Якість, стандартизація, безпека, екологічність та ергономічність машин і технологій
Quality, standardization, safety, environmental and ergonomic properties of machines and techniques

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The organization of first aid in disasters: the world experience

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The article considers the world experience for first aid in disasters. Scientific and technological progress has not reduced the likelihood of emergencies, but has also increased their number due to man-made disasters, the threat of terrorism, climate change, those add to natural disasters and pandemics. Helping people to save and survive in such situations is a crucial task for the authorities and rescue services. The analysis shows that different countries use various ways to first aid, the division of responsibilities and the system of interaction between the response structures in disasters. Knowledge of these features can improve the system of first aid in Ukraine. An important result of this analysis is the awareness of the key role of establishing the interaction of various branches of the authority with rapid feedback. The experience of disaster management in the United States and Japan shows, in particular, small teams (not more than 5-7 people) to solve one task should be involved.

The Incident Command Systemmade up of an Incident Commander, a Deputy Commander (if a person puts in more than a 12-hour shift), a Media Liaison, and a Safety Officer. Under the Command Staff are the organizational areas of the Incident Command System. They consist of planning, logistics, operations, finance, and administration.For all type of disasters, the main points are the three T's, which are triage, treatment and transport. The problems faced by people living in Third World countries are in coping with disasters goes beyond the inadequacy of building regulations.The Cuban government is unique in that it has paid an equal amount of attention to the structural and physical aspects of disaster preparedness, but has also created a “culture of safety” through successful education and awareness campaigns. People in schools, universities and workplaces are continuously informed and trained to cope with natural hazards. They also have, every year, a two-day training session in risk reduction for hurricanes, complete with simulation exercises and concrete preparation actions.

This experience should be taken into account while developing specific first aid protocols in Ukraine. The lack of a clear procedure and a clear division of responsibilities according to the needs of emergencies are the main factors that reduce the effectiveness of the first aid system in Ukraine.

Keywords*: disasters, Incident Command System, triage – treatment - transport, disaster risk management, disaster medicine*

1. Introduction. It is crucially important to solve consequences of disasters fast and save people as many as possible. How is the organization on disaster management built in different countries?

2. Statement of the problem. As a rule people believe they are the main creatures and hosts on the earth. But we constantly face some disasters. For example, the tropical regions are subject to hurricanes. The Ring of Fire has earthquakes and possibly tsunamis. Severe weather is a risk for most places in the world, pandemics by definition are risk factor for everyone everywhere. Terrorism is a threat that effects almost everywhere certainly more so in some areas then others but really just above anywhere.

We should help mitigate it, we should plan, we should try to survive. But ultimately, if it is a disaster, if it is a terrorist attack. You are not going to have a lot of control over it and you can't change the facts of what's going on around you. So, we shouldn’t waste our time trying to, shouldn’t waste our time worrying about it this is not a time for paranoia. This is a time for preparation and attempting to lessen the effects. Lessen the bad effects of the disaster, be it man made or natural.

It involves all thepreparations we make to try to survive a disaster.It involves risk management. It means communication plans, security plans and issues and authority structures. Even within your

personal life there are certain authority structures and they'll affect how you're going to approach a disaster. Four steps is highlighted in disaster risk management as mitigation, response, recovery and then finally repeating mitigation.

3. The aims and tasks. The main aim of the work is to learn the experience of different countries on organization of first aid during disasters and apply it in Ukrainian reality.

It includes to learnfrom what happened and what we did that worked and what we did that didn't work. What we did to try to survive and what's going to work best the next time. We take what we learn and apply it to our preparations for the next disaster, to make them better, to try to better enable us to survive.

To mitigate or lessen the effects of the disaster we should:

1. Compare and contrast disaster resources and services among countries.

2. Identify resources and support systems available to victims on the personal, local, and national levels.

3. Develop emergency plans and protocols for communication, security, and other concerns.

4. Assess our risks, attitudes, and awareness in disaster situations.

4. Analysis of recent experiences and publications. In every disaster there are going to be authorities. There are going to be elected officials, emergency management officials, locally elected officials, locally appointed officials. They all have some degree of say in what's going to happen to you and what kind of response is going to be mounted to help you.

