INTERNATIONAL BUSINESS SCHOOL
BOTEVGRAD

ABSTRACT

ON A DISSERTATION ON THE TOPIC:

DEVELOPMENT OF A MANAGEMENT STRATEGY MODEL FOR INCREASING THE KNOWLEDGE AND SKILLS OF THE POPULATION OF BULGARIA FOR PROVIDING FIRST AID

For the awarding of an educational and scientific degree "doctor" in a professional direction 3.8. Economy

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The dissertation contains 173 pages, of which 17 pages are appendices. It is structured in an introduction, three chapters, a conclusion, 3 appendices, 38 tables, and 37 figures. The bibliography covers 108 sources, of which 41 are in Cyrillic, and 67 are in Latin.

The dissertation has been discussed and referred for defense with the decision of the Educational and Scientific Council, protocol No.4 of 18th January 2023, and the decision of the Academic Council, protocol No.4 of 25th January 2023, of the International Business School, where the Ph.D. candidate is enrolled in an independent form of doctoral studies.

The defense of the dissertation will be held on 15th May 2023, at 10:00 a.m. in the "Academic Council" meeting room of the Distance Learning Center, Sofia, at a meeting of a scientific jury composed of:

Internal members:
1. Prof. Tsvetan Iliev Petkov, Ph.D. , International Business School
2. Assoc. Prof. Stella Ivanova Baltova, Ph.D., International Business School

External members:
3. Prof. Dr. Tsvetelina Milcheva Petrova-Gotova, Medical University - Sofia
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The defense materials are published on the website of the International Business School and are available at the business school.

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I. List of abbreviations used

AED	Automated External Defibrillator
AHA	American Heart Association
BRC	Bulgarian Red Cross
BRCA	Bulgarian Red Cross Act
CAF	Common Assessment Framework
CPR	Cardiopulmonary resuscitation
EENA	European Emergency Number Association
EMS	Emergency Medical Services
EQF	European Qualification Framework
ERC	European Resuscitation Council
FA	First Aid
GDPR	General Data Protection Regulation
HSWA	Health and Safety at Work Act
IFRCRC	International Federation of the Red Cross and Red Crescent
ILCOR	International Liaison Committee on Resuscitation
IME	Institute of Market Economy
MOI	Ministry of the Interior
NC	National Council
NHIF	National Health Insurance Fund
NSI	National Statistical Institute
RTA	Road Traffic Act
SCA	Sudden Cardiac Arrest

II. Introduction

In today's world, the need for first aid (FA) skills is increasingly urgent. Incidents happen frequently and the probability of witnessing one increases significantly. Ambulance arrival times cannot be reduced below 5 to 8 minutes, necessitating the need for bystanders or first responders to perform FA for life-threatening injuries and conditions.

In Bulgaria, until 2019, it was difficult to find modern statistics on what is the society's attitude towards the provision of FA, as well as what are the extent and scale of those trained to provide help in case of need, an author's national online survey was conducted (February-October 2019) to learn more about the topic. This dissertation aims to evaluate and analyze the preparation of the population of Bulgaria for FA at the present time and to propose a management strategy model for increasing the knowledge and skills of the population of Bulgaria for performing FA. The goal is achieved by considering aspects in two directions: (1) objective factors (including an overview of the Bulgarian legislation, good European practices, and medical justification for the importance of the topic) and (2) subjective factors (personal perception of the public about their preparation, assessed by conducting a second wave of the author's national online survey "SOCIETY AND FIRST AID").

The dissertation includes two parts – theoretical and empirical.

In the theoretical part, an in-depth overview of where and how the concept of "first aid" is found in Bulgarian legislation, an overview of good European practices for preparing the population to provide help in case of need, the importance of the topic, the purpose, the methods, the essence of the problem and a necessary toolkit for developing empirical research.

The empirical part contains an analysis of the results obtained from the study, divided into sections, recommendations based on these results, and guidelines for the future development of FA in Bulgaria. Based on the results of the overview of the regulatory framework, practices, medical justification, and the subjective perception of the public about their preparation for FA, the implementation of a management strategy model and a training system for increasing the knowledge and skills of the population of Bulgaria is proposed, examined and detailed delivery of FA and, more specifically, teachers from junior high school and high school training courses and their distribution among students.

The author's research that is used in this Ph.D. thesis is real and was conducted as follows: 1) Wave 1: in the period September - October 2019 and 2) Wave 2: October 2021 – March 2022.

III. Structure of the dissertation

The dissertation contains 173 pages, of which 17 pages are appendices. It is structured in an introduction, three chapters, a conclusion, 3 appendices, 38 tables, and 37 figures. The bibliography covers 108 sources, of which 41 are in Cyrillic, and 67 are in Latin.

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IV. General characteristics of the dissertation

The dissertation follows a structure that translates the process of consideration, research, findings, and recommendations regarding the given topic through several stages.

Relevance and significance of the researched issues

The relevance of the topic is expressed in the fact that not knowing and not distinguishing between different emergency situations, as well as the need to perform FA, are becoming increasingly tangible problems. The negative consequences of untimely, inadequate, delayed FA have extremely negative and/or fatal consequences both on the health and quality of life of the casualties, and on the financial aspects of our health care system for the subsequent treatment of the consequences. In order to be able to achieve lasting and significant results, a systematic, strategic approach is needed to eliminate the consequences of this ignorance, as well as a sustainable model and mechanism guaranteeing the effectiveness of the process. From a management perspective, the focus should be on establishing the relationships and dependencies of the various actors, and their roles, and responsibilities in delivering FA.

First of all, these are the performing FA, who are not limited only to helping casualties in a given situation, but also to preserving their own health and life[1]. The literature analysis on the subject shows that the problem is poorly studied in Bulgaria. There is a lack of both an adequate legal framework for responding to such situations and a reliable and spatially empirical study of FA knowledge and skills. Secondly, it is the institutional structures of Emergency Care and related units that are subject to management and budgeting as part of the national health system. Thirdly, these are the structures of the Bulgarian Red Cross (BRC), which are an intermediate unit responsible for conducting mandatory training for performing FA, only and only for obtaining a motor vehicle driving license. In the fourth place – a wide range of other participants (municipal structures, non-governmental organizations, etc.) and interested persons directly and indirectly related to the timely provision of FA in public places.

Deriving a concept and developing a model ensuring sustainability in FA training would also serve as a basis for creating prerequisites for targeted policies to improve the health and quality of life of the population, preventing the development of severe incidents and the manifestation of acute forms of illnesses. This would also have a positive economic effect on all concerned, including a reduction in costs for emergency teams, hospital stays, and treatment of the injured.

In this dissertation, the concept of "*first aid*" is considered a set of actions and measures in the case of an acute form of illness or injury, which should be undertaken until the arrival of a specialized team (primarily Emergency Medical Services (EMS)) (Zideman et al., 2021). In some situations, these are also BRC Water and Mountain Rescue teams, police, fire brigade, etc. In connection with this, it is necessary to study the possibility and readiness for the reaction of the largest possible number of people from the population of Bulgaria.

The discussion questions that are posed in the development, as well as the analyzes made, are based on theoretical and empirical studies, an overview and analysis of European good practices, and the author's personal experience of participating in the FA training process of different types of groups from society.

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[1] Ref. *The role of the first aider*. St John Ambulance. 2021. Available from: https://www.sja.org.uk/get-advice/i-need-to-know/the-role-of-the-first-aider/. [Accessed 16.06.2022].

Objective and thesis tasks

The main **objective** of the dissertation is *the study of the knowledge and skills of the population to perform FA, by creating and approbating a conceptual model for their improvement*.

Dissertation tasks:
1. Situational analysis of the Bulgarian legislation in the field of performing FA. Comparative benchmarking analysis of good practices from leading European countries.
2. Conducting an empirical study on the preparation and readiness of the population of Bulgaria to provide FA in the event of an accident or acute illness.
3. Development and approbation of a strategy model for increasing knowledge and skills for performing FA on the example of the specific target group.

Object and subject and time range of the study

The **object** of the dissertation empirical research is the availability of knowledge and attitudes in the Bulgarian society for the provision of FA.

The **subject** of the study is the possibilities of forming knowledge and skills for performing FA among the Bulgarian society, and more specifically - the teachers from junior high school and high school courses of study and their distribution among students.

The temporal scope includes two directions - an overview of the regulatory framework of Bulgaria, summarizing the period of the earliest adopted law (BRCA, 1995), up to the present day. And a second period – that of the empirical research and its comparison of the two considered waves – from February 2019 to March 2022.

Research questions

Конкретните изследователски въпроси, включени в емпиричното проучване са:
1. What is the evaluation/self-evaluation of the preparation of the Bulgarian society to perform cardiopulmonary resuscitation (CPR) in case of sudden cardiac arrest (SCA)?
2. What are the attitudes of Bulgarian society and its readiness to accept and/or use automatic external defibrillators (AED) in public places?
3. What readiness does the Bulgarian society show to provide FA measures in the event of an incident (readiness for action)?
4. What is the assessment of the adequacy and readiness of the Bulgarian society to provide FA in the event of a life-threatening incident?

Research thesis and hypotheses

The defended **thesis** is that the application of a model for the formation and development of FA skills will lead to the increase and development of adequate knowledge and skills among the representatives of the target groups. This will have a direct impact on the reduction of mortality, respectively optimization of costs (for hospital treatment, support of EMS, etc.), quality of life, and achievement of strategic goals in the healthcare sector.

Working hypotheses include:
1. The lack of legal and normative regulation has a negative impact on the maintenance of knowledge and skills for performing FA among the Bulgarian society.
2. The low share of trained people in FA, as well as the absence of a system for monitoring and evaluation/self-assessment of the level of knowledge and skills, are

the main factors responsible for the unsatisfactory self-assessment of the Bulgarian society for providing FA.

3. The implementation of a national model of management strategy will lead to a significant, permanent and sustainable increase in the knowledge and skills for performing FA among the Bulgarian society.

Methodical toolkit

In the process of implementing the theoretical-empirical research, the following **methodological toolkit** were used:

1. A literature review and critical analysis of the available secondary information on the subject related to the provision of FA and the preparation of the population.
2. Situational analysis and primary data from the author's national survey "Society and first aid from 2019" (wave 1) (See Appendix 1).
3. Conducted an empirical study "Society and First Aid II" from 2022 (Wave 2) to study the knowledge and skills of the population to provide FA.
4. Development and approbation of a conceptual model for increasing the preparation of the population in performing FA based on the specific target group - teachers from junior high school and high school courses and their distribution among students.

The research conducted used a questionnaire with open and closed questions and information screens for the two consecutive surveys in 2019 and 2022.

Sources of information

The research is based on the collection and review of the available secondary data from a number of legal acts in force in Bulgaria - the Bulgarian Red Cross Act (BRCA), the Road Traffic Act (RTA), the Health and Safety at Work Act (HSWA), regulations, strategies, and others. Good practices in European countries (Germany, Austria, Norway, England) and reports of international organizations working on the subject - European Resuscitation Council (ECR), American Heart Association (AHA), International Federation of the Red Cross, and Red Crescent are also examined (IFRCRC), European Emergency Number Association 112 (EENA 112) and others.

The dissertation uses purposefully collected, processed and analyzed primary information as a result of the comparison of data from two consecutive surveys conducted in 2019 and 2022.

Limitations

A **major limitation** and assumption is that *dissertation is not aimed at preparing a strategy, but an indicative model of a management strategy for increasing knowledge and skills in the field of FA approbated on the example of a specific target group*. In the scope of all the analyzed strategic documents, it was not established that the provision of FA is an independent object of analysis and evaluation. Precisely for this, as a result of a thorough study of the normative framewrok, taking into account the results of the conducted empirical studies, the Ph.D. candidate aims to develop a conceptual model allowing to overcome the identified deficits in the preparation and training for performing FA, for the example of a specific target group.

Among the limitations of the research is that the profile of the respondents is not taken into account, and the society is considered as a whole, without specifying the various specifics of its component parts.

From a methodological point of view, the method of forming the sample based on the principle of respondents is also a **limitation**, as well as all the limitations of the online toolkit for conducting empirical research.

Utility and originality

The **utility and originality** of the research are expressed in the overall overview and critical analysis of the Bulgarian legislation on the subject, as well as the collected primary information regarding the preparation of the population for performing FA from two relatively distant periods from each other - 2019 and 2022. The studies conducted are the first of their kind in terms of representativeness and national scope and can serve as a basis for conducting policies in the field of health care and the provision of FA. The lack of data on the topic contributes to the **originality** of the research on which the doctoral dissertation was developed.

V. Brief content of the dissertation

In the **first chapter, "Analysis and assessment of the legislative and regulatory framework in Bulgaria, concerning the knowledge and skills of the population of Bulgaria to perform FA"**, an overview of terminological clarifications and a review of the regulatory framework is made, the economic aspects and financing of emergency aid in Bulgaria are considered, and a comparative benchmarking analysis of good practices from the leading European countries is made.

The review begins by establishing the presence (or absence) of a specific definition of what FA is and who can perform it.

The term "first aid" is found in the texts of three of the acts of the Republic of Bulgaria:
1. Bulgarian Red Cross Act (BRCA);
2. Health and Safety at Work Act (HSWA);
3. Road Traffic Act (RTA).

The presence of the concept of "first aid" in BRCA is limited to its mention in only two of the points of the relevant act:
- Art. 4 (1) (Previous text of Art. 4, amended - SG No. 80 of 2011, in force from 14.10.2011), item 2, letter c;
- Art. 4 (1) (Previous text of Art. 4, amended - SG No. 80 of 2011, in force from 14.10.2011), item 4.

When going deeper into the regulations, we reach Ordinance No. 24 of December 2, 2002 on the conditions and procedures for training to provide first aid by drivers of motor vehicles. Although the regulation mentions the way (the whole regulation) and the scope of FA training (Article 9), here again the sought definition and who can provide FA is not found.

Moving on to the reading of the next act - Health and Safety at Work Act (HSWA), a more significant presence of the concept of "first aid" is found compared to the previous one. It is mentioned in four places:
- Art. 20 (1), item 1 (amended - SG No. 40 of 2007, amended - SG No. 88 of 2010, effective from 01.01.2011),
- Art. 20 (1), item 2 (amended - SG No. 40 of 2007),
- Art. 20 (2) (Amended - SG No. 18 of 2003, amended - SG No. 102 of 2006, amended - SG No. 40 of 2007, amended - SG No. 102 of 2008, amended - SG No. 93 of 2009, in force from 25.12.2009),
- Art. 26 (1) (amended - SG No. 40 of 2007), item 2 (amended - SG No. 40 of 2007).

The HSWA texts mention who can provide FA in the workplace, but not what it actually means as a concept. It is noteworthy that the scope of the training is left in the hands of the respective employer. These texts arouse discussions in various specialized forums and online groups, including among specialists from occupational medicine services.

When examining the third act, the Road Traffic Act (RTA), it can be seen that the concept is formulated with one of its valid constructions - "first aid". FA is mentioned in Art. 152 (2), which discusses the requirements for obtaining a license to drive a motor vehicle, part of which is FA training and art. 152a, item 2, which mentions the conditions and procedures for training. It is only here, when considering the RTA, that what constitutes "first aid" is defined in the "Additional Provisions" section.

