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***EVALUATION OF THE ROMANIAN AMBULANCE SERVICES
FROM THE CAPACITY OF RESPOND PERSPECTIVE AT THE
SPECIFIC MEDICAL SERVICES NEEDS OF THE POPULATION***

THESIS SUMMARY

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Introduction

The research has a multidisciplinary character, studying the emergency medical assistance system from the organizational, legislative, human resources, financial and especially the medical activities point of view in order to obtain elements that, applied in practice, lead to the increase in the performance of public ambulance services.

The main purpose of the study is to evaluate the resources used in order to make services more efficient and increase their performance.

The work includes in the personal contributions part three studies on emergency medical systems.

The first study is a critical analysis of the current situation of public ambulance services in our country. The second aims to x-ray the intervention capacity and performance of each segment involved in the provision of emergency medical care and first aid, i.e: ambulance services, UPU/CPU hospital wards and SMURD mixed crews (doctors, nurses employed in UPU/CPU hospital wards CPU and paramedics from IGSU). Finally, the last study is a comparative analysis of the public ambulance services in Romania with the European ones, in order to adopt the necessary measures to increase the intervention capacity in the field of emergency medical assistance in the pre-hospital.

I. GENERAL PART

Chapter 1. The organization and operation of the health system in Romania

1.1. Brief history of the sanitary and specific legislation regarding emergency medical assistance

The sanitary legislation in our country has its beginnings 149 years ago, in 1874, when the first sanitary law in Romania was adopted and published - the Law on the sanitary service, continuing with numerous specific normative acts, it is currently governed by Law no. 95/2006 on health reform.[1]

1.2. Organizational models in public healthcare:

The centralized model, based on a central authority, The partnership model (public / private), The integrated model involving the integration of public health services with healthcare services.

1.3. The national health system-structure, resources, evolution

According to Law no. 95/2006, health care in our country has several components, as follows: Primary health care, National emergency health care system, Specialized ambulatory health care, Mobile health care, Hospitals and specialty clinics. [1]

Chapter 2. Emergency medical assistance in Romania

2.1. History of ambulance services

The establishment of the Ambulance in Romania is linked to the name of Professor Nicolae Minovici who, on July 28, 1906, founded the "Salvation Society" in Bucharest, under the motto " Always and everyone, ready to help!"

In 1992, the current Ambulance Service of the Municipality of Bucharest-Ilfov, the first school of ambulance and emergency registrar operators, was established within the Rescue Station of the Municipality of Bucharest. Starting with 1995, based on GD no. 174/1995, the former rescue stations were named "ambulance services", operating under the Ministry of Health.

2.2. The general framework for the organization of emergency medical services and ambulance services

The public ambulance services in Romania are public health units of strategic importance, with legal personality, under the coordination of the specialized department of the Ministry of Health, according to the provisions of article 92 paragraph (1) letter m) of Law no. 95/2006 on health reform , under the direct authority of the Ministry of Health, which provides the necessary funds for its operation, approves the organization and operation regulations, the job descriptions and the number of positions. [1]

At the same time, the public ambulance services are operationally coordinated, in the field of emergency situations, by the Department for Emergency Situations - a structure without legal personality, within the Ministry of Internal Affairs.

2.3 Specific legislation and regulation of emergency medical care professions

Law no. 95/2006 (art. 92 letter d) defines emergency medical assistance as the activity of establishing diagnoses and therapeutic measures given by doctors and medical assistants with different degrees of training. [1]

In addition to the emergency medical assistance provided by medical personnel, ambulance drivers specially trained in the School of Ambulances and emergency operators-registrars from the emergency medical dispatches of the public ambulance services, paramedics are also active within the SMURD crews, they are firefighters trained in providing qualified first aid, defined as "personnel without medical training specially trained at different levels in providing qualified first aid".

II. PERSONAL CONTRIBUTIONS

Chapter 3. Critical analysis of the current situation of ambulance services within the emergency medical assistance system in Romania

3.1. Research hypothesis

The current system of organization and operation of the public ambulance in Romania presents a series of dysfunctions regarding the insufficiency of resources (material, human, financial) that affect the ability to provide efficient and quality emergency medical assistance services in the pre-hospital and cannot cope the challenges.

3.2. Purpose and objectives

Obtaining reasonable guarantees regarding the conditions necessary for a safe and performing system, adapted to the requirements and needs of the population.

Evaluation of resources in correlation with the needs and specifics of the population served, depending on the approved norms.