In the USA the Incident Command System is gathered in this case. It is the structure as the Command Structure, of what is happening around us. The system was developed in the 1970's and it was a response to some massive fires that were happening in California. So the Incident Command System was developed to organize and centralize the authority and the response structure. It has a central command structure, areas are organized around that with similar tasks and teams designed to be small and manageable, generally with one single task that they need to accomplish. And then they go back and get a new task.

This all starts with the Command Structure. It's made up of an Incident Commander, if necessary, a Deputy Commander, a Media Liaison, and a Safety Officer [1].

The Incident Commander is the person who's in charge of the disaster response. They're really the only essential part of the system. We always need an Ensign and Commander. This may be an elected official, this may be an appointed official. This might be a disaster or public safety professional. It is, in all circumstances, the person who has the authority to make the decisions.

New Orleans after Katrina, the person who had the authority to make the decisions was the mayor. In Mississippi, the Emergency Operations Center was not manned by the Governor of the state. The Governor was certainly involved, he was there to support. But it was the Incident Commander, it was the disaster response professional at the Emergency Operations Center that was in charge and made the decisions that needed to be made from moment to moment. He was given the authority by the Governor.In an ideal situation, it would be someone who has both the authority and the knowledge.

Next, the Incident Command System has the Deputy Commander. For most disasters, go on for a fairly long period of time. The Deputy Commander is someone who leaves the Incident Commander when they need to sleep. It is found that if a person puts in more than a 12-hour shift, they really begin to lose some of the ability to make good decisions. So we need to rest. The Deputy Commander takes over during the time when the Incident Commander is offshift. The Deputy Commanders might be in charge of smaller command sites out away from the main emergency operation center.

The Incident Command System has a Media Liaisons Officer. This is the official source of information for the media. He or she gets consistent, accurate information out to the public, out to the media sites. And this is really quite important. Under what circumstances people should seek medical treatment, where food and water is being distributed and any safety concerns in that area. So the Media Liaison Officer gets information out to the media.

Next, there is the Safety Officer in this System. In a disaster response, the most important concern is not to add to the disaster. We don't need any more victims. So the Safety Officer is the person that watches everything that's going on. The Safety Officer is the person, who prevents any more victims from being added to the toll from responders who foolishly go out and do things that they're just not supposed to do.The safety office is responsible for assuring all plans and actions are safe and are not going to unnecessarily responders in danger.

Under the Command Staff are the organizational areas of the Incident Command System. They consist of planning, logistics, operations, finance, and administration. Planning is responsible for coming up with the plans, the hows and wheres and whats of the response.

Logistics goes over what supplies are needed to carry out the plans. Transportation, supplies, resupplies getting people to and from where they need to go. It is about bandages,pharmaceuticals, chainsaws, tractor trailers refrigerator tractor trailers…Operations is the area that actually puts the teams together to carry out the plans and utilize the supplies from logistics.

Each team has a specific task. It will be a team that's going to triage. It will be a team that's going to treat. And it will be a team that's going to transport. Emergency medical services are going to be divided up just as it is described. Law enforcement might be providing security in the situation. They might also be investigating crimes and recording information. Fire and rescue and so on. Each of these teams are going to have specific tasks within their area and each of them are part of operations.

Finance and Administration are the people that track the time, the money, the man hours. They track the supplies, for reimbursement, the training, certifications, qualifications, and so on. And this is quite essential. They believethat teams are generally kept small, 5 to 7 people on a team. And a team only has one task. The whole system can be expanded and contracted as necessary.