With the exception of the RTA, which profiles and limits the concept of "first aid" only to the cases of a traffic accident, the review of the legal framework ends with the lack of specifics on the subject.

For this reason, in order to give a clearer definition, it is necessary to take it from the most authoritative organizations in the field. The most current definition of FA has been published, along with penultimate guidelines for performing FA, by the ERC, AHA, and the International

Liaison Committee on Resuscitation (ILCOR). All three institutions come together and give a very brief but at the same time understandable definition of what FA is, what the FA provider should be able to do, and what the goals of FA are:

„The aid and initial care provided in acute illness or injury. It is carried out by a witness to the accident or the first person to arrive at the scene. A first aider is someone trained in first aid who should recognize, assess and prioritize the need for first aid measures, render aid using relevant skills, assess how much they can help, and seek further assistance when necessary. The goals of first aid are to save a life, relieve pain, prevent further injuries, and support the victim's recovery.“

The lack of clear scope, boundaries, recommendations, and models for the development of FA in the Bulgarian legislation directly affects not only public health, and the quality of life, but also has a serious economic impact. Among the key issues, the complexity and inefficiency of the allocation of financial resources in the health sector, and in particular, those for emergency care, which do not benefit society, stand out. In this sense, there are guidelines that show that only severe and serious cases that require immediate medical assistance and treatment of patients should be admitted to the structure of the EMS, whose activity is paid for by the state (Ivanova, 2020), while excluding incidents of a minor nature. The provision of FA, in addition to being life-saving, is directly related to other complex issues such as readiness and willingness to provide assistance, knowledge, and skills for this and/or transfer of responsibility to emergency centers.

The question of how it will be prioritized and who will determine the severity of the injury raises concerns. If these are the eyewitnesses of the accident, will they be able to adequately assess the condition of the victim without specialized training? This is a key point that determines the need to educate the population on FA. In this case, clarification of the problem could help 1) to realistically assess the level of severity of a given injury or condition and 2) if the mentioned guidelines are not implemented, FA training will help to reduce the cost of providing EMS teams, allowing them to focus on serious incidents.

In the National Health Strategy (2014-2020), in section Policy 4.2, it is mentioned that „*The analysis of the state of the emergency medical aid system shows the presence of numerous problems, which, against the background of growing public dissatisfaction with its activity, necessitate radical changes in its structure, organization, functions, quality of activity and financing.* “[2] This text also states that insufficient funding is one of the reasons for the deteriorating staffing, insufficient qualification, and motivation of EMS workers. If the number of cases handled by this service is reduced, without reducing their remuneration, the quality of the services offered will increase and thus the dissatisfaction and health uncertainty of the public will decrease. This confirms that providing FA training to the public will be useful and necessary so that they can respond to milder cases and specialists focus on the more severe ones.

In the National Health Strategy [3] there is a drive to improve emergency outpatient medical care through the implementation of various policies tied to specific results. One of the expected results is ensuring promptness of service - up to 30 minutes for more than 95% of patients. From a medical point of view, in many cases of life-threatening injuries and conditions, this is too long a waiting period for the casualty to be fatal by the time the ambulance arrives. Implementing FA training would help support the lives of those in need in those crucial 30 minutes. *The conclusion that emerges is that, apart from economic, the knowledge and skills to perform FA also have a human aspect.*

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[2] Ref. *National Health Strategy*. Ministry of Health of the Republic of Bulgaria. 2013. Available from: https://www.mh.government.bg/media/filer_public/2015/04/08/nacionalna-zdravna-strategia_2014-2020.pdf. [Accessed 16.06.2022].
[3] There again.

The need for a strategic model to provide FA training is also confirmed by the number of EMS calls recorded. Although the number of patients served exceeds 95% for the period 2000-2019, it does not exceed 99%.[4] The remaining 1% to 5% of cases in which specialist services cannot respond could be covered by FA-trained bystanders. In addition, the overall rate of calls to EMS could be reduced by providing coordinated and targeted FA training. In addition, it will reduce the workload of EMS teams, reduce the costs they generate and increase the motivation and satisfaction of the medics.

The economic benefits of developing a strategic model for FA training also include the reduction of subsequent hospital costs after an accident. Bulgaria is the country with the lowest allocated expenditure/budget for health care. According to official data from Eurostat, health care costs of 626 euros[5] could be optimized by reducing the number of hospital admissions with an adequate bystander response to an incident or acute illness. The effect would be significant, given that according to data from the National Health Insurance Fund (NHIF) and the National Framework Agreement[6] the costs for hospital medical care represent 74.08%, and those for primary outpatient medical care only 9.9% of the annual amount of funds for health insurance payments for medical activities for 2022, which are worth a total of BGN 3,670,771.5 thousand.

In conclusion of the review and critical analysis of the legal framework of Bulgaria, it is necessary „*to support measures to introduce FA training for all who participate in the Unified Rescue System, as well as for voluntary organizations*".[7] The priority is already present in the project for the National Health Strategy of the Ministry of Health, which confirms the importance of the topic of the dissertation and the need for strategic management decisions aimed at training to provide FA.

Chapter one continues with an examination of the economic aspects and financing of emergency aid in Bulgaria. Bulgaria spends 7.1% of GDP on healthcare, which is below the EU average of 9.9%[8]. This is an increase of 54.3% compared to the value in 2009[9]. As of 2019, healthcare spending per capita (adjusted for differences in purchasing power) is the lowest in the EU at €1,273. However, the analysis shows a significant increase in healthcare expenditure (per capita) - between 2009 and 2019 by 83% compared to an average growth of 28% in the EU[10].

The report of the European Commission states that **the Bulgarian health system is based on a mandatory social health insurance scheme, with voluntary health insurance playing a small role (1.6%)**. It states that in 2019, public funding accounted for 60.6% of total healthcare spending. This is an increase of 54.3% over the value in 2009 and is the highest reported share of public health spending since 2005. Per capita, this means that in 2019 public funding amounted to €771, an increase of €377 compared to 2009.

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[4] Ref. *Healthcare 2021*. National Statistical Institute. 2022. Available from: https://nsi.bg/sites/default/files/files/publications/Zdraveopazvane_2021.pdf. [Accessed 16.06.2022].

[5] Ref. *Healthcare expenditure statistics*. Eurostat. 2019. Available from: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Healthcare_expenditure_statistics&fbclid=IwAR2sVHE0mgigBRwJ58DTKwayBNiNhhX_yroFYV3KLqwiClxNpa6GkPps23Y#Healthcare_expenditure. [Accessed 16.06.2022].

[6] Ref. *Contract № РД-НС-01-4-14 of August 24, 2022 on amendments and additions to the National Framework Agreement for medical activities between the National Health Insurance Fund and the Bulgarian Medical Union for 2020 - 2022 (SG, No. 7 of 2020)*. Ministry of Health. 2020. Available from: https://www.nhif.bg/get_file?uuid=E83D1421D683F85AE05304098C0A3239. [Accessed 19.09.2022].

[7] Ref. *Draft National Health Strategy 2021-2030*. Ministry of Health. 2020. Available from: https://www.mh.government.bg/media/filer_public/2020/12/29/proekt_na_natsionalna_zdravna_strategiia_2021-_2030.pdf. [Accessed 16.06.2022].

[8] Ref. *State of Health in the EU. Bulgaria. Country Health Profile 2021*. European Commission. Available from: https://health.ec.europa.eu/system/files/2022-01/2021_chp_bulgaria_bulgarian.pdf. [Accessed: 13.09.2022].

[9] There again.

[10] There again.

Although the social health insurance system in Bulgaria is based on the principle of universalism, a significant part of the Bulgarian population is not insured. According to the data of the NHIF[11] from 2020, according to which at the end of 2019, just over 1 million people (14.8% of the population) were not covered by health insurance. According to the Ministry of Finance, this share is about 10%. The large number of uninsured individuals is a serious cause for concern with regard to access to medical care[12].

On the other hand, additionally, direct payments from patients account for a large share of healthcare spending and are more than twice the corresponding spending in the EU. They accounted for 37.8% of healthcare spending in 2019 – the highest share in the EU, approximately 2.5 times higher than the share for the EU as a whole. In 2019, direct payments by patients for health services, excluding long-term care, represented 4.4% of final household consumption in Bulgaria – the largest share among EU countries for which data is available. Key factors for the high proportion of direct payments include services outside the scope of the health insurance package and co-payments for some of the services included in the package, especially drugs.

Non-regulated payments account for a significant share of household health expenditure and contribute to financial pressure on households (Zahariev et al., 2018). This calculation is also proven by the Eurobarometer data cited in the report, which indicate that 10% of Bulgarians paid unofficially to a doctor, nurse or hospital.

Of the additional direct payments for health care in Bulgaria, the catastrophic health costs are the highest in the EU. Catastrophic expenditure is defined as expenditure on direct payments by households that exceed 40% of total household expenditure excluding subsistence expenditure (ie food, housing and utilities). In 2018, approximately 19% of households in Bulgaria reported having incurred catastrophic healthcare costs – almost three times the average for EU countries for which data is available. Approximately two-thirds of all catastrophic costs in Bulgaria are concentrated among the poorest households; this share is higher than in other countries with high levels of catastrophic spending such as Lithuania and Latvia[13].

As a conclusion, it is noted that with the general situation of high health costs and the lack of financial protection of households, it is clear that it represents a risk of impoverishment or deepening poverty of households with the lowest incomes.

Despite the increase in health care costs, the death rate is almost twice the EU average (427 per 100,000 people compared to 256 for the EU). The main contributor to this is the persistently high mortality from cardiovascular disease and cancer. Cases of premature death from stroke are 4 times more than the EU average, and those from ischemic heart disease - 1.5 times more than the EU average[14]. These cases represent a total of 42% of all deaths due to treatable causes [15].

In Bulgaria, hospital treatment takes a huge advantage over prevention, and policies for prevention and health promotion have a very limited impact. The costs of hospital treatment to out-of-hospital care are in the ratio of 5:1 against an EU average of 1.5:1, and the

[11] Ref. *Annual reports of the NHIF.* National Health Insurance Fund. 2020. Available from: https://www.nhif.bg/page/2035. [Accessed 19.09.2022].

[12] Ref. *State of Health in the EU. Bulgaria. Country health profile 2021.* European Commission. Available from: https://health.ec.europa.eu/system/files/2022-01/2021_chp_bulgaria_bulgarian.pdf. [Accessed 13.09.2022].

[13] There again.

[14] Ref. *Overview of public revenues and expenditures of the Republic of Bulgaria.* Ministry of Finance. 2021. Available from: https://www.minfin.bg/bg/1532?fbclid=IwAR30G7I8aiid-RAc8CAkBL5WE8Wqz0EJ4C9QL5JyFqj0aRlyzd5EWDfSpyU. [Accessed: 13.09.2022].

[15] Ref. *State of Health in the EU. Bulgaria. Country health profile 2021.* European Commission. Available from: https://health.ec.europa.eu/system/files/2022-01/2021_chp_bulgaria_bulgarian.pdf. [Accessed 13.09.2022].

average annual income per head of the population for prevention is €34 against an EU average of €89[16]. These cases represent a total of 42% of all deaths due to treatable causes[17].

The costs of pre-hospital care in 2019 are 0.6% of GDP with an average of 2.3% in the EU, on the other hand, the costs of hospital care are above the average in the EU (3.1%) - 3.4%[18].

Considering the shortage of nurses (and an average age of 55), the fact that 63% of doctors are over 51 years of age and other structural health care problems, it can be concluded that there is a huge negative pressure on the health system that reduces its effectiveness.

Urgent and emergency medical care play an extremely important role in the overall process of providing medical services. In a report by the Ministry of Finance[19] a distinction is made between the two types of assistance - immediate and emergency. Immediate medical assistance is a medical activity for providing urgent medical assistance to sick and injured persons whose lives are not directly threatened, but who need medical assistance in a short period of time. Emergency care is an activity for providing emergency medical care to sick and injured persons in a condition that directly threatens their lives[20]. In the report of the Ministry of Finance, it is pointed out that the unclear distinction of the two specialized medical activities stems from the unfinished reform in primary medical care and creates functional problems for their organization[21].

In order to set the specifics and framework of the current doctoral research and to make a deeper section of the topic, it is necessary to organize a comparative benchmarking analysis of good practices from leading European countries. Such an overview is imperative in order to adopt a specific, adequate way of asking basic questions related to the provision of FA, to make a subsequent comparison of the data and results obtained and, on this basis, to lay the foundations for the transfer of positive experiences and practices from countries with a developed system in this area.

The efforts of countries such as England, Norway and Germany to educate[22] a huge part of its citizens (over 70%) are more than optimistic and bring peace to the whole society. Despite the quoted percentages, the important question remains as to how many of those trained are actually ready to respond if necessary.

In 2018, the British Red Cross in association with St. John Ambulance Service and the British Heart Foundation published the results of a study[23], which stated that only 5% of adults surveyed felt confident to respond in an incident situation. The results demonstrate the vital need for FA training in schools to overcome the public's lack of knowledge and confidence at an early age. The research reveals that only 1 in 20 (5%) people would feel knowledgeable, confident and ready to act in these three scenarios - 95% of people would not. The need for repeated FA training is something the British Red Cross confirms, citing Joe Mulligan, head of the organisation's FA training programmes.

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[16] Ref. *Overview of public revenues and expenditures of the Republic of Bulgaria*. Ministry of Finance. 2021. Available from https://www.minfin.bg/bg/1532?fbclid=IwAR30G7I8aiid-RAc8CAkBL5WE8Wqz0EJ4C9QL5JyFqj0aRlyzd5EWDfSpyU. [Accessed 13.09.2022].

[17] Ref. *State of Health in the EU. Bulgaria. Country health profile 2021*. European Commission. Available from https://health.ec.europa.eu/system/files/2022-01/2021_chp_bulgaria_bulgarian.pdf. [Accessed 13.09.2022].

[18] Ref. *Overview of public revenues and expenditures of the Republic of Bulgaria*. Ministry of Finance. 2021. Available from https://www.minfin.bg/bg/1532?fbclid=IwAR30G7I8aiid-RAc8CAkBL5WE8Wqz0EJ4C9QL5JyFqj0aRlyzd5EWDfSpyU. [Accessed 13.09.2022].

[19] There again.

[20] Ref. *Healthcare financing and management - theoretical foundations, models, problems, and trends*. Ministry of Finance. Available from https://www.minfin.bg/document/2891:1. [Accessed 13.09.2022].

[21] There again.

[22] Note: This is about TRAINED people, not what percentage of those trained WOULD PROVIDE FA if needed.

[23] Ref. *Press release - new research shows just 5% of adults have the skills and confidence to provide first aid in emergency situations*. 2018. British Red Cross. Available from: https://tinyurl.com/44znmwz9. [Accessed 16.06.2022].

A Norwegian survey conducted in April 2014 by Norstat telemarketing company (Oslo, Norway) found that among 1,000 telephone interviewees, 90% had received FA training, with 54% having received such training within the last 5 years. (Bakke et al., 2017) Of the 43% who were in a situation requiring FA to be performed, 89% performed FA in that situation. These are data that once again support the claim that FA performance skills are being forgotten and need to be periodically refreshed.

