

Institutional Platform to Ensure the Interaction between the Subjects of Combating Medical and Biological Emergencies Mechanism

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ABSTRACT

The article is devoted to studying the current condition of state regulation over medical and biological emergencies in Ukraine and the development of proposals on the organization of more effective interaction between the institutional platform subjects. The urgency of the research lies in the fact that the current state authorities' activities are inefficient and do not cope with the problem of exacerbation of COVID-19 disease level. Relevance is supplemented by the unpredictability of pandemic crisis development, requiring reforming the current medical support system. The study aims to develop recommendations on forming the institutional platform and effective system interaction between the participants of regulation in medical and biological emergencies. In the course of the study, general scientific knowledge methods are used and institutional platform modeling. As a result of the study, systematized information about the present state of state regulation defined recommendations for improving the current relationship between regulators. The study's novelty lies in the improvement of the mechanism to ensure the interaction of subjects to combat emergencies of medical and biological nature. The study's practical value consists of obtaining a set of recommendations, which can be implemented by public authorities responding to emergencies.

HIGHLIGHTS

- ① The article is devoted to studying the current condition of state regulation over medical and biological emergencies in Ukraine and the development of proposals on the organization of more effective interaction between the institutional platform subjects.
- ② As a result of the study, systematized information about the present state of state regulation defined recommendations for improving the current relationship between regulators.
- ③ The study's practical value consists of obtaining a set of recommendations, which can be implemented by public authorities responding to emergencies.

Keywords: Institutional regulation, emergencies, COVID-19, Ukraine

The modern economic development of Ukraine is characterized by variable-complicated and sometimes even extreme situations. Although global civilization development has a positive impact on

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humanity, it forms many threats to the vital interests of society and the state as a whole. Among these threats recently, the most dangerous are medical and biological situations. It is especially typical in the period of the Covid-19 pandemic, which significantly influences the policy and organization of every state, regardless of its developmental level. Covid-19 had a significant impact on the development of Ukraine when the established and stable structures turned out to be incompetent, which led to the need to reorganize, transform and develop them under the current challenges.

In this connection, the Unified State System of Civilian Protection of Population and Territories plays a significant part in ensuring medical safety today. The primary institutional body forms the response, control, and consequences liquidation in crises of medico-biological nature. Such a body is built by analogy with developed countries, which include rapid response bodies capable of liquidating emergencies, including medical and biological ones. But the Unified State System is not a single body; it is an institutional platform that combines the work of several authorities. Therefore, it is essential to establish effective interconnections capable of responding quickly to new challenges, being mobile, flexible, and not in conflict with each other.

Counteraction to biomedical situations involves activities that directly affect the everyday population life of the country, the functioning of state institutions, and the national economy. This management process involves the respective agencies of different influence spheres, which must work holistically and cooperate effectively. Such activities include providing assistance to the population and organizing it; starting, organizing, and even stopping the operation of certain enterprises; and coordinating the authorities and public institutions. All this requires rapid decision-making at all levels: state, regional, local, and object (Akimova *et al.* 2020). Thus, special attention is required to create crisis response systems that include management mechanisms and structures that allow the country and its population to quickly adapt to a crisis, mobilize resources to deal with the crisis, and resume normal life activities (Kryshtanovych *et al.* 2021).

Today it can be argued that Ukraine requires a significant improvement of the response system to

crises of medico-biological nature. Those systems built on the past known approaches in conditions of unpredictability lose their efficiency, which was felt by the country's population in 2020. To this end, many expert theorists and practitioners offer different methods to address the issue.

The study aims to develop recommendations on the institutional platforms formation and effective system interaction between the participants of regulation in the conditions of medical and biological emergencies.

It is necessary to solve the following tasks to achieve the goal:

- ♦ identify the main actors and participants in the formed institutional platforms;
- ♦ determine the main methods of interaction;
- ♦ investigate the levels of interaction;
- ♦ show the goals of interaction;
- ♦ to define the main drawbacks of such interaction;
- ♦ to offer solution methods for ineffective systems of interaction.