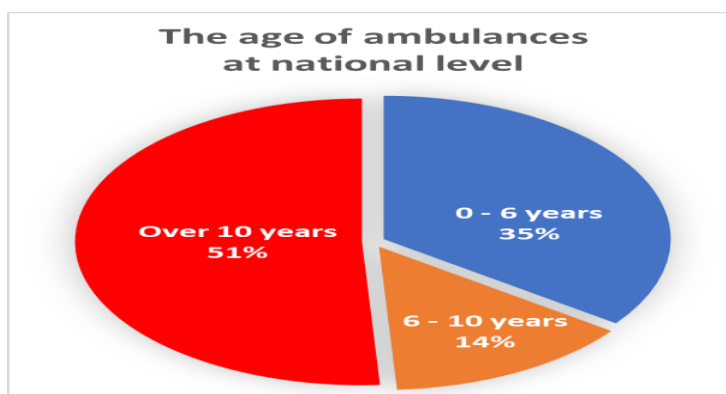
3.3. General research methodology.

The collection and centralization of information regarding the infrastructure, human resources and funding benefited by the 41 public ambulance services and the evaluation of the level of coverage of the required resources, compared to the approved norms.

3.4. Evaluation of resources related to the activity of public ambulance services

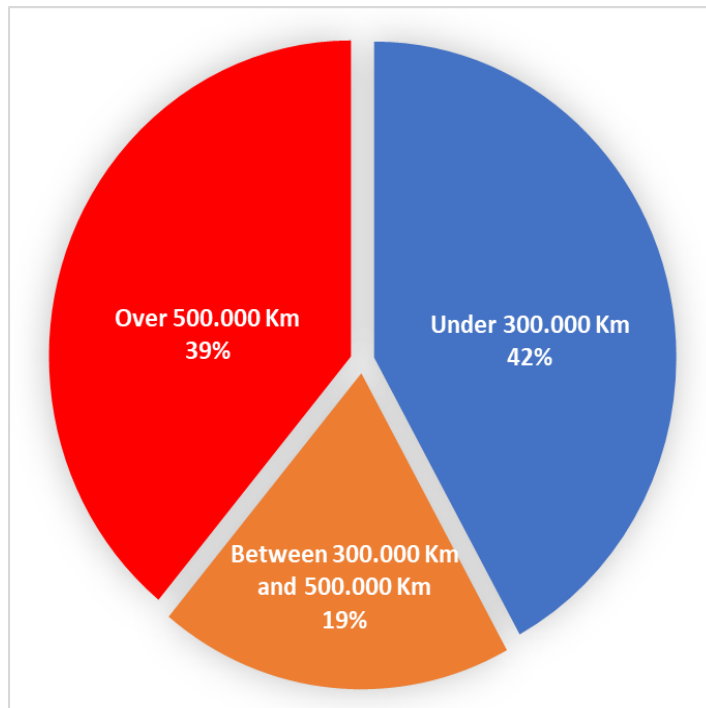
All the resources (equipment, personnel, funding) provided to public ambulance services during the period under investigation (2016-2022) were and remain deficient.

Thus, 65% of the number of equipped ambulances exceed the maximum duration of operation provided by HG no. 2139/2004, given that the vans (rescues) operate continuously 24 hours a day.



At the national level, the 2,698 ambulances plus 3 boats, of which two are medical, provide emergency medical interventions for over 4 million requests annually, respectively 11,129 daily calls.

A number of 1,516 ambulances (1011+505), representing 57.7% of the total, have mileages of over 300,000 km, of which 1,011 have over 500,000 km on board, according to the next DIAGRAM.

