7,0	3,4
Malta	8,5	8,0	0,4
Netherlands	10,2	9,8	0,5
Poland	8,8	13,8	-5,0
Portugal	7,7	12,1	-4,4
Romania	9,3	17,5	-8,2
Slovakia	10,4	13,5	-3,1
Slovenia	9,0	11,0	-2,0
Hungary	9,7	16,1	-6,4
Finland	9,0	10,4	-1,5
France	10,9	9,7	1,2
Croatia	9,2	15,8	-6,6
Czech Republic	10,6	13,3	-2,7
Sweden	11,0	8,8	2,1

As it could be seen from the table, Bulgaria is the EU country with the highest death rate (21.7‰) and the lowest natural population growth (-13.2‰) for 2021.

Eurostat data shows that the EU's population decreased in 2020 by around half a million people, and in 2021 by almost 0.3 million people. This is mainly explained by the direct and indirect consequences of the COVID-19 pandemic. In 2023, a slow recovery of these indicators is observed.

In principle, the ideal indicator for assessing the effects of the pandemic is considered to be excess mortality. According to a number of researchers, it is used as the most accurate indicator of the victims of the pandemic (direct and indirect), since in addition to officially registered deaths from COVID-19, deaths from the disease without being officially registered should be added, as well as deaths as a result of the untimely treatment of other diseases caused by the overload of the health system. But it has certain limitations. Some studies have found that it is relatively difficult to compare different countries on mortality caused by the SARS-CoV-2 virus, as well as excess mortality. For this reason, the authors use all-cause mortality data, which they believe are more reliable indicators of the impact of the COVID-19 pandemic. This may be explained by the fact that they are less sensitive to coding errors, competing risks, and the potential for misclassification when determining the cause of death. It should not be overlooked that this way it is much easier to compare the data between individual countries. Also, in excess mortality, the age at which this condition is registered is not taken into account.

Figure 38 shows that the mortality (total and by gender) had increased since the announcement of the COVID-19 pandemic. In 2019, the total number of deaths was 108,083, in 2020 - 124,735. In 2021, it reached its peak of 148,995 people. This level of mortality was the highest in Bulgaria, reached historically from 1945 until now. Compared to the previous year, they increased by 24,260, or by 19.4%. This could be explained by the presence of different variants of the coronavirus. In 2020 and 2021, the Alpha and Delta variants were distributed on the territory of our country. During that period (second peak of the virus) the highest morbidity and mortality were registered, not only on the territory of Bulgaria, but also in the entire EU. The highest share of deceased persons (67.7 %), as well as the highest values of 14-day mortality, were from this period. It is also significant that the third epidemic wave had the longest duration (about 20 weeks). The largest share of registered persons in the information system was in this period (43.6%).

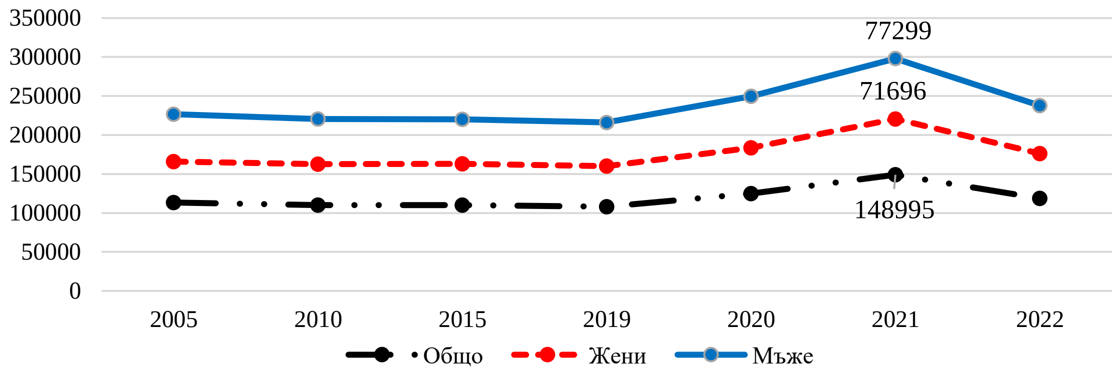

Fig. 38. Mortality (total and by gender) for the period from 2005 to 2022.

After the worst year of the pandemic for Bulgaria, a slight drop in mortality was observed in 2022 (118,814 people). It will be significant to track the various indicators for reporting trends in the country in the coming years.

