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PROBLEMS AND PERSPECTIVES OF THE PUBLIC HEALTH EMERGENCY MANAGEMENT AND THE ACTIVITIES OF EMERGENCY OPERATIONS CENTERS

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Abstract. *Public health emergencies can have devastating social, economic and health consequences, including the loss of many lives in a short period of time. The article describes the problems and perspectives of the public health emergency management and the activities of emergency operations centers. The key components of the public health emergency management (PHEM) are reviewed: - organizational and programmatic (i.e., sectoral) standards, as well as incident management systems (IMS). Based on international and national experience, the article analyzes the positive aspects and shortcomings of the functioning of emergency operations centers (EOCs) in the public health system.*

Keywords: public health, emergency, emergency operations center, incident management system

All countries face risks and potential threats to health from a growing range of hazards, such as infectious diseases, chemical and radioactive incidents, food contamination, and threats related to climate change, including extreme weather events and deforestation (WHO, 2022).

Risk factors such as poverty, gender, age, migration, health and nutrition status, and unplanned urbanization increase people's vulnerability to these threats and hazards (WHO, 2022).

The WHO supports its Member States and pays great attention to the assessment, development and strengthening of the core capacities set out in the International Health Regulations (2005) to detect, assess, report and communicate events, and to respond promptly and effectively to public health emergencies. The strategy for ensuring biological safety and biological security is based on the One Health approach.

Based on the results of numerous reviews, discussions and consultations, 10 proposals by the WHO Director-General to strengthen public health systems under the auspices of the new comprehensive pandemic agreement have been formulated.

The recommendations are grouped into three main components of the response to global pandemics: management, systematic response and operational capacity, and financial support.

The management system suggests:

- establish a Global Health Emergency Council and a Committee on Health Emergencies for the World Health Assembly;
- make targeted amendments to the International Health Regulations (2005);
- expand the scope of the Universal Health and Preparedness Surveys and strengthen independent monitoring.

The WHO sees the need to develop systems and operational processes:

- strengthen global alerts for health emergencies;
- strengthen global health alert and emergency response teams that are trained to common standards, interoperable, rapidly deployable, scalable, and appropriately equipped;
- strengthen coordination of actions in the case of health emergencies through standardized approaches to strategic planning, financing, operations and monitoring of public health emergency preparedness and response;
- expand and strengthen partnership networks for a whole-of-society approach to joint surveillance, public protection, medical care, and access to countermeasures for epidemics and pandemics.

Funding for these approaches should cover the following aspects:

- establishing a coordination platform for financing to promote internal investment and channel existing and international financing to priority areas;
- establishing a financial assistance fund to ensure pandemic preparedness and response;
- expanding the WHO Emergency Preparedness Reserve Fund to enable rapid scaling up of funding for response;
- strengthen funding for a global framework for rapid response to public health threats.

A public health emergency, according to Ukrainian legislation, is the occurrence or immediate threat of a dangerous incident that leads or may lead to the spread of infectious or mass non-communicable diseases, other negative consequences for human health and requires appropriate coordinated measures (Law of Ukraine “On the Public Health System”. Bulletins of the Verkhovna Rada of Ukraine (VRU), 2023, No. 26, p. 93).

A public health emergency can be defined as “the occurrence or imminent threat of a disease or health condition that poses a significant risk of a large number of human deaths, injuries, or permanent or prolonged disability” (WHO, 2015).

Responding to a public health emergency requires decisive collective action at the local, national, and global levels, including a capable health system to prepare, plan, and manage these actions (Rose, 2017).

In this regard, the health impacts of infectious disease outbreaks, natural disasters, industrial and environmental emergencies, and conflicts have garnered global attention in recent years and reinforced the importance of strengthening public health systems to better protect communities and populations from natural and human-induced threats. To address these needs, various approaches and programs have been developed in national and global contexts, including public health preparedness and global health security initiatives. While much has been written about these approaches, there is little evidence on the relationship between public health and emergency management - and even less on what we call “public health emergency management” (PHEM) (Katz, 2014).

