



**World Health
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REGIONAL OFFICE FOR **Europe**



**ADOPTING
A PEOPLE-CENTRED APPROACH
TO IMPROVE THE PREHOSPITAL
CARE SYSTEM
IN EASTERN UKRAINE**



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ABSTRACT

WHO conducted a qualitative and quantitative survey of emergency medical services (EMS) across the Donetsk and Luhansk oblasts of eastern Ukraine in 2019. In a follow up to this survey, WHO conducted a descriptive analysis of selected data sets based on identified indicators and including a literature review of key documents drafted by the Ministry of Health in Ukraine. The follow-up study aims to offer evidence-based recommendations to improve the quality of prehospital care in eastern Ukraine. This report presents an overview of the study's results and recommendations, focusing on strengthening emergency medical care and adopting a people-centred approach. It demonstrates that the fundamental building blocks of prehospital care in Ukraine are present but require certain improvements, including ensuring the availability of appropriate medical supplies and medical equipment for EMS, strengthening governance and accountability, improving the coordination of services within and across the sector, creating a culture of safety and an enabling environment, and launching a computerized medical register.

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Acknowledgements

The authors of this report are: Omar Saleh, Trauma and Emergency Medicine Coordinator, WHO Country Office, Ukraine; Jonathan S. Berry, Chief Executive Officer, Fjelltopp Ltd, United Kingdom; Stanislav Gaievskiy, Study Coordinator, WHO Country Office, Ukraine; Jarno Habicht, WHO Country Representative, Ukraine; and Caroline Clarinval, Coordinator, WHO Health Emergencies Programme, Ukraine.

The authors would like to acknowledge the regional health authorities of Donetsk and Luhansk oblasts and the Ministry of Health for supporting WHO in the collection of data required to complete this report. Grateful thanks are extended to all health workers and patients who agreed to participate in the study. Thanks also to Tomek Sabala (Technical Director, Fjelltopp Ltd, United Kingdom), Anastasia Brylova (Health Service Delivery Officer, WHO Country Office, Ukraine), Olga Demeshko (National Professional Officer, Health Financing, WHO Country Office, Ukraine), Elina Dale (Advisor on Health Policy, WHO Country Office, Ukraine) and Vitalii Stetsyk (Technical Officer, Country Preparedness, WHO Country Office, Ukraine) for their helpful comments and suggestions to this report.



Acronyms

CBRN	chemical, biological, radiological and nuclear (materials)
CDS	computerized dispatch system
CI	confidence interval
CPD	continuous professional development
EMS	emergency medical services
GPS	global positioning system
ICU	intensive care units
NASEMSO	National Association of State EMS Officials of the United States
NHSU	National Health Service of Ukraine
PHC	primary health care
SDGs	(United Nations) Sustainable Development Goals
USPCEMDM	Ukrainian Scientific and Practical Centre for Emergency and Disaster Medicine



BACKGROUND AND INTRODUCTION



Background and introduction

When all 193 Member States of the United Nations agreed on the Sustainable Development Goals (SDGs) in New York, United States of America, in 2015, they set out an ambitious agenda for a safer, fairer and healthier world by 2030. Within SDG 3 (Ensure healthy lives and promote well-being for all at all ages), goal 3.8 calls for achieving universal health coverage, including access to quality essential health-care services, financial risk protection, and access to essential medicines and vaccines for all.

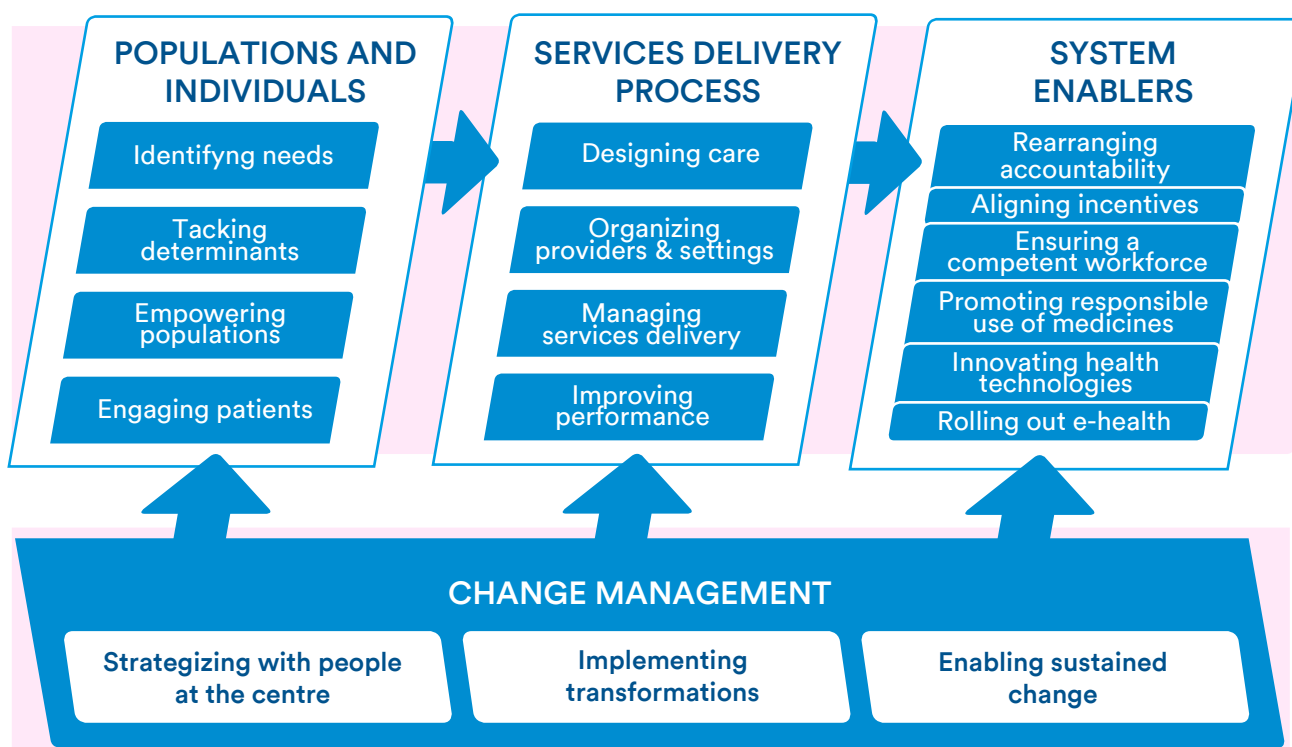
The WHO European Region adopted the vision of strengthening people-centred health systems set out in the European policy for health and well-being, Health 2020 (WHO Regional Office for Europe, 2012). Health 2020 strives to accelerate the achievement of maximum health and well-being gains for populations and individuals, reduce health inequalities, guarantee financial protection and ensure efficient use of societal resources, including through intersectoral and multisectoral actions consistent with whole-of-society and whole-of-government approaches.

The WHO policy framework identified four domains of intervention as priority areas for action, sequenced as shown in *Fig. 1*.

The four domains are described as follows (WHO Regional Office for Europe, 2016):

- populations and individuals – to identify health needs and work in partnership with populations and individuals as patients, family members, carers and members of communities, civil society and special interest groups, to support health-promoting behaviours, skills and resources in order to ensure that people have the potential to take control of their own health, while also working to tackle the determinants of health and improve health across the life-course without discrimination by sex, gender, ethnicity and religion;
- services delivery processes – to ensure that the processes of designing care are matched by organizing, managing and improving services accordingly in order to optimize the performance of health services delivery in alignment with the health needs of those populations and individuals it aims to serve;

Fig. 1. Overview of the European framework for action on integrated health services delivery



Source: WHO Regional Office for Europe (2016).

- system enablers – to align the contributions of other health system functions in order to support the conditions required for services delivery by arranging accountability mechanisms, aligning incentives, preparing a competent workforce, promoting the responsible use of medicines, innovating health technologies and rolling out e-health; and
- change management – to lead and manage the process of change strategically at the different stages of transforming health services delivery by setting a clear direction, developing and engaging partners and piloting innovations to ensure transformations are tailored to the needs of the population and rolled out and sustained over time.

Emergency medical services (EMS), a significant part of the prehospital care system, play a vital role in saving lives and decreasing morbidity. During the Seventy-second World Health Assembly, Member States agreed that, “a functional emergency care system is essential to universal health coverage, and investing in frontline care saves lives, increases impact and reduces costs in other parts of the health system” (WHO, 2019a). Many health interventions require early administration in order to save lives. Emergency care delivers these time-sensitive health interventions for acute illness and injury, incorporating care at the scene through to transport and on to early operative and critical care at hospitals where needed.