Fig. 38 shows the data on mortality and by gender. In men, it has a higher value than in women. This trend has been maintained since 2005. It is not yet established what the causes of these gender differences in the morbidity and mortality of COVID-19 might be. Most likely, various aspects and factors related to the virus will be thoroughly studied.

Regarding mortality by age groups, we have found that mortality from the disease was recorded among all age groups. But up to the age of 20, the cases were single, between 20 and 34 years there were less than 10, between 35 and 49 years there were between 15 and 68 cases.

Distribution of mortality by age groups showed that with increasing age an increase in mortality was observed, with the highest absolute value for men between 75-79 years, as well as for women aged 85+.

Table 4 Mortality for 2022 from COVID-19 by gender and age groups

	50-54 y	55-59 y	60-64 y	65-69 y	70-74 y	75-79 y	80-84 y	85 +
Men	123	215	355	575	861	**945**	824	909
Women	47	108	215	389	698	782	784	**908**

We examined and analyzed the mortality by main causes in Bulgaria for the period 2020-2022. As it could be seen from table 5, COVID-19 has permanently settled among the leading causes of mortality of the population by causes after the declaration of the pandemic. For 2020 and 2022 it was in third place after circulatory diseases and neoplasms, while in 2021 it is in second place or 18.5% of the total number of deaths.

Table 5. Mortality by main causes for the period 2020-2022.

		2020 y	**2021 y**	**2022 y**
TOTAL		124 735	148 995	118 814
Cardio-vascular diseases	Total	75 586	80 002	71 069
	Men	37 017	38 749	34 467
	Women	38 569	41 253	36 664
Cancers	Total	18 527	17 119	71 069
	Men	10 638	9 799	34 467
	Women	7 889	7 320	36 664
COVID-19	Total	**8 554**	**27 588**	**8 993**
	Men	5 284	**14 731**	4 967
	Women	3 270	**12 857**	4 026
Respiratory diseases	Total	6 006	6 809	5 586
	Men	3 610	3 777	3 243
	Women	2 396	2 932	2 343
Diseases of the digestive system	Total	4 153	4 329	4 465
	Men	2 759	2 903	2 962
	Women	1 394	1 426	1 443
External factors	Total	2 507	2 524	2 426
	Men	1 820	1 821	1 786
	Women	687	703	640

According to NSI's 2020 annual data on deaths from causes, the total number of deaths was 124,735, of which 8,554 (7%) were from SARS-CoV-2. Compared to 2019, the absolute number of deaths increased by 16,652. In 2021, the number of deceased persons increased by 24,260, or by 19.4%.

When looking at the death rate from COVID-19 in the EU, it was highest in Bulgaria, Hungary, Croatia, the Czech Republic and Slovenia. From data for Bulgaria, it has been established that the change in mortality in percentages for 2020 compared to 2019 was 17%, and for 2021 compared to 2019 was 38%. Only Slovakia had a 38% increase in mortality in 2021 compared to 2019. In all other countries, this indicator had a lower value. For comparison, its change for EU countries in total was 13%.

Table 6 Change in mortality in %

	Change in mortality in 2020 y compared to 2019 y, in %	Change in mortality in 2021 y compared to 2019 y, in %
Bulgaria	**17 %**	**38 %**
Greece	7 %	15 %
Italy	18 %	10 %
Spain	20 %	9 %
Poland	19 %	27 %
Romania	17 %	29 %
Slovakia	13 %	**38** %
Slovenia	19 %	12 %
Hungary	11 %	20 %
Croatia	12 %	21 %
Czech Republic	17 %	25 %
EU	13 %	13 %

Another important indicator of a nation's health is life expectancy (LE). It is also associated with mortality. According to NSI data, it has been increasing over the last 20 years in Bulgaria. Its value for the period 2020-2022 was 73.6 years. The highest life expectancy was in the capital (74.8 years), and the lowest in Vidin (69.4 years). Gender differences were also observed. It was 70.1 years for men and 77.4 years for women. The highest value for women was in Sofia (the capital), and for men in Kardzhali (71.4 years). The lowest for both sexes was in Vidin (women - 73.8 years and men - 65.8 years). Differences were also registered depending on the settlement. It was found to be 2.4 years higher for the urban population (74.3 years) than for the rural population (71.9 years).

After the announcement of the COVID-19 pandemic, there has been a change in this indicator. Compared to 2019, LE had decreased by 1.3 years for women and by 1.7 years for men, which was a sharp drop against the background of its slow and steady increase over the years.