Public Health Emergency Management (PHEM) is an emerging field of science and practice that draws on specific sets of knowledge, techniques, and organizational principles from the fields of emergency management and public health that are necessary to effectively manage complex health problems and emergencies with serious health consequences. Although concepts such as public health preparedness and global health security are important components of PHEM, the terms should not be confused.

There are two main components on which PHEM is based:

- organizational and programmatic (i.e. industry) standards;
- incident management systems (IMS).

They are the key domains, or functional areas of PHEM.

Public health and, of course, emergency management have a long history of involvement in eliminating/minimizing the consequences of disasters and complex emergencies.

Even before public health professionals began working in emergency operations centers (EOCs) or other equivalents of these operational centers or even heard of incident management systems (IMSs), they have developed, managed, and supported, and implemented efforts to respond to numerous emergencies involving infectious diseases such as influenza, typhus, cholera, smallpox, tuberculosis, and HIV/AIDS, as well as various environmental and technogenic hazards, including hurricanes, floods, and industrial chemical releases.

Likewise, the scope of emergency management, defined in international normative documents as “a management function designed to create conditions in which communities reduce vulnerability to hazards and cope with emergencies” (Federal Emergency Management Agency, 2007), has long been focused on a range of emergencies, including but not limited to public health events.

Crisis management and exchange of experience in the field of public health emergency management is based on communication and coordination of the community of professionals and scientific potential. In particular, public health and emergency management have also merged into professional associations in each area. For example, the International Association of Emergency Managers has organized several meetings to discuss the impact of a number of health-related emergencies.

Similarly, the U.S. National Emergency Management Association has partnered with the Association of State and Territorial Health Officials to form a joint policy working group. This association coordinates federal grant programs between emergency management agencies and health departments, and aligns training requirements across programs, among other activities.

The National Association of City and County Health Officials, the leading policy development and advocacy organization for local health departments in the United States, holds an annual conference on public health and healthcare preparedness, response and recovery.

Scientific support and dissemination of knowledge in these areas plays an important role in the development of systems and philosophy of public health emergency management. In this aspect, it is worth mentioning specialized peer-reviewed journals such as *Health Security* (formerly *Biosecurity and Bioterrorism: Biodefense Strategy, Practice and Science*) and *Disaster Medicine and Public Health Preparedness*, as well as programs at academic institutions such as the Emergency Preparedness and Response Research and Training Centers, formerly funded by the CDC.

A useful framework for understanding the relationship between public health and emergency management is the emergency management cycle, which is described in curricula, textbooks, and government sources using different models of emergency management. The most commonly used model in the world is the 4-stage model of the emergency response cycle, which includes forecasting and mitigation, preparedness, response and recovery. These phases are useful for describing the capabilities and activities of the emergency management system and are closely related to the 5 areas of activity and corresponding core capabilities of the Federal Emergency Management Agency's National Response Network (US Department of Homeland Security, 2008).

Prevention and mitigation focuses on reducing the loss from a hazard or hazard risk and controlling the expected damage; activities in this phase can be carried out before, during or after an emergency. “Mitigation” is a term that is occasionally used in the context of public health or emergency management in the field of public health. Examples of mitigation include

targeted vaccination of humans and animals, culling of animals, and other public health control measures, including food safety and sanitation measures, aimed at reducing the impact of an infectious disease outbreak or environmental exposure risks in an emergency setting (e.g., a shelter or other mass gathering place) (CDC, 2011).

Preparedness activities take place before an emergency occurs and focus on building or maintaining existing human resources, systems and infrastructure, as well as planning, training and exercises necessary to identify gaps and improve emergency response capabilities. Examples include the development, testing and evaluation of emergency response plans, alert and warning systems, emergency staffing procedures, as well as training and improvements to physical and information technology infrastructure, such as emergency operations centers, surveillance and reporting systems.