Aiming to develop a comprehensive strategy for EMS in the country, the Ministry of Health of Ukraine initiated policies to improve existing services (Ministry of Health, 2019a). The Ministry previously identified that “these changes will require recalibration of the educational, training, and practice patterns of all EMS personnel in the nation” (Ministry of Health, 2017a).

In collaboration with the Ministry, WHO conducted a survey of EMS and prehospital care in Ukraine to provide evidence-based recommendations. Based on the data sets collected during this survey, WHO performed a descriptive analysis of selected data sets

based on identified indicators and included a literature review of key documents drafted by the Ministry of Health to provide recommendations for building a more people-centred emergency care system.

Member States committed to five key strategies to promote a people-centred approach in health during the Sixty-ninth World Health Assembly in 2016 (WHO, 2016):

- engaging and empowering people and communities;
- strengthening governance and accountability;
- reorienting the model of care;
- coordinating services within and across services; and
- creating an enabling environment.

This study was tailored to address each of the five strategies.



Aim

The aim of the study was to provide evidence-based recommendations for the advancement of people-centred prehospital care in Ukraine.



Objectives

Using data from the WHO 2019 survey of EMS in the Luhansk and Donetsk oblasts, the study:

- adopted a people-centred approach to describe the capacity, use and efficiency of prehospital care across selected regions of Ukraine;
- considered how the use and outcomes of prehospital care in these regions could be improved;
- identified recommendations for improvement of prehospital care from local stakeholders, including EMS providers, hospital-care providers, administrative staff and patients; and
- drew together any findings and recommendations in a series of structured evidence-based strategies for the advancement of people-centred prehospital care in Ukraine.

Methodology

The data used in this study were collected as part of the 2019 WHO EMS survey. Due to the broad range of research questions addressed, multiple methodological approaches were used. In general terms, it was a cross-sectional study with retrospective elements.

Both qualitative and quantitative data were collected for the study through semi-structured and structured interviews respectively. Responses to the interviews were entered into electronic forms on tablet computers. Qualitative responses were given in Ukrainian and translated at a later stage, before being coded according to key themes. The objectives and methodology of the study were explained to interviewees in person prior to their participation in the study.

Luhansk and Donetsk are highlighted in this report due to the humanitarian challenges that arise from the current conflict situation in these oblasts. The interview teams visited all the large EMS establishments in Luhansk and Donetsk and interviewed a convenience sample of staff and patients. The adopted principle for sampling was to ensure the highest coverage, and confidence intervals (CIs) were calculated based on the numbers of respondents.

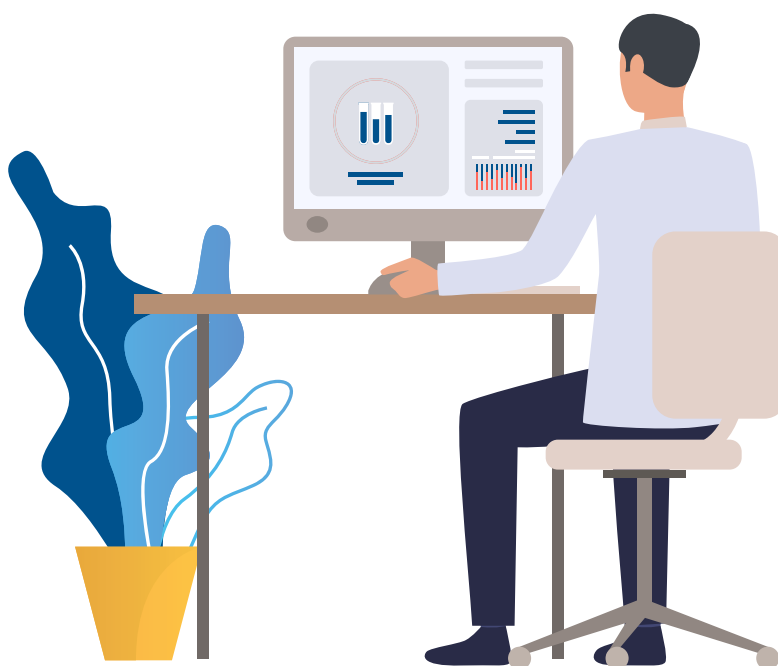
For further details, please refer to the publication *Quantitative and qualitative analysis of Ukraine's emergency medical services to assess current capacities and opportunities for future development* (WHO Regional Office for Europe, 2019).



Study limitations

This study is limited by:

- the composition of certain participant groups – for instance, there was only one EMS director per oblast;
- the selection of indicators used in the analysis – the analysis began with a set list of research questions;
- the geographic sample – some areas could not be surveyed due to the context;
- the convenience sample – participants from each establishment were not randomly selected;
- self-reported information – responses are subject to human error and bias;
- national registry data quality – registry data are not collected electronically and may be subject to human error and bias; and
- translation errors.



RESULTS AND DISCUSSION



Results and discussion



Engaging and empowering people and communities



Community engagement

In 2016, the Ministry of Health started working towards strengthening community engagement in response to emergencies by updating educational standards for basic and advanced first-aid providers (Ministry of Health, 2017b). The educational standards aim to improve the medical knowledge of community first responders, police and firefighters to support their responses to medical emergencies. The community response was further endorsed by the Ministry's proposal to pass the so-called Good Samaritan Law to improve protection of nonmedical responders, but it has not yet been approved by parliament (Parliament of Ukraine, 2018). These initiatives need to be supported by the development of national laws, training curricula and first-aid courses for first-aid responders.

The number of civil society organizations that provide first-aid responses and other types of community-care services has increased substantially in Ukraine in recent years. This is certainly a positive development, as community-based providers not only reduce costs, but also reduce mortality by 25–50% in some low-to-middle-income country contexts (WHO, 2019b). Strengthening community participation should therefore be further supported and scaled up in Ukraine. First-aid courses provided by the Ukrainian Red Cross are accredited by the International Centre of Excellence in First Aid (Paris, France).



Prevention programmes

The EMS study did not focus specifically on the availability of prevention programmes, but a report from the International Labour Office in 2018 highlighted the absence of reporting and monitoring systems and prevention programmes as one of the main reasons

for the high rate of occupational injuries in Ukraine (International Labour Office, 2018). Information-gathering and analysis of injury-related data, including injury-prevention policies, strategies and implemented activities, are needed to better understand the scale of the problem, not only for work-related injuries but also for other types. Injury-prevention campaigns conducted by state institutions and ministries and some international and nongovernmental organizations are acknowledged.



Strengthening governance and accountability



Leadership

Responsibility for overseeing the EMS lies with the Ministry of Health, which includes a group of experts in emergency medicine. Additionally, the Ministry hosts the Ukrainian Scientific-Practical Centre of Emergency Medical Care and Disaster Medicine (USPCEMDM), which serves as the leading EMS entity (Ministry of Health, 2009). USPCEMDM primarily is responsible for providing technical advice to the Ministry on EMS policies, developing EMS standards, collecting EMS statistics, measuring quality indicators and conducting research.

The EMS survey carried out by WHO identified systemic challenges regarding the USPCEMDM scope of work. These included delays in collecting and publishing yearly EMS statistics (in some cases by up to two years), absence of regular updates of EMS treatment protocols and standards, and scarcity of publications in international peer-reviewed scientific journals.

Considering the above systemic challenges, the following actions should be initiated or further developed:

- computerized data across all levels of EMS care should be collected continuously and analysed;
- EMS professionals should be able to access and contribute to fully integrated

patient-centred medical records (e-health);

- quality indicators that focus on outcomes should be measured;
- a participatory approach should be pursued throughout the emergency medical cycle, including when establishing policies, implementing programmes, and in monitoring and evaluation; and
- communities should systematically be involved in decision-making processes.

It is recommended that research is promoted across regions and countries to allow identification of best practices and innovations to ensure continuous improvement in EMS.



Local governance

Prehospital care in Ukraine is coordinated at oblast (subnational) level. This results in operational differences in prehospital care across regions. The Law on Emergency Medical Services adopted in 2012 assigned administrative and financial responsibilities for prehospital emergency care to EMS centres at regional level, moving from a fragmented district-based approach to a more coordinated regional approach (Parliament of Ukraine, 2013; Lekhan et al., 2015). This represents an initial step towards strengthening governance at oblast level.

Following the first phase of Ukraine's health finance reform, in which all primary care facilities were contracted by the National Health Service of Ukraine (NHSU), the second phase will start to contract specialized health-care facilities that meet the specified requirements, including EMS and acute care hospitals. It is envisioned that from April 2020, institutions at all health-care levels will move to NHSU funding (Parliament of Ukraine, 2017).