Chapter one concludes with an examination of good practices for population training in Europe. This includes basic training of the population in terms of legal regulation and availability of AEDs for public use. On the basis of this overview, the contribution of these countries is summarized and its application is proposed in the countries that could benefit from this experience and increase the overall preparation of their population to perform FA. The collected information is synthesized and analyzed, on the basis of which two groups of criteria are outlined: **Group 1** – criteria for selecting the investigated objects in the study and **Group 2** – criteria for examining and comparing the investigated objects.

The criteria by which the research objects are selected refers to the available and publicly available secondary information, using data from one of the most authoritative organizations in the field – IFRCRC, published in 2009 in the report „First aid for a safer future Focus on Europe - Advocacy report 2009"[24]. In its estimation, the review and analysis consider and adopt a criterion ***„percentage of the population prepared to provide FF"*** in 22 European countries. In order to narrow the scope of the review of good practice, a second criterion is introduced – ***a threshold of over 80% trained population***. For the purposes of the review and analysis, it is assumed that the countries with the highest percentage of trained population also have the best practices in FA training. Only three of the studied countries correspond to this characteristic, which reduces the focus of this analysis to Norway, Germany and Austria.

Given that the topic is narrowly profiled, the sources of information are limited in number. Information on the preparation of the population for FA and provision of AEDs can be found in specialized publications, studies and publications of organizations that work in the field. Regarding the significance of the criteria used, the selected ones define the status of each of the countries under study and are grouped into 4 sections:

A) Legislation regulating FA training for different population groups.

B) FA training within the local Red Cross Society.

C) Legislation governing first aid kits, providing FA by an eyewitness, protecting the providing FA from prosecution.

D) Legislation governing the use of AEDs.

Table 1. Comparative characteristics of Norway, Germany and Austria, 19 indicators each

№	Indicator	Norway	Germany	Austria
A	Legislation regulating FA training for different population groups			
1	Candidate drivers (non-professionals)	✓	✓	✓
2	Professional drivers (taxi, bus, school bus, etc.)	✗	✓	✓
3	Teachers, educational staff	✓	✓	✗
4	Company employees (FA in the workplace)	✗	✓	✓
5	Medical students	No data	✓	✓
6	Students studying to become nurses	No data	✓	✓

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[24] Ref. *First aid for a safer future Focus on Europe - Advocacy Report*. The International Federation of Red Cross and Red Crescent. 2009. Available from: https://issuu.com/ifrc/docs/first_aid_europe. [Accessed 16.06.2022].

7	Professionals who care for children	✓	✓	✗
8	Professionals who care for the elderly	✗	✓	✗
9	Cops	✗	✓	✗
10	Schools: pupils and students	Programs	✗	✗
B	FA training within the local Red Cross Society			
11	Validity of FA training certificates	No exp date	No exp date	No exp date
12	The Red Cross Society provides an opportunity for refresher courses	✓	✓	✓
C	Legislation governing first aid kits, providing FA by an eyewitness, protecting the providing FA from prosecution			
13	It is mandatory to have a first-aid kit in motor vehicles	✗	✓	✓
14	Obliges people to show FA in case of accident	✗	✓	✓
15	Protects the people who provided FA from being prosecuted (*Good Samaritan Law*)	✗	✓	✗
D	Legislation governing the use of AEDs			
16	Use of AEDs by non-medical persons	✓	✓	✓
17	Legal framework governing the use of AEDs	No data	✓	✓
18	AEDs available in public places	✓	✓	✓
19	The Red Cross Society participates in the training of non-medical persons in the use of AEDs	✓	✓	✓

With the presence of AEDs in public places, accurately mapped and/or using a mobile application to quickly locate them when needed, cases of fatal SCA in the out-of-hospital setting could be significantly reduced. Unfortunately, to date, the use of AEDs in Europe remains uneven, but 75% of countries have a register of available AEDs. (Gräsner et al., 2021)

The overall estimate for people affected by this condition, according to the ERC, cited in the European Registry of Cardiac Arrest (EuReCa) study, which is carried out in 27 European countries, is as follows: 3000 cases per year for Norway (0.06% of population), 100,000 cases for Germany (0.12% of the population) and 6,000 cases for Austria (0.06% of the population) (Gräsner et al., 2016).

According to this same study, the cases of SCA in Europe are 350,000, of which 100,000 could have been saved if CPR had been administered immediately and before the arrival of an ambulance. This means that successful cases could increase by 31%, which would reduce the fatality figures for Norway, Germany and Austria.

As of April 2017, Norway is estimated to have over 20,000 AEDs[25]. The country is introducing a national registry for the location of defibrillators. Together with the services that serve the emergency number in Norway and that a person can call for an ambulance, they create an application Help 113 App.[26] The aim is for most gyms/clubs, companies and institutions to register their available AEDs, thus making access to them much easier in case of need.

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[25] Ref. *New defibrillator registry in place*. Norway Today. 2022. Available from: https://norwaytoday.info/news/new-defibrillator-registry-place/. [Accessed 16.06.2022].
[26] Ref. *Hjelp 113-appen – hele Norges nødapp!*. Norsk Luftambulanse Stiftelsen. 2022. Available from: https://norskluftambulanse.no/hjelp113/. [Accessed 16.06.2022].

Data for Germany is not conclusive. According to a report by the European Emergency Numbers Association, the number of public AEDs in the entire country is unknown, but certainly exceeds 40,000, which is the number of those machines that are maintained by the Björn Steiger Foundation. (Rose et al., 2020). The likely reason for not having an exact number of installed machines is that although there is a regulation for their use in Germany (Medical Device Directive (MPBetreibV)), the EENA report 112 reports that in the country it is not mandatory to report to the authorities in case, for a device to be installed.

According to the EENA report 112 in Austria, it is not mandatory to report the installation of AED to the authorities, but it is recommended. This, in turn, gives a clearer opportunity to track the total number of installed machines, which amounts to 5,000 pcs. In this way, it is easier to map the available AEDs and thus to facilitate access to them. An additional advantage is that according to the municipal website of the city of Vienna, there is a mobile application ("Samaritan") that can be installed for free.[27] It uses a GPS system to locate the user and then suggest the nearest AED. The application also provides instructions for performing FA in the event of SCA.

The most impressive good practice is implemented in Norway. For a faster and more effective response to a cardiac arrest, a potential opportunity is being used to introduce an innovation - drones that could transport AED to the scene of the accident. In a detailed report, Thomas Rootwelt from the Norwegian University of Science and Technology looks at how this innovation can be implemented. (Rootwelt, 2016) At the moment, the idea is quite ambitious, since, on the one hand, it requires a serious financial investment, and on the other, it affects many legal areas, including regulations regarding the aviation of unmanned aircraft. The introduction of such technology can significantly increase the survival rate in cases of cardiac arrest, significantly shortening the time from cardiac arrest to the first defibrillation. A demonstration simulation of what it would look like can be viewed here.[28]

Regarding the accessibility of the devices, in addition to the already described application that works together with the emergency number 113, there are other applications such as Staying Alive, which can also be downloaded for free from the app stores of Android and iOS operating systems for mobile devices. A characteristic feature of the Staying Alive app is that if a person is trained to perform FA in a SCA condition, they can register with their phone and receive notifications. A similar application (iHelp) also exists in Slovenia and Bulgaria.[29] It maps and visualizes all the people who can help within a radius of 500 meters.

A good example of encouraging people not to worry about using AEDs in Germany is the relaxed regime under which the machines can be installed. There are no specific requirements regarding the specification of AEDs, and this regulation applies to both the corporate sector and publicly available machines. In order for their use to be easy and timely, the places where they are placed are marked with the corresponding distinctive signs, and access to the boxes in which the devices are stored is not difficult. Thus, any person, in case of need, can use it without having to go through a preliminary training course. It is possible for a person who has never operated an AED to use it correctly as the machine gives clear voice commands in the appropriate local language. Of course, this does not detract from the recommendation that people be educated on the subject, as certainly going through educational programs on the proper use of AEDs increases their peace of mind and willingness to help in the event of an SCA.

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[27] Ref. *More defibrillators for Vienna - every second counts*. City of Vienna. 2021. Available from: https://www.wien.gv.at/english/health-socialservices/defibrillators.html. [Accessed 16.06.2022].
[28] Ref. *TU Delft - Ambulance Drone*. TU Delft. 2016. Available from: https://www.youtube.com/watch?v=y-rEI4bezWc. [Accessed 16.06.2022].
[29] Ref. *iHelp is a safety app for you, your family and friends*. iHelp. 2020. Available from https://ihelp-bulgaria.com/. [Accessed 16.06.2022].

The situation is similar in Austria, where according to the EENA report 112 practically anyone can purchase and install an AED. Like Germany, in Austria it is not mandatory to report this event, but it is highly recommended. To encourage the reporting of newly installed AEDs and consequently improve the mapping of available machines, anyone can register their device on the website https://definetzwerk.at. All available defibrillators are mapped on the website www.144.at/defi. The report notes that in the FA's mandatory motor vehicle licensing courses, every applicant must be trained in CPR with and without an AED. A clear boundary is also set for the use of automatic and non-automatic (hospital) defibrillators. The second type can only be used by EMS medical personnel.

Last but not least is the development and adoption of legislation categorically protecting the FA provider from legal consequences, such as the ***Good Samaritan Law*** following the example of Germany. Here, a particularly strong emphasis must be placed on the fact that, in addition to medical personnel, the ordinary citizen must also be protected. The fact that so far only less than 15% of countries in Europe have adopted such a legal framework is worrying. Despite the existence of such a protective law, people are still worried about providing FA. Texts in the legislation that arouse a lot of discussion in public forums regarding their ambiguity must also be categorically eliminated. One such example is that if a person finds himself in an accident situation and fails to provide FA, then he can suffer financial penalties or imprisonment, as is the case in France. But, if the injured party dies, the person helping can be held legally liable. (Jaeck et al, ****)

In conclusion, the use and adaptation of the good practices from the mentioned European countries is a strong tool for increasing the knowledge and skills of the society in Bulgaria to perform FA.

The cited national studies in Germany and England serve as a basis for starting a process of studying the weak points in the legislation of our country, taking into account the public's position on the subject.

Borrowing in-depth FA training programs in schools is also a practice that will combine the cooperation between the formal (schools) and informal (non-governmental organizations) sectors of education - a non-standard approach, for the implementation of which an interagency effort is needed from both ministries , as well as from the non-governmental sector. The introduction of municipal programs for early defibrillation, following the example of the cited countries, and the organization of information campaigns is an aspect that would reduce the number of SCA casualties.

Last but not least, a particular emphasis on which efforts should be made to develop is the enactment of legislation that categorically protects from prosecution FAs committed in good faith. Judging by the accumulated experience of the cited countries in this area, the timely resolution of all the problems that have arisen in Bulgaria will increase the confidence and readiness of our society to react in case of need.

Chapter two, "Approach and methodological toolkit for conducting an empirical study on the preparation and readiness of the population of Bulgaria to provide FA in the event of an accident or acute illness", begins with the discussion of criticality regarding the knowledge and skills to provide adequate FA in the first minutes of the incident and self-assessment of the population in Bulgaria. The importance of acquiring the skills to perform FA is also enforced by the fact that even the fastest ambulances in the world cannot arrive at the scene immediately after a signal is given to the EMS. According to data presented by the National Health Service of Great Britain,[30] the average time for an ambulance to arrive at the scene of a life-threatening condition requiring CPR, cannot be reduced below 7 minutes. This means that a person in such a state may die by the time an EMS team arrives. For the casualty's

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[30] Ref. *Ambulance response times*. Nuffield Trust. 2022. Available from: https://www.nuffieldtrust.org.uk/resource/ambulance-response-times. [Accessed 16.06.2022].

survival, it is of utmost importance that bystanders begin providing CPR until an ambulance arrives.

Up to 2019, it is difficult to find up-to-date data on the preparation of the population for performing FA in Bulgaria. This initiated the author's study "Society and First Aid".[31] It was organized and conducted with the support of the First Aid School of FirstAidbg.com and the "First Three Minutes" Foundation, and the initiator and organizer of the research is the author of the current dissertation.

The main aim of the survey was to reach the maximum number of people and get a clear self-assessment of how the public perceives their preparedness to provide help in the event of an accident or acute illness.

On the other hand, the study aims to investigate the attitude of the population towards providing FA as an act of help, as well as how they perceive the placement of the life-saving AED equipment in a public place.

The survey was conducted in the period February-October 2019 with a total of 3334 respondents, of which 756 were men and 2578 were women. The results cover all 28 regions of Bulgaria, and the initial goal of reaching a minimum of 15 people per region has been met. The majority of the participants in the study are women aged 25 to 44, who live in Sofia and have a higher education - bachelor's or master's degree.

A semi-structured online questionnaire lasting within 5-7 minutes was used for the purpose of the study.

The conclusion is that the main concern of people to provide first aid is the fear of harming the victim, due to lack of up-to-date knowledge and availability of FA refresher courses. The results showed that a very large percentage of people had not taken FA courses in the last year. Other data show that there are people who have undergone such training only once in their life - during the driver's candidate courses more than 5 years ago. In these cases, the respondents themselves are defined as inadequate to provide FA in case of need.

The obtained results are a solid basis proving the need to conduct refresher courses. The main data and conclusions about how the public perceives their FA preparation are presented in Appendix 1.

The following conclusions are outlined from the above:

Conclusion 1.: The need to increase and/or strengthen the public's knowledge and skills in providing first aid and using life-saving AED equipment is increasing.

Conclusion 2: The preparation of a proposal for a management strategy model and the introduction of a legal framework for mandatory refresher courses in CPR, and FA in general, will channel this need and Bulgaria will reach, and even surpass, the threshold of 30% trained population - such as is considered acceptable at the European level.

Conclusion 3: People are afraid to perform FA due to lack of sufficient preparation and periodic updating of the knowledge and skills they have.

Chapter two continues with a description of the chosen approach for developing a management strategy model. For the purposes of the dissertation, the SMART goal setting approach is used as the most appropriate for defining goals as specific, measurable, acceptable, realistic. (Macleod, 2013) An acronym has different nuances to the words that are used in it, but the most common wording is as follows.

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[31] There again.