A response in the emergency management cycle occurs when a hazard is identified that threatens to overwhelm the day-to-day functions or capabilities of the system. In the public health context, emergency response activities can vary widely, but typically include the following:

- coordination of specific public health response functions between different organizations or partners;
- collection, integration and analysis of epidemiological, laboratory and other data;
- sharing information with partners;
- developing and circulating guidelines, emergency risk messages, and other recommendations for target audiences or risk groups;
- coordination of control measures, such as distribution and issuance of appropriate medical protective equipment.

Finally, the recovery phase occurs during and after the emergency response and encompasses efforts to return to or adapt to new conditions after the emergency has been resolved. In the context of public health, this may include efforts to transition from response-related activities to normal public health programs and functions in an orderly manner, capacity-building efforts to restore or strengthen health systems, or monitoring long-term effects such as mental or behavioral health problems in the affected population following a major public health emergency or disaster (Office of the Assistant Secretary for Preparedness and Response, 2016).

Standards are an important fundamental element of public health emergency management. They should be understood as codified and unified expectations for response practices, usually in the form of guidelines or requirements for functions, processes, resources, or performance in an organization or system (CDC, 2016).

The purpose of standards is multiple (ISO, 2012). In particular, they can contribute to the improvement of an organization or program by serving as the desired end result of a particular activity (e.g., being able to activate an emergency response within 60 minutes of being notified of an emergency).

Gaps in capacity or abilities can be assessed based on the standards and strategies put in place to address these gaps. Standards also serve an important accountability function; adherence to standards assures funders and governing bodies that organizations and programs are directing their efforts and activities in the desired or even required direction, or that their level of performance meets minimum acceptable requirements (CDC, 2014).

In this way, standards can also contribute to the credibility of an organization or program. In some disciplines and industries, adherence to standards may even be a sign of excellence or elite status. Another key benefit of standards is that they can be recognized and adopted by entire communities of practice, regardless of geography, type of organization, or individual experience. Finally, compliance with the standards can be verified through empirical

observation, often through second (i.e., client or sponsor) or third (independent, external) party verification, reducing the need to rely solely on self-assessment.

Currently, the field of public health emergency management is organized around several sets of standards and guidelines. Standards in the field of public health and health care are relatively new: most, if not all, have been published within the last 10 years.

Standards developed in the field of emergency management have a longer history, with roots in fire safety and building regulations and more recent developments in theory and practice related to the emergency management cycle, with a strong emphasis on planning, education, training, exercises and assessment.

There are numerous emergency management standards in the United States and around the world. These standards typically include some or all of the following functional areas:

- hazards and risks assessment,
- planning,
- prevention and mitigation,
- incident management,
- resource management,
- communications,
- operations,
- training, exercises,
- evaluation,
- corrective actions,
- continuous quality improvement.

In the United States of America, the Gold Standard for Emergency Management Standards is part of the Emergency Management Accreditation Program, a voluntary process to standardize, evaluate, and accredit emergency preparedness programs across the country. The Emergency Management Accreditation Program covers a number of elements and functions that are expected to be in an emergency management program, from administration and finance to communications and warning systems. In 2013, the CDC became the first civilian agency of the U.S. government to receive accreditation from the Emergency Management Accreditation Program in recognition of the fact that it meets all the required standards for its emergency management program (CDC, 2014).

Relevant standards include:

- 1) National Fire Protection Association Standards 1561 and 1600, which have long been adopted by first responders and professional associations as the primary standards for emergency management in the United States,
- 2) international standards, such as the International Organization for Standardization 22300 series, which cover topics such as operational continuity, incident response, organizational resilience, emergency management capability assessment, and training guidelines (ISO, 2012, NFPA, 2016, a,b).

The mention of these standards does not mean that they have been adopted uniformly or, in some cases, not at all within public health preparedness and response programs or in the emerging field of PHEM. PHEM as a field of practice has begun to emerge in areas where these standards overlap: hazard and risk identification; planning, teaching and training; use of IMS; and public information about emergencies.

Another fundamental component of PHEM is the Incident Management System (IMS).