This will allow them to move from the outdated system of line-item budgeting to a more flexible pay-for-services model. Health managers will have more autonomy in finance allocation, which will promote better

governance at local level (WHO Regional Office for Europe & World Bank, 2019).

Decentralization of EMS is a key strategic move towards better governance and supports people-centred health services, but the overarching legislative framework should guarantee parity among services across the nation.

A critical aspect of effective and timely provision of EMS is coordination of the NHSU, local authorities and medical services providers, including EMS providers. EMS pathways should be revised carefully in accordance with the hospital district development plan and the NHSU contracting arrangements to guide EMS transportation decisions. It is important that updated information on which medical providers are contracted by the NHSU to provide, for instance, acute myocardial infarction, stroke and neonatology care and assistance to women in labour is shared with EMS centres and dispatcher units to enable effective ambulance management.



EMS dispatch system

Implementation of the 2012 Law on Emergency Medical Services required regional EMS centres to establish a single, centralized computerized dispatch system (CDS) rather than having multiple, independent, paper-based dispatch stations within one oblast (Parliament of Ukraine, 2013). This requirement aimed to allow better coordination and control of the EMS system at regional level. The Ministry reported that at the time of this publication, 23 regions across Ukraine had implemented some form of CDS. The WHO EMS survey indicated that Donetsk oblast has a computerized system for dispatching ambulances, but no such system exists in Luhansk, reinforcing the Ministry statement that not all EMS centres have installed CDSs.

Ukraine complies with WHO guidelines that state there should be a single, easy-to-remember number to access EMS (WHO, 2010), but according to EMS directors, this number is not attached to a global positioning

system (GPS) locator to help identify the location of callers at dispatch. GPS location of the caller is a publicly available technology that would be a significant enabler of more timely responses and greater access to Ukrainian EMS for the population.

To address some of these shortcomings, the Ministry has allocated additional funds for the installation and upgrade of CDSs in all regions that have not yet installed such a system, including in Luhansk (Ministry of Health, 2019b). Computerized systems help to reduce human error and improve the quality and monitoring of service data. Efforts by the Ministry to establish CDSs therefore should be supported to improve the quality of prehospital care and drive patient outcomes.



Data-informed decisions

The Ministry is collecting all data from the regional CDSs in a national data repository called Central 103 (Ministry of Health, 2018). This allows the current paper-based EMS reporting system to be updated to a computerized one. Central 103 will provide reliable information on the functioning of the national EMS system, which will enable improved service monitoring and planning at national and local levels. The EMS data can also provide relevant information to improve other areas of public health.

According to the Ministry, 17 regional EMS centres already are submitting real-time data to Central 103. This is certainly a step in the right direction towards making better informed decisions and improving overall planning of the EMS system. This initiative therefore needs to be supported and scaled up to cover all oblasts of Ukraine.



Resource allocation

The national registry reports 94 state-owned ambulances in Luhansk and 371 in Donetsk. This corresponds to 4.3 and 8.7 ambulances per 100 000 people respectively in each oblast. These ambulances are not only operational in emergencies, but also cover

primary health care (PHC), provide patient transportation, respond to people's mental health needs and deliver medicines. It is important to acknowledge that ambulances in Ukraine have a broader use than those in other countries, which needs to be factored into any comparison. In some countries, separate systems are set up to perform non-emergency tasks and therefore decrease the caseload on emergency response ambulances. Any reform aimed at improving emergency care needs to consider the reduction of the total number of calls directed to the EMS dispatch centre or, alternatively, the introduction of a triage system to eliminate non-emergency calls and enable more efficient utilization of limited resources and reorientation of non-emergency tasks.

One key indicator regarding EMS performance is the speed at which emergency vehicles can respond to incidents. Emergency vehicles should be distributed strategically at all times to ensure adequate coverage and rapid response (WHO, 2010). Data from the WHO EMS report demonstrated that both Donetsk and Luhansk regional EMS use only population density to calculate the required number of ambulance units and their distribution. This complies with national regulations that require one ambulance per 10 000 people (Ministry of Health, 2013), but more efficient computerized systems for ambulance allocation, based on actual demand, would contribute to optimizing distribution of limited EMS resources.



Reorienting the model of care



Reorientation of non-urgent calls

Ambulance staff, doctors and dispatchers highlighted a lack of community awareness of the EMS system mandate, including a lack of knowledge of when to call EMS and how to interact with EMS staff, and when to reach out to the PHC system. Participants interviewed in the WHO EMS survey recommended raising public awareness and improving PHC services. A national plan to increase public awareness about when and how to access the EMS system should be developed and implemented.

Slots for social advertising on TV, including mobile alerts and social media, could be used to educate the public. In addition, strengthening the PHC system is essential for reducing the burden on EMS by absorbing non-urgent cases.

One option would be to establish a hotline system for the public that assists people to identify whether summoning an ambulance is the right response to their medical concerns. The hotline would provide access to a trained call handler who would help the patient identify the issue and route them either to an ambulance call or an appointment at a PHC facility. An example of such a solution would be the NHS 111 service implemented in the United Kingdom (Pope et al., 2017).



Communication

Ambulances use mobile phones as their main means of communication. Most ambulance drivers reported that there was no backup system in place, so in situations where there was no mobile network coverage, they would resort to finding a nearby landline or borrow a mobile phone on a different network. This has a detrimental effect on EMS access and coverage. Only 3% of ambulance staff reported using the radio, and only over short distances.

Communication is critical in life-and-death situations; a durable and reliable two-way radio service should be introduced to ensure bidirectional real-time communication between all EMS actors. Improving communication among health-care actors will increase the efficiency and efficacy of health-service delivery.

EMS directors and drivers agreed that ambulances could communicate to the receiving facility, but this was only possible by phone. All interviewed doctors in hospitals confirmed they had access to an alert system to inform the department about incoming cases, but the alerts were communicated only after the arrival of the case at the hospital. A computerized system would enable timely information-sharing, including announcements

of incoming patients before their arrival at hospital, allowing hospital staff to be better prepared to provide life-saving interventions. It would also decrease the number of secondary referrals and improve patient care.

The EMS director for Luhansk reported that dispatch had real-time knowledge of the number of intensive care unit (ICU) beds available in hospitals, but Donetsk did not. Following further analysis, the findings showed that dispatchers in Luhansk had to call the hospital to request the required information. Transfer of information was neither systematized nor written up in a protocol. This demonstrates a lack of timely information-sharing and suggests suboptimal utilization of limited resources. Improvement of the health information system would facilitate the timely provision of information and enhance decision support to reduce errors and improve outcomes.



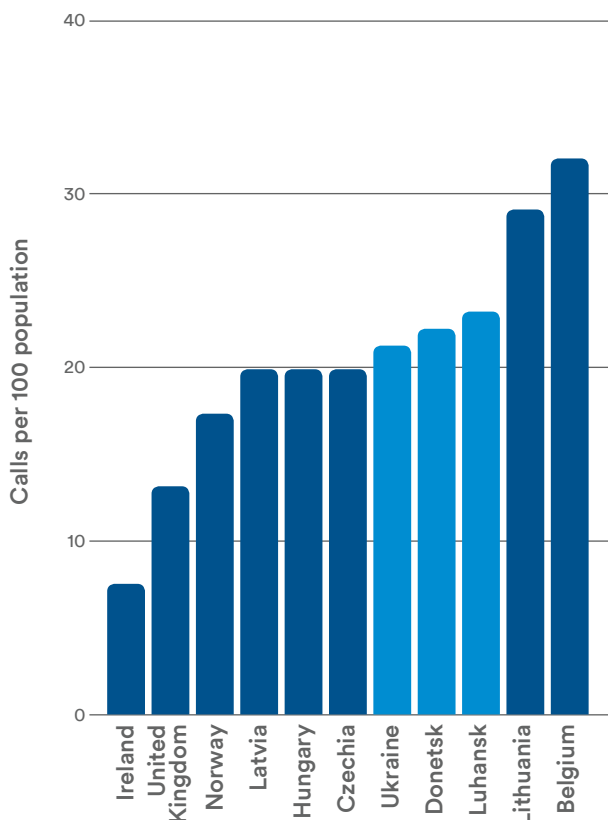
Dispatch call prioritization

Ukraine has a functioning legal framework for EMS. EMS, however, currently are undergoing reform. The legal framework includes treatment and ambulance triage protocols under the Ministry of Health (Ministry of Health, 2019c). All ambulance medical staff confirmed that they have access to these protocols, though only 51% found the protocols to be useful. This suggests that additional research is required to test the functionality of the current protocols and perceptions of their quality. All dispatchers reported that they had protocols for prehospital care and 75% felt the protocols were good. Their focus, though, was on treatment protocols: the survey data suggest a need to develop, endorse, implement and monitor a triage protocol at dispatch level.