Review of Literature

The regulation and formation mechanism of combating emergencies of medico-biological character is sufficiently studied in foreign and Ukrainian scientific literature. Some studies are devoted to theoretical and methodological bases of principles formation of state management and regulation of emergencies liquidation, including medical and biological character (Farmbry & Krauskopf, 2013; Boisvert & Moore, 2003; Puchkov *et al.* 2016). The development of the global network in the field of economic relations caused the emergence of new types of activities and opens up fundamentally new opportunities for business development (Kryshtanovych *et al.* 2022; Akimov *et al.* 2021). The international regulatory literature, particularly on the regulation of the issue in the United States, shows the relationship between the country's Department of Health and the World Health Organization (PAHO, 2012), whose goal is to combat localized outbreaks. In turn, the research and regulatory literature of this period did not envision the practical effectiveness of such structures at the global threat scale. Romero *et al.* (2021) showed how COVID-19 influenced the public emergency management structure in their study.

Most studies, however, have not focused on institutional regulatory mechanisms but instead on emergency management techniques, evaluating the effectiveness of government, including institutional organizations. For example, in their study, Davies & Savulescu (2022) show the different country cases, particularly Great Britain. Their institutional bodies have taken comprehensive measures to combat COVID-19, which relate to treatment and financial support. At the same time, the author emphasizes the importance of organization on the state's part, which also affects the population's behavior. If it is properly organized, people become controllable, and the disease's spread becomes predictable. In the United States, medical assistance during disasters is provided through the National Disaster Medical System (NDMS). The Department of Health and Human Services and the Department of Defense are responsible for its state, engaged in federal planning of organizational, medical, and evacuation activities. The NDMS is organizationally part of the management and is one of the essential components of the Federal Emergency Management Agency, FEMA (Bernhard *et al.* 2004). The prevention and management of natural and man-made disasters is the responsibility of several agencies reporting directly to the President of the State. FEMA is the central agency with the primary role. It coordinates the activities of state civil defense agencies, federal departments and agencies (energy, transportation, etc.), and the private sector (Moroz *et al.* 2018).

In the EU and NATO, response agencies include facilities and systems, up to 85 % of which (for example, in the United States) may be privately owned. In such countries, the development of public-private partnerships is one of the generally recognized principles of government agencies in this area. Their efforts in this direction are focused on developing mutually beneficial partnerships between the public and private sectors, a prerequisite for creating an atmosphere of trust between government and business. In his study, Kumar (2022) shows the importance of private and public organizations in dealing with various emergencies in India. Particularly in the case of Covid-19 in rural areas, the only way to get medical care was through interaction with public organizations. Relevant provisions on such exchange are included in national legislation, policy, and conceptual

documents of such countries as the U.S., Germany, the U.K., and other countries (Burbela & Kondratov, 2020).

Part of the foreign research is devoted to interaction directions between regulatory authorities. Andrew *et al.* (2021) show the experimental results of using different telecommunication channels between institutional bodies to solve problems quickly, focusing on the use of redundant channels, including radio communication, satellite Internet communication, and cell phones. Liu (2008); Jiang *et al.* (2021) explore the possibility of online interaction through sites.

It is necessary to conduct research based on an analysis of the current situation and the application of international experience, working toward developing recommendations for institutional platforms and effective systemic interaction between regulatory actors in biomedical emergencies. At the same time, regional features have a significant impact on solving the outlined problems (Klymenko, *et al.* 2016; Deyneha *et al.* 2016).

Such work was done in 2010 by Terentieva (2010). She developed a comprehensive approach to emergency response at the regional level, involving the necessary forces and means. Radish & Terentieva (2009), Koretskyj (2020), Maslei (2021) substantiated the state regulation mechanisms and determined the implementation directions of the research results in the state management practice of health protection practice.