The IMS is a scalable, flexible system for organizing emergency response functions and resources, characterized by such principles as standardized roles, modular organization, and unity of command.

It covers management by objectives at the overall response level, the IMS is essentially a modified command and control system. An effective IMS is based on the integration and coordination of personnel, systems, and infrastructure within a standardized organizational structure, typically managed from a national operations center, joint field office (headquarters in the national context), or similar agency.

In the United States, recipients of preparedness funding are required to develop an incident management structure that is consistent with the National Incident Management System.

The U.S. National Response Framework describes the key objectives of the IMS in the context of response, including:

- 1) development of a joint set of goals,
- 2) use of a collective strategic approach,
- 3) improving the flow of information and coordination,
- 4) creating a common understanding of shared priorities and constraints,
- 5) ensuring that the legal authority of any agency is not compromised or neglected,
- 6) optimizing the combined efforts of all participants within a joint plan.

Following the basic research in this area and adapting it, we consider that the main work of IMS in the context of the public health system includes:

- coordination between functional units or groups of experts within and across organizations;
- collecting, integrating and sharing information within the IMS, as well as with response partners and other stakeholders;
- developing and disseminating public information and messages about crisis and emergencies to target audiences and the general public;
- ensuring access to and deployment of resources, such as personnel and equipment, to the emergency area or the field (including management and logistics of emergency response personnel).

The IMS is also aimed at informing the government or interacting with elected officials and other political or high-level officials (e.g., to address multifaceted issues such as mandatory evacuation orders, quarantine of people, closure of schools or facilities, and travel restriction recommendations to avoid exposure to dangerous pathogens).

Internationally, public health emergency management is becoming an increasingly prominent element of global health initiatives. In 2005, the International Health Regulations were revised to provide Member States with a framework for better protecting their populations from public health threats and to emphasize the need for emergency preparedness and response to fulfill their obligations. Despite the fact that the International Health Regulations are a binding legal instrument for all World Health Organization member states, fulfilling their obligations remains a challenge.

The Global Health Security Agenda (GHSA), launched in 2014, expanded the International Health Regulations (2005) by strengthening national public health committees, among other PHEM elements.

In line with this initiative, CDC is conducting a Public Health Emergency Management Fellowship Program to train leaders and practitioners in the global public health community in PHEM concepts and principles.

There are challenges in determining how best to maximize limited public health infrastructure resources. In some cases, governments lack the political will to invest in emergency management systems and capacity in the area of public health, and finance or expertise is instead diverted to other health or economic priorities.

In some countries, civil conflict and instability, such as the full-scale military invasion of Ukraine by Russian aggressors against Ukraine's independence and people, have hampered the implementation of national strategies to improve public health.

A number of recent disease outbreaks around the world, including the COVID-19 pandemic, remind us of the importance of developing and maintaining capacity to effectively manage public health emergencies.

The future of public health emergency management is difficult to predict, but its development may partly depend on at least 2 factors. The first factor is related to the need for an evidenced-based approach. Well-established public health programs in areas such as epidemiological surveillance and prevention of infectious and chronic diseases depend on high-quality data and evidence of effectiveness.

The second factor relates to training and workforce development. Whether and to what extent PHEM will continue to develop as a practical field will depend on how its core principles and practices are transferred to the young professionals who fill the public health system and its response component.

A global priority for decades, especially since the early 2000s, has been the acute respiratory coronavirus syndrome (SARS-CoV), which has spread to many countries, causing around 8,000 cases and claiming more than 700 lives. In 2005, the International Health Regulations were revised to strengthen the capacity of countries to respond quickly and effectively to public health risks and health emergencies (IHR, 2005). One of the mechanisms to comply with the International Health Regulations is the establishment and/or strengthening of public health emergency operations centres (PHEOC).

PHEOC is a physical or virtual space designed to coordinate critical aspects of a public health emergency (WHO, 2015).