Figure 1. A graphical representation of the SMART model for goal setting
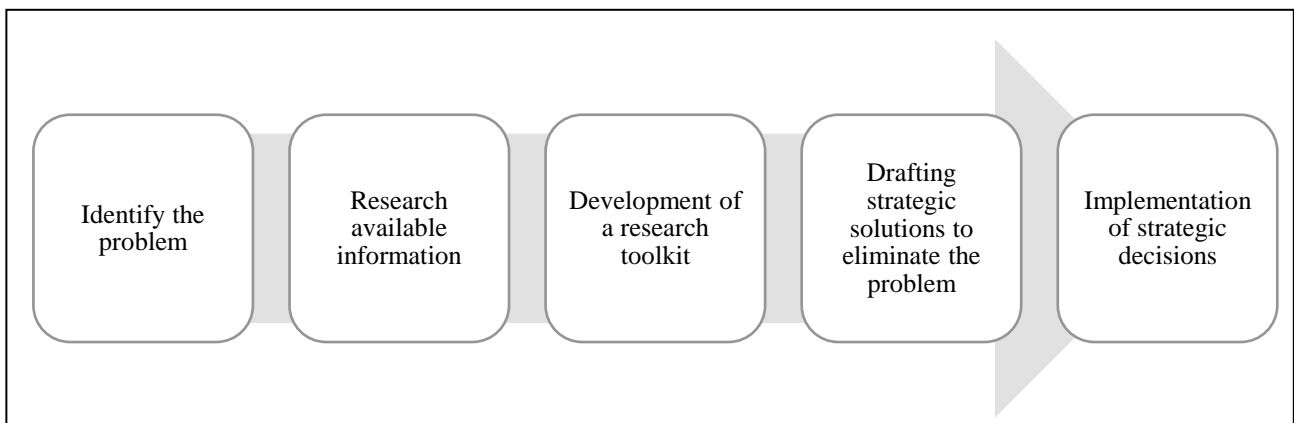
S	Specific	The goal should be specific
M	Measurable	The goal should be measurable
A	Accepted	The goal must be accepted by the people who will work on it
R	Realistic	The goal should be realistic
T	Time-bound	To be oriented in time
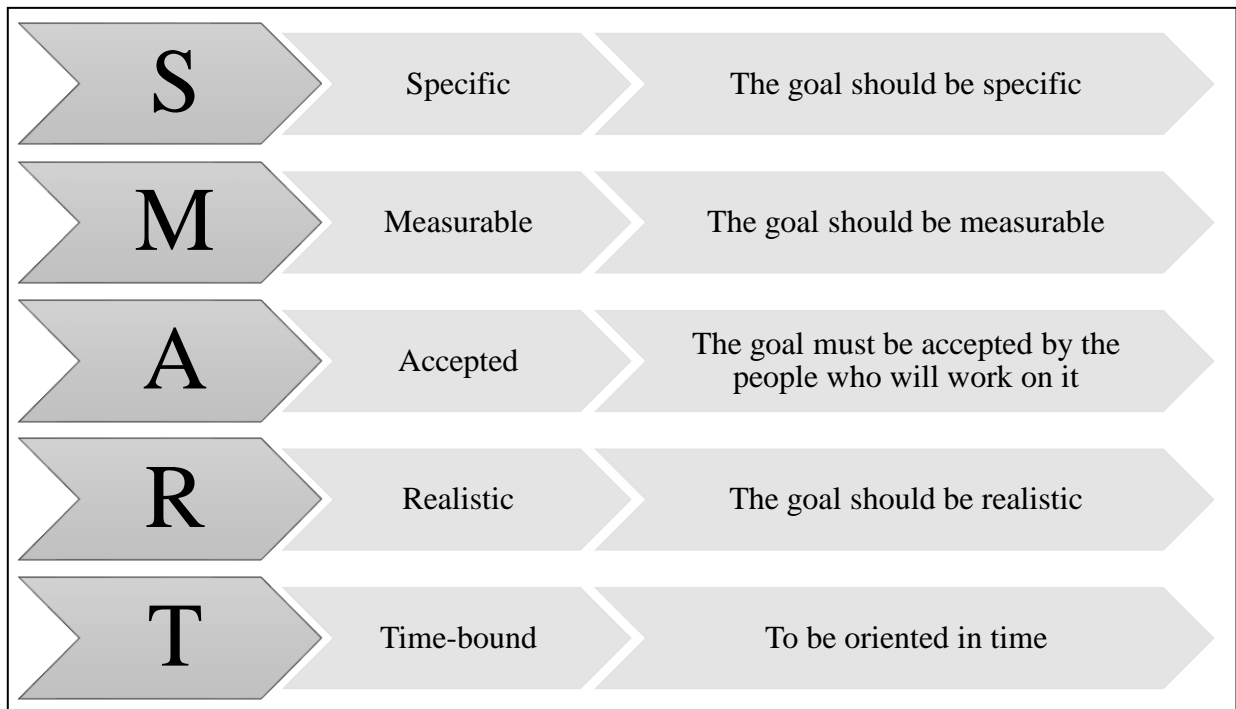
For a managerial decision-making model to be used for the needs of the present work, a five-step scheme is adopted as follows:

Figure 2. A five-step model for achieving the goal of this dissertation

Identify the problem	Research available information	Development of a research toolkit	Drafting strategic solutions to eliminate the problem	Implementation of strategic decisions

In a more detailed section of the management model, by reflecting the specifics needed to fulfill the purpose of the dissertation, the model and the algorithm of action look like this:

Table 2. Detailed presentation of the decision-making model to achieve the goal of the doctoral dissertation

№	Management decision stage	Details to achieve the goal of a dissertation
1	Identify the problem	• lack of compulsory nature of FA training, apart from those for obtaining the right to drive a motor vehicle, organized and conducted by the BRC;

		• lack of legal regulation for repeatability of FA training in order to maintain the level of theoretical knowledge and practical skills; • insufficient/rare up-to-date data on the preparation of the population of Bulgaria for FA; • and others.
2	Research available information	• review of Bulgarian legislation in the field of FA - BRCA, RTA, HSWA and other legal acts, regulations and strategies; • study on the availability of data on the preparation of the population in FA - percentage of trained population; • and others.
3	Development of a research toolkit	• developing a national online survey tool; • trial of the national online survey tool (10 people); • data collection (fieldwork) for a national online survey; • evaluation and analysis of data collected from a national online survey; • reliability and validity of the instruments used; • study group; • and others.
4	Drafting strategic solutions to eliminate the problem	• conducting a second wave of a national online survey to assess the current picture in the field of FA; • preparation of a management strategy model for increasing the knowledge, skills and readiness of society to perform FA - refresher training on FA, according to the needs arising from the results of the study (CPR, severe bleeding control, etc.); • stakeholders who would participate in the process – governmental and non-governmental organizations; • and others.
5	Implementation of strategic decisions	• given the fact that step 5 would require multidisciplinary and interdepartmental efforts of multiple stakeholders (both individuals and institutions), the step will be touched upon briefly in the present development in the nuance of what receipts of the proposals from item 4 should are made.

The time frame for the development of the dissertation work is realized and visualized according to the Gantt Chart model:

Table 3. Dissertation Timeline

Stage	Se 21	Oc 21	No 21	De 21	Ja 22	Fe 22	Ma 22
1. Revising the structure of a dissertation. *Adapting to the resources and discoveries during the doctoral studies.*	▓						
2. Literature review and critical analysis.	▓	▓					

Task	1	2	3	4	5	6	7
Overview and critical analysis of the regulatory framework of Bulgaria, overview and analysis of good European practices on the subject, medical justification for the need to perform FA, etc.	■	■					
3. Choosing a Dissertation Development Model. *Overview, analysis and model selection for management decisions, rationale, etc.*		■					
4. Selection of methodological tools to implement the empirical research. *Selection and development of online survey tools, sample types, selection of question types, definition of expectations, etc.*	■						
5. Testing and approbation of the online survey questionnaire.	■						
6. Field work.		■	■	■	■	■	■
7. Summary of interim results from the national online survey. *Key findings, comparative characteristics between wave 1 and wave 2 of the survey, etc.*					■		
8. Testing and validation of the proposed method.					■	■	
9. Preparation of a management strategy model.						■	■

Chapter two continues with an examination of the methodological tools for conducting the empirical research. In the empirical study, the object and subject of the research are formulated. A logical sequence is followed and the process is organized in a vertical direction. A problem is defined, the essence of the desired object of research is determined and its specific characteristics and specifics are reached - subject.

The following figure illustrates the transfer of this approach (problem-object-subject) to specific dimensions and specifics of the present study.

Figure 3. An approach to defining the "problem-object-subject" of empirical research
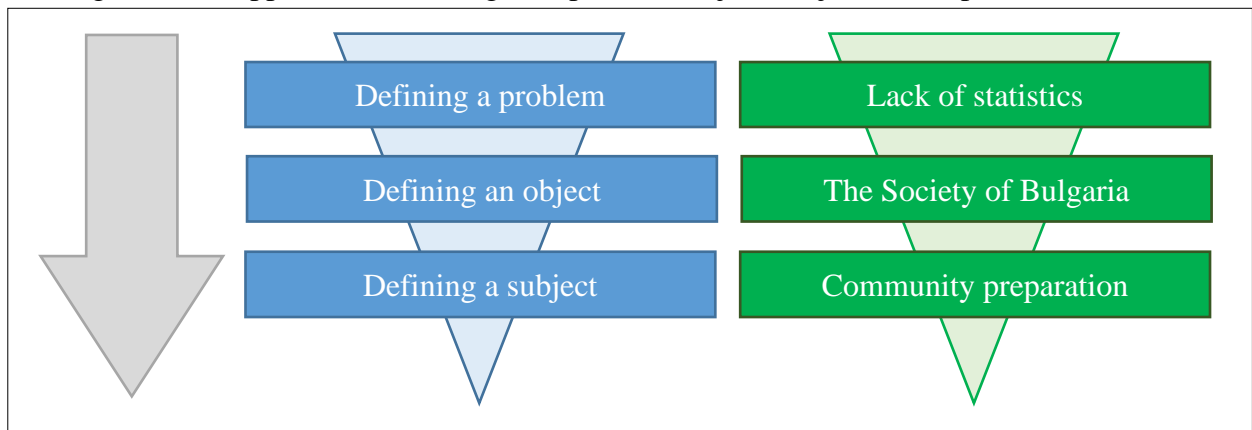
Given the nature of the chosen method (online survey), the object of the research is the presence of knowledge and attitudes in the Bulgarian society for providing first aid among people of all ages who can and use the Internet freely. The survey is carried out through a free-to-access platform, with the random sampling principle of the respondents. The goal is to collect as much data as possible for a specific period of time. However, on a database of online

platforms (Facebook)[32] for user activity, the assumed profile of the research object is built by educated men and women between the ages of 25 and 45.

The current development aims to collect sufficiently comprehensive and representative data on the preparation of the population to perform FA and compare them with the previous period - 2019. In this way, organizations engaged in training the population in FA will receive an adequate and realistic assessing the situation in order to target their efforts in terms of frequency, specificity, technique or particular way of training.

An additional task that the dissertation sets itself is to understand how the public's readiness to accept the idea of placing public AEDs has changed over the past 2.5 years. To achieve this goal, the study answers several main research questions:

1. What is the evaluation/self-evaluation of the preparation of the Bulgarian society to perform cardiopulmonary resuscitation (CPR) in case of sudden cardiac arrest (SCA)?
2. What are the attitudes of Bulgarian society and its readiness to accept and/or use automatic external defibrillators (AED) in public places?
3. What readiness does the Bulgarian society show to implement FA measures in the event of an incident (readiness for action)?
4. What is the assessment of the adequacy and readiness of Bulgarian society to provide first aid in the event of a life-threatening incident?

The sequence to achieve the set goals for evaluation and analysis of the FA preparation of the population of Bulgaria according, it goes through the following stages:

Development of a questionnaire

The questionnaire of the present study is a methodically constructed data collection instrument that is oriented to explore the good experience of the respondent during the filling. (Dillman et al., 1999) This ensures that it is refined and specified in the particular area of research, by consulting specialists who have in-depth knowledge of the problem. When developing this tool, the methodology takes into account a number of factors such as: structure of the survey, type of questionnaire (structured, semi-structured, unstructured), number of sections in the questionnaire, number of questions in a specific section, type of specific questions, wording of each question, necessity from asking a specific question, length of questions, order of questions, length of the entire interview, the general layout of the questionnaire, etc.

Approbation of the questionnaire

The questionnaire is tested with a small test group of respondents. In this way, a preliminary assessment of whether the questions are unambiguously asked and whether their meaning is correctly understood is organized. The reactions of the respondents are monitored, namely whether they are willing to answer, whether the questions asked in this way are interesting/attractive. The 10-person test group was selected in a way that did not include subject matter experts. After this stage, changes are required in the structure and way of asking the questions or their overall wording. After this stage is organized and conducted, the actual fieldwork begins.

Real data collection is the third main point in achieving the research objectives of the present work. It is conducted with real respondents and aims to collect a predetermined amount of data. This part goes through several stages:

1. ***„soft launch"*** of the project. The main goal is to test the questionnaire once again for the meaning and appropriateness of the questions presented. This stage is essential and

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[32] Ref. *Facebook Insights*. First Aid School of FirstAidbg.com. Available from (only for administrators): https://www.facebook.com/firstaidbg/. [Accessed 16.06.2022].

helps to verify that the developed questionnaire and the logic programmed in it are functioning correctly. A specific example subject to this check is the sequence of questions related to AED knowledge. If respondents answer "No", the system displays a screen with explanatory text and an illustration. If the answer is yes, then this additional screen is not displayed and the respondent can proceed to the next question in the section. This verification is important to validate the technical provision of the study. Otherwise, there is a risk that, due to a technical error, some of the questions will remain unanswered.

2. *„full launch"* of the study is carried out only when the previous stages have been carried out and the reliability and proper functioning of the study, from a technical point of view, has been confirmed.

3. ***Evaluation, analysis and interpretation of collected data*** is the last and most important stage of the whole study. After its completion, the data is in raw form (raw data) and is subject to initial processing, selection, clearing of errors and invalid/illogical records (bad cases). After the organization of this step, the obtained data is brought into a readable form for the analysts, including graphs, tables, diagrams, figures. With the help of these elements, trends are deduced, interpretations are made, specific recommendations are made and prospects for improvement of the researched area are outlined. For example, in the specific case, the 2022 survey showed that over 96.17% of the 1516 people interviewed accepted the idea of placing AEDs in public places, and this gives a solid basis at the national level to make efforts to change the legal framework on the subject. as well as to train more people to operate these devices.

Advantages determining the chosen method of empirical research

The aim of the two national online surveys - from 2019 and 2022 on the availability of knowledge and attitudes in the Bulgarian society regarding the provision of FA is to reach the maximum number of people. This necessitates the need to choose a survey method that can reach a large number of people in a short time, has minimal costs, has the ability to quickly process partial data through the available software solutions that modern platforms for working with surveys offer . Choosing to organize an online questionnaire is the most logical for the purpose of the survey. The positive sides of the approach are presented in the following table. (Nayak et al., 2019; Evans et al., 2005)

Table 4. Advantages of online surveys

Advantages
Engagement and dynamics of respondents
Equal perception of the manner of asking the questions
Environmental friendliness
The possibility of respondents influencing each other is avoided
Interactivity
Short lead time
Many times, cheaper than traditional surveys
Immediate feedback
Unlimited number of samples
Data processing through software
Receiving multiple data per unit of time, etc.

Toolkit of operation, reliability and validity of the instruments used and study group

When choosing a survey instrument, the nature of the information sought is the determining factor in selecting the survey method. Factors such as how quickly the data must be collected, the type of objects being studied, the size of the research team, the technical capabilities and competence of the team to process the data, budget, etc. are significant about the selection of the toolkit and methods.

The goals of this study include the goal of reaching the maximum possible number of people in a limited period of time. This determined the choice of the toolkit to be in the form of a semi-structured online questionnaire (See Appendix 2.). The questions are prearranged and their order is fixed. During fieldwork, the sequence of questions asked does not change. This ensures that every single respondent sees the questions in the same way as others. With this type of online surveys, subjectivity is also eliminated when completing an interview with an interviewer (face to face/F2F interviews).