So as individuals, families or groups affected by disaster or stuck in disaster or preparing for a disaster as it's coming down upon people, there is great wisdom in listening to the authorities.They do have the most knowledge concerning the scope of the disaster or potential disaster. They have the best judgment concerning the infrastructure and the survivability of that infrastructure.

A lot of disasters occur in the Ring of Fire, one of the most earthquake-prone regions in the world. Many countries believe the huge problem is inadequacy of building regulation.

New Zealand's building codes set a world standard in seismic building regulations and are incorporated into the building codes of several countries, including the Caribbean Uniform Building Code. Haiti, on the other hand, had no known building regulations. According to a report provided to the Global Task Force on Building Codes by a member of a disaster risk management team that visited Haiti prior to the earthquake in 2009, Haiti reportedly has some building regulations, but they were not focused on building safety and were rarely implemented [2].

The Philippines is one of the countries most vulnerable to earthquakes and studies have found that the country's school children are especially vulnerable due to substandard building construction. Tens of thousands of people could die, in Manila alone, from an earthquake of the magnitude that hit Haiti and New Zealand. The building industry is riddled with corruption, undermining the implementation of building industry safety standards and regulations. The urban poor, who are a significant proportion of the urban population, live in hovel-like structures that are assembled with flimsy pieces of cardboard, wood and discarded roofing materials, easily washed away by rains and typhoons. Typhoon Ondoy, which hit the country in October 2009, killing thousands of people and displacing tens of thousands, gives us a terrifying preview of what an earthquake could unleash [2].

But the problems faced by people living in Third World countries are in coping with disasters goes beyond the inadequacy of building regulations. The basic problem is poverty.

However, even a poor country can take effective measures to mitigate the loss of lives and injuries if there is political will in government to prioritise protecting the lives of its people. If New Zealand sets the world standard with its seismically safe buildings, then Cuba sets the world standard on how a poor country can save lives during disasters. And the Cuban example has been acknowledged and praised even by those not partial to the Cuban Revolution, such as the United Nations, which identifies Cuba as a case study in disaster risk management. Between 1996 and 2002, six major hurricanes hit Cuba, killing 16 people out of the total 665 deaths in the affected countries. Hurricane Charlie killed four people in Cuba and 30 people in Florida. When Hurricane Ivan threatened Cuba, the country evacuated 1.9 million people, 17% of the population, over 15 days. All shelters were staffed with nurses, and doctors were sent to the high-risk areas. Then-president Fidel Castro went to the highest-risk area to assist the effort. No one was seriously injured or killed as a result of the hurricane [2].

According to the International Secretariat for Disaster Reduction (ISDR), Cuba is an example that the vulnerability of people can effectively be reduced with low-cost measures and strong determination. "It is part of their development planning and their culture, which play a key role in saving lives and livelihoods… Leaders of countries around the world have at their disposal the knowledge needed to reduce risk and vulnerability to hazards. Even poor countries are not entirely without options to mitigate or prevent the consequences of hazards. What is often lacking are concrete programs of action and the political will to implement policies and measures."

The Cuban government is unique in that it has paid an equal amount of attention to the structural and physical aspects of disaster preparedness, but has also created a "culture of safety" through successful education and awareness campaigns. The ISDR points to education as one of the main reasons for the low level of hurricane mortality rate in Cuba compared to its neighbours. Disaster preparedness, prevention and response are part of the general education curriculum. People in schools, universities and workplaces are continuously informed and trained to cope with natural hazards. From their early age, all Cubans are taught how to behave as hurricanes approach the island. They also have, every year, a two-day training session in risk reduction for hurricanes, complete with simulation exercises and concrete preparation actions. The Cuban Red Cross, which provides teaching material, is reinforced by training courses and disaster drills for parents in the workplace, as well as by radio and television broadcasts.

There is an adequate road system in the country that facilitates speedy evacuation and building codes are enforced, which reduce the element of highly vulnerable substandard construction. Most importantly, the Cuban population is mobilised through a range of social, professional and political organisations in the country that provide structures that can quickly mobilise the entire population in disaster.