The EOC is typically activated in response to a public health emergency risk or event (both non-communicable and communicable diseases) and is integral to ensuring a coordinated response, especially when conventional public health services, systems and structures are overwhelmed (Bryant, 2018).

An incident management system is typically used within the operation of an EOC, which usually consists of 5 main functions: command, operations, logistics, planning, and administration/finance. These functions work together to perform tasks such as collecting and disseminating data, deploying resources (personnel, equipment and supplies), organizing/distributing funding, and communicating with other agencies and the public (Medical Surge Capacity and Capability Handbook, 2012).

Literature sources indicate that EOCs play a role in both the preparedness and response phases of public health emergencies.

In Ukraine, the processes of responding to public health emergencies are being intensively developed due to the implementation of the Law of Ukraine 'On the Public Health System' (2023) and the functional subsystem of ensuring sanitary and epidemiological well-being of the population of the Unified State System of Civil Protection (2022).

The available literature mentions the role of EOCs in the preparedness phase. In the preparedness phase, EOCs have been used to support tasks such as risk mapping, education and training, identification of emerging issues/observations, and development of plans. The role of the EOC in the response phase is described, including assisting in mobilizing financial and human resources, ensuring and monitoring technical and strategic coordination, generating situational awareness, providing advice and support, managing field activities, tracking, collecting and analyzing data, sharing information with partners and the public, and implementing response/operational plans.

The factors that influence the effective functioning of the EOC in responding to public health emergencies include the following.

- 1) Incident management system and coordination

Problems. The use of the Incident Management System (IMS) posed challenges to the work of the EOC. For example, during the MERS-CoV outbreak in South Korea, there was "a different level of understanding of the incident management system" that made it difficult for

the response to function properly. Several countries faced problems with IMS implementation during the 2014 Ebola response in West Africa.

The agency responsible for coordinating the IHR was also mentioned as a factor influencing the work of the EOC. For example, during the Ebola outbreak in Sierra Leone (2013-2016), different agencies coordinated the IMS throughout the response. This often led to tensions between local agencies and those from abroad. The IMS coordinator may not have sufficient authority to hold others accountable or to make decisions without challenge from other authorities, making it difficult to move decisions forward.

Supportive factors. The facilitating factors include an understanding of the importance of using an incident management system to ensure clear coordination and optimize the effectiveness of the response.

2) Plans, policies/procedures and legal authority

Problems. There are reports in the literature that there is no proper planning system for preparing for and responding to public health emergencies. In addition, during the Ebola response, the Nigerian national EOC did not have any formal authority.

Agreements within the teams working under the IMS were not well developed and coordinated, leading to problems with asset management, accountability, and difficulties in setting work limits.

Supportive factors. The literature describes the importance of having clear plans, policies and procedures in place for public health emergencies, as well as a legal mandate for the operation of the EOC, to ensure the smooth functioning of the response system. This includes a plan with clearly articulated criteria for activating rapid response teams (RRTs) and adapting the plan to the country's existing legal framework. It was also suggested to have a mandatory plan to create a solid basis for seeking additional funds, resources and support in the case of a public health emergency. Long-term planning for human, technical and financial resources, as well as planning for how the EOC will be used in the routine (day-to-day) mode, is also important, especially in terms of sustaining the EOC and RRT after the public health emergency response is over.

3) Partnership, communication and communication in the sphere of public health emergency management

Problems. Several studies have noted that communication within and outside the EOC has an impact on the effective functioning of the response system. For example, during the MERS-CoV outbreak in South Korea (2015), there was no system for sharing information about crisis situations, which led to a lack of communication between different levels of government and between agencies. The researchers also pointed to a lack of data sharing among stakeholders and within government departments, which made it difficult to determine situational awareness and implement appropriate responses. Information sharing between the U.S. Centers for Disease Control and Prevention (CDC) and the public was also problematic during the MERS-CoV outbreak in South Korea, as communications were inconsistent and non-transparent, causing public distrust.