The works of Shostak, Zhukov, and Klimenko are also helpful for the study. Shostak (2014) investigated the influencing factors on the government interaction mechanisms during the liquidation of the emergencies consequences and proposed her classification of these factors. Zhukova (2002) considered the possibility of building effective public administration in the sphere of civil protection. It should be based on an optimal ratio and interaction of subsystems with structural security elements. Klimenko (2006) proposed a conceptual framework for assessing the reliability of public administration in emergencies. The researcher paid special attention to the formation of the regulatory framework used as a tool to respond to emergencies; Riabets (2021), in his study, shows the state regulation of the health protection system.

Since the formation of proposals takes a multilevel approach, the articles of Marchenko (2008), which investigated the system of state regulation of emergency response at different levels, were studied. At the same time, such struggle can become relevant in other conditions, for example, in the military, terrorist actions that occur in Ukraine (Voronenko *et al.* 2011; Badyuk, 2008; Voloshyn & Galushka, 2006).

Since the institutional platform involves the interaction of different organizations, similar work that has been done before was investigated. Roshchin *et al.* (2010) focus on issues of interagency coordination in the process of dealing with the biomedical consequences of emergencies. The study's main purpose is to explore directions for deepening interdepartmental collaboration in the management decision-making process to deal with the biomedical effects of emergencies. Current research by Volianskyi *et al.* (2021) shows the importance of public emergency service in organizing to deal with biomedical emergencies.

Considering medical aspects of state management in a crisis situation, it is found that the developed standards work only in stable and ideal conditions but become practically incapable in a contingency situation (Maidanchik, 2013). Modern experts Burbela & Kondratov (2020) showed the shortcomings of state regulation processes of medical and biological emergencies. They proposed to improve them with the formation of new responsible regulatory bodies and regulatory changes.

But given that all the studies conducted in 2010–2019 have almost lost their relevance due to the emergence of medical and biological nature threats, a new study in this industry will be of particular significance. It also has practical importance since the pandemic has gained new momentum for three years. But unfortunately, effective mechanisms to combat it still do not exist today.

Research Methods

The theoretical and methodological basis for the implementation of the research goal is the use of general and special methods:

- ♦ Analysis – used in the study of regulatory and legal regulation, as well as the critical study of foreign literature, which can be the basis

for the formation of proposals to improve the interaction between the subjects of the institutional platform;

- ♦ Synthesis – used to generalize data, patterns, and trends in the formation of institutional platforms;
- ♦ Induction – the basic forms of organization and mechanisms of catastrophe medicine services functioning are discovered;
- ♦ Deduction – proposed methods for improving the interrelations between the authorities to make the work more effective;
- ♦ Systemic – the interaction and internal relationship of medical and biological risks and their impact on the state management of emergency medical service formations) were investigated;
- ♦ Comprehensive – analyzed various factors of the impact of emergencies on the development of a unified system of civil protection of population and territory as a component of the system of national security);
- ♦ Analogy – a typical model of medical support to victims in the process of overcoming the medical and sanitary consequences of medical and biological emergencies was developed;
- ♦ Modeling – models and mechanisms of medical protection system management in emergencies of medico-biological character and mobile formations of emergency medicine in the process of overcoming the consequences of emergencies were developed.

The instrumental platform of the proposed interaction model is:

- ♦ a network planning method for technologically aligning all phases of the response process;
- ♦ compliance with the requirements of the modern medical practice of care for the severely.

Research Findings

The main elements of critical infrastructure protection are covered by the unified state system of civil protection, which functions under the Civil Protection Code of Ukraine and the Regulation on the Unified State System of Civil Protection, approved by the Cabinet of Ministers of Ukraine (2014). In particular, responses to medical and biological

threats are provided by the subsystem “ensuring the sanitary and epidemiological well-being of the population”, which until 2018 functioned in the Ministry of Health.

An infographic representation of the main subjects of the institutional platform to ensure interaction in emergencies, in particular, medical and biological risks, is shown in Figure 1. It shows that all horizontal and vertical informing takes place through a control points system, operative-coordination dispatching service with an application of telecommunication systems.