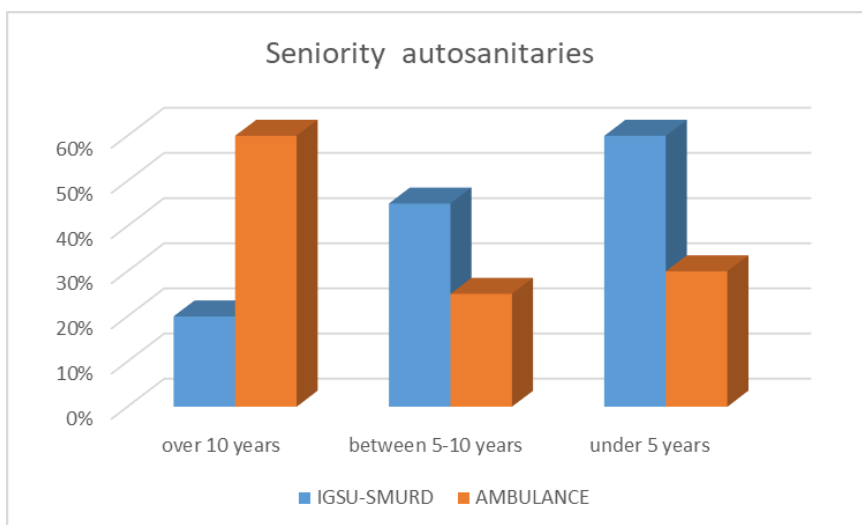


In the period 2016-2023, the Ministry of Health had no budget allocated to the investment chapter for the purchase of ambulances needed for public ambulance services.

In the 2017-2023 period, the coordination of all activities related to financing, procurement procedures and the delivery of ambulances needed by SAJ/SABIF was the responsibility of the DSU from MAI, according to GEO no. 74/2017. Thus, at the national level, the public ambulance services received, in use/on loan, in 2018 and 2019, 600 ambulances, these being insufficient and meeting the conditions to be scrapped next year (2024).

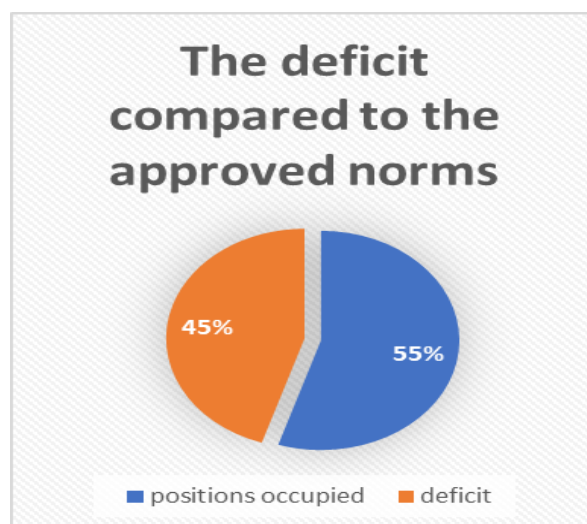
Annually, with its 2,628 ambulances, SAJ/SABIF performs 90% of all emergency medical interventions in the pre-hospital. The 10% difference is covered by mixed crews (medical staff from UPU/CPU hospital wards and paramedics employed by the ISU)

SMURD which, according to the "DSU 2022 evaluation report" page 255, has a total number of 1023 ambulances, of which 51% they are new, less than 5 years old. [3]



Another result is the deficient situation of human resources, with a requirement of 22,470 positions, according to the norm, having, in fact, 12,414 occupied positions, with 10,056 positions less than the **NORMATIV**.

The deficit recorded, by professional category: doctors 57.55%, medical assistants 40.21%, ambulance drivers specially trained in the School of Ambulances 47.88%, emergency registrar operators 38.2%.



In the 41 public services in Romania, there are only 22 IT professionals, not even one specialist at the level of each SAJ/SABIF.

Ambulance substations, at the national level, operate in a total number of 336 buildings, of which only 127 (37.8%) are owned, the remaining 209 (62.2%) belong to other public or private authorities.

The total number of pharmacies operating at SAJ/SABIF level is 24 and for a number of 17 SAJs (42% of the total) no pharmacy is organized.

3.5. Results and discussion

Frequent legislative changes have affected both the organization of public ambulance services and their financing. It is necessary to understand the place of emergency medical care provided by ambulance services in the architecture of the

Romanian medical system, the quality and performance of medical services provided by the public ambulance, its risks and perspectives.

3.6. Partial conclusions

In fact, a new approach is needed in the field of ensuring the resources necessary to provide emergency medical assistance in the pre-hospital by the public ambulance services, which, year after year, provide 90% of the total emergency medical interventions in cases taken through the SNUAU-112 system.

Chapter 4. Evaluation of the intervention capacity of public ambulance services in emergency medical care and ways to increase performance

4.1. Research hypotheses

The intervention capacity of the public ambulance is affected by the poor road infrastructure. The average response time to public ambulance calls in Romania is longer than in other European countries, thus suggesting a lower possibility of intervention. The underfunding of the public ambulance system in Romania affects the capacity for intervention.