Supportive factors. "At almost all levels, individuals and personal relationships have proven to be key to the functioning of the Centers for Disease Control." The importance of clear communication between the CDC and external agencies was discussed, including the sharing of tools, resources, and information between partners to ensure support, mutual accountability, political influence, and seamless collaboration. Having an official representative to interact and share information with regional and international organizations was important to improve interagency communication. Regular meetings with partners, including the development of a "cooperation agreement" to support innovative and joint responses, were cited as an important aspect of improved communication and cooperation. Having a responsible person in charge allowed for a clear communication mechanism to reduce conflicts on critical issues, such as when to communicate risk messages to the affected local community.

4) Information/data management

Problems. Many studies have found that data and information management within the EOC is challenging. The fragmented and complex nature of data flows, including surveillance data collected from different sources, makes timely outbreak detection and accurate situational analysis difficult. Several studies have highlighted the challenges associated with accessing up-to-date, comprehensive information detailing the availability and tracking of resources and assets. Another key obstacle to data coordination is the existence of different data collection guidelines and reporting formats across agencies, which makes it difficult for the EOC to collate this information in a timely manner.

Supportive factors. It has been established that having access to appropriate technology within the framework of the EOC activities improves the timely identification, collection and interpretation of data necessary for effective response to public health emergencies. It is important to introduce the most appropriate technology for collecting and managing information at an early stage, including the creation of a database with information on previous public health emergencies and lessons learned. This is an important part of preparing for a public health emergency.

The importance of having a national inventory system to ensure rapid mobilization and deployment of resources in health emergencies was noted. It is important to introduce innovations such as artificial intelligence-based information and communication technologies to explore the potential for enhanced surveillance and outbreak prediction.

5) Workforce and training

Problems. Many EOCs, especially in resource-poor settings, considered building and developing staff capacity a challenge. Constant staff turnover and the continuity of staff transferred from other departments often led to gaps in the implementation of tasks within the EOC and other health programs. The lack of professionals made it difficult to improve skills in the event of a public health emergency.

Supportive factors. Building and maintaining a competent workforce by recruiting, training, and retaining experienced and qualified staff ensures the successful operation of the EOC. The importance of training EOC staff in the “practical elements of working in the EOC”, including the principles of the incident management system, writing action plans, conflict management, communication and logistics management is undeniable. At the same time, staff training in the technical aspects of a public health emergency, such as epidemiology, including data analysis, interpretation and presentation, is also essential.

It is important to use previous experience in responding to public health emergencies to improve the effectiveness of response to new emergencies.

6) Physical infrastructure, location and resources

Problems. Several obstacles related to the physical layout and infrastructure within the EOC were found to impede its effective operation. These obstacles included inadequate or inappropriate office space for the EOC, lack of internet access, and lack of access to adequate communication equipment.

Supportive factors. Conversely, a good location and appropriate structure were found to facilitate the smooth operation of the EOC. The location of the EOC near or within the Ministry of Health facilities was found to be an important factor to facilitate work, especially for staff with dual roles.

It was found that using an “open plan” and providing space for interdisciplinary teams to meet and share information improves communication and coordination. In addition, it was suggested that the EOC should ideally be located away from potential hazards and have a backup power source (e.g., a generator) and hard copies of key documents to facilitate continuity of operations in the event of a natural disaster or power failure.

Finally, having a regular EOC that can be used during an outbreak and a non-outbreak period for routine tasks such as surveillance was suggested to help maintain the resources,

infrastructure, and staff needed to analyze and interpret incoming health information and facilitate a rapid transition to a response mode in the case of a public health emergency.

A review of the available literature highlights the role of national EOCs in responding to recent public health emergencies, and our paper shows the challenges and factors that affect the effective operation of EOCs in public health emergencies. Some of the obstacles faced by countries using EOCs to manage public health emergencies included inadequate information and data management systems, lack of infrastructure, and workforce capacity issues. These challenges are consistent with the existing public health challenges and broader health issues faced by countries, especially in resource-limited countries, which today include Ukraine in the context of russian aggression.

