

## **PARTICIPATION OF THE MILITARY SANITARY SERVICE AND BY DEFAULT, OF THE NATIONAL HEALTH SYSTEM, IN MULTI-DOMAIN OPERATIONS**

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**Abstract:** *Multi-domain operation is an US military advanced concept of approaching future military action, superior to joint operation, able to optimize the way the military force adapts to the specifics of new risks and threats to the security of states and alliances. The participation of the Military Sanitary Service and implicitly of the National Health System, as well as other military and civilian components, in multi-domain operations is important for maintaining the combat capacity of the staff and Forces, for caring for the sick and wounded, for coordinating medical countermeasures in operational situations, thus contributing to the success of the operation by minimizing health losses. The National Health System (NHS) includes all national, regional, local and individual entities that aim to maintain health, regain it and prevent disease in the entire population, including the Armed Forces of that state. The NHS includes state and private organizations, all of which work together and co-operate as needed to address local or national health crisis situations or engage in international aid (e.g. Red Cross). Moreover, the field of Human Medicine is integrated, through the new and realistic “One health” concept, with Veterinary Medicine, Animal Husbandry, Agronomy and Environmental Protection.*

**Keywords:** *multi-domain operation; joint operation; modern warfare; National Health System; Military Sanitary Service; civil-military cooperation.*

### **Introduction**

The new multi-domain operations (MDO) concept aims at preparing Armed Forces for the next conflicts wherein they need to operate in a rapidly changing future operating environment (FOE). Thus, there must be envisioned possible lessons learned from the multi-domain operations that will take place in the future (foreshadowed by the current military confrontation between Russia, which has all the means to initiate such operations, and Ukraine which has only forces for joint operations, with less naval capabilities but, being helped by NATO, has access to some means from this category of operations) it is necessary that the field of military scientific research be completed with medical-military scientific research that would benefit from this “situational experiment”. We must not neglect the fact that in the military everything is simulation, except war. In this context, also the sanitary services, medical facilities, personnel, units, and equipment to be used during these conflicts must be examined. This is the scope of our paper.

National Health System (NHS) is part of the national meta-system created to cover human needs in society, along with the education system, the military system, or the public pension system (Atanasiu 2021). In fact, health is one of the vital dimensions of security, along with the economy and education, as presented in the Romanian National Defence Strategy 2020-2024

Moreover, the sphere of relations of the NHS “includes all sectors of security: political (through public policies developed in the field of health), economic (by ensuring the good health of the working population), military (through the existing health subsystem in the Ministry of Defence), societal (through services provided to all individuals) and environmental (air pollution,

poor water quality, poor hygiene and hazardous chemicals affect the health of individuals).” (Atanasiu 2021)(56).

In any civilized country, including Romania, the NHS includes all national, regional, local and individual entities that aim to maintain health, and also to regain it and prevent disease in the entire population. This system includes state organizations (ministries, professional organizations, hospitals, health institutions, education and research