4.2. Purpose and objectives

The purpose of the research on the intervention capacity in the emergency medical assistance activity in the prehospital is to evaluate and analyze the current system of medical intervention at the scene of the incident or at the patient's home and to identify the opportunities for quick resolution of the case. This aims to understand how the public ambulance currently works in Romania, as well as the challenges and limits of this system.

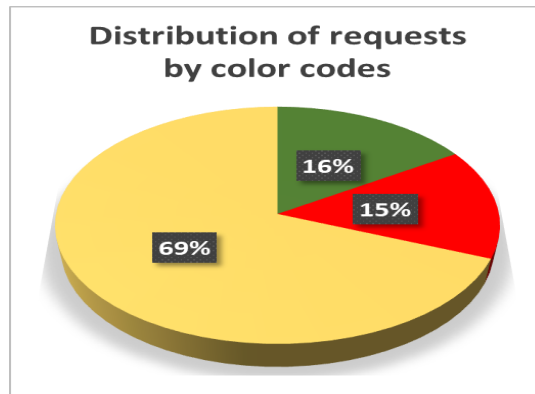
4.3. Research material and methods

The general research methodology related to the intervention capacity of ambulance services in Romania involves exploring the current level of ambulance intervention capacities in SAJ/SABIF, statistics and data analysis, taking into account the available resources and the technical feasibility of different methods.

4.4. Results and discussion

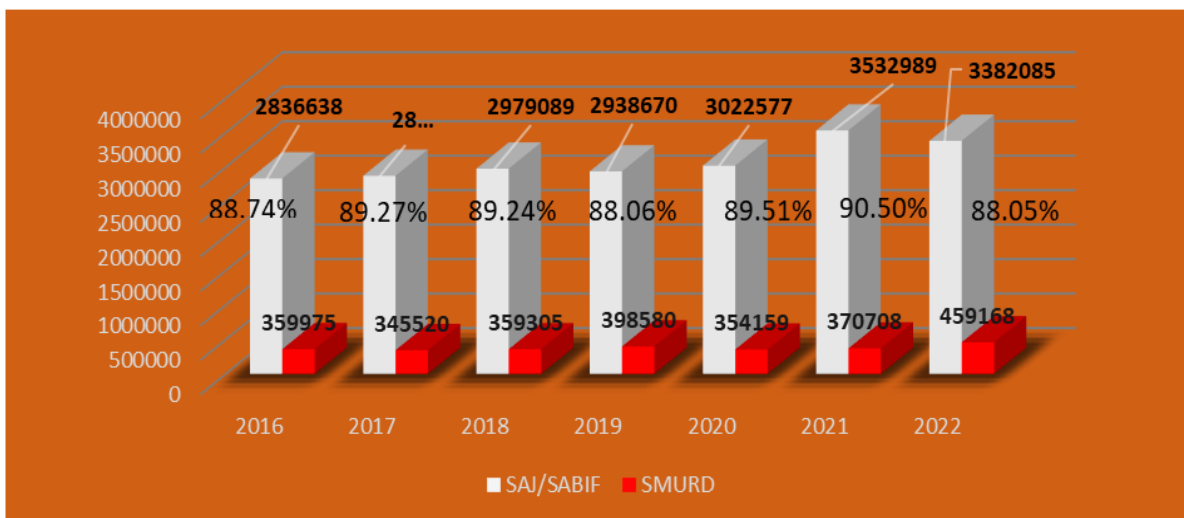
Through the unique 112 call system and through the territorial public health directorates, the Ambulance Services received, in 2022 alone, over 4 million requests. The increase in the number of requests experienced an upward trend in the period 2016-2022 and, in particular, due to the Covid-19 pandemic, in the period March 2020-March 2022.

Breakdown of emergency medical interventions by color codes: 15% are red code emergencies, according to the approved classification index, 69% are yellow code emergencies, the remaining 16% are classified as green code.