The experience on disaster preparedness in Japan is very interesting. Saving people is provided by Disaster Medical Assistance Teams (DMAT). Japanese DMAT is quite different from American DMAT. A team consists of five members. Since each team consists of a small number of people, it is different from American DMAT, in which a small scale hospital goes to the disaster site.

Each team includes physicians, nurses, pharmacists, and administrative staff for logistics.The purpose of Japanese DMAT is to provide medical care for the period of 48 to 72 hours, about three to four days after a disaster occurs. [3].

There are two purposes in the Japanese DMAT. One is to move the patients from the disaster area to outside. Since the medical resources are limited in the disaster area, it is difficult to provide the medical care for a lot of patients. Therefore, they try to move the patients to the outside of the disaster area as quickly as possible to save more patients. SDF, Self-Defense Force of Japan, is engaged in this logistical transportation.

Another purpose is to provide the medical care inside of the disaster area if there is not a hospital which can still function as a medical facility.

Also, medical emergency centers and hub hospitals in the disaster area are designed in each prefecture to support the controlling teams. The prefectural government plays a central role as an organization. On the medical side, relatively large hospitals fulfill the rule of disaster medical care by working as hub hospitals and the Health, Labor and Welfare Ministry supports the whole. Functioning as working groups, DMAT works for the first three to four days after disaster occurs. In Japan, firefighters and emergency rescue teams handle medical transportation in disaster areas where they support the DMAT. Also transporting patients for long distances such as from disaster areas to perimeter areas is done by the SDF, Self Defense Force.

As the experience of the Great East Japan Earthquake in 2011 showed, usual communication system might be destroyed. And they couldn't use the regular cell phones from certain areas. So they used satellite telephones between DMATs in each prefectoral government. Also, traffic information from police organizations, fire organizations and other DMAT teams were used.

Japanese DMAT got information more easily from other organizations because they had known each other through the training.Speaking about disaster training, the best way is to simulate actual patients and disaster sites in realistic time frames. However, in this kind of training there is a need for people and money. Therefore, Japanhas introduced different solutions aside from more actual training. Another solution involves theoretical training with some simulation. They have disaster training with Emargo training system using a manequinsim patient, which was developed in Sweden. Along with the syn patient, they do this training using a whiteboard [3].

5. Results and Discussion. For all type of disasters in different mentioned and unmentioned countries, the main points are the three T's, which are triage, treatment and transport. First what must be done, is attempt to save patients from the disaster site and provide triage to divide them into groups by degree of severity.

Therefore all the people must be gathered and grouped into mild, moderate, and severe levels. Triage does not involve treatment. EMTs, paramedics, whoever's doing the triage, will classify the victim and move on.

This is one of several triage systems for adults. It should take less than 60 seconds per victim. First, all who will be asked to stand up and walk to a specific spot. These are considered the walking wounded. They can follow orders, they can walk and they're classified as minor or green.

Second, the triage person will go to each victim who has not gotten up and moved to that spot. They'll see if they are breathing. If they are not breathing, they will open the airway. If they begin to breathe, they will be tagged as red, immediate. If they do not begin to breathe they will be tagged as black or deceased.

Third, the triage person will check how fast the victim is breathing. If over 30 breaths per minute, they will tag the victim as red. If it's less than 30, they will check perfusion, or blood flow.

Fourth, to check perfusion or blood flow, they will check if they have a radial pulse, and they will look at what we call capillary refall, refill. Capillary refill is how fast the fingernail, or similar part of the body, pinks back up after we gently squeeze it. It should be less than the three seconds. If there is no radial pulse, and the person can be alive and not have a radial pulse, or if the capillary refill is very slow, they are tagged as red.

Fifth, for mental status, they will ask the question, the person to do two things, such as squeeze their fingers and then let go. If they cannot follow two simple commands, they are tagged as red. If they can follow two simple commands, they have passed this stage as well as well as the others, and are tagged as yellow, or delayed.