According to official statistics extracted from the national registry, the total number of emergency calls received in 2017 by Luhansk was 151 533, and for Donetsk 451 855. The corresponding numbers of calls published by the Ministry of Health in 2017 were 157 514 for Luhansk and 419 830 for Donetsk (Ministry of

Health Medical Statistics Centre, 2017). This means there are differences of 4% and 8% respectively between the national registry and the published figures. The reasons for these differences are unclear, although human error could be included among the causes. A computerized system would help to improve the accuracy and traceability of these data. Fig. 2 compares the registry data with data from other European countries (Bos et al., 2015). The number of emergency calls received in Luhansk and Donetsk is comparable to other eastern European countries (Czechia, Hungary and Latvia) but larger than the number of calls received in Ireland, Norway and the United Kingdom.

Fig. 2. Ukraine registry data compared to data from other countries

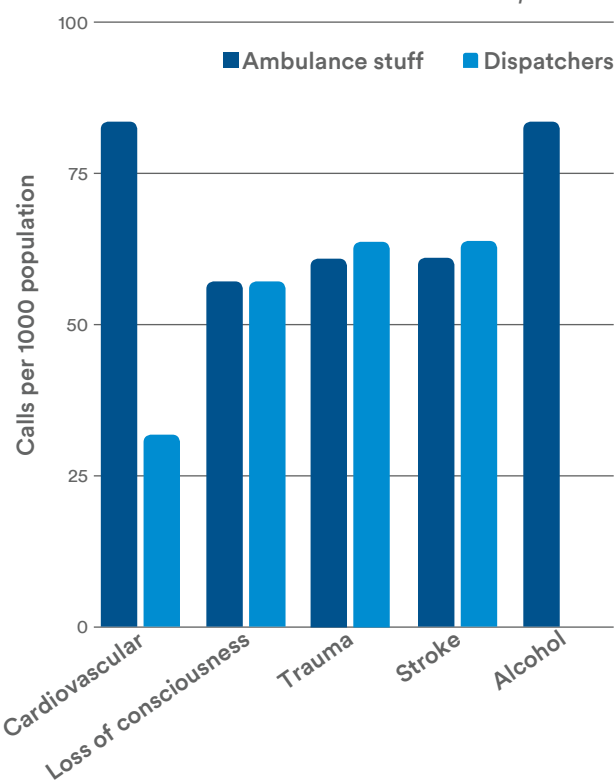


Source: Bos et al. (2015). Data for Ukraine for 2018 from: USPCEMDM (2018).

Distribution of the most common emergency cases reported to ambulance and dispatch staff is shown in Fig. 3. The most common emergency cases that ambulance staff observed on site were cardiovascular-related incidents, while for dispatchers, the most common cases recorded were loss of consciousness. Loss of consciousness is an

easily recognizable sign to the population and is a clear prompt to call the EMS. This could explain why dispatchers report this as the primary cause of the emergency, instead of gathering in-depth information. Upon arrival at the scene and after examination, trained medical staff may then attribute this sign to another category of medical emergency cases.

Fig. 3. Most common emergencies cited by ambulance staff and dispatchers



Ambulance and hospital staff agreed that they have access to triage protocols to help them prioritize cases when needed, but no clear dispatch-level triage protocol was found. This is likely to increase the number of non-urgent cases to which the EMS must respond. It is recommended that triage protocols are developed, endorsed, implemented and monitored at dispatch level. The triage protocol should include guidance on the use of ICU ambulances and seek to improve appropriate utilization of ambulances and referrals to PHC or acute care centres. An appropriate triage system is required at the dispatch centre. Further studies are required to analyse the predisposing and precipitating factors based on the existing pattern of diseases. Strategic procurement of selected medications to treat the most common cases is recommended.



Monitoring system

Based on the national registry, the average time of arrival of an ambulance to the scene in Luhansk was eight minutes and that in Donetsk 10 minutes. In the absence of an electronic registry, however, human error cannot be excluded. When patients were asked how long it took the ambulance to arrive after their call, the average (median) response time in both Luhansk and Donetsk was 15 minutes. Further research should use an electronic system to monitor response times and include other factors, such as the type of incident reported, the duration of the phone call and the number of other calls being handled during that time. Using average response time as the primary quality indicator of the EMS in the absence of a computerized system is unreliable. A computerized system is mandatory to improve the accuracy of the calculated average response time, allowing health authorities to better plan the dispatch of their fleet and medical teams. Consequently, the population will benefit from timely emergency health interventions.



Life-saving medicines and equipment

The WHO EMS survey states that ambulances are maintained upon demand and, in some cases, yearly. The vehicles are stored in the open air and in enclosed garages. Ambulances in Donetsk are checked daily; Luhansk does not have a transportation department and there appears to be no systematized mechanism to maintain the ambulances. The ambulance equipment in one oblast has not been updated in four years. When patients were asked how their experience could be improved during their transport in an ambulance, the most common suggestion was to improve the quality of the vehicles, including the temperature control. According to an oblast-level financial administrator, the maintenance of EMS ambulances is significantly underfunded. Establishing an ambulance fleet management body will reinforce governance and increase the resilience of the EMS, allowing it to meet the population's expectations.

The quality of prehospital care depends on multiple factors, including the availability of equipment, medication and well trained staff. Supplies of equipment and medications are typically replenished from the warehouse at the EMS station, where staff verify that the equipment is available and registered. The replenishment of supplies seems to occur mostly on an ad hoc basis during the shift. Ambulance staff seem generally to be satisfied with the availability of supplies in the ambulances, but in a separate survey question, four of 35 ambulance medical staff surveyed had reportedly bought equipment at personal expense to fulfil their work commitments, including items such as clothing, flashlights, intubation tubes and stethoscopes. Non-centralized, ad hoc purchases of medical devices and disposables by medical staff is not recommended, due in part to issues of compliance with quality assurance, storage and safe handling procedures. A robust supply system should be introduced, with appropriate financial resources allocated in a timely fashion to ensure that procurement complies with local rules and regulations. It is recommended that a computerized system be implemented to track the supply chain nationally and to monitor ambulance supply and equipment status before they run out of stock or face supplies dropping to critically low levels.

Official statistics state that ambulance teams receive daily replenishments of oxygen and aspirin. Ninety-one per cent of ambulance medical staff said they gave aspirin to patients over 35 with suspected cardiac chest pain, but only 80% of ambulance medical staff said they provided oxygen in respiratory arrest/distress; one participant even noted that some ambulances “do not provide for equipping with oxygen cylinders.” The availability of oxygen in basic and advanced ambulance units is recommended by WHO to ensure appropriate care for critically ill or injured people (Sasser et al., 2005). A reliable system for monitoring essential ambulance equipment therefore should be established, with all ambulance staff trained in its use.

When ambulance medical staff were asked about pre-shift routines, actions seemed to differ. Key components of their pre-shift routines reportedly include checking medicines (mentioned by 88% of the 34 staff questioned), equipment (also 88%), cars (79%), documents (70%) and uniforms (69%), with a few staff also saying that they report in the journal (6%) and check with the outpatient clinic (3%). For ambulance drivers, the pre-shift routine was less clear and included checking the technical condition of the ambulance (mentioned by 67% of the 13 staff surveyed), refilling with fuel (33%), checking medicines (33%), water (17%), battery (17%), oil (17%) and oxygen (8%) levels, medicines (8%) and taking an alcohol test (8%). It is recommended that clear guidance on the pre-shift routine (featuring items such as checklists) be included in the legislative framework for EMS, as currently there is a lack of standardization and governance. Appropriate pre-shift routines will allow EMS to be better prepared before being dispatched. This will also demonstrate professionalism and promote the delivery of appropriate care, which will have a positive effect on the population.



Coordinating services within and across sectors



112 Integrated response

In accordance with WHO guidelines (WHO, 2010), there is a national standard phone number to access EMS in Ukraine – 103. Currently, however, separate numbers are being used to access fire and police services. Ukraine was set to launch the common European emergency number (112) for access to all emergency services in 2012 (Parliament of Ukraine, 2015), but the number is not yet fully operational. Adopting the 112 model has the significant advantage of allowing the dispatcher to call for any type of support – ambulance, police or fire brigade – if and when needed. In the current situation, this is not possible; at best, the dispatcher can send an ambulance and inform the police and/or fire brigade, but does not have the authority to dispatch them to the site.

EMS directors reported daily contact between EMS and other services, but the outcome of these communications remains unclear and further research is required. Coordination among ambulance services, the police and the state emergency service is essential for EMS, both to better address the needs of people and communities and to ensure security for EMS staff if violence is anticipated.