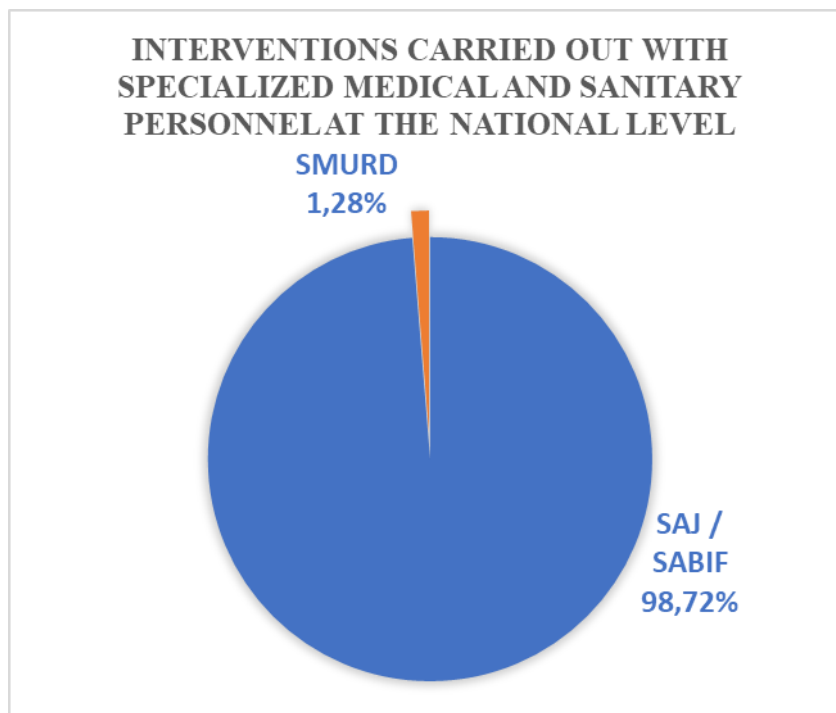


In the period 2016-2022, the share of emergency medical interventions in the pre-hospital provided by the public ambulance services was between 88.05%-90.50% of the total, the difference of 11.95%-9.5% of the total, being achieved by paramedic fire crews and the so-called "integrated" SMURD crews made up of fire-paramedics of the MAI-ISU and medical personnel from the UPU/CPU sections belonging to public hospitals, as it results both from the centralization of the data reported by SAJ/SABIF and from The annual reports drawn up by DSU for the period 2016-2022 [2] [3]

Diagram of emergency interventions at the national level 2016-2022



From the total of 3,578,906 (3,532,989 SAJ/SABIF+ 45,917 SMURD) interventions regarding emergency medical cases in the pre-hospital, the SAJ/SABIF medical crews intervened in 98.72% of the cases, and the integrated/mixed SMURD crews (MS/MAI), acted with medical personnel only in 1.28% of cases, the medical personnel involved in the respective interventions being, in fact, made up of doctors and medical assistants, leaving the UPU/CPU departments of the hospitals to act in the so-called crews "integrated" SMURD.



4.5. Partial conclusions:

The intervention capacity of public ambulance services is closely related to human resources and the competence of emergency medical crews. Responsiveness definitely depends on the equipment and vehicles in the equipment. Good coordination between ambulance services, hospital emergency departments and other medical facilities is essential for an efficient and prompt response.

Chapter 5. Comparative analysis of the performance of public ambulance services in Romania in a European context

5.1. Research hypotheses

The level of resources allocated to public ambulance services in Romania is insufficient and negatively affects their performance compared to other European countries. The existence of a deficient system of collaboration and cooperation between the emergency medical services provided by the public ambulance and the patient pick-up systems in Romanian hospitals contributes to delays and lowers the performance of public ambulance services compared to some European countries.

5.2. Purpose and objectives

The research aims to identify and assess differences in the characteristics, facilities and performance of the prehospital emergency medical care system, focusing on the existence and use of resources, response time, quality of care and regulations related to ambulance services.

Another objective of this comparative research is to obtain a broad perspective on the differences and similarities between the ambulance services in Romania and those in Europe, with the aim of contributing to the development and increase of the performance of the ambulance services in Romania, so that they offer efficient and quality medical assistance in emergency situations.

5.3. Research material and methods

Identifying similarities and differences between health systems in general, but especially between ambulance systems and analyzing the factors that influence the quality of ambulance services

5.4. Results and discussion

From the documentation regarding emergency medical assistance in pre-hospitals from Romania and from 13 other European countries, common elements emerged, but also significant differences regarding resources, the number of calls, the triage systems and dispatch centers that evaluate emergency situations and directs the resources, the response time, the composition of the emergency medical teams, depending on the severity of the cases, the national regulations and the specific needs of each country.

5.5. Partial conclusions

The analysis of performance indicators such as: the way emergency assistance is financed, the response time, the number and qualifications of medical personnel, the equipment and technical equipment of ambulances, the accessibility of services, the emergency coordination system, show significant differences between European countries.