Let's consider subjects, ways, levels, and purposes of subjects' interaction in the mechanism of struggle against emergencies of medico-biological character.

Subjects of interaction. A unified state system of civil protection includes standing control bodies of civil protection, coordinating bodies, civil protection forces of functional and territorial subsystems.

Standing management bodies for civil protection, whose responsibilities include the organization and implementation of civil protection measures, are:

- ♦ at the state level – the Cabinet of Ministers of Ukraine, the State Service for Emergency Situations, as well as the central bodies of executive power, creating functional subsystems, and civil protection units within their apparatuses;
- ♦ at the regional level – regional, Kyiv and Sevastopol city state administrations, their subdivisions on civil protection issues, territorial bodies of the State Service for Emergency Situations;
- ♦ at the local level – district, district state administrations in Kyiv and Sevastopol, executive bodies of city councils, units on civil protection issues formed in their composition, administrative bodies of settlement and village councils, units of territorial bodies of the State Service for Emergency Situations;
- ♦ at the object level – governing bodies of enterprises, institutions, and organizations, as well as units (officials) on civil protection, which are formed (appointed) by such bodies following the legislation (Regulations on the unified state system of civil protection, 2014).

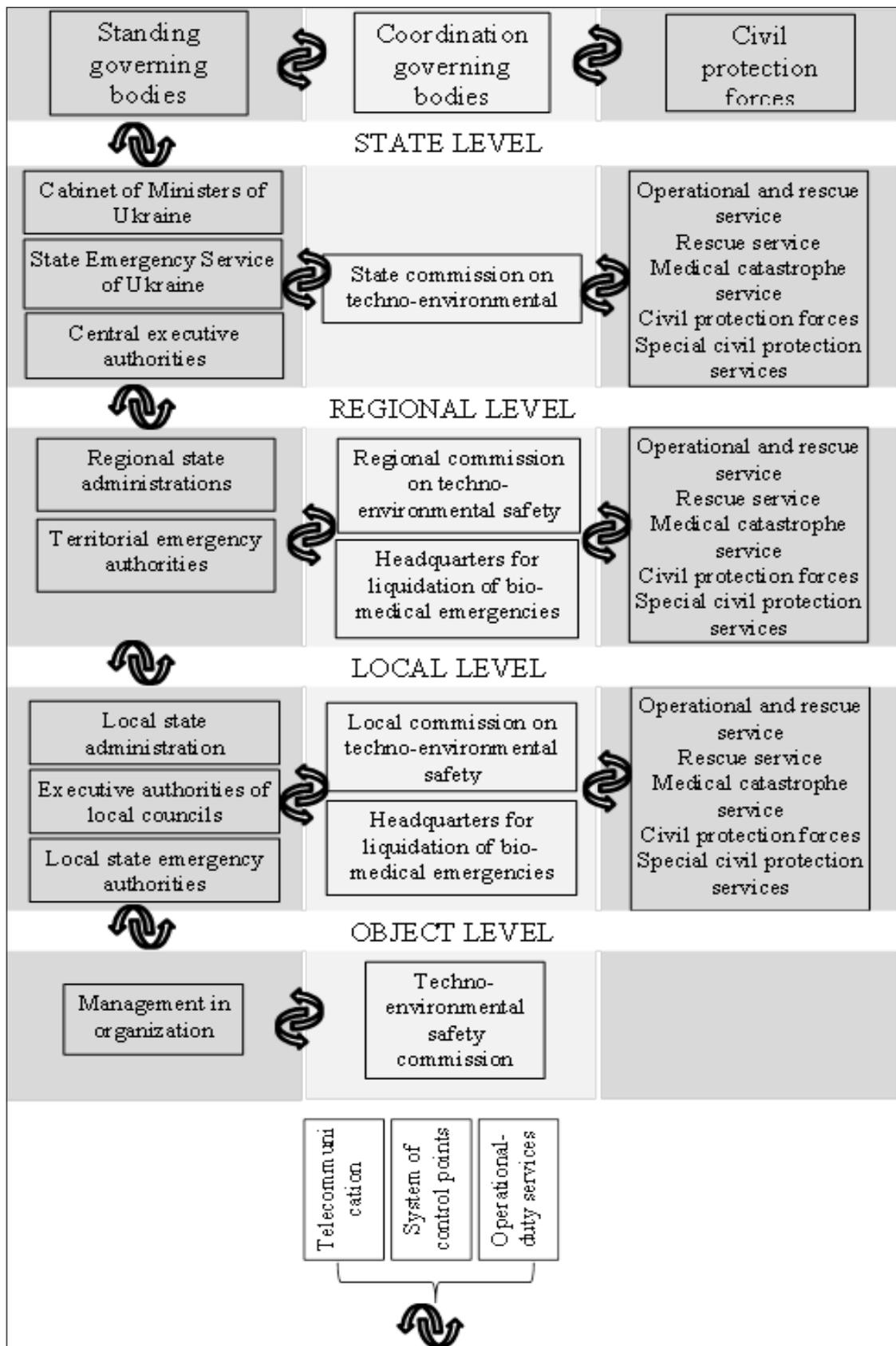
The coordinating bodies are:

- ♦ at the national level – the State Commission on technogenic and environmental safety and emergencies;
- ♦ at the regional level – commissions on technogenic and environmental safety and emergencies of the Autonomous Republic of Crimea, regions, the city of Kyiv and Sevastopol;
- ♦ at the local level – commissions on technogenic and environmental safety and emergencies of districts, cities, districts in cities, settlements;
- ♦ at the object level – emergency commissions of enterprises, institutions, and organizations (Regulation on the unified state civil protection system, 2014).

Special commissions for the liquidation of the emergency consequences are formed as necessary, conducted under regulations on such commissions to coordinate the liquidation of the results of a particular emergency at the state, regional, local, and object level. For example, in 2020, a headquarters was organized to liquidate the medical-biological emergency consequences at the local and regional levels. This headquarters works under the State Commission on technogenic-environmental safety and emergencies.

To ensure management in the mode of the daily functioning of management bodies and civil protection forces, coordination of their actions, implementation of round-the-clock duty, and ensuring the functioning of the system of collection, processing, summarizing, and analysis of information about the situation in the areas of emergencies are functioning:

1. at the state level:
 - ♦ operative-ordinary service of the state emergency management center of the State Emergency Situations Service;
 - ♦ operative-emergency (regular, dispatching) services of the central executive authorities (in case of their formation);
2. at the regional level:
 - ♦ operative-ordinary services of the control points of the regional, Kyiv and Sevastopol city state administrations;
 - ♦ operative-duty services of the emergency



Source: Author's elaboration.

Fig. 1: Institutional platform for combating biomedical emergencies

control centers of the territorial bodies of the State Emergencies Service;

- ◆ Operative-duty (regular, dispatching) services of territorial agencies of central executive authorities, enterprises, institutions, and organizations (in case of their establishment);
3. at the local level:
- ◆ duty services of district state administrations and executive bodies of city councils;
 - ◆ dispatch services of the territorial agencies of the central administrative authorities, enterprises, institutions, and organizations (in the case of their creation);
4. at the object level – duty (dispatch) services of enterprises, institutions, and organizations (in case of their formation) (Regulations on the unified state system of civil protection, 2014).

In emergencies, representatives of the state authorities concerned are involved in operating the emergency control centers.

The forces of civil protection of the unified state system of civil protection include:

- ◆ operational and rescue service of civil defense;
- ◆ emergency rescue services;
- ◆ civil protection formation;
- ◆ specialized civil protection services;
- ◆ fire and rescue units (parts);
- ◆ voluntary civil protection formation.