The patients in red are the ones whose vitals are in changing and are in extreme need of urgent

care.They must be treated in 12 to 24 hours. These will be transported and treated first. The ones in yellow mean that they need some treatment but can wait a little longer, in 24 to 48 hours. The ones in green are in relatively mild condition, and are able to walk.The black ones are the ones that have no other chance of survival. For severe patients must be provided some treatment to them, so they can endure transport. Then they are transported to appropriate hospitals. In this way, regardless of whether disaster is big or small, during triage is the main task.

Upon doing the three Ts, triage, treatment, and transport, the important thing is to remember CSCA as a concept. C means to make sure you have a chain of command. S is safety. This includes rescuers' safety while saving patients, safety of sites, and safety of patients. Another C stands for communication. It is very important how rescuers communicate the chain of command and information. Finally, A stands for assessment at sites. It is very important to continue to improve the disaster manual, through disaster training, with a PDCA cycle. That is plan, do, check, act.

It should be realized that then after three to four days after a disaster, the chronic diseases or infections diseases would become more of a problem.

As we know, regular medical care is doing our best for each individual patient.However in disaster medicine, they have to save as many patients and injured people as possible, with very limited medical supplies. Itis very unusual for medical staff to have training for mass casualties, which is extremely different from regular medical care. However, the necessity of disaster training is emerging.

Interesting things in many countries is Good Samaritan laws. The "Good Samaritan Law" in the countries with the legal system of English Common Law protects those who deliver healthcare services in an emergency situation when the individual delivering the services is a volunteer, or the individual acts within his/her level of ability or within his/her scope of practice. It is a legal principle that prevents a rescuer who has voluntarily helped a victim in distress from being successfully sued for wrongdoing. Its purpose is to keep people from being reluctant to help a stranger in need for fear of legal repercussions should they make some mistake in treatment [4]. Ukraine doesn't use this legal principle.

Conclusion. Ukrainian legislation provides for participation in emergency response of rescue services, civil defense teams, fire and rescue services, voluntary teams [5].Emergency response managers are appointed, emergency response headquarters are formed; the need for civil defense forces is determined, but Ukrainian system differs that the approaches are not specified. The developed procedure for emergency medical care workers establishes a mechanism for decision-making only in general matters and alert [6]. The foreman of the first team to arrive on call must organize the logistics, triage and alert of the scale of the event. That is, a staffthat would be responsible for logistics and organizational moment is not provided.

Emergency plans and protocols for communication, security, and other concerns should be designed. It is very important to continue to improve the disaster manual, through disaster training.

Residents should assess therisks, attitudes, and awareness in disaster situations on the basic access to information about the real situation. Possibly the most important thing for the people in a disaster is to be aware and have that right attitude. Don't make the situation worse by becoming depressed, anxious, agitated, or angry. We really can't control this. Don't waste the energy worrying about it. Don't get anxious about it. Try to enjoy what you can enjoy. Don't get agitated or angry. It is just plain silly.