Understanding the incident management system, including the different functions of incident management, was also a barrier identified in this review. Strengthening incident management training in the preparedness phase of public health emergency management, as well as conducting training before and during public health emergencies, can help to address this issue.

Since the launch of the Global Health Security Program, CDC has prioritized supporting countries in emergency management training, including the implementation of public health emergency management fellowships.

WHO has also developed a number of online training courses through the OpenWHO transfer platform, including the Incident Management System (Level 1 and Level 2), Standard Operating Procedures for Emergencies, and the Ready 4 Response Exercise.

WHO has also provided specific guidance on training and exercises in the Public Health Emergency Planning Guide.

Assessing training needs and utilizing existing training platforms, such as those mentioned above, can help strengthen this area.

In addition to this review, it would also be valuable to explore the factors that influence the use and potential adaptation of traditional incident management functions in the EOC to optimize the effectiveness of the use of IMS in public health emergency response.

Public health emergency management included the implementation of an incident management system, strong government support and legal authority for the establishment of the EOC, qualified and trained personnel, and effective information management systems. These mechanisms are aligned with current best practices for the establishment and operation of EOCs.

For example, the WHO Framework for PHEOCs recommends that governments, ministries or agencies establish, maintain or advise PHEOCs at all levels (local, provincial/state and national) to ensure that the EOC is implemented:

- uses an incident management system;
- has a sufficient number of qualified personnel trained in the IMS;
- has adequate government support;
- has legal authority;
- has effective information management systems;
- has sufficient financial support;
- has sufficient infrastructure.

Importantly, having clear legal authority for the establishment and operation of an EOC and incorporating these legal regulations into response plans can provide a solid foundation for activating and gaining support for the use of EOCs. Authorities should be engaged in a dialogue to explain the purpose and importance of the EOC, which is a valuable step to support and prioritize funding and resources for the establishment of the structure. Recommendations on how to establish a regional office WHO Africa has recently developed a legislative framework for EOC to strengthen advocacy and capacity in this area. These suggestions can be applied to EOC at the local, subnational and national levels.

While this review identified barriers and factors that have influenced the effectiveness of EOCs, none of the included studies measured the impact of these factors on public health emergency outcomes.

Performance demonstrations of EOCs in public health emergency management are important to validate the current “best practice” of the guidelines, as well as to advocate for the use of EOCs at the national, subnational and local levels. Countries may consider including impact indicators to track implementation and evaluate the effectiveness of activities.

Key indicators focusing on critical timelines and actions and how they impact public health emergency response can be an important factor for countries to demonstrate the effectiveness of the EOC.

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ПРОБЛЕМИ ТА ПЕРСПЕКТИВИ УПРАВЛІННЯ НАДЗВИЧАЙНИМИ СИТУАЦІЯМИ У СФЕРІ ГРОМАДСЬКОГО ЗДОРОВ'Я ТА ДІЯЛЬНІСТЬ ОПЕРАТИВНИХ ЦЕНТРІВ З РЕАГУВАННЯ НА НАДЗВИЧАЙНІ СИТУАЦІЇ

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Резюме. Надзвичайні ситуації у сфері громадського здоров'я можуть мати руйнівні соціальні, економічні та медичні наслідки, включаючи втрату багатьох життів за короткий проміжок часу. У статті описано проблеми та перспективи управління надзвичайними ситуаціями у сфері громадського здоров'я та діяльність оперативних центрів з реагування на надзвичайні ситуації. Оглянуто ключові компоненти управління надзвичайними ситуаціями (НС) у сфері громадського здоров'я (ГЗ)(PHEM): - організаційні та програмні (тобто галузеві) стандарти, а також системи управління інцидентами (CUI/IMS). Спираючись на міжнародний та національний досвід проаналізовані позитивні сторони та недоліки функціонування оперативних центрів з реагування на НС (ОЦРНС/ЕОС) в системі громадського здоров'я.

Ключові слова: громадське здоров'я, надзвичайна ситуація, оперативні центри з реагування на надзвичайні ситуації, система управління інцидентами

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