Standardization of care

According to the Ministry of Health, the national EMS clinical guidelines have been updated for the first time in over five years (Ministry of Health, 2019c). The guidelines are based on recommendations from the Evidence-based Guideline Project, led by the National Association of State EMS Officials of the United States (NASEMSO, 2019). Technical protocols cover the following topics:

- universal care
- cardiovascular conditions
- general medical conditions
- resuscitation
- paediatric-specific conditions
- obstetrics and gynaecology
- respiratory conditions
- trauma
- toxins and environmental conditions.

Regional EMS services are required to use these guidelines in their practice and are allowed to adjust them based on local service needs. The guidelines were not well received by EMS teams as they created both legal and technical concerns. It is recommended that national guidelines be developed, utilizing a bottom-up approach based on good international practices, and encompassing basic and advanced life-support algorithms (such as the WHO–International Committee of the Red Cross basic and advanced emergency-care algorithms). More efforts should be undertaken to support the introduction and promote dissemination of the protocols. Using a participatory approach will ensure greater ownership among EMS staff. Involving and

training EMS staff is key insofar as they are closest to local populations and are aware of their needs.

Ninety-four per cent of ambulance medical staff and all of the dispatch staff surveyed believed that their colleagues adhered to the protocols. As part of the survey, the ambulance staff answered several technical questions exploring their knowledge and adherence to the standard treatment protocols. Their responses are shown in *Table 1*.

The results show that 80% of the staff did not feel able to intubate patients in prehospital settings. This might be due to a lack of knowledge and skills or equipment, or because they use alternative methods such as laryngeal masks. The use of treatment protocols is not monitored across EMS, meaning there is a lack of staff accountability, which in turn affects the quality of services and delivery of needed improvements in the transition of emergency care.

Table 1. Ambulance staff responses to technical questions

Procedure question	Yes (%)
Do you provide oxygen in respiratory arrest/distress?	80
Do you intubate in the prehospital setting?	20
Do you perform a 12-lead electrocardiogram in patients over 35 with suspected chest pain?	97
Do you give aspirin to patients over 35 with suspected chest pain?	91



Hospital care

The Government of Ukraine introduced hospital districts in 2016 to enable better planning in the existing networks of hospitals and to provide equal coverage of acute care services across the entire territory of Ukraine (Cabinet of Ministers of Ukraine, 2019). Hospital districts are defined as aggregates of health-care institutions and individual entrepreneurs that are legally registered, have a licence for medical practice and provide medical services to the population of the respective territory. Local authorities are to

revise public health facilities networks and make decisions on establishing, terminating, reorganizing or re-profiling health facilities, taking into account the 3–5-year hospital district development plans devised by oblast state administrations to be agreed with the Ministry of Health. Hospital district development plans include descriptions of patient pathways (Cabinet of Ministers of Ukraine, 2019).

This reform aimed to change the outdated, fragmented system of hospital distribution based on administrative rayons. Now, oblast health administrations support the Government in these efforts. The United States Agency for International Development (through its contractor Deloitte) conducted an analysis of multi-profile hospitals based on over 40 criteria for assessing the capability of the hospitals to provide intensive care, with one multi-profile children’s hospital per oblast selected for assessment. This resulted in over 200 hospitals being recommended for centralized investment (Cabinet of Ministers of Ukraine, 2019).

During the EMS survey, doctors (N = 15) who work in regional hospitals in Donetsk and Luhansk oblasts were asked, “Which hospitals are providing emergency care?” Opinion was divided, with 72% saying it was regional hospitals, 45% district hospitals and 36% general hospitals. The lack of consistent nomenclature across the hospital system was confirmed by ambulance staff, who reported frequent secondary referrals due to the inability of the first hospital to provide a full spectrum of acute care. This supports the above notion that the oblast-level health administration requires some assistance with planning and implementing the district hospital concept. Once the district-based health-service delivery network has been established, referral and counter-referral pathways will improve, streamlining care provided to the population.

The study also demonstrated that national requirements regulating emergency

department supply and staffing are outdated. Overall, the concept of the emergency department is not applied consistently. This statement was confirmed during interviews with hospital doctors, who believed that delay in the provision of emergency care mainly could be attributed to a lack of emergency departments. Ministry of Health efforts to improve the quality and accessibility of emergency hospital care at hospital level should be reinforced. The standards of care provided at district and regional hospital levels should be reviewed and a comprehensive package of services for all population groups needs to be developed in a participatory and transparent way, including emergency medical staff and elected representatives of the community. Community representatives should be consulted when hospital policies are being developed.



Training of the hospital team

Doctors reported that their establishments provided advanced trauma training (43%), basic trauma training (35%), training for mass casualty situations (28%) and other types of training (50%). The quality of the training, however, is yet to be evaluated, as only 53% of the doctors said they could perform endotracheal intubation in the admission department, and 80% specified that they did not perform a lactate test for multi-trauma patients. Such results cannot wholly be attributed to lack of equipment, as 73% reported having the required tools and equipment for their jobs. They do, however, indicate a need for the provision of state-of-the-art training, such as advanced trauma-care training for doctors who work in emergency departments. This would certainly have a positive impact on the quality of care and patient outcomes.



Hospitals' disaster preparedness

A well established triage system in a hospital allows treatment for the greatest number of patients according to the available resources. In the WHO EMS survey, only 69% of doctors stated that they applied the principles of triage in their hospitals. The triage system

in acute care hospitals therefore is not well established.

WHO states in recommendations for hospital preparedness tools that all hospitals must be able to initiate triage in cases of mass admission. This has proven to be a valid strategy for reducing mortality and morbidity among emergency patients. The readiness of acute care hospitals to withstand a disaster situation and provide appropriate care to a large number of patients should be further assessed.

According to the directors of health in Donetsk in Luhansk, response plans for chemical, biological, radiological and nuclear materials (CBRN) exist, but the effectiveness of the plans is unknown, and their functionality needs to be tested. Based on this information, it is suggested that a centrally led review of existing oblast CBRN plans should take place regularly. In addition, intersectoral partnerships should be encouraged and interagency training programmes and simulation exercises that include local communities should be promoted.



Creating an enabling environment



Professional development

The Ministry of Health introduced a new model of continuous professional development (CPD) for physicians practising in Ukraine in 2019 (Ministry of Health, 2019d). This also changed the way in which EMS physicians undergo recertification. The new model of CPD will count international courses, such as basic trauma life support, advanced trauma life support and mass casualty management, and encourage yearly recertification. This is set to promote the implementation of international standards of care and potentially lead to an improvement in patient outcomes.

Feldshers, of whom 47% are based in rural areas, are the backbone of EMS in Ukraine, as they account for more than 39% of the EMS workforce (Ministry of Health Medical Statistics Centre, 2017).

The CPD system for feldshers is not as well developed as that for doctors, however. The WHO EMS report stated that programmes for feldshers were mainly director-led at oblast level and lacked comprehensiveness and consistency. One oblast reported that training depended on requests from staff or in response to an analysis of EMS data that suggests a specific need for training. There is no professional body to set standards for professional certification in emergency medicine for feldshers, so a certification system for feldshers should be developed.

The survey illustrated heterogeneity in opportunities for accessing training across health-care professions. For instance, all drivers had received refresher training in the previous year, and all dispatchers had received refresher training in the last five years (30% of whom had received training in the last year). Ninety-seven per cent of ambulance medical staff had received refresher training in the last five years (45% having received it in the last year); just one member of the ambulance medical staff surveyed said they had not received any training for seven years. Continuous training programmes are essential