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Анотація

Організація першої допомоги в умовах надзвичайних ситуацій: світовий досвід

С.О. Ляшенко, А.М. Фесенко, В.М. Кісь, В.В. Юрченко

Стаття розглядає світовий досвід при організації надання першої допомоги в умовах надзвичайної ситуації. Науково-технічний прогрес не лише не зменшив імовірність виникнення надзвичайних ситуацій, а й лише збільшив їх кількість через виникнення техногенних катастроф, небезпеку тероризму, зміни клімату, що додаються до природних небезпек та пандемій. Допомогти людям врятуватися і вижити в таких ситуаціях – складна задача, що стоїть перед владою та рятувальними службами. Аналіз показує, що в різних країнах використовується різні підходи до надання першої допомоги, до розподілу обов'язків та системи взаємодії різних служб в умовах надзвичайних ситуацій. Знання цих особливостей здатне вдосконалити і систему надання першої допомоги в Україні. Важливим результатом проведеного аналізу є усвідомлення ключової ролівстановлення взаємодії різних гілок влади з швидким зворотним зв'язком. Досвід ліквідації катастроф у США та Японії, зокрема, передбачає формування невеликих команд (не більше 5-7 осіб) для вирішення якоїсь однієї певної задачі. Керівництво системою надання першої допомоги має складатися з керівника, його замісника (для можливості відпочинку при цілодобовому проведенні робіт), спеціалістів у галузі зв'язків з медіа, безпеки, служби логістики та фінансів. Трьома основними задачами надання першої медичної допомоги є сортування, стабілізація та транспортування постраждалих до найближчих обладнаних лікарень. У країнах з високою небезпекою природних катастроф важливими є профілактичні заходи в будівельній галузі, що допоможе попередити великі руйнування та спростити процедуру розчищення завалів. Куба, один з світових лідерів у галузі протидії природним катастрофам, основну увагу направляє на швидкодіючу систему евакуації населення, оповіщення та щорічні дводенні тренінги поведінки населення у надзвичайних ситуаціях. Цей досвід має бути врахований при розробці конкретних протоколів надання першої допомоги в Україні. Відсутність розробленого чіткого порядку дій та чіткого розподілу обов'язків відповідно до потреб надзвичайних ситуацій – основні фактори, що зменшують ефективність системи надання першої допомоги в Україні.

Ключові слова*: надзвичайна ситуація, система управління ліквідацією надзвичайної ситуації, сортування – стабілізація – транспортування, управління ризиками, медицина катастроф.*

Аннотация

Организация первой помощи в условиях чрезвычайных ситуаций: мировой опыт

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Статья рассматривает мировой опыт во время организации оказания первой помощи в условиях чрезвычайной ситуации. Научно-технический прогресс не только не уменьшил вероятность возникновения чрезвычайных ситуаций, но и увеличил их количество в результате возникновения техногенных катастроф, опасность терроризма, изменений климата, которые прибавляются к опасностям природным и пандемиям. Помочь людям спастись и выжить в таких ситуациях – сложная задача, которая возникает перед властями и спасательными службами. Анализ показывает, что в разных странах используются различные подходы к оказанию первой помощи, к распределению обязанностей и системе взаимодействия различных служб в условиях чрезвычайной ситуации. Понимание этих особенностей способно усовершенствовать и систему оказания первой помощи в Украине. Важным результатом проведенного анализа является осознание ключевой роли эффективного взаимодействия различных веток власти с быстрой обратной связью. Опыт ликвидации катастроф в США и Японии, в частности, предусматривает формирование небольших команд (не более 5-7 человек) для решения какой-то одной определенной задачи. Руководство системой оказания первой помощи должно состоять из руководителя, его заместителя (для возможности отдыха в условиях круглосуточного проведения работ), специалистов в области медиасвязей, безопасности, службы логистики и финансов. Три основные задачи оказания первой медицинской помощи – это сортировка, стабилизация и транспортирование пострадавших в ближайшие оборудованные больницы. В странах с высокой опасностью природных катастроф важнейшими считаются профилактические меры в строительной отрасли, что позволяет предупредить большие разрушения и упростить процедуру расчистки завалов. Куба, один из мировых лидеров в области противодействия природным катастрофам, основное внимание направляет на быстродействующую систему эвакуации населения, оповещение и двухдневные ежегодные тренинги для населения. Этот опыт следует учесть при разработке конкретных протоколов оказания первой помощи в Украине. Отсутствие разработанного четкого плана действий и четкого распределения обязанностей в соответствии с потребностями чрезвычайной ситуации – главные факторы, которые уменьшают эффективность системы оказания первой помощи в Украине.

Ключевые слова: *чрезвычайная ситуация, система управления ликвидацией чрезвычайной ситуацией, сортировка – стабилизация – транспортирование, управления рисками, медицина катастроф.*

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