Operational and rescue service of civil protection operates in the State Service for Emergency Situations system.

The civil protection forces of the functional subsystems include:

- ◆ specialized professional emergency rescue services;
- ◆ the object of emergency rescue service;
- ◆ an object of civil protection formation;
- ◆ branch and object specialized civil protection services;
- ◆ state fire and rescue units (parts) providing departmental fire protection;
- ◆ voluntary civil protection formation.

Civil protection forces at the state level are accounted

for by the State Service for Emergency Situations and at the regional level by its territorial bodies (Regulation on the Unified State System of Civil Protection, 2014).

To manage the unified state system of civil protection, a public telecommunications network, a particular purpose telecommunications network, and the state system of governmental communication are used (Regulation on the Unified State System of Civil Protection, 2014).

Methods of interaction. System of control points. The control facilities list, with which control points are equipped, and the procedure for their use shall be established by the state authorities and local self-government bodies to which they belong. They are selected depending on the tasks carried out at such a control point.

For the management in the mode of the day-to-day functioning of the subjects of civil protection and the coordination of the actions of management bodies and civil protection forces, there is a round-the-clock duty, and a system of collecting, processing, summarizing, and analyzing information is provided.

The State Center for Emergency Management ensures the formation and implementation of state policy in civil protection.

At the regional level, in the central body of executive power, which ensures the formation and implementation of state policy in civil protection, state control centers operate in emergencies.

In case of emergencies, the respective emergency management centers directly interact with the emergency response headquarters in case of its formation and ensure its operation.

Operational and coordination dispatch service. Operative-coordination dispatch service operates in a day-to-day round-the-clock mode in the absence of national and regional emergencies and threats of their occurrence. However, the Operative-coordination dispatch service operates in high readiness mode in case of essential deterioration of the environment and probable threat of national or regional medico-biological emergencies.

Telecommunication. It should be noted that interaction occurs through the exchange of information between agencies. Telephones, e-mail, nodes of

data, and analytical processing of information of the Ministry of Health of Ukraine in the Government Information and Analytical System on Emergency Situations are used.

Interaction levels. Depending on the circumstances, scale, nature, and possible development of the emergency, interaction is organized:

- ♦ at the national level – directly between management bodies and forces of functional and territorial subsystems;
- ♦ at regional, local, and object-level – between territorial bodies of central executive bodies, local executive bodies, their forces, as well as economic entities (Regulation on the unified state system of civil protection, 2014).

Objectives of interaction. In the unified state system of civil protection, to prevent and respond effectively to emergencies on time, interaction is organized on the issues of:

- ♦ determination of management bodies that are directly involved in response to emergencies, the composition and number of forces (means) of response to them;
- ♦ coordination of the procedure for the implementation of joint actions of civil protection forces in response to emergencies with the definition of the main tasks, place, time, and ways of their performance;
- ♦ organization of the management of joint actions of management bodies and civil protection forces in the performance of tasks as assigned;
- ♦ comprehensive provision of joint measures carried out by management bodies and subordinate civil protection forces, including mutual assistance with transport, engineering, material, technical and other means (Regulation on the unified state system of civil protection, 2014).

Shortcomings of the interaction system. According to the Unified State System of Civil Protection, the central management bodies are the Cabinet of Ministers, the State Service for Emergency Situations, and the apparatus of the executive branch. This system does not include the Ministry of Health and other agencies. The State Commission plays the coordinating role on Technogenic and Environmental Safety, subordinate to the State

Service for Emergency Situations and has an additional body – the headquarters for liquidating the medical and biological emergency consequences. Although interactions are quite clear under the conditions of this model, in practice, when other agencies must also be involved in the problem, their interaction becomes unsystematic. The practice has shown that in conditions of contingencies, the work of institutional bodies becomes uncoordinated.

Recommendations for an interaction mechanism. Based on the analysis results, to ensure the safety and sustainability of the system, to improve the mechanisms and procedures for responding to threats of different origins, including those of a complex nature, it is recommended.