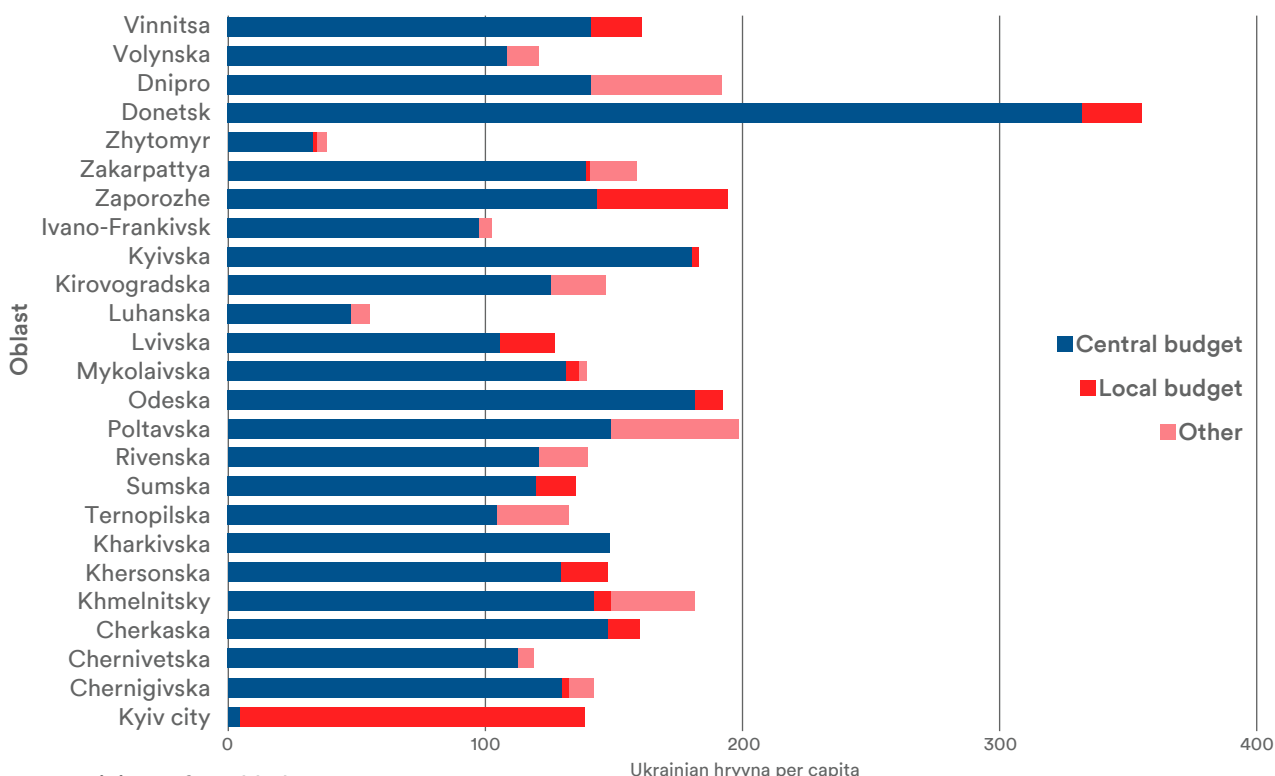
to ensure the quality of health-care services provided. Training should therefore empower staff to deliver efficient and effective health-care services to benefit the community.

Financing

Fig. 4 shows how EMS funding per capita for Luhansk and Donetsk is sourced. The EMS budget comes from the central Ministry of Health and is channelled through oblast health administrations, with potential top-ups from regional or local government. The EMS directors for Luhansk and Donetsk believed that the EMS in their oblasts were underfunded, a view backed by 73% (N = 15) of the surveyed financial administrators at establishment level.

The Ministry uses the number of urgent calls and number of requests as the primary indicators for determining extra funding from emergency regional services. According to the EMS directors and oblast-level financial administrators, other indicators, such as population density, number of facilities and analysis of the yearly budget, are also used to develop budgets.

Fig. 4. Breakdown of EMS funding sources per capita in 2018 from 24 oblasts



Source: Ministry of Health data.

Budgets are held at national, oblast and facility levels. Yearly audits, taxation reviews and an electronic accounting system are used to track finances across national EMS. Financial administrators at oblast and establishment levels agreed that financial tracking mechanisms are in place. Despite this, both oblasts believed they were significantly underfunded. It is important that within the new financial model, these mechanisms feed into budgeting and funding decisions at regional and national levels so decisions to underfund an aspect of EMS are clearly accountable.

Access to prehospital care is free by law in Ukraine. This was confirmed by the study, with the finance administrators and Ministry leadership agreeing unanimously that the service is free. Only two of the 523 surveyed patients reported paying something during the process of receiving EMS. It seems likely these payments were made at hospital level, where some staff members admitted extra payments were accepted to administer some services. From April 2020, the NHSU will contract a designated EMS centre to provide emergency care per region. This service will be covered fully by the state.

Staff safety

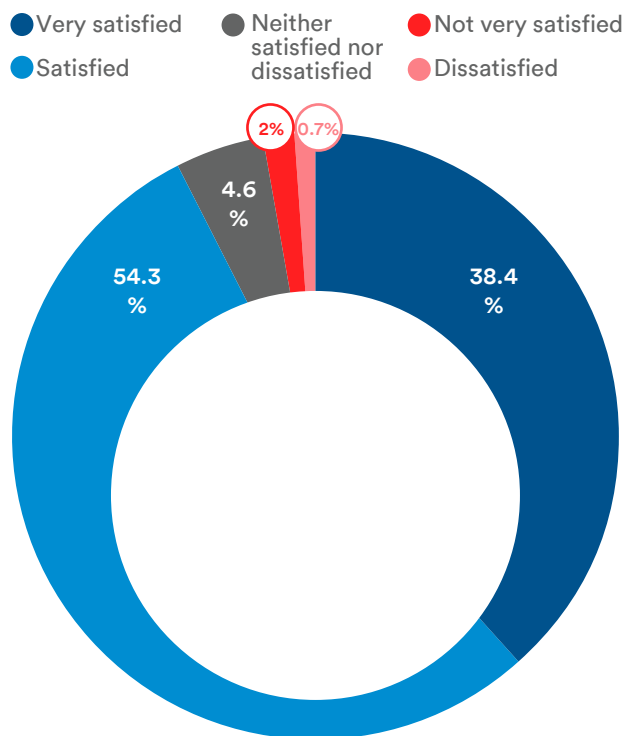
Forty-nine per cent of ambulance medical staff, 33% of drivers and 50% of dispatchers reported having been the victim of violence during their work. Only 25% of medical staff, 17% of drivers and 25% of dispatchers reported having a protocol (most likely at oblast or facility level) to protect themselves against violence. Of the staff who reported having such a protocol, most found it useful. It is therefore recommended that a national protocol and training course be developed to help staff understand how to address and/or avoid those who are violent. This should be integrated with other emergency services, such as the police force, to create team-based care.

Patient satisfaction

Ninety-three per cent of the interviewed patients (n = 523) were satisfied with their

experience of using EMS. This is essentially due to the commitment, engagement and motivation of EMS staff. The distribution of patient satisfaction can be seen in Fig. 5.

Fig. 5. Distribution of patient satisfaction



Patients particularly liked the services' professionalism and short arrival time. On a scale of 1–10, 90% of patients rated the politeness and professionalism of the dispatcher as 8 or higher. Patients suggested their prehospital experience could be improved by scaling up the fleet, and improving road conditions, staff salaries and equipment. A nationwide patient satisfaction survey is required to promote a people-centred health-care approach in Ukraine.

Worker satisfaction

A WHO report found that the average percentage of general health-care expenditures used for human resources globally is 42% (Hernandez et al., 2006). This is strikingly lower than the figure of 68% given by a financial administrator from Luhansk for spending on EMS human resources in the oblast. Despite this, 27% of the 59 prehospital care staff surveyed said they would change their job if they had the chance. All EMS ambulance staff surveyed

felt their salary was not satisfactory, and 92% of the dispatchers agreed. When asked what could improve their job satisfaction, 100% of dispatchers suggested a salary increase, ranging between US\$ 80 and US\$ 370. The majority of prehospital staff were satisfied with their working conditions and management, and most would not change their job if they had the opportunity to do so. Based on these results, a strong commitment among EMS staff can be inferred. Improving funding and payment modalities, including a performance-based system, would result in greater retention of the qualified health workforce.