Reliability and validity of the instruments used

The accuracy of data collected for socio-demographic and other factual type research questions is of utmost importance if the researcher is to make any claim about the data collected. Accuracy, as a characteristic of data quality, is perhaps the most important issue of all. (Singh, 2011)

From a total of 1,619 completed interviews received for the 2022 survey, the total number of units in the sample of people reached was 93.63%. The number of interviews considered invalid is 103.

Studied group

The survey seeks to reach the maximum number of people who use the Internet. In this sense, the selected type of sample is random, i.e. includes the most accessible items/persons or all those who responded, (Bhardwaj, 2019) for example, a survey published in a newspaper.

With this type of sampling, only the qualitative characteristic of the object is determined, but not the quantitative one. Such samples are formed when a link to the study is published on a given Internet site, Facebook group or page. In this case, it is expected that the expected respondents will be active and fill out the online questionnaire. It is not possible to expect a guaranteed success rate or to fill the planned quota (for example, women aged 25-34, with a higher education, from the Plovdiv region).

By definition, for the concept of "representativeness", this sample is non-representative, i.e. the rule that all people have an equal chance to participate in the study is violated. Due to the fact that the survey is online, the likelihood of including people over a certain age, for example, falls away.

There is a position that such a sample can be representative if a large number of successful interviews are achieved. This follows from the Law of Large Numbers in statistics, which states that as the number of uniformly distributed, randomly generated variables increases, their sample mean approaches their theoretical mean (Routledge, 2016).

When talking about online surveys, the introduction of the General Data Protection Regulation (GDPR), which came into force on 25 May 2018, should be considered. Researchers should be particularly attentive to this aspect of the survey and ensure that all participants have been informed and have confirmed their consent for their data to be processed.

Chapter three, „**Development and approbation of a strategy model for increasing the knowledge and skills for providing FA to the specific target group**" begins by considering the results of the experimental study defining the model for increasing the FA knowledge and skills of the community. The data collected from the author's national online survey "Society

and first aid", conducted in 2019, served as source data regarding the study of knowledge and skills for providing first aid.[33] Its results were summarized and analyzed and this helped to make a situational analysis and a snapshot of the public's attitudes towards the topic of performing FA.

The first study conducted clearly highlights a number of problems in the delivery of FA. Due to the lack of systematic efforts and concrete measures with a view to overcoming the identified problems, a re-study is required in order to ascertain the existence of the critical areas of intervention and the need to develop a strategy model. Between the two surveys, no action was taken to influence and change the identified deficits at the national level. The results of the survey carried out in 2019 found wide public interest, provoked public discussions and entered the perimeter of attention of the non-governmental sector and, more specifically, FA training schools. Regardless of the active civil position of NGOs, the problem remains unsolved at the national level and requires a different approach to increase knowledge and skills for performing FA. Organizations from the non-governmental sector work and reach a very small part of society, but their experience clearly highlights the need for larger-scale and systematic actions for education and training to increase the knowledge and skills of society.

In order to be able to ascertain, analyze and report the change in the behavior of a given studied object, the tools with which it is studied must be the same. For this reason, both waves of the survey used the same questionnaire. In the second survey conducted, two additional questions were added in the demographics section - place of residence and income of the respondents. The reason for this is that income information will help to investigate whether paying for FA courses is relevant and therefore only high income earners could afford it.

The profile of the respondents is of utmost importance in terms of target segments within the strategic decision model and filling the identified knowledge and skills gaps.

In the present study, the question of what medications the respondent would give to a casualty in the event of an accident or acute illness was omitted. From a research perspective, this question would have no applied utility to the study results.[34]

The following table presents a brief comparison of the period, method and type of sample for the respective two waves of the survey, as well as an explanation of why this particular approach was chosen.

Table 5. Duration, method and sample of the 2019 and 2022 studies.

Component	2019	2022
Period of conduct	February 14 - October 20, 2019 (8 months)	October 25, 2021 – March 25, 2022 (5 months)
Method	The method chosen to conduct the national online survey is an online semi-structured interview *(Computer assisted personal*	

[33] Ref. *Society and first aid - a national survey.* The First Three Minutes Foundation. 2019. Available from https://www.tinyurl.com/1f0eif1a. [Accessed 16.06.2022].

[34] Clarifications:
1. The "Society and First Aid II" study was initiated solely for the purposes of this dissertation.
2. Given the objectives, the period of organization and the conduct of Wave 2, the study collected 1516 completed interviews.
3. However, it is now possible to work with these results, because according to the Law of Large Numbers, any sample with more than 1000 units in it is representative.
4. To be able to equate and compare the results of wave 1 and wave 2, within the framework of this dissertation, we will work not in absolute values, but in percentage terms.
5. In order to be able to achieve a greater concentration of specifics, adhering to the main goal of the present dissertation, the exposition that is related to the presentation and data analysis of the sections "Cardiopulmonary Resuscitation (CPR)", "Automated External Defibrillator (AED)", "First aid" and "Additional case questions related to the provision of PP", will focus only on basic questions that have applied importance for the present work. Data mapping is available in tabular form.

	interviewing (CAPI)). This method was chosen based on the need to reach as many people as possible in a relatively short period of time and with relatively low costs for organization and implementation.	
Sample	Given the chosen method, the type of sampling is random, according to the responded respondents, typical of surveys published on an Internet site, where people are expected to be the active party and take the initiative to complete their proposed survey.	
Total number of study participants	3334 successful interviews	1516 successful interviews

In order to analyze the results obtained, comparative tables are organized based on the previous period (wave 1) to see what is the rise or fall of the individual values in specific questions.

For the "DEMOGRAPHY" section, it was found that during wave 1 of the survey, all 28 regions of Bulgaria were covered, and the initial goal of reaching a minimum of 15 people per region was met. This ensures coverage of the entire territory of the country and is another sign that the survey can claim to be representative. Wave 2 of the survey also guarantees coverage of the entire territory of Bulgaria, but at this stage of the survey's development, a minimum of 15 people per district has not yet been reached. This is also one of the goals that the current study sets itself, namely to reach and even exceed the coverage that wave 1 provided as results.

At this stage of the study, the comparative characteristic between wave 1 and wave 2 shows that the relative proportion of women participating in the study has risen by 7.24%. The data demonstrate that the majority of the participants in the study are aged between 25 and 44 years old, who live in Sofia and have a higher education - bachelor's or master's. If a more detailed breakdown of age is made, the relative share of the 25-34 age group dominates for wave 1, while 35-44 dominates for wave 2. However, viewed as a whole, this 25-44 segment continues to be dominant and maintains the trend of participation in both waves. This is also the expected profile, given the online activity of the different age and gender groups, given the data that is also available in online platforms, for example Facebook Insights, Instagram Insights, etc.

Regarding the monthly income, no difference can be commented, because as described earlier in the present dissertation, this question was not included in the wave 1 questionnaire.

A second section, "CARDIOPULMONARY RESUSCITATION (CPR)", shows that the percentage of people who know what CPR means has increased by 8.8% compared to the previous period. This comes to show that the concept is beginning to accept more and more continuity in society and is not simply accepted as a foreign term meaning artificial respiration and heart massage. On the other hand, it also demonstrates that the population is ready more and more to take the topic of their preparation seriously and perceive the CPR technique as a life-saving manipulation that should be performed without delay in the case of SCA. The data of the following questions also speak for this. Also, this positive rate of change testifies that the efforts made by the organizations involved in organizing and conducting FA courses have a positive effect.

Table 6. Percentage distribution of answers to question Q5

Q5. Do you know what cardiopulmonary resuscitation (CPR) is?		
Responses	Wave 1	Wave 2
Yes	37.04%	45.84% ▲
No	62.96%	54.15% ▼

Both during wave 1 and wave 2, the idea of the author's national survey was not only to be descriptive and collect primary information, but also to be educational. For those respondents who answered that they do not know what the term CPR is, the online survey offers an information screen with explanations.

The following questions from the survey go into greater depth and answer questions such as the regularity of CPR training, willingness to provide CPR to a stranger, etc.

Table 7. Percentage distribution of responses from question Q7

Q7. Have you completed a CPR training/course?		
Responses	Wave 1	Wave 2
Yes	48.86%	52.84% ▲
No	51.14%	47.16% ▼

Table 8. Percentage distribution of responses from question Q8

Q8. How long ago did you complete CPR training/course?		
Responses	Wave 1	Wave 2
In the last 1 year	21.12%	19.98% ▼
1 - 2 years	11.79%	14.48% ▲
2 - 5 years	19.09%	22.60% ▲
More than 5 years	45.73%	43.32% ▼
I can not remember	2.27%	2.62% ▼

More than half of the participants underwent CPR training, and it is satisfactory that the relative share of these people, compared to the previous period, increased by 4.18%. Unfortunately, however, the total percentage of people who have gone through this training in the last 1 year has decreased and only reaches 1/5 of the survey participants. This is only about 10% of the surveyed respondents, which is far from the 30% European minimum, and significant efforts should be made to increase these percentages.

Conclusion: **A mechanism is needed to ensure more frequent CPR courses given that this is a life-saving procedure.**

Of interest are the answers to Q14A compared to the answers to Q8. Question Q14A asks participants how long they would take a CPR training/course. Whether or not the divergence in these responses is paradoxical cannot be stated unequivocally, without further and more in-depth research. Despite the increase in the willingness of the surveyed participants to undergo CPR training/courses, compared to the previous period, there is still a lack of action on the part of society. Here the current question is posed, in what exact way, a point of contact should be found between the willingness and motivation to undergo such training/courses - whether these should be incentives in a different form from the state, whether discounts should be used in the prices of the CPR training/courses. The hypothesis of increasing the number of information campaigns can also be considered, and this will raise additional questions to whom they will be assigned, who will implement them, how they will be financed and who will observe the control over the implementation of the campaigns in question.

Conclusion: **There is a weak point between the public's willingness to take CPR courses and how to encourage them to learn.**

The data from the other questions in the section show that over 98% of the participants believe that the population should undergo CPR training and would spend between 4 hours and 2 days every 2-3 years to be trained. And during wave 2 of the survey, this trend remained almost unchanged from the trend in 2019. This is an extremely encouraging fact, which means that the topic is not alien to society and in the presence of *standardized programs* and training

method, people would respond in terms of learning how to perform CPR in case of need, and making efforts to maintain and refresh this knowledge and skills.

More than 86% of participants would perform CPR on a stranger if needed, with most knowing that delaying CPR on a person in cardiac arrest can lead to permanent brain damage. Those who would not take CPR to a stranger are most often worried about their *insufficient preparedness*. The relative proportion of people who gave these responses was, unsurprisingly, the same for both Wave 1 and Wave 2 time periods examined. This conclusion puts an even stronger emphasis on the need to regularly refresh theoretical knowledge and practical skills on the subject, in order to ensure that, in case of need, society will take the necessary actions.

The AUTOMATIC EXTERNAL DEFIBRILLATOR (AED) section demonstrates that there is a remarkable difference in raising awareness of what an AED is. Compared to the previous period, the relative share of people who are familiar with the essence of the device has risen by as much as 17%. It is very likely that this, in turn, also leads to a general increase in people's willingness to use it in the event of an SCA situation. The increase is 6% in relation to this topic. During wave 1, nearly 92% of participants believed that placing AEDs in public places was important. The fact that these percentages have increased by 4 compared to the last researched period is satisfactory.

Apart from everything else, this data also demonstrates a very good attestation regarding the efforts of the organizations that deal with the topic of promoting AEDs in Bulgaria. Areas where additional efforts can be invested are related to increasing the overall percentage of the population that is willing and confident to use an AED. The European minimum of 30% has been passed. The next goal is certainly to reach a rate similar to those demonstrated by countries such as Germany, Norway and Austria, cited in the overview of European legislation and good practices on the subject.

One of the most important sections is "FIRST AID (FA)". Like the previous two sections, this one begins with introductory questions about the topic. At the beginning, respondents are asked if they know what the term "first aid" is, according to the most current ERC definition. This question is followed by questions related to whether the respondents have been in a situation in which FA had to be performed and, accordingly, whether they have performed it. The need for these questions is rooted in verifying whether the hypothesis is really true that FA performance skills are not something that every person has to use, every day, constantly and daily, and accordingly the intensity of theoretical knowledge and practical skills fade over time, which gives rise to the need for refresher courses and periodic repetition.

Table 9. Percentage distribution of responses from question Q18

Q18. Do you know what first aid is, according to the guidelines of the European Resuscitation Council (ECR) and the American Heart Association (AHA) from 2015?		
Responses	Wave 1	Wave 2
Yes	39.86%	44.99% ▲
No	60.14%	55.01% ▼

Table 10. Percentage distribution of responses from question Q19

Q19. Have you ever been in a situation that required you to have adequate first aid skills?		
Responses	Wave 1	Wave 2
Yes	37.64%	37.73% ▲
No	62.36%	62.27% ▼

Table 11. Percentage distribution of responses from question Q20

Q20. Did you help in this situation?		
Responses	Wave 1	Wave 2
Yes	76.41%	80.07% ▲
No	23.59%	19.93% ▼

As can be seen from the data obtained, although only 5%, the knowledge of what constitutes "first aid" as a term is prominent. This is yet another positive assessment of the contribution of the organizations involved in organizing and conducting FA courses.

Impressively, the relative proportion of people who were in a situation that required them to perform FA did not change. It remains about 1/3 of the number of respondents. Of course, this fact has two dimensions - a positive one, which in this case has an axiomatic character and one should not reflect on whether a person has been in an accident or not. But on the other side is the negative aspect, which shows that the lack of an environment in which a given knowledge and skill can be exercised causes them to fade over time. In this plane, one should reflect on the need for the knowledge and skills to perform FA not to be just a passive arsenal for a person, but to actively take care of maintaining their good level.

The data from the answers to question Q20 are also of interest, namely that the willingness to be a first responder in the event of an accident has increased by about 4% compared to the previous researched period. The two human factors in whether someone would provide FA when needed are willingness and confidence. It is clear from the data that about 4/5 of the respondents would do so and this is guaranteed by 80% of the responses. In practice, one factor to turn out FA, readiness, is there. For reference, the confidence aspect is addressed in the following survey questions.

The next three questions, Q23, Q24 and Q25 provide an answer for completed FA training/courses, the place and/or institution to which the corresponding one was completed and the number of completed training to date by the surveyed respondents.