When comparing data for our country with other EU countries, it was found that in 2020 this indicator in Bulgaria was 6.8 years lower than the average for EU countries and was the lowest compared to all countries- EU members.

Years of life lost (YLL) can be calculated from the LE indicator. In this way, the severity of deaths occurring at a younger age of the subjects is taken into account. The premature mortality rate in 2021 (20.3%) was down from the previous year 2020 (20.5%). There were significant differences in the values of the premature mortality indicator for men and women. Deceased women under the age of 65 were 13.9% of all deceased women, and the value of this indicator for men was 26.2%.

The worst consequences of the COVID-19 pandemic are the loss of human potential. The high value of preventable mortality shows that prevention programs are ineffective, and the treatment of certain diseases does not show a good enough result, at least in comparison with other EU countries. This results in a higher overall mortality rate as well as a reduction in life expectancy.

d. Social consequences

Humans are social beings who live, work, learn, etc. In a society. Through it they interact with their peers and with the environment. COVID-19 has changed this interaction.

One of the first measures against the unknown causative agent and disease was to declare a lockdown in many countries around the world at the national level. In Figure 39, we have presented the number of days in some of the European countries that were in national lockdown during the pandemic caused by the SARS-CoV-2 virus:

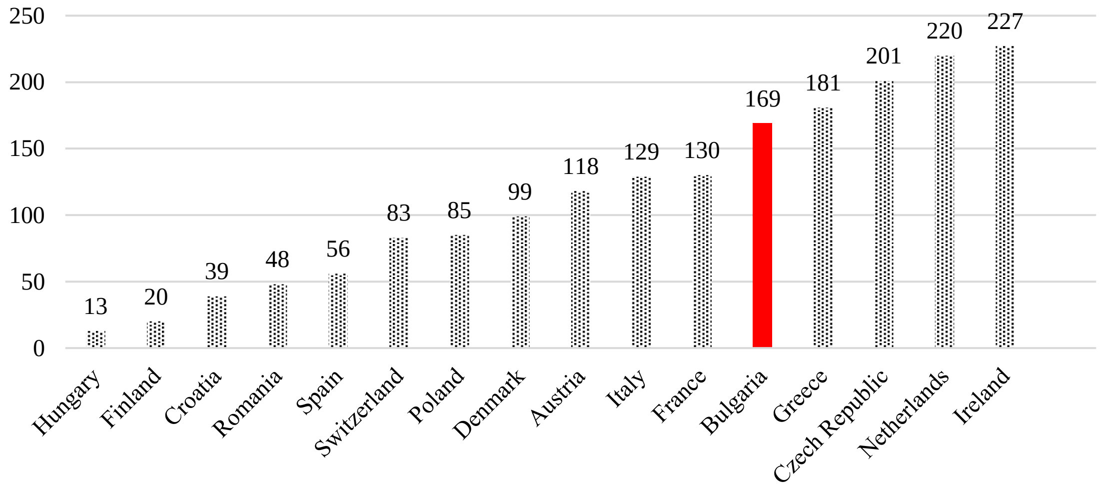

Fig. 39 Number of days in national lockdown of some European countries during the COVID-19 pandemic

As it could be seen from the figure, the differences between individual countries were mainly in the number of days the population was under national lockdown. Hungary and Finland were the countries with the shortest restrictions of the EU countries represented. Under 50 days were Croatia and Romania. Spain, Switzerland, Poland and Denmark had been under restrictions for up to 100 days during the epidemic crisis. Italy was one of the countries in Europe that suffered extremely hard already at the beginning of 2020. The national lockdown in the country was 129 days. France followed with 130 days. The longest measures were Germany (in some areas up to 298 days), Ireland (227 days), the Netherlands (220 days) and the Czech Republic (201 days).

In Bulgaria, the total duration of restrictions at the national level was 169 days, including those in 2020 and 2021. In general, our country experienced three lockdowns, which also corresponded to the first three waves of peak morbidity and mortality on our territory. The longest interval was during the first wave (94 days). It was announced by Order No. RD-01-124 of the Minister of Health from 13.03.2020 to 15.06.2020.

The WHO recommends that these restrictions should be for a short time, which was necessary for the competent authorities in the respective countries to reorganize and rebuild the various types of resources to deal with the health crisis and the burden on the health systems. Social responsibility must also be supported by the personal responsibility of citizens in order to protect and preserve health and life.