The Cabinet of Ministers of Ukraine to develop and approve the order of interaction of institutional bodies. In particular, it is recommended to develop a commission for rapid response to emergencies organized by the State Service for Emergency Situations and the Ministry of Health at all levels. It is also recommended to manage the subordinate headquarters of the Commission for the liquidation of the medical and biological emergencies consequences at all governmental levels. Through this headquarters, information on the level of damage to the population will be transmitted and accumulated, and the processes of providing assistance by various agencies will be monitored.

The Ministry of Health of Ukraine - to work on the subsystem functioning for the sanitary and epidemic well-being of the population of the civil protection unified state system in conditions of the spread of COVID-19.

State Service for Emergency Situations – to work on the mobility of the study of the level of disease and provision of prompt assistance, with the possibility of supplementing the medical infrastructure with mobile points of assistance.

Ministry of Economic Development, Trade, and Agriculture of Ukraine – develop a draft law “On Amendments to the Law of Ukraine “On Public-Private Partnership” for submission to the Verkhovna Rada of Ukraine in the prescribed manner, which provides the list of public-private partnerships in the sphere of national security and defense (Burbela & Kondratov, 2020).

These non-institutional organizations can become an essential component of the issue's solution. It is also necessary to establish interaction between these private and public organizations with public clinics and hospitals, providing advice and assistance in solving issues.

The basis of effective interaction between subjects of the state system of combating bio-medical emergencies is a system of bilateral information flows, ensuring the functioning of the relevant institutional platform. These communications can be organized by control centers using telecommunication means.

DISCUSSIONS

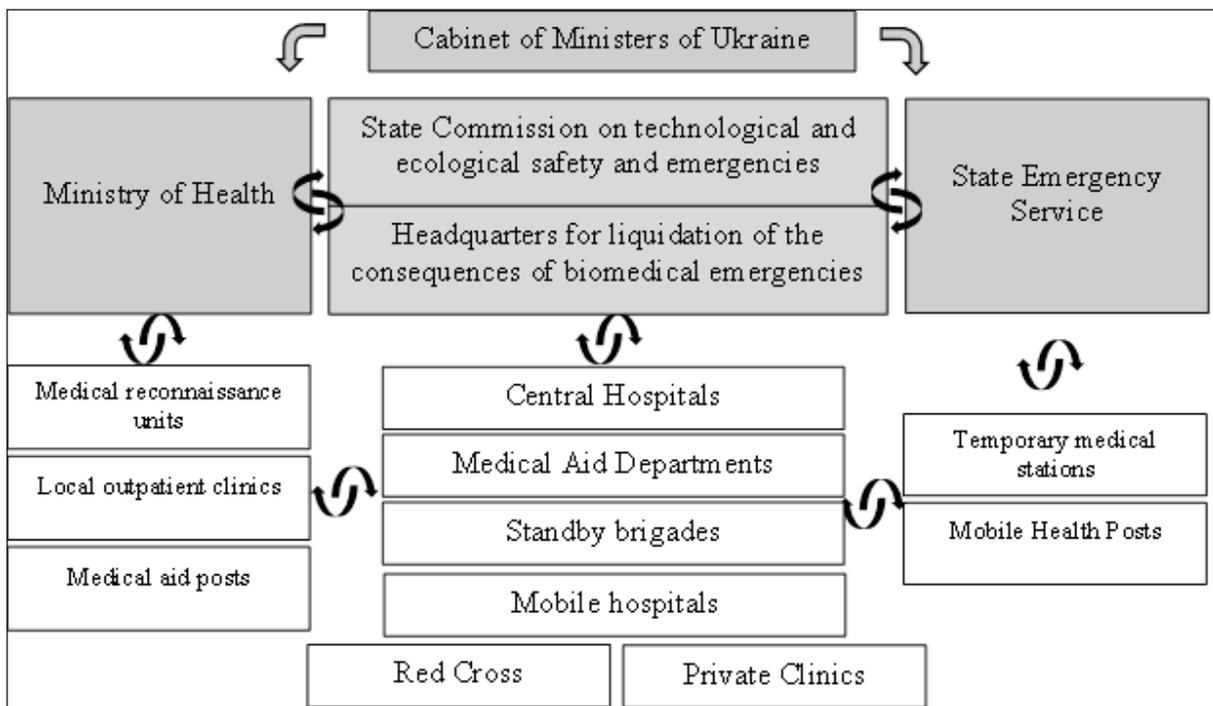
The state supply system for medical and biological emergencies is an already established structure. The proposed structure requires significant changes in the way aid is provided to the population and the interaction of institutional bodies. During the first days of the quarantine, an extensive discussion evolved around these issues. During the discussion of state government and experts, methods of rapid response to situations were put forward, so the proposed option could increase awareness, that