Table 12. Percentage distribution of responses from question Q23

Q23. Have you ever taken a first aid training/course?		
Responses	Wave 1	Wave 2
Yes	71.78%	78.43% ▲
No	28.22%	21.57% ▼

Table 13. Percentage distribution of answers to question Q24 (in absolute values)

Q24. Where did you take this training/course? (you can specify more than one location)		
Responses	Wave 1	Wave 2
To an organization or professional training center	312	229
To a specialized first aid training center	256	225
At the work place	333	204
For military/ scouting/ water rescue/ security or other type of training	225	90
As part of a first aid course for a candidate driver	1625	797
Other	331	145

Table 14. Percentage distribution of responses from question Q25

Q25. How many times have you attended a first aid training/course?		
Responses	Wave 1	Wave 2
1	58.13%	52.14% ▼
2	21.02%	21.03% ▲
3	6.60%	10.09% ▲
4 or more	14.25%	16.74% ▲

The data from question Q23 shows that over 78% of the respondents answered that they had taken FA courses at some point in their life. Compared to the countries in the literature review and good European practices, this high number looks much more than satisfactory at first glance. If, however, a detailed section is made and data from Q24 and Q25 are crossed in this percentage, the total percentage drops sharply. When filtering the data according to the following criteria: 1) have undergone FA training/course and 2) have undergone FA training/course during candidate driving test and 3) have undergone training only once in their life, the relative share of these people amounts to the threatening value of 39.86%. Given the fact that the candidate driver's course exam in Bulgaria is taken around a person's 18th birthday and the dominant sample is aged 25-44, it becomes clear that there is a gap of at least 7 years in which people do not refresh their knowledge and their FA-related skills. Added to this is the fact that, as mentioned earlier in this dissertation, the BRC's FA Training Strategy also identifies this weakness – the only mandatory place where one takes an FA course is the candidate driving course in question. The worrying trend is that in the event of an accident, 4 out of 10 people would not be able to react due to a lack of up-to-date knowledge and skills to provide help in case of need. However, 78.59% of people believe that the course prepared them adequately (question Q27).

More information on the topic of the second aspect of FA performance, *confidence*, is obtained from follow-up questions Q29 and Q30.

Table 15. Percentage distribution of responses from question Q29

Q29. By today, do you think you would know what to do in the event of an emergency or injury?		
Responses	Wave 1	Wave 2
Yes	37.22%	36.74% ▼
No	27.86%	25.86% ▼
I do not know	34.91%	37.40% ▲

Although the decrease in overall confidence compared to the previous period is only within less than 1%, against the background of the general picture, only about 37% of the survey participants believe that they will know what to do in case of a situation. Question Q30, through an open answer, allows the remaining 63% of respondents to answer why they do not believe or do not know at all whether they will be able to cope. Summarizing the data from wave 1 and wave 2, it becomes clear that the main concerns retain their homogeneity in both periods studied. The top 5 reasons why people feel uncertain about their knowledge are: 1) need to refresh knowledge and skills; 2) lack of (deep) training; 3) depends on the situation; 4) lack of preparation; 5) lack of confidence.

In total, the relative proportion of these responses for both Wave 1 and Wave 2 represented about 67% of the total number of responses. This supports the hypothesis that the lack of habitually repeated FA courses reduces people's confidence to act in an accident or acute illness situation.

Conclusion: **There is a gap between the public's willingness to take FA courses and how to incentivize them to learn.**

The FA performance section of the survey concludes with two questions (Q31 and Q32) regarding what FA performance measures respondents would not complete.

Table 16. Percentage distribution of responses from question Q31

Q31. Is there any first aid measure that you would definitely NOT perform?		
Responses	Wave 1	Wave 2
Yes	21.39%	29.75% ▲
No	78.61%	70.25% ▼

The number of people with FA measures who would not comply has risen by over 8% year-on-year. Heart massage and artificial respiration, defibrillation, stopping severe bleeding, which are life-saving measures, are outlined as the most frightening to perform by the participants. The victim's survival depends on their correct application by witnesses of the accident until the arrival of an emergency team.

Another nuance that also makes an impression is that people are reacting to the current pandemic context with the presence of Covid-19. A very large number of people who would not perform CPR on a casualty are worried about contracting the virus. Another niche that needs to be worked on in the sense of educating society.

Shortly after the announcement of a pandemic situation by the World Health Organization, ERC changed the algorithm for the so-called Basic Life Support, adapting it in a way that preserves the health of the FA provider. The adapted algorithm[35] is a separate aspect of FA training in the conditions of Covid-19, which, when developing modern strategic and management models for increasing the capacity of society on the subject, should be taken into account. Apart from the training, it is highly recommended to follow the guidelines for working in this environment as set by the world organizations working in the field[36].

Among the listed measures that people would not take, there are also exclusively medical manipulations that are not applied by non-medical persons when performing FA.

The last section of the survey, "FIRST AID ADDITIONAL QUESTIONS", shows that several case questions about first aid were also asked to test how respondents would react in these situations. Responses to the questions on specific FA performance situations indicated that the majority of participants knew the basic current FA algorithms, but the combination with responses from the measures section that would not perform demonstrated the need for refresher and reinforcement of knowledge acquisition of confidence and security in a critical situation.

Finally, survey respondents are asked whether they would enroll in an FA course, offering a variety of responses that range from a completely Yes to No scale. The answers to this question, in turn, will allow the organizations involved in organizing and conducting FA training to understand in what direction and with what specifics to organize their courses. Almost half of the participants would enroll in an FA course, most often if it focused on everyday risks, family and children and took place nearby outside working hours and was free or paid for by the employer.

The overall summary of the data from the empirical studies in 2019 and 2022 prove the second working hypothesis of the thesis, namely that the low proportion of trained

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[35] Ref. *COVID-19 Guidelines for Basic Life Support*. European Resuscitation Council. 2020. Available from: https://cms.erc.edu/covid-courses/basic-life-support. [Accessed 16.06.2022].

[36] Ref. *ILCOR guidelines for bystander cardiac arrest CPR and AED in the context of the COVID-19 pandemic. Translated and adapted content.* The First Three Minutes Foundation. 2020. Available from: https://firstaid.bg/wp-content/uploads/2020/04/ILCOR-Covid-19-Guidelines.pdf. [Accessed 16.06.2022].

people in FA, as well as the absence of a system for monitoring and evaluation/self-assessment of the level of knowledge and skills are the main factors responsible for the unsatisfactory self-assessment of the Bulgarian society for performing FA.

In the second part of chapter three, the dissertation examines the structure of a management strategy model. The overview stops at the CAF method (**C**ommon **A**ssessment **F**ramework, CAF), which, according to the Institute of Public Administration, is a quality management tool developed specifically for the public sector at the initiative of the European Public Administration Network. According to the Institute, the model in question can be used successfully in a wide range of areas of the public sector and at the same time be applicable to organizations of a public nature at all levels.

Using the structure of the CAF model as a starting point, for the purposes of the present development, the following stages/elements are selected to be included during the development of the management strategy model to increase the preparedness and confidence of the population to provide FA in the event of an incident or in an acute form of the disease.

Figure 4. Process and steps for developing a management strategy to increase population readiness and confidence to perform FA
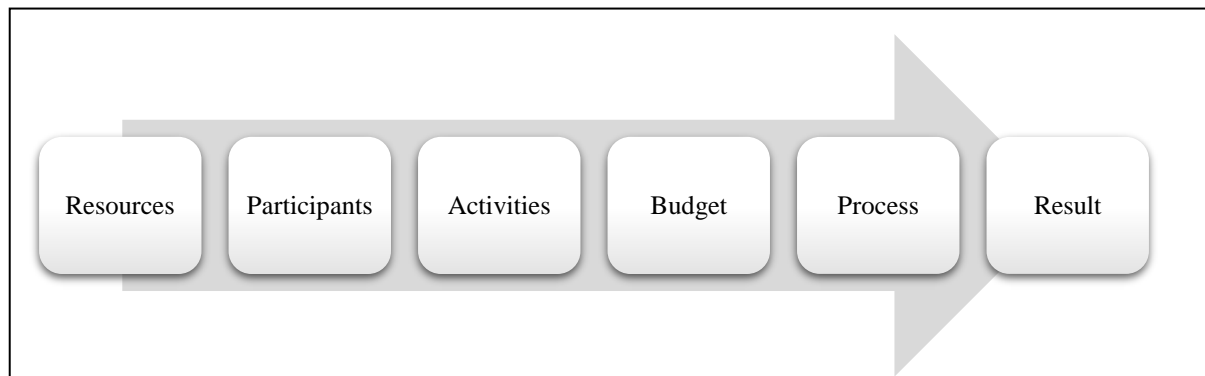
In addition to the selected management strategy model, two vertical approaches are used in order to determine and compile the individual stages of strategy implementation. Approach „*down → up*" (from studying the needs of the society obtained as a result of a survey to the preparation of a strategy) and approach „*up → down*" (from an overview and critical analysis of the national regulatory framework in Bulgaria and its limitations for the preparation of a strategy to eliminate these weak points), shown in the figure below.

Figure 5. Approach in preparing a management strategy model
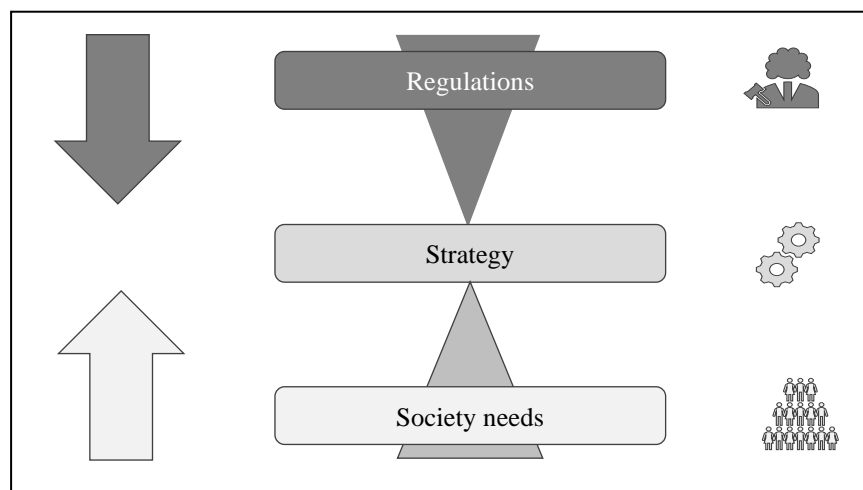
The dissertation does not aim to develop a strategy, *but an indicative model of a management strategy for increasing knowledge and skills in the field of FA*.

The National Health Strategy 2030 is **the flagship strategy document for the Healthcare sector,** which represents **the long-term vision for its development**, the strategic goals, and priorities, as well as specific policies for their implementation. The provision of FA outside of emergency medical care is not explicitly included as a priority in the National Health Strategy. The defined object of research - the presence of knowledge and attitudes in the Bulgarian society for the provision of FA, goes beyond the scope of the National Health Strategy, in which FA concerns only emergency medical care specialists. The proposed author's model tries to fill the established gap in legal and normative regulation (Chapter 1), taking into account the real needs and wants of society (conducted empirical studies, Chapter 3).

The management strategy model contains:
1. Current status
   1.1. The legislative and regulatory framework in Bulgaria regarding the knowledge and skills of the population of Bulgaria to perform FA
   1.2. Institutions and organizations responsible for the implementation of policies in the field of FA
2. Challenges to FA training
   2.1. SWOT analysis of internal and external environmental factors
   2.2. Assessment of the level of knowledge and skills to perform FA
3. Strategic goals and priorities (result orientation)
   3.1. Mission, vision, priority areas
   3.2. **Development of a system for FA training**
      3.2.1. **Definition of evaluation criteria and determination of level**
      3.2.2. **Development of an online assessment tool (testing)**
      3.2.3. **Determining the quality, extent and level of training**
   3.3. Providing quality and effective FA training
   3.4. Making FA training accessible in a lifelong learning context
   3.5. Strengthening the participation and responsibility of all interested parties to increase the level of knowledge and skills for performing FA
4. Financing
5. Measures and activities

The main contribution of the model is the proposal to create **an online tool for assessment and self-assessment of FA performance knowledge and skills**. On the one hand, this will allow to organize an analysis and assessment of the level of knowledge, and on the other hand, it will serve as a basis for optimizing the quality of the training offered.

An entry point in the process of preparing and optimizing a management strategy model is the availability of the level of knowledge and skills to perform FA. On the basis of the already stated need for knowledge and skills to react in case of an accident or an acute form of illness, the strategic goals for the education of society are defined. After setting the goals - reaching at least 30% of the trained population (European minimum), preparedness to respond to incidents and reducing the health consequences of acute forms of diseases, evaluation criteria are prepared to determine the level. The criteria are prepared by specialists in the field of FA. Testing and assessment is organized using an online tool[37]. The introduction of an online tool (into the model) for pre-testing and determining the level of knowledge and skills to perform FA is a thesis contribution to the model. This tool would be of essential importance, both for

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[37] Ref. *Test: First Aid (basic level).* The First Three Minutes Foundation. 2022. Available from https://forms.gle/o4WYZAzpnU9tRnXLA. [Accessed 02.09.2022]

determining the levels of knowledge, respective quality of training completed so far, and for the personal motivation and conviction of the population to provide FA in case of an accident or an acute form of illness in general.

After summarizing the results of the test process, the criterion "Level of achieved results" is considered. FA specialists determine the threshold (in percentage terms) above which the person being tested will be considered to have a satisfactory level of knowledge and skills to perform FA. In case of unsatisfactory result, basic FA courses will be planned and conducted. After conducting these courses, the participants in them will be tested again, in the manner described in point 3.3. Approbation and validation from the present doctoral dissertation. In case the result exceeds the predetermined threshold, refresher courses should be planned and conducted once a year, according to the recommendations of the European and world organizations working in the field. The process ends with the achievement of the previously set strategic goals. In order to guarantee the success of this model, periodic monitoring of the trained people is planned. This part of the process will take place during the annual FA refresher courses.

In order to achieve applicability and narrow the focus of the present work, the choice of group was focused on teachers from a high school course of study. The idea is that once they are trained, they will pass on their knowledge and skills in performing FA to their colleagues and students. In this way, habits will be cultivated, the adoption of which can prove to be a life-saving factor in the event of an accident or an acute form of illness.

There are studies that show gaps in teachers' ability to deal with emergency situations of accidents or manifestations of illness. (Eze et al., 2015) Immediately after passing the FA training, a significant difference in skills and knowledge to deal with such situations was observed. (Li et al., 2020) (Alkhotani et al., 2022) However, over time, these skills fade over a period of 6 months, necessitating the need to repeat the training. (Papaleo et al., 2022)

The reasons for choosing the specific group can be considered in several directions - types of incidents at school and the legal framework that regulates the presence of a medical worker in this environment.

According to the survey " *Incidents requiring first aid in schools: Can teachers provide first aid?*" (Faydalı et al., 2018) about 10% to 25% of accidental (unintentional) incidents involving children occur on school grounds or in their immediate vicinity. The high rate is a serious premise that adds weight to the need for school personnel (including teachers, administrative workers, medical personnel, security guards, etc.) and high school students to be trained in how to perform FA. Subsequently, it is necessary to work to build sustainability and regularity in the conduct of such training and to create a lean trend and repeatability that will maintain the required level of knowledge and skills.

According to data from the same survey, 45.3% of teachers teaching children aged 6 to 15 years, 81% of them are familiar with FA and its basic principles, but only 23% claim that they have adequate knowledge to really help in case of an accident. In this sense, one of the main conclusions that the study makes is that updating teachers' knowledge regarding their preparation to provide FA is important to ensure a safe educational environment.

Looking at the second aspect for choosing a target group - the regulations, it becomes clear that according to Ordinance No. 3 of 27.04.2000, health offices are organized in childcare facilities and schools, as art. 3 (1) provides that " ***The activity of the health offices is carried out by a nurse or paramedic with a specialist or bachelor's degree.***".[38] Although Art. 6 of the same Ordinance states that medical specialists undergo annual training in FA, according to a previously prepared schedule by the Director of the relevant institution, it is not detailed how long it is and what material is included in the training.