In addition to the total duration of Table 7, we had also presented the number of restrictions that had been imposed by the governing authorities of the respective countries. The largest number of restrictions was observed in Austria – a total of 4, with the third one having the longest duration (43 days). Only four European countries had only one lockdown (Hungary, Finland, Romania and Spain). Most of them had two or three limitation periods. During the first lockdown, only Great Britain (between 98 and 112 days) had a longer duration than Bulgaria (94 days).

Only some European countries had a second national lockdown. Bulgaria was also among them for 65 days. The measures were significantly longer in Greece, the Czech Republic, the Netherlands and Germany.

Regarding the third lockdown, in all countries it lasted longer than in our country (only 10 days).

Table 7. Total duration in days and number of restrictions of a national lockdown

Country	**Total duration**	**Number of lockdowns**	**Duration of the first lockdown**	**Duration of the second lockdown**	**Duration of the third lockdown**	**Duration of the fourth lockdown**
Hungary	13	1	13			
Finland	20	1	20			
Croatia	39	2	32	7		
Romania	48	1	48			
Spain	56	1	56			
Switzerland	83	2	41	42		
Poland	85	3	29	20	36	
Denmark	99	2	33	66		
Austria	118	4	28	27	43	20
Italy	129	2	70	13		
France	130	3	55	46	29	
Bulgaria	**169**	**3**	**94**	**65**	**10**	
Greece	181	2	42	139		
Czech Republic	201	2	27	174		
Netherlands	220	3	22	172	26	
Germany	195-298	2	76	119-222		
UK	195-223					
▪ England	213	3	103	27	83	
▪ Scotland	195	2	98	97		
▪ Wales	223	3	102	14	107	

▪ Northern Ireland	212	3	112	17	83	
Ireland	227	3	67	41	119	

One of the serious challenges and social consequences of the COVID-19 pandemic is unemployment. It is determined by the percentage of unemployed persons compared to the entire population of working age. Depending on the development of the economy in the respective country, a different percentage of people registered as unemployed can be observed. Its increase is a sign of an economic crisis or recession.

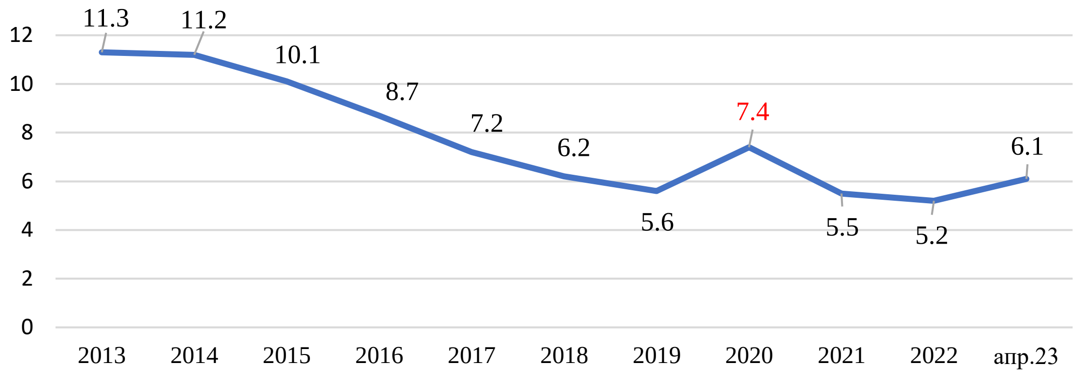

Fig. 40. Unemployment rate for the period 2013 - 2023

Figure 40 shows the unemployment rate for the period 2013-2023. The labor market at the end of 2019 had a downward trend. For seven years, the unemployment rate decreased from 11.3% to 5.6%, which was associated with high levels of employment and growth in labor income. Unfortunately, the general reduction of the labor force and the ongoing negative demographic processes were important. Bulgaria is an EU country with negative natural population growth.

With the announcement of the COVID-19 pandemic on 03/13/2020, there was also a change in the labor market, which could also be seen in figure 40. In 2020, there was a sharp increase in unemployment from 5.6% to 7.4%. This could also be explained by the several national restrictions introduced - closure of educational institutions, shops, parks, restaurants, various commercial establishments, etc. As a result, many people had to stay at home, and only some of them had the opportunity to work from home. These trends were global in nature.

When we look at the unemployment rate by month for 2020 and 2021, we could find that its increase started in March 2020, rose sharply in April 2020 and reached its peak in May 2020. Then it gradually decreased and reached 6.7% in December 2020. This could be explained by the adaptation and organization of many businesses in our country.