Emergency medical care registry

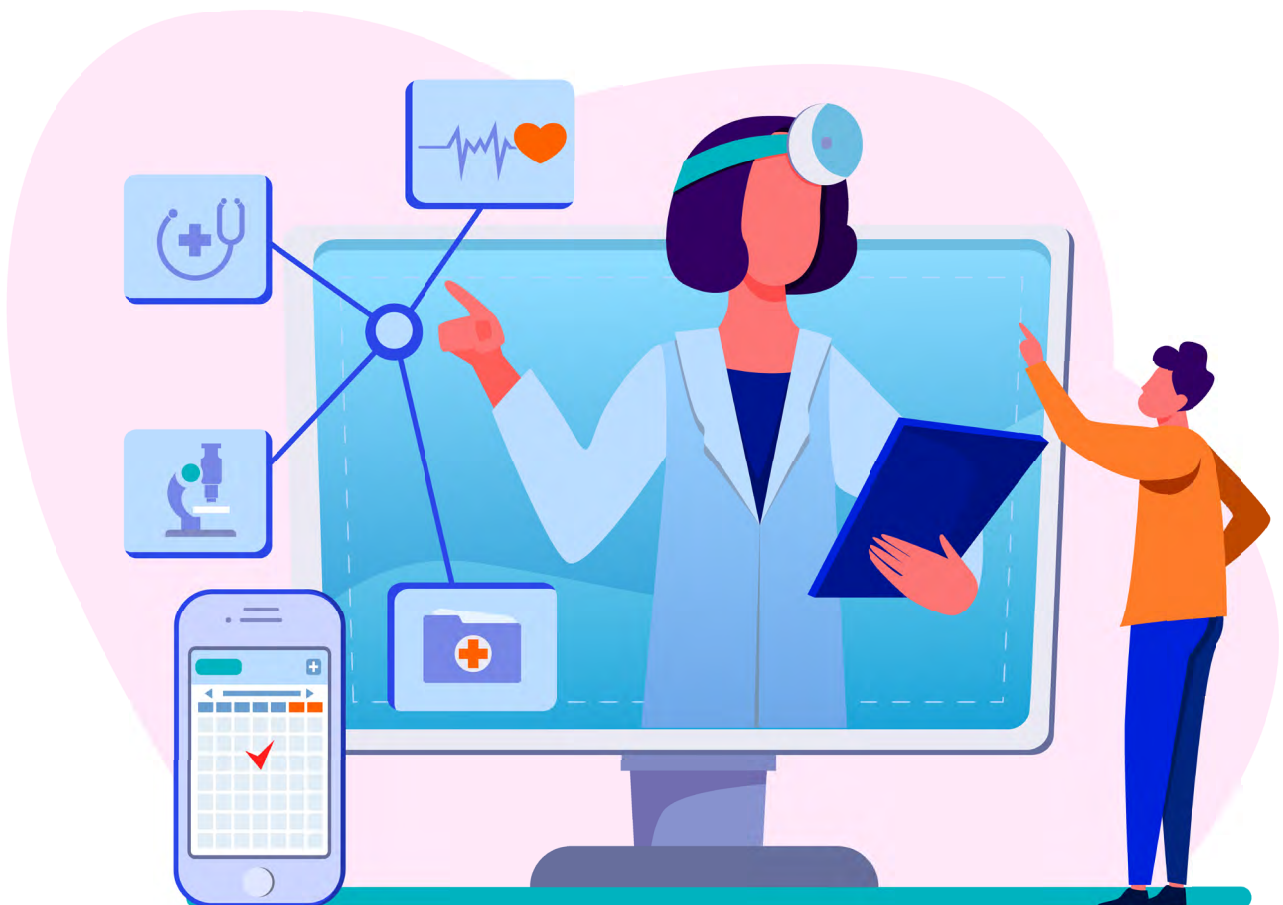
Patient outcomes should be evaluated to determine the effectiveness of the emergency care system and identify areas requiring continuous improvement. To achieve this, all stages of emergency care should be recorded

and interconnected to optimize patient care. This, however, requires computerized prehospital and hospital medical record systems across all levels. In the WHO EMS survey, over 50% of physicians working in hospitals reported having a paper-based internal registry. The Donetsk EMS director reported using a computerized dispatch, while Luhansk did not. It is unclear, however, whether patient medical records in Donetsk are also computerized.

Establishing a computerized interconnected registry between the prehospital and hospital care settings has a dual purpose. First, access to accurate patient information is facilitated. Secondly, it allows monitoring and evaluation of the efficiency and effectiveness of case management and follow up of patient outcomes for post-hospital care.



CONCLUSIONS AND RECOMMENDATIONS



Conclusions and recommendations

The fundamental building blocks of prehospital care in Ukraine are present but require improvements. Certain actions are recommended to strengthen emergency care in the Luhansk and Donetsk oblasts.

This report proposes three types of recommendations for action. First, some aspects of prehospital care, including the EMS system, are functioning, but they require continuous support. Secondly, other components of prehospital care are functioning partially and require significant support. Lastly, certain areas of prehospital care are non-existent and should be established.

For each type of intervention, a multisectoral approach involving all concerned actors, including health workers, local and national government, civil society, community representatives and international organizations, should be adopted.

Based on data obtained from the WHO EMS survey and the literature review, selected indicators are highlighted in this report. The proposed recommendations described below aim to promote a people-centred approach for the Ukrainian emergency care system, as adopted by the World Health Assembly in 2016. The recommendations are limited, however, to the indicators selected for this analysis. Further research is recommended to gain a wider understanding of the challenges and opportunities regarding the promotion and implementation of people-centred emergency care in Ukraine.

Member States committed to five key strategies to promote a people-centred approach to health during the World Health Assembly in 2016. The recommendations are tailored to address each of the five strategies.

Strategy 1. Engaging and empowering people and communities

Areas that need to be supported

- Current Ministry of Health efforts to provide basic and advanced first-aid training, health promoting programmes and recourses to a greater number of people around the contact line needs to be supported. This will help build a more resilient community that is able to respond to emergencies when they occur.

Areas that need to be improved

- To sustain a competent workforce, preparation of national training curricula and courses for community health workers and rescue, police and firefighter personnel should be standardized and rolled out.
- Existing civil society initiatives of community-care providers, particularly in the areas of emergency response and postoperative care of disabled and older patients, should be supported and new ones initiated. This will strengthen social participation in health and reduce the burden on EMS.

Areas that need to be developed

- Computerized collection and analysis of emergency care data, including current injury prevention programmes, should be developed at national level. This will allow a more thorough understanding of the burden of cases, provide the evidence required for the full cycle of a people-centred approach and improve the quality of emergency medical care.

Strategy 2. Strengthening governance and accountability

Areas that need to be supported

- The computerization of health-care services, including dispatch centres initiated by the Government, should be supported in both oblasts. This measure

is essential to monitoring the quality of services provided, adjusting service deliveries where required and establishing evidence for better governance across health facilities.

- Ministry of Health efforts to upgrade the structure of regional dispatch centres through implementation of a CDS should be supported, as currently such a system exists only in Donetsk oblast. The caller GPS locator capabilities, for instance, should be included in the CDS. Such measures allow increases in the efficiency of allocations of limited EMS resources.

Areas that need to be improved

- A national data repository (Central 103) that will connect all regional EMS dispatch centres, allowing syndromic surveillance, needs to be created to increase the efficiency of emergency medical care within its limited resources. Such a repository will provide data to other health sectors, including public health, and enhance preparedness.

Areas that need to be developed

- A computerized medical registry that connects prehospital, hospital and post-hospital records should be developed. EMS professionals should be able to access and contribute to a fully integrated patient-centred medical record (e-health).
- A set of national EMS quality indicators, including outcome indicators, should be developed and measured. It is recommended that this system should capture gender- and age-sensitive services. This will allow comparison among regions and internationally, and provide evidence to address shortcomings.

Strategy 3. Reorienting the model of care

Areas that need to be supported

- Community representatives should be consulted when health

policies are being developed at all levels.

- The Ministry of Health initiative to develop, implement and monitor a dispatch-level prioritization system should be supported. The system should be based on existing caseloads of communicable and noncommunicable diseases.
- The large number of non-urgent calls currently managed through the dispatch of an EMS ambulance can be reduced through increased public awareness campaigns educating the population on when to utilize EMS, the service package provided and how to access PHC services.
- Enhancing PHC services (within and outside walls) increases the opportunity for populations to access the health system through its first point of entry. Improving the quality of, and access to, PHC facilities allows populations to approach PHC instead of EMS. Strengthening PHC will decongest EMS and alleviate the burden of non-urgent case management.
- A computerized communications platform that integrates population registration with accountable health-care providers, including PHC, should be created. The platform should be linked with hospital databases that feed the national database to facilitate common workflows through the emergency medical care system. This will provide real-time situational awareness and support decision-making, which will reduce errors and improve outcomes.

Areas that need to be improved

- As an alternative to the currently unreliable (particularly around the line of contact) mobile-phone usage to manage any type of response, radio frequency channels and equipment that are suitable to provide voice communication between ambulances, dispatch centres, emergency departments and other health-related

agencies at community, regional and national levels should be set up. Providing reliable radio equipment across the EMS system and with key stakeholders would also facilitate a timely response in times of crisis when mobile networks break down.

- Standard operating procedures for ambulance maintenance, including equipment, should be updated and disseminated. A computerized logistics system should manage the fleet.
- Strategic procurement of life-saving medicines, medical supplies and medical equipment for ambulance teams should be improved.
- Pre-shift checklists for all prehospital care staff are essential to improve quality and ensure professionalism.