Compared to certain European countries, the ambulance system in Romania still needs development and needs additional investment to ensure faster and more efficient emergency medical care.

Aspects that can be improved concern the updating and legislative-normative harmonization in the field of emergency medical assistance and medical transport.

The non-updating of the normative acts in the field of emergency medical assistance and sanitary transport increases the operational risks and their legal consequences, among which we mention the risk of public and court challenges.

Conclusions and personal contributions

The three studies carried out on the pre-hospital emergency assistance system in Romania and some European countries showed the need to increase the intervention capacities in the field of medical emergencies and the need to harmonize the regulations, especially in our country.

A new approach is required in the field of ensuring the resources necessary for emergency medical assistance in the pre-hospital by the public ambulance services, which provide, year after year, 90% of all emergency medical interventions.

The provision of ambulances is totally insufficient, with outdated or insufficiently equipped ambulances, unable to cover, in a timely manner, requests for critical cases, especially.

It can be appreciated that, in terms of technical equipment, in the process of digitalizing the emergency medicine system in the pre-hospital, important steps have been taken, starting with the emergency medical dispatchers that use IT applications that allow the triage and dispatch of requests taken from SNUAU-112 -administered by STS.

The most complex computer system named, for short-DISPEC-112, adapted to the complexity of the data system processed at the level of the Bucharest-Ilfov Region that manages about 25% of the total number of emergency medical calls at the national level, belongs to SABIF, having international recognition, being presented in international

publications, both under the auspices of the European Commission - General Directorate for Information Society and Mass Media and the United Nations - Division for Public Institutions and Digital Governance. [4] [5] [6]

At the same time, starting in 2015, a project was implemented, carried out by STS, through which the relevant data sets, necessary to carry out emergency medical interventions in the pre-hospital, are completed electronically, "on a tablet", by the ambulance crews and can be retrieved, in electronic format, by UPU/CPU hospital wards, saving precious time.

The following measures would lead to increased activity efficiency and performance in public ambulance services: Optimizing the allocation and use of financial, human, material and informational resources.

The development of the information platform and the communication system and the improvement of the technical endowment with high-performance medical and self-sanitary equipment corresponding in number and endowments.

Increasing the number and skills of doctors and assistants employed in public ambulance services and developing the didactic and scientific activity of medical staff regarding pre-hospital emergencies.

Harmonization of legislation on pre-hospital emergency medicine.

The present work constitutes a novelty in the field of emergency medical care in the pre-hospital and establishes a pioneering in the field of analysis of the emergency medical system in the pre-hospital in Romania. It examines the activity of the ambulance in Romania, starting with its establishment in 1906 and the evolution, during the 117 years of its existence, during which the Romanian ambulance intervened permanently, with all its forces, providing emergency medical assistance to those affected by fierce trials such as were the two World Wars, epidemics (typhoid, cholera, Covid-19), floods (1970 and 1975), the devastating Earthquake of 1977, mass accidents and any other requests for emergency medical assistance.

It is the first integrated analysis of the activity of all entities involved in emergency medical assistance or, as the case may be, first aid. In fact, within the work, the contribution and intervention capacity of each organizational segment was examined and exposed, respectively: the public ambulance, the hospital emergency departments (UPU/CPU) and the complementary contribution given by the mixed crews made up of staff medical officer assigned to the UPU/CPU hospital wards within the Ministry of Health and firefighters-paramedics assigned to the MAI-IGSU-SMURD;

The scientific research sought to make some comparisons between the activity carried out by the Romanian ambulance and other similar systems from countries with are: England, Austria, Bulgaria, Switzerland, France, Germany, Italy, Norway, Holland, Serbia, Sweden. [7] [8] [9]

It is very clear that the future of medicine is closely linked to the evolution of technology, especially communication, artificial intelligence, robotics. We are preparing to keep up with these developments. Thus, at the level of the Bucharest-Ilfov Region, there are premises for the public ambulance to be the first "paper free" institution through the implementation of a pilot project, called "Resursa mobilă IA". With the help of an intelligent application, with learning capacity, the intervention form can be completed without actually writing on paper and without "typing" on the tablet. The computer application can take over what the crew dictates into the microphone, filling in the PRE-HOSPITAL INTERVENTION SHEET directly, by the computer system. In this way, not only is the time currently allocated for filling out each pre-hospital intervention sheet on a tablet and in paper format reduced by 30%, but all this information can be transmitted immediately to the UPU/CPU hospital wards.

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