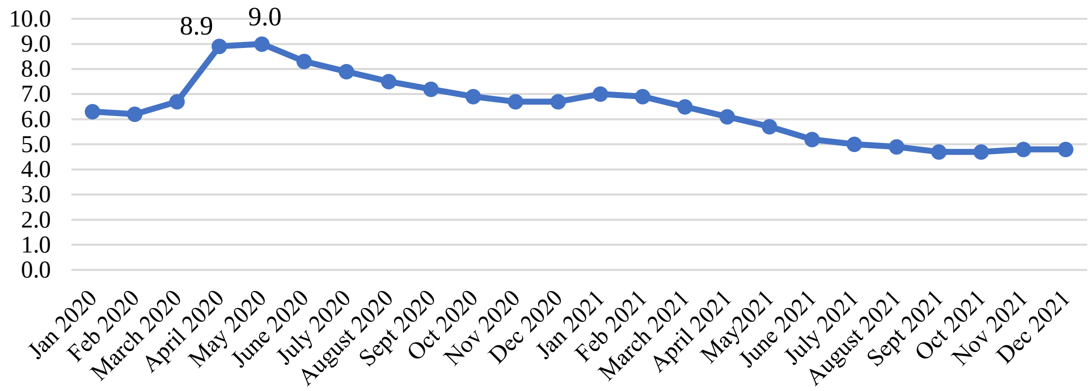

Fig. 41. Unemployment for the period January 2020 - December 2021.

The presence of a high unemployment rate is a serious problem for a country, as it directly affects economic growth, is associated with a decrease in real production, a decrease in demand and an increase in the public deficit. Its increase is a sign of an economic crisis or recession.

Unemployment is a key measure to monitor whether a country is on track to achieve the Sustainable Development Goal of promoting stable and inclusive economic growth, full and productive employment and decent work for all.

The crisis caused by the SARS-CoV-2 virus significantly changed the labor market in Bulgaria, it went through many different phases - from high unemployment during the lockdowns, followed by a boom and a very high demand for labor after them, to record employment and a shortage of workforce at the end of 2022.

There was an uneven distribution of unemployment on the territory of our country. Northwestern Bulgaria was distinguished by deteriorated social and economic indicators compared to the rest of the country and was one of the poorest in the EU. Vidin, Vratsa and Montana are among the regions with the lowest income and standard of living, which predetermines the high share of poverty and unemployment in them.

Since the beginning of the coronavirus pandemic, thousands of businesses had remained closed, millions of Europeans had lost their jobs, and most of them had to change their pattern of social and personal life.

The impact of the pandemic on the labor market was very different from that of the financial crisis. According to data from the World Bank, at the end of 2020, unemployment in the EU was close to 7.8% and 6.9% in the world, in contrast to 7.5% and 5.5% in 2019, respectively. Despite the fact that employment and total hours worked fell at the sharpest rates on record, no large differences were reported between 2019 and 2020.

The pandemic has hit the most vulnerable and poorest members of our society hard, exacerbating health and social inequalities. One of the European Commission's objectives during the COVID-19 pandemic is to protect workers and jobs, because the unemployed are at higher risk of poverty, social exclusion and health problems. The fight against inequalities, youth unemployment and poverty is a major focus of the Recovery Plan and the EU's multiannual financial framework.

The coronavirus pandemic poses new challenges to people's professional development. After the health and economic crisis, they need to acquire new knowledge and acquire skills to adapt to the changed labor market.

Studying the social consequences of the pandemic is important because, according to some studies, our country's population will continue to decline in the coming decades. It is expected that by 2060 the population will be between 5.3 and 4.5 million people. It is expected that there will also be a change in the working-age population. With zero migration, it will decrease by 36% in 2060 compared to 2020. But if there are also migration processes, the decrease will be by 49%.

For these reasons, the preparation of our country for the manifestation of new and extreme situations and processes will be particularly significant, because they will help the rulers and the population itself to minimize their consequences.

e. Economic consequences

The COVID-19 pandemic has shown how health problems can cause very serious social and economic crises. The effect on the world economy is the action of various and multifaceted factors. By the end of 2020, the global economy had shrunk by 3.5%. It was responsible for the growth of poverty, the deterioration of women's work and social conditions, the disruption of education and the increase of job and food insecurity. For example, between 2019 and 2020, female employment fell by 4% compared to a 3% decline for men. Part of this can be explained by the fact that women had to spend more time caring for children at home during the peak waves and national restrictions. In addition, the pandemic has worsened the burden of private and public debt on economies around the world. This is especially serious in developing countries. While the pandemic has had a devastating impact on all segments of society, it has had a disproportionate effect on the most economically vulnerable groups of society. The incomes of the poorest 20% suffered a sharper decline in 2021 than the group with higher incomes. This drop in income has resulted in about 100 million more people living in extreme poverty. Poverty and health are directly related to each other, because health can lead to poverty, and poverty can lead to deterioration of all aspects of health.

In Table 8, we have presented the main indicators of poverty in the period 2018 - 2022. In 2022, the poverty line for the country is BGN 525.92 per month on average per household member. With this size of the line, 1.572 million people were below the poverty line, or 22.9% of the country's population. Compared to the previous year, the size of the poverty line increased by 4.3%, and the relative share of the poor population increased by 0.8 percentage points.

Table 8 Main poverty indicators

	2018	**2019**	**2020**	**2021**	**2022**
Poverty line (average monthly amount, BGN)	351,11	413,04	451,00	504,33	525,92
People below the poverty line (in millions)	1,551	1,586	1,660	1,532	1,572
Relative share of the poor - % of the population	22,0	22,6	23,8	22,1	22,9
Ratio between the incomes of the poorest and richest 20% of the population (S80/20)	7,7	8,1	8,0	7,4	7,3

In 2020, apart from the fact that there was a high percentage of unemployed in Bulgaria, there was also the largest number of persons below the poverty line (1.6 million). It also proves that the COVID-19 pandemic has had a strong impact on society.

In 2022, the share of the poor among the employed in the 18-64 age group remained unchanged compared to the previous year - 10 percent, and the risk of falling into poverty among those working part-time was approximately three times higher than that among those working full-time. At the same time, the risk of poverty among working women was 3.2 percentage points lower than that of men.

The level of education has a significant impact on the risk of poverty among the employed. The relative share of the working poor with primary and no education was the highest - 68.5%. As the level of education increases, the relative share of the working poor decreases by two times for those with primary education and more than seven times for those with secondary education. The share of the working poor with higher education was the lowest - 3.2%. Key factors in the fight against poverty remain the social and educational system, as well as the economic activity of the population.

Estimates of poverty by household type showed that the relative share of the poor was highest among single-person households with a person over the age of 65 (61.3% in 2022) and one person in a household - a woman (56, 2% for 2022). Among single-person households, the risk of poverty for women was 21.9 percentage points higher than for men. If one person over 65 lives in the household, the risk of poverty was 35.4 percentage points higher than a household with one person under 65.

Table 9 Population at risk of poverty and social exclusion

	2018	**2019**	**2020**	**2021**	**2022**
Total - thousand	2343	2327	2340	2193	2206
Relative share of the population - %	33,2	33,2	33,6	31,7	32,2
Men - thousands	1046	1051	1052	984	974
Relative share of the population - %	30,5	30,9	31,2	29,4	29,4
Women - thousands	1296	1277	1288	1209	1231
Relative share of the population - %	35,7	35,4	35,9	33,9	34,8

Table 9 shows the data on the population at risk of poverty and social exclusion for the period from 2018 to 2022. The highest share of the population was at risk in 2020 (total 2340 thousand), with a preponderance of women (1288) as opposed to men (1052). In 2022, 32.2% of the population, or 2,206.1 thousand persons, were at risk of poverty and social exclusion. The value of the indicator increased by 0.5 percentage points compared to 2021, remaining at the same level for men and increasing by 0.9 percentage points for women.

One of the major and unintended economic consequences of COVID-19 is reduced productivity due to employee absenteeism. It can be as a result of illness, caring for loved ones or contact with infected people.

The COVID-19 pandemic is responsible for increasing the risk of sickness absence among the general workforce and especially among healthcare workers. Healthcare workers play a key role in treating such patients. They are at higher risk of infection because they are at the forefront of the fight against the epidemic caused by SARS-CoV-2. As a result, they are more likely to quit their jobs and miss work.

A growing body of evidence from scientists around the world shows that many health outcomes from life expectancy to infant mortality and obesity can be linked to the level of economic inequality within a population. Greater economic inequality leads to poorer health outcomes. By greater inequality, epidemiologists do not mean just poverty, although poor health and poverty go hand in hand. But according to epidemiological studies, high levels of inequality negatively affect the health of even the wealthy, mainly because inequality reduces social cohesion, which leads to more stress, fear and uncertainty for everyone.