Areas that need to be developed

- Public awareness campaigns should include information about emergency medical care entry points, rehabilitation facilities and acute care hospitals, and should employ new communication means to increase the efficiency and efficacy of utilization of services by the population.
- A single national non-emergency medical consultation hotline should be established. This would reduce the number of non-urgent calls to EMS and provide better access to health advice to the population.
- A prehospital health coverage and utilization study needs to be developed, identifying and analysing access challenges and opportunities, and modalities of intervention.

Strategy 4. Coordinating services within and across sectors

Areas that need to be supported

- The initiative of the Government of Ukraine to introduce a single emergency number (such as 112) for all public

safety services, including police, fire and medical services, should be supported. This will improve intersectoral collaboration and coordination and facilitate the provision of comprehensive services to people and communities.

- Ministry of Health efforts to review, update and monitor the implementation of up-to-date prehospital care, including EMS treatment and triage protocols, should be supported.
- Preparedness and response plans, including simulation exercises to manage health crises among actors, will enhance case management for sick and injured people during disasters.
- The creation of a network of acute care hospitals with emergency departments universally available across the two oblasts should be supported. This will improve referral pathways and counter-referral systems and the provision of optimal care for emergency surgical and medical cases, contributing to improving patient outcomes.

Areas that need to be improved

- Coordination between the health and education sectors to align professional curricula and include all required skill training for emergency care staff, such as advanced trauma training, should be endorsed. Undertaking such training should be established as a prerequisite to working in an emergency department. This will lead to improvement in, and standardization of, emergency care provided to patients.

Areas that need to be developed

- Emergency medical care should be included in all policies to streamline and guarantee effective coordination of, and response from, all actors.
- A mechanism for assessing the emergency care system's capacity to respond to and withstand a major disaster should be developed. WHO tools, such as

the Hospital Safety Index, can be used as initial assessment tools.

- All EMS staff and their partners in public safety should receive comprehensive training. Active participation during the preparedness phase will facilitate team-based care when responding to disasters, including mass casualty incident management. Interagency training programmes and simulation exercises, including CBRN incidents and the management of mass casualties, should therefore be developed and rolled out.

Strategy 5. Creating an enabling environment

Areas that need to be supported

- Education materials and medical equipment should be updated, procured and made available.
- The Ministry of Health initiative to introduce a new CPD model should be supported and expanded to include all members of the EMS workforce. This will lead to an improvement in the quality of care and better perceptions of EMS professions.
- The development of a national training strategy based on continuous quality assurance will contribute to mitigating health workforce shortages.
- Accredited training facilities and instructors and standardized curricula, including independent examinations for emergency care personnel, should be supported. Promoting an integrated system of care will be facilitated, provided all key stakeholders are equally well trained.

Areas that need to be improved

- Continuous research to assess overall funding needs across emergency care services is required. This should take into consideration the overall reform of health finances in Ukraine while exploring different financing modalities.

- The current EMS system in Ukraine is free of charge by law, but further research is required to assess the magnitude of out-of-pocket payments and their impact on access to health services.
- Separate funding regulations are needed for all levels of medical care in the regions adjacent to the conflict zone, with additional reserve funding to enable readiness to provide services. To date, purchasing of emergency services is planned on the per capita principle. This may not be enough to ensure sufficient funding in the two regions to create the necessary changes in the patterns of EMS delivery, with the significant level of emigration the regions experience. Payments for emergency care may also need to include incentives to: reduce the time from call to emergency room for acute conditions; ensure appropriate transportation of patients according to defined clinical pathways; and define reference points for patients with strokes or heart attacks (cardiovascular conditions), maternal care, neonatal care and all other emergencies, infectious diseases, mental health, metabolic-related diseases and cancers. This may lead to the inclusion of results-based mechanisms for purchasing EMS, meaning payment regulations for emergency care may need to be revised.

Areas that need to be developed

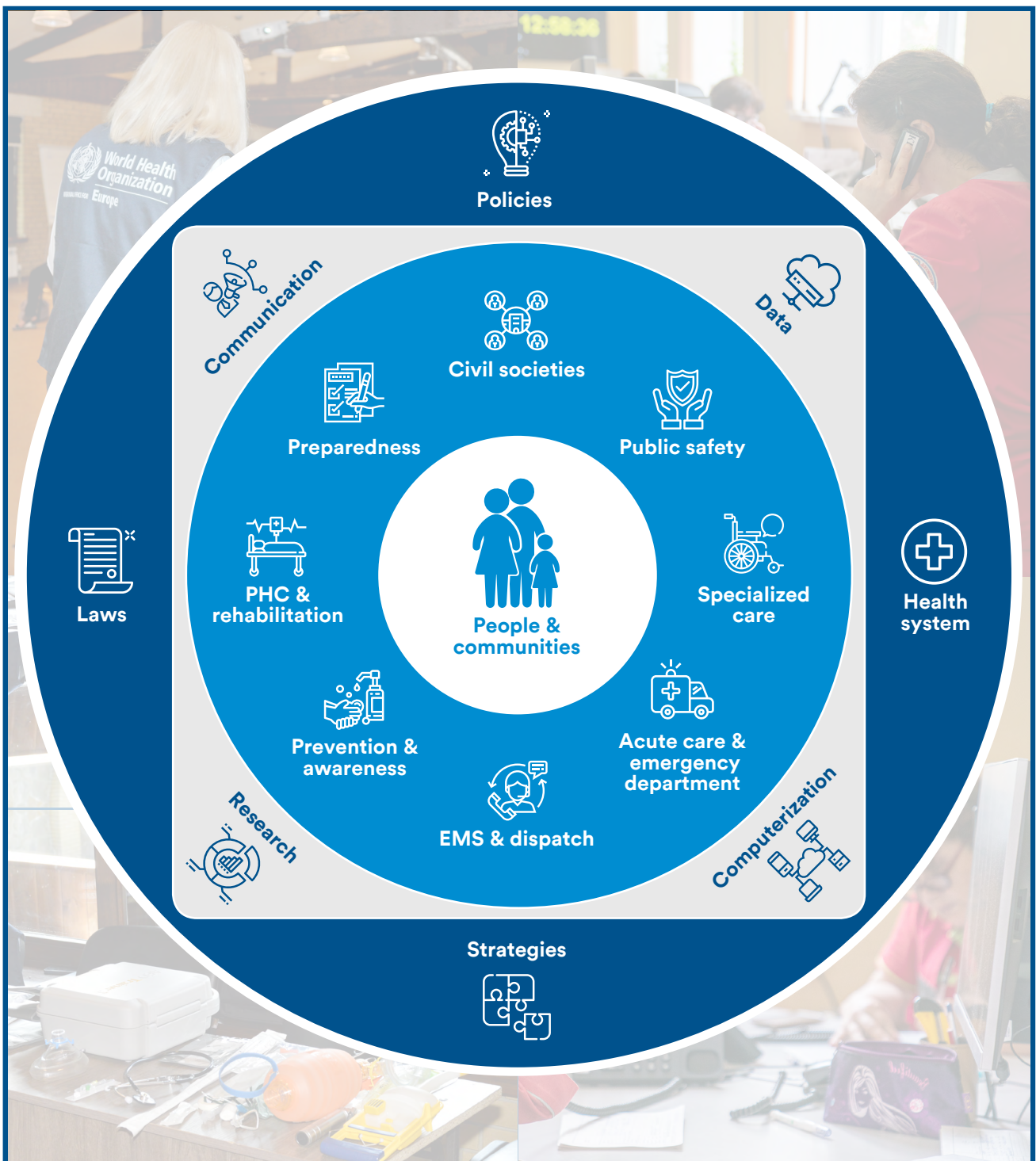
- Prehospital care, including EMS systems at local and national levels, should embrace the culture of safety for health workers. National laws, protocols and training courses should be developed to help staff understand how to address and/or avoid job-related violence and occupational hazards.
- An explicit system of regular nationwide patient satisfaction surveys should be developed, and the results should be reflected in policies. This will enhance community participation in policy evaluation and formulation.

- Performance-based indicators (including in hardship areas) should be included in contracts and defined in salaries. This will lead to better performance and accountability of staff.
- An integrated registry that collects data on diseases and injuries across all levels of the health system is needed. This registry will permit systematic analysis of

disease patterns, burdens and caseloads, especially for noncommunicable diseases. The findings will support continuous improvement of service delivery, promote the introduction of innovative approaches to care and improve patient outcomes.

Fig. 6 shows the interlinkage and integration of the people-centred approach to prehospital care.

Fig. 6. Interlinked components of people-centred approach to prehospital care



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The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.



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**World Health Organization
Regional Office for Europe**

WHO Country Office, Ukraine

58 Yaroslavska Street, 04071, Kyiv, Ukraine
Tel.: + 380 444285555 Fax: +380 444258828
Email: eurowhoukr@who.int
Website: www.euro.who.int