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[38] Ref. *Regulation 3* from 27.04.2000 for health offices in children's institutions. Ministry of Health of the Republic of Bulgaria. 2022. Available from https://www.lex.bg/laws/ldoc/-549433854. [Accessed 16.06.2022].

Another problem that arises is the physical limitation and the possibilities to provide PP in case of need. (Baleva, 2020) A problem arises from Art. 5, which introduces a minimum number of students served by one medical specialist – 800. In the same Art. 5 (1), it is mentioned that " ***When less than 800 students study in two or more schools located on the territory of one municipality, the medical specialist can serve more than one school.***".

In conclusion, the goal is to achieve the "Pay it Forward" effect first outlined by Catherine Ryan Hyde.[39] She describes a domino-like phenomenon where one act of kindness creates a cascade or chain reaction of kindness. Likewise, by reaching out to key teachers in schools trained to provide FA for life-threatening injuries and conditions, they pass these skills on to their colleagues and students. Thus, a multiplier effect will be achieved, through which the maximum number of people will be reached with relatively minimal effort.

The training system includes resources of three types: human, material and technical base, knowledge, in the form of qualifications for FA training.

Human resources include FirstAidbg.com First Aid School PPE instructors and First Three Minutes Foundation volunteers. The First Three Minutes Foundation is the only organization in Bulgaria authorized by the ERC to conduct Basic Life Support and AED training. The foundation's volunteer instructors have undergone ERC instructor training and have the necessary qualifications and experience. The material and technical base is expressed in all the necessary equipment and a hall for conducting the FA training with the teachers. Required equipment includes: CPR mannequins, chocking simulator vest, dressing materials (gauze, cotton, bandages, triangular bandages), tongue root prolapse demonstration model, and other supplies and materials. Last but not least is knowledge in the form of resources. Some of the First Aid School instructors at FirstAidbg.com, as well as the volunteers of the First Three Minutes Foundation, have more than 24 years of experience in the field. All instructors have received their knowledge and certification from international organizations involved in the issuance of guidelines for the performance of FA by specialists and non-specialists.

Participants in the whole process are divided into two parts:
- participants who are directly involved in the considered model;
- participants, beyond the scope of the considered model, but of importance in the subsequent implementation of the strategy.

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[39] Ref. *PAY IT FORWARD. A nice (and good movie), or a real thing.* Envision Kindness. 2022. Available from: https://tinyurl.com/2p97zzcn. [Accessed 16.06.2022].

Figure 6. Participants and interaction of participants in the model for building management strategy
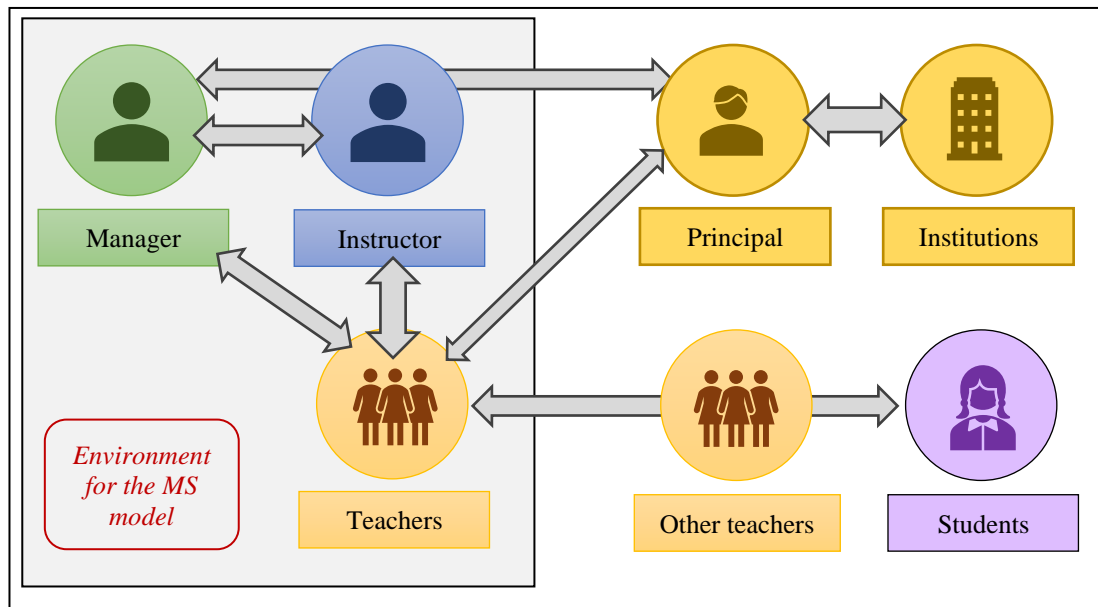
In the figure above, in a gray rectangle, the environment in which the management strategy model will be implemented is described. It presents the specific participants - manager, as an organizer; instructors who conduct the FA training; teachers who are direct beneficiaries and will participate in the FA training. Gray arrows demonstrate the interaction between each participant as follows: the manager contacts the specific principals of selected schools to be involved in a pilot project → after approval by the principals, the manager contacts the teachers to confirm their participation in the course → the manager contacts the instructors for the organization and conduct of the course → instructors interact with teachers during the course itself → the manager and the instructors report the results of the training.

For the purposes of obtaining a more complete and clear picture, how the model of management strategy would unfold beyond the limits of the current doctoral dissertation, the right part of the figure presents the actors and the interaction between them, which will interact in the globalization of the current model. For the purposes of the present development, a detailed examination of this part of the figure is not imperative, but it will inform further discussions in making the model mandatory, as well as discussions on organizing financial resources.

Clarification of the activities: Given the fact that the purpose of any training or course is to build and achieve a certain level of knowledge and skills on the subject, they should, subsequently, be measurable. When setting targets and setting indicators under the current management strategy model, the European Qualifications Framework (EQF) is used. It is divided into 8 levels and covering three aspects: 1) knowledge defined as theoretical or factual, 2) skills described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and use of methods, materials, tools and instruments), 3) responsibility and independence, which within the EQF are described as the learner's ability to apply knowledge and skills independently and responsibly.

According to the nature of the objective of the management strategy model, namely: 1) teachers to be trained to provide FA for life-threatening injuries and conditions and 2) to subsequently transfer this knowledge and skills to their colleagues and students, with the help and guidance of FA instructors (including preparation of resource materials, presentations, etc.) according to the EQF, this is defined as level 3 and level 4.

The activities for the implementation of the management strategy model are organized in the table below, based on the overview of the regulatory framework of Bulgaria, the good European practices on the subject and the needs arising from the results of the author's national online survey "COMMUNITY AND FIRST AID" (waves 1 and 2), which were discussed in the previous points. The activities are divided into 3 parts, tentatively divided into before, during and after the FA courses.

Table 17. Activities to implement the management strategy model

Stage	Activity
Before the course	1. Initialize the model. 2. Initiating conversations with the principals of the selected schools. 3. Selection of teachers to be involved in the pilot phase of the model. 4. Conversations with teachers about inclusion in FA courses. 5. Technical organization of the course - registration forms, feedback forms, structuring and preparation of the course and presentations, organization of the material and technical base, etc. 6. Email reminders and instructions to teachers on where, how and when the course will be held. 7. Other activities urgent at the specific stage.
During the course	8. Organization of FA entrance test. 9. Conducting the FA course. 10. Compliance with logistical issues. 11. Organizing feedback. 12. Arranging an FA exit test to report a result (similar to that of the "Testing and Approbation" point) of the course delivery. 13. Other activities urgent at the specific stage.
After the course	14. Summarizing the results of the course - tests and feedback. 15. Feedback to teachers. 16. Feedback to principals. 17. Follow-up monitoring and assistance in organizing FA courses in schools by the teachers who attended the basic course. 18. Other activities urgent at the specific stage.

The budget for implementing the management strategy model can again be organized and detailed as before, during and after running an FA course. For the purposes of this dissertation, it is presented in summary and an exemplary amount of financial needs are placed in the following table.

Table 18. Sample budget, neobodhim for the implementation of the management strategy model (1 present course, of 12 course participants)

№	Heading	Amount (BGN)
1	Administrative costs	50.00
2	Materials, equipment *FA equipment, mannequins and simulators, first aid kits, etc.*	75.00
3	Activities to implement the management strategy model *Paying the instructors for conducting the course, paying for making presentations, renting a room, etc.*	535.00
	Total	**660.00**
	Price per course participant	**55.00**

In order to pilot and approve the management strategy model, the initial funding is procured by applying for projects of organizations that support the development of educational activities (for example, the Foundation "Public Board of TELUS International in Bulgaria", which finances the "Pay it forward - first" project aid for teachers and students"[40], the prototype of which is the model proposed in the present development). After the successful implementation of the model, work will be done to develop programs at the national level, involving the various institutions mentioned above. This will be organized in order to make this model mandatory and accordingly to find financial alternatives for its implementation. Subsequent finalization can be done with own funds, with state funding or on a project basis.

To give more context to what FA is, the course will also include topics related to the nature, principles and objectives of FA. The table below shows several stages of the organization of the course and the subsequent training by the teachers that they will conduct with their colleagues and students.

Table 19. Synopsis for FA courses

Aspect	Synopsis
Main course, 5 academical hours	***THEORETICAL TRAINING*** • Meaning, objectives and principles of first aid. FA in the conditions of Covid-19. Correct use of protective equipment. • Materials and equipment - modern means of performing FA. • Rescue chain and priorities in rendering FA. • Normal vital functions and assessment of the victim's condition. • FA in shock. • FA in choking. • FA in unconsciousness. • FA when normal breathing stops. Use of an automated external defibrillator. • FA in emergency situations – seizure, epileptic seizure, asthma attack, diabetic crisis, heart attack, stroke. • FA in severe bleeding and shock. • FA in wounds. Protection against infections. • FA in burns. • FA in specific injuries – nosebleeds, bone and joint injury, head injury. • FA in bite, sting and allergic reaction. ***PRACTICAL TRAINING*** • FA in choking. • FA in unconsciousness. • FA when normal breathing stops. Use of an automated external defibrillator. • FA in severe bleeding and shock.
Course in the schools, 5 academical hours	The main thing that teachers are recommended to emphasize in schools is FA in life-threatening incidents, in which, after the third minute without oxygen to the brain, irreversible processes begin to occur. This aspect of the medical justification for the need to perform FA was addressed in the first point of this dissertation. This for the measures to provide: • FA in choking.

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[40] Ref. *Project "Pay it forward - first aid for teachers and students".* The First Three Minutes Foundation. 2020. Available from https://firstaid.bg/projects/obuchenie-na-uchiteli/. [Accessed 16.06.2022].

	• FA in unconsciousness. • FA when normal breathing stops. Use of an automated external defibrillator. • FA in severe bleeding and shock. In case of need/necessity/desire on the part of teachers to expand this aspect and cover a larger range of topics, they can always consult the FirstAidbg.com School of First Aid teams and the First Three Minutes Foundation.

The immediate results of FA course delivery within the framework of the management strategy model are reported through: 1) constant monitoring by the instructors of the teachers regarding the correct implementation of the basic FA delivery techniques and 2) an exit test, the results of which, those of the incoming one are compared and the increase in success rate is reported (discussed in the "Testing and Approbation" section).

The direct subsequent results of applying the management strategy model are the acquisition of modern knowledge and practical skills for providing FA to 10 secondary school teachers and increasing the confidence, motivation and sense of responsibility for actions in a real incident. After completing the initial FA training, there will be an increase in the culture of teaching FA curriculum subjects in all schools across the country and a corresponding improvement in students' and teachers' knowledge and practical skills, as well as increasing confidence, motivation and feeling for responsibility for actions in the event of an actual incident on their part.

In a global aspect, and given the fact that providing timely FA, helps the faster, qualitative and effective recovery of the injured, it will also help to reduce the burden on the health system and reduce the subsequent costs of hospital stay.

In conclusion, this is an investment that justifies the costs of development on the one hand of the educational system in a way that is innovative, interactive and attractive and on the other hand - recognition of the performance of FA as an important part of the health system of Bulgaria.

The last, third point of chapter three, describes the testing and approval of the proposed method, which is carried out by means of a control sample. The aim of this stage of the empirical research is to check to what extent people who are trained and go through the FA courses perceive the topics studied. For this purpose, an instrument in the form of a test was developed within the framework of this dissertation. The purpose of this test is to assess the theoretical preparation of the participants in the test phase, requiring the students to complete the test before and after the course.

The parameters of the training system testing and approval are listed in the table below:

Table 20. Testing parameters and approbation

№	Element	Description
1	Stage of empirical research	Testing and approbation of the proposed method
2	A tool for testing and approbation	A test to be completed before and after the FA course
3	Number of questions	- 10 closed with 3 answers each, only one of the given answers is correct. - 1 open question that requires a 1 word answer. TOTAL: 11 questions
4	Place	First Aid School Training Center at FirstAidbg.com
5	Period of conduct	29 January - 13 February 2022
6	Number of participants	42 people

7	Method of selection of participants	Random sample, all responded ***Remark:*** The participants are students in the practical FA courses that the First Aid School of FirstAidbg.com organizes and conducts.
8	Success criteria	For the purposes of testing and approval, a satisfactory level and a positive rating for the tested method is assumed, an average success rate of 85% is assumed.

The table below presents the results obtained, which for the purposes of the study are divided into 4 categories: 1) Number of correct answers received before the course - average absolute value and average percentage and 2) Number of correct answers received after the course - average absolute value and average percentage ratio.

Table 21. Average test results and control sample approbation

Indicator	Mean absolute value	Average percentage ratio
Before the course	5.21	47.40%
After the course	9.55 ▲	86.80% ▲

Given the achieved results of an 86.80% success rate after the course, it can be mentioned that the method is sufficiently adequate and reliable because the success rate exceeds the previously planned levels of 85%.

The third chapter ends by clarifying the economic benefits, value and potential of FA training for reducing healthcare costs in the Bulgarian healthcare system. Determining the value of first aid training is the utility that an individual, health system or society can derive from acquiring first aid skills. This value is measured in life years gained in full quality of life (QALY – quality-adjusted life years[41]) – a criterion that is widely applied worldwide in healthcare in various regulatory contexts to determine its utility. This concept is not able to cover all the elements responsible for the formation of value. Due to a lack of data, this dissertation does not aim to measure the value of first aid training in this way.

The cost-effectiveness of FA training in the general population is unknown, as trainees are recruited on a random basis rather than according to specific risks. With these prior assumptions and limitations, estimated benefits and cost effects of FA training as a tool to optimize health care costs are derived.

Providing FA and conducting trainings for providing FA are not part of the costs of the health care system in Bulgaria (NHIF, Ministry of Health). FA represents an alternative strategy for providing assistance in specific life- and health-threatening events, and the trainings are conducted by the Bulgarian Red Cross and private licensed companies.

The price of a FA course is determined by market demand and supply of the service. By 2022[42], an on-site FA training course is priced at BGN 57.50 (excluding VAT), as part of the training course participants receive modular knowledge and skills to provide assistance in a number of areas, including responding to cases where death is preventable such as a stroke, cardiac arrest, trauma, etc.