According to the World Bank, the pandemic and associated economic recession pushed an additional 97 million people into extreme poverty in 2020, leading to the first increase in global poverty in nearly a quarter century. This makes the sustainable development goal of reducing global extreme poverty to 3 percent even more elusive. COVID-19 may have exacerbated already existing inequalities in developing countries. In advanced economies, this appears to have been the case before social transfers were increased – the loss of income and jobs due to COVID-19 was greater among low-income households, and the lockdown increased inequality. Conversely, social transfers in low- and lower-middle-income countries, which were a fraction of what was used in upper-middle- and high-income countries, were insufficient to mitigate the impact of income loss among the vulnerable.

The 2022 World Disaster Report takes an in-depth look at the successes and challenges of the past three years. It cites data from the International Monetary Fund, according to which the pandemic will cost the world economy $13.8 trillion by the end of 2024. The socio-economic consequences are also huge, and the indirect impacts have affected the lives of almost every community. No disaster in recent decades has had such massive consequences.

FINDINGS

As a result of the presented results, we have made the following main findings from the dissertation work:

1. Prevention of the spread of COVID-19 consists of medical and non-medical measures aimed at reducing the consequences of the pandemic. 91.9% of the respondents wore a protective mask and 80.3% followed hygiene measures. 50.2% have been vaccinated against COVID-19.
2. Regarding the morbidity of COVID-19 - 64.5% were sick, and 95.2% of them were at home during their treatment. The average duration of illness was 13 days. 40.3% of them returned to work but did not feel well. Among the sample, the unregistered morbidity was 47.1%. Self-rated health at the end of the pandemic decreased from the categories "excellent" and "very good" to mostly "good".
3. Social restrictions were highly pronounced during the COVID-19 pandemic. Almost half of the respondents avoided crowded places (45.0%), maintained a social distance of 2 m in public places (44.3%) and avoided leaving home without an important reason (43 .7 %). 36.7% of respondents reported a "very good" self-assessment of their social status.
4. Absence due to illness was an important indicator of health. 25.5% were absent between 15 and 30 days. 82.2% were under quarantine. The average quarantine period was 16 days. One of the major and unintended economic consequences of COVID-19 is reduced productivity due to employee absenteeism.
5. At the end of the pandemic, 44.3% of respondents defined "good" economic well-being. "Fair" and "poor" - 27% of them. A decrease in income was reported between 16% and 23% of respondents in different age groups. Differences were also observed by gender - women had lower incomes.
6. COVID-19 has permanently settled among the leading causes of death in the population. For 2020 and 2022 it was in third place after circulatory diseases and neoplasms, while in 2021 it is in second place or 18.5% of the total number of deaths.
7. Bulgaria was the EU country with the highest death rate (21.7‰) and the lowest natural population increase (-13.2‰) for 2021. For men, it had a higher value than for women.
8. The crisis caused by the SARS-CoV-2 virus significantly changed the labor market in Bulgaria, it went through many different phases - from high unemployment during the lockdowns, followed by a boom and very high demand for labor after them, to record employment and labor shortage at the

end of 2022. Unemployment corresponds to that in the EU for the studied period.

9. The COVID-19 pandemic has exacerbated global economic inequality, due to severe job and income losses among low- and middle-income populations.
10. According to the World Bank, the pandemic and the associated economic recession pushed an additional 97 million people into extreme poverty in 2020.
11. According to the International Monetary Fund, by the end of 2024, the pandemic will cost the world economy 13.8 trillion dollars. No disaster in recent decades has had such massive consequences.

CONCLUSION

The COVID-19 pandemic is an unprecedented challenge to public health and the world as a whole. The disease itself, its spread and infection of a significant number of the global population led to multiple consequences. They vary widely across individuals, different groups, and society. We can say that COVID-19 has not only an impact on people's health, but also on their social and economic status. A variety of health, social, economic and environmental factors influence public health. In all countries – whether low, middle or high income – there are large differences in the health status of different social groups. The lower the socioeconomic status of the individual, the higher the risk of ill health. This confirms the statement that the vulnerable groups of the population are particularly affected - the sick, the poor, the unemployed and the socially weak. Morbidity and mortality rates differ between high- and low-income countries, lower and higher socioeconomic groups, and between urban and rural areas.

Under the circumstances of the COVID-19 pandemic, health management has become a real challenge. The right to health is associated with access to health services and care that an individual needs. They should be provided where and when they are needed. No one should suffer, get sick or die just because they are poor or do not have access to a medical facility. All EU member states have a responsibility to provide safe, effective, high-quality and adequate in quantity and quality medical care and services.

Unfortunately, the world will struggle with the consequences of the virus for a long time. The public health crisis has quickly turned into a social and economic crisis that has both direct and indirect consequences. The way of life, work and communication between people has changed. All the aspects that determine the health of the nation - physical, mental and social condition and well-being - were affected. It turns out that a significant portion of the population has been defined as "unhealthy" since the start of the first wave of COVID-19 pandemic in 2020.

RECOMMENDATIONS

The analysis of the conclusions based on the developed dissertation work gives us the basis to make recommendations to the relevant institutions to take action in accordance with their powers. We believe that implementing the recommendations will lead to more effective health management in emergencies in the future. The recommendations we offer are the following:

I. Regarding health policy and practice
To: Ministry of Health, Regional Health Inspectorates, National Health Insurance Fund

- Implementation of strategies for the development of Bulgarian healthcare, based on the needs of the population for medical services and healthcare in the conditions of extreme situations.
- Determination of priority national policies in accordance with European and world practice to minimize the medical, social and economic consequences for society due to emergency situations. Validation of European criteria for medical, social and economic acceptability through integration of health systems.
- Introducing pluralism regarding the mechanisms for dealing with emergency situations.

II. Regarding the normative organizational practice
To: Ministry of Health, National Assembly of Bulgaria, National Health Insurance Fund, Voluntary Health Insurance

Legal update on:
- Preparation of proposals for regulatory changes to organize the construction of national and local mechanisms for health control and management of possible future emergencies.
- Expanding the scope of mandatory and voluntary health insurance activities by preparing and implementing health insurance packages in order to reduce the negative socio-medical and economic consequences of emergencies.

III. Regarding investment in people's health
To: Ministry of Health, Regional Health Inspectorates

- Confirmation of European practices for guaranteeing affordable medical care for the population, paying attention to vulnerable groups of the population.

- Development of programs to track the causal relationships between exposure and results of the action of various agents during emergency situations.
- Priority approval and actual implementation of health promotion and disease prevention as a basis for health-related and socio-economic well-being by constantly increasing the health culture of the population.

IV. Regarding the investment in personnel training
To: Universities

- Development and implementation of thematic courses (continuing training and qualification) for the training of personnel who are theoretically and practically prepared for the needs of the population and for the ways of ensuring their needs in the conditions of extreme situations.
- Support for conducting scientific research to assess the well-being of the population and develop proposals for the realization of healthy and safe living conditions.
- Investing in more online training in the post-pandemic era and educating people from different sectors of society to use online services which further will contribute to effective care.

CONTRIBUTIONS

Scientific and theoretical contributions:

1. In the literature review, an original comprehensive analysis is made by researching the management of health under the pandemic circumstances and its current challenges are indicated.
2. A competent expert assessment of the medical, social and economic consequences that affect public health management is made.
3. The need to track the medical, social and economic consequences of the COVID-19 pandemic is indicated, as well as the importance of their use as a tool for better organization and management of health under the circumstances of extreme situations.

Practical contributions:

1. A population survey was conducted regarding the medical, social and economic consequences of the COVID-19 pandemic.
2. An original and comprehensive analysis of the medical, social and economic consequences of the COVID-19 pandemic was carried out by evaluating public health indicators and coefficients of national and global databases.
3. Modern recommendations have been developed to optimize the management of medical, social and economic consequences of the COVID-19 crisis through changes in regulatory and organizational practice, investments in people's health and training of personnel, serving the country's population.

LIST OF SCIENTIFIC PUBLICATIONS RELATED TO THE DISSERTATION

1. Mihaylov N., **Nikolov N**., Zlatanova T., Popov N., The Voluntary Health Insurance in Bulgaria during the Period 2017-2021, Science of Europe, № 94 (2022), p 60-63, ISSN 3162-2364

2. **Nikolov N.,** N. Shtereva-Nikolova, Reorganization of the Work Process during the Pandemic of COVID-19, J Health policy and management, 2023, Vol 23, № 3, 10-14, ISSN 1313-4981

3. **Nikolov N.,** N. Shtereva-Nikolova, N. Popov, T. Zlatanova, Self-Assessment of Health before and at the End of Pandemic of COVID-19 in Proceedings of the Fiftieth Scientific and Technological Session CONTACTS June 30, 2023, Sofia, TEMPO, p. 128-134, ISSN 1313-9134

4. **Nikolov, N.,** Current Challenges of Health**,** J Health policy and management, 2022, Vol 22, № 2, 36-39, ISSN 1313-4981