is, interaction at all levels (Burbela & Kondratov, 2020). It is very important that such systems could be implemented quickly and with little budget expenditure.

Analysis of foreign experience allowed to highlight the main principles of the organizational concept of emergency response:

- ♦ centralization of service management, which ensures promptness, phasing, and strict continuity in the provision of emergency medical care;
- ♦ concentration of material-technical, personnel, and scientific potential in the framework of a single service makes it possible to organize the whole range of specialized medical care in all regions of the country with maximum efficiency;
- ♦ the unification of all parts of the service into a single system simplifies the targeted financing and real provision of state guarantees of free and accessible emergency medicine services.

Thus, the basis of the proposed model is the international experience of forming an institutional platform to ensure the interaction of subjects of the



Source: Author's elaboration

Fig. 2: Subjects interaction of the institutional platform to ensure the fight against biomedical emergencies

mechanism of combating emergencies of medical and biological nature, taking into account the domestic operating system.

Similar proposals were put forward by Terenteva (2010) and Shostak (2014). There is an interaction model between the subjects of the state system of medical and sanitary emergencies liquidation at the basis of their model. The authors point out that central, regional, and district hospitals are at the center of attention, which provide direct assistance to the population. They also involve first- and second-line emergency teams, which have at their disposal a certain number of beds in hospitals of local, regional, and central importance. Patients are brought to medical facilities due to rapid medical assistance units, medical reconnaissance teams, and emergency response headquarters. The main emergency management body is the HQ (with which the author's team of this study agrees), but in the research of Shostak (2014), the role of this HQ is to work at the scene of medical emergencies. When such situations become widespread, the HQ should assume responsibility at the facility or local level and the regional and state levels in a pandemic.

CONCLUSION

A current state analysis of the state management system showed that the existing unified state system of civil protection from emergencies consists of management bodies, coordinating bodies, and civil defense. Within each subsystem, there are organizational structures: permanent management bodies of civil protection, coordinating bodies, civil protection services. Moreover, each organizational structure consists of functional units with different powers, responsibilities, and tasks.

During the study, the problems of current interaction between the participants of the institutional platform were identified: during the liquidation of the emergencies consequences, there is quite a severe difficulty in the interaction between all actors involved and control over the performance of their functional duties, which affects the efficiency of response and management efficiency.

The paper proposes a correction to the organization of interactions between the management, coordination, and civil protection. The base of the management process is the headquarters, which will be formed by two organizations: The Ministry of Health

Protection and the State Emergencies Service. This headquarters will concentrate the logistics, staffing, and regulation of the whole range of assistance both at the state, regional and local levels for existing and establishing new mobile medical centers for victims. The headquarters will also receive information on private organizations to direct their actions toward solving the problem. At the same time, the Ministry of health functions will remain to provide first-level medical care, and the functions of the public service will remain to ensure the mobility of medical facilities.

The practical value of the proposals lies in obtaining a set of recommendations that state agencies can use in responding to emergencies. The field of further research is the reform of the normative-legal base for regulating the activities of the subjects of combating emergencies of medical and sanitary nature.

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