The economic effects on reducing health care costs, as well as the potential direct payments, which can be a huge economic burden on households, are complex, as the first aid knowledge and skills gained within the course are complex, but they can **hypothetically** to be

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[41] Ref. *Quality-adjusted life year*. Wikipedia. 2022. Available from: https://en.wikipedia.org/wiki/Quality-adjusted_life_year#History. [Accessed 13.09.2022].

[42] Ref. *First aid courses attended*. FirstAidbg.com. 2022. Available from https://firstaidbg.com/курсове-по-първа-помощ/присъствени-курсове. [Accessed 19.09.2022].

proven based on the analysis of the main costs of the health care system in case of ischemic stroke.

Premature death from stroke is 4 times higher than the EU average, and this condition is a major contributor to persistently high levels of preventable death from cardiovascular disease.

FA training teaches techniques to prevent fatal and severe stroke outcomes until the arrival of EMS. Adequate intervention means not only saving the casualty's life, but also potentially saving part of the costs of the health care delivery chain, including the costs of diagnosis and treatment of ischemic stroke, currently defined in four clinical pathways, the cheapest of which costs 1300, and the most expensive 3736 BGN.[43] on account of the price of a FA course amounting to BGN 57.5. It is clear from this example that the costs of training and adequate intervention are incomparably lower than those that would occur if FA was not provided at all and the health system bore the entire burden of the cost. To these costs can be added those that would be saved for direct additional payments (medicines, consumables, etc.), which would ease the pressure on households and the risks of impoverishment.

In the 2022 "Society and First II" survey, 37% of respondents indicated that they had been in a situation where they had to administer FA to a casualty. Approximately 80% of them applied knowledge and skills to deal with the situation. Even if only they bear the burden of the costs for the other trainees who will never be in a situation to perform FA, the cost of training the people who will actually perform FA is approximately BGN 195. The two examples below illustrate these calculations and are based on 100 people (with a course price of BGN 57.5).

Example 1: Cost of training people who were in a situation to perform FA (N=37).

The cost of training the people who were in a situation to show FA is BGN 2072 (37 people x BGN 56). The cost of training the remaining 63 people amounts to BGN 3,528. If to the costs of the original 37 people, the costs of those who have never been in a situation to show FA are deducted, the total sum amounts to BGN 151. Through mathematical notation, the calculations are expressed as follows:

$$100 - 37 = 63 \text{ x } 57.5 = 3622.5 : 37 = 97.90 + 57.5 = 155.4 \text{ лв.}$$

Example 2: Cost of training the people who actually performed the FA (N=30).

The second example looks at the costs for those people who actually performed FA – 80% of 37 people (approximately 30 people). The final amount for the training of such a person, who will bear the burden of the costs for the others who did not provide FA and were not in a situation to provide FA, amounts to BGN 186.67. Through mathematical notation, the calculations are expressed as follows:

$$100 - 30 = 70 \text{ x } 57.5 = 4025 : 30 = 134.17 + 57.5 = 194.67 \text{ лв.,}$$

which again is many times less than the costs that the health system would incur to help a stroke patient who did not receive adequate care. FA courses provide preparation for responding to multiple life-threatening conditions (including SCA, choking, severe bleeding, massive trauma, etc.).

The main conclusion is that in Bulgaria, health prevention policies have a very limited impact, but a clear economic sense and potential to optimize health care costs. FA training can be a very important element in the balanced equalization of costs of hospital treatment to pre-hospital care, which are currently in the ratio of 5:1 against an EU average of 1.5:1. Further, more in-depth analyzes of the cost-effectiveness of FA training and its targeting not only to the general population at random but also to specific groups that have a greater chance of being in a situation to exercise skills for FA are needed, performing FA in a specific condition.

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[43] Ref. *The new prices of clinical pathways – NRD 2020 2022 from 01.05.2022.* Medical Center "St. Trinity". 2022. Available from: https://tinyurl.com/mry9r3sy. [Accessed 13.09.2022].

VI. Conclusion

With the modern way of life, society is less and less able to recognize the different types of emergency situations. Failure to recognize them leads to a lack of response in cases of life-threatening incidents or acute illness.

The contributions of the research are realized in several directions. From a theoretical point of view, during the development of a model for achieving the strategic goals and overcoming systemic gaps set in the National Health Strategy (2021-2030), the proposal was made to develop and create an online tool for pre-testing and assessing the level of knowledge and FA performance skills. From a practical-applied point of view – the tool has exceptional applicability and importance for a wide range of interested parties – NGOs and FA training organizations, as well as for the motivation and self-assessment for providing FA to the population as a whole. The obtained results would serve to outline and increase economic efficiency in various areas, to reduce health care costs, as well as to improve the quality of life of the population.

The critical analysis of the legal acts that operate on the territory of Bulgaria, including the National Health Strategy 2030 related to the provision of FA, as well as the review of good practices in Europe outline a number of problem areas that are poorly studied in the country. The relevance of the current doctoral dissertation follows from the conclusions made in this way.

There are deficits in the legal regulation, provision and funding of FA training. It is much more economically efficient to invest in training than in emergency care or hospital treatment. The criticality of knowledge and skills to perform FA in the first minutes, significantly improve the chances of survival, respectively negative consequences, treatment and quality of life in general. It is extremely difficult to specify the economic and financial parameters, due to the lack of data and information both on the type of emergency and on the first responders at the scene of the incident.

The starting point for the outlined situational analysis is the author's study conducted in 2019, which revealed major gaps in the system - lack of a clear definition and scope of FA, gaps in the legislation to categorically regulate FA training and a deficit in promoting regular passing through such. The topic is becoming increasingly relevant and significant from both a quality of life and economic perspective, related to the expenditure of funds on care for minor incidents that could be provided by people trained to provide FA. It is for this reason, with the aim of deepening, researching trends and in the search for solutions, that the second phase of the author's national online survey is being conducted, taking into account the changes compared to the previous period.

In the definition of a conceptual model, methods such as CAF, process approach, synthesis, deduction and induction were used to determine the need for clear strategic goals and parameters to assess the level of FA knowledge and skills. A dissertation contribution to the model is the proposal to include an (online) assessment and self-assessment tool. This tool would be of essential importance, both for determining the levels of knowledge, respective quality of training completed so far, and for the personal motivation and conviction of the population to provide FA in case of an accident or an acute form of illness in general.

On the basis of this theoretical-empirical work, the dissertation proposed and tested a model for a management strategy to increase the knowledge and skills of the population of Bulgaria to perform FA.

The first of its kind in-depth and detailed situational analysis of the regulations and current legislation affecting the knowledge and skills of the Bulgarian population to perform FA shows the main weak points in this area. There are still no texts in the legal framework of the country that clearly and unequivocally establish the mandatory nature of passing FA training. The only place where this question comes up is when taking the driver's license test. In this sense, even

experts from the Bulgarian Red Cross, an organization that is mainly related to the provision of FA, express concerns that none of the texts of the relevant laws provide for a mandatory FA course (except for the already mentioned case). Also, there are no texts in the regulatory framework that regulate and/or encourage the passing of refresher training on FA during a certain period of time in order to maintain an adequate level of knowledge and skills.

The in-depth review of the regulatory framework related to the field of health care found weaknesses in two main aspects - economic and humanitarian. With a lack of trained persons to perform FA, EMS teams are committed to attending to minor injury incidents, thus not being able to focus on serious trauma situations. The cases they have to serve increase and the pay stays the same. This leads to a strong demotivation of the personnel capacity and lowering the quality of the services offered.

The second aspect is because with the lack of trained civilians to respond to life-threatening injuries and conditions, the quality of life of the entire population deteriorates. Life-threatening conditions are those in which the victim cannot wait for the arrival of an ambulance, which increases the number of fatal cases and affects the mortality rate in general.

These concerns are also proven by the results of the population's self-assessment of preparation and motivation to perform FA, realized in two consecutive studies, organized and conducted over a relatively long period of time between them (2.5 years). Despite the willingness and desire to provide help in the event of an accident or acute illness, people's concerns are rooted in a lack of confidence resulting from insufficient and in-depth theoretical knowledge and practical skills in FA.

A contribution to the study of this problem area is the organized and conducted large-scale and comparative benchmarking analysis of good practices, which shows that the leading European countries in the field in terms of the largest percentage of trained population are Germany, Norway and Austria. They manage, through Red Cross Societies or through non-governmental organizations, to exceed a total of 80% passed through FA courses (quantitative indicator). It remains unclear whether these people would be willing to help if they were in a real life-threatening situation (qualitative indicator). The reason for this is the lack of sufficient knowledge and training, and, above all, the absence of a legal framework to regulate re-passing through FA courses over a certain period of time. In all three countries examined in the study, a weak point appears to be that the certificates obtained for FA when acquiring the right to drive a motor vehicle are indefinite. In addition, governments should encourage both the introduction of compulsory education in schools to start training from an early age and *mandatory refresher courses after obtaining a driver's license.*

A similar approach should be taken in the workplace - a model adopted in Germany and Austria. Workplace FA courses should also be mandatory for all employees, not just individual teams responsible for health and safety at work. *In this way, a person who has chosen not to be a driver will also have the opportunity to undergo a mandatory training course, which will subsequently be repeated over a period of time.*

Developing early AED defibrillation programs is the next metric to build on to reduce SCA casualties. The leaders in the development and implementation of early defibrillation programs are municipalities and municipal structures, which, according to European reports, is still lacking in many EU member states. (EENA, 2020)

Mandatory indicators for the successful introduction of AED devices are: 1) strategic location of AEDs with easy accessibility (shopping centers, subway stations, train stations, airports, schools, universities, etc.); 2) mapping of already deployed AEDs; 3) training of potential AED users; 4) inclusion of trained people in emergency plans; 5) creation of a registry on the success rate of AED use; 6) carrying out information and educational campaigns for quick and effective recognition of SCA and application of early CPR and AED and other practices, with the implementation of which SCA casualties will be reduced.

Organized and conducted the author's national online survey "Society and First Aid II" in 2022, collected a large array of data. They confirm that a mechanism is needed to ensure that FA courses are taken more often, because over 30% of the population passed one more than 7 years ago, and only within the framework of a candidate driver's course. For this and other reasons, only 36.74% of those surveyed in 2022 defined themselves as confident in performing FA. Compared to the previous period (2019), the percentage of people who would not provide specific measures for FA increased by 8.36%. Despite the willingness of people to help declared in the survey, the lack of repeated training shows a weak point in terms of readiness to respond in case of an accident or an acute form of illness. Society self-defines its confidence as low due to fear of harming the victim.

Processing the responses to the open-ended questions demonstrates that there are people who are afraid to show FA in order to avoid being judged. Legislation, such as Germany's Good Samaritan Act, is needed to protect people from prosecution and reduce this fear when they have made a well-intentioned FA.

By summarizing the previous two stages of the development of the doctoral dissertation, the first two defended hypotheses set forth in the exposition of the development are proven, namely:

1. The lack of legal and normative regulation has a negative impact on the maintenance of knowledge and skills for performing FA among the Bulgarian society.
2. The low share of trained people in FA, as well as the absence of a system for monitoring and evaluation/self-assessment of the level of knowledge and skills, are the main factors responsible for the unsatisfactory self-assessment of the Bulgarian society for providing FA.

The third hypothesis:

3. The implementation of a national model of management strategy will lead to a significant, permanent and sustainable increase in the knowledge and skills for providing FA among the Bulgarian society was empirically proven through the testing of the model for training teachers from a high school course.

The target group was selected in order to narrow the focus of the developed model and to offer survey data to demonstrate the need for school staff training. The model was tested by a control sample of 42 people and its success rate exceeded the previously set goal of 85% - a contribution that guarantees the effectiveness of the proposed approach.

The proposal of this model of strategy is the basis for launching inter-agency and multi-disciplinary work between stakeholders such as FA course organisations, schools, education inspectorate, Ministry of Education, Ministry of Health etc.

The proposed model involves the training of teachers in a high school course, who will then pass on the knowledge and skills to their colleagues and students in the upper course.

The proposed method is also universal, as it can be applied to other target groups of society, including employees in large manufacturing enterprises, shopping centers, urban mobility centers, etc. In this way, the model demonstrates another contribution in addition to the one already mentioned, namely reducing the costs of training by a specialist in these organizations, relying on the knowledge and skills of specific employees to take on the role of FA instructors in their own organizations.

The future development of such a strategy requires concentrated, purposeful work and continuity of the topic on the part of the school staff and constant monitoring and evaluation of the activities carried out, with the aim of reporting their effectiveness. If necessary, the proposed model can be adapted, according to the needs arising from the feedback, in relation to the target group.

This dissertation achieves its goal in the development of a justified model of a management strategy for increasing the knowledge and skills of the population based on a situational analysis of the current situation on the subject in Bulgaria, the review of good practices in Europe and the population's self-assessment of the readiness to react in case of need.

Conducting research on the topic is rational after one year of the implementation of the model, in order to ascertain what success rate it has among the target group, including economic and educational effect, strengthening the commitment of the society to an actual problem and increasing the quality of life of people.

VII. Dissertation Contributions

Based on the theoretical and empirical studies of primary and secondary information, the following contributions stand out within the dissertation work:

1. Based on an analysis of the Bulgarian legislation, the deficiencies in the Bulgarian legislation regarding the definition and application of the term "first aid" have been identified, studied and systematized. As a result, the thesis defined first aid as a specific area of critical importance to be studied and developed.

2. An in-depth comparative analysis of good practices in European countries regarding the preparation of the population for providing first aid in the event of an accident or acute illness was carried out, based on which guidelines were proposed for increasing the capacity of Bulgarian society in providing first aid.

3. As a result of a nationally representative study, empirically comparative characteristics of the behavior of the Bulgarian society have been derived, trends in the behavior of the studied object have been outlined and conceptual views have been proposed for activities and trainings to increase the capacity of society to react in the event of a need for first aid. An important practical-applied contribution on a social problem unexplored in the last three decades.

4. A model is proposed for developing a management strategy to increase the readiness and confidence of the population to provide first aid. The model has been tested as the achieved success rate exceeds the originally set goal of 85%. These results form the most significant contribution with a scientific-applied nature of the dissertation work.

VIII. Scientific publications related to the dissertation work

1. Georgiev, Andrian. ***The experience of the leading European countries in the preparation of the population in case of an accident.*** Proceedings of an international conference " TOURISM AND GLOBAL CRISES ". Publishing house "I&B". 2021. pg. 830-839
2. Georgiev, Andrian. ***European practices to reduce the health and social consequences of sudden cardiac arrest (SCA)***. magazine "MEDICINE AND SPORTS". Publishing house "UNI - MM" EOOD. 2021. # 3-4. pg. 46-51
3. Georgiev, Andrian. Tsanova-Savova, Silvia. ***Research, analysis, and assessment of the Bulgarian population's preparedness to provide first aid***. International Journal of Scientific Research and Management. IJSRM ISSN: 2321-3418. 2021. vol 9 No 11. pg. 463-470. https://ijsrm.in/index.php/ijsrm/article/view/3540
4. Georgiev, Andrian. ***The need to include first aid practice in formal and informal education, in order to ensure the safety and health of children***. 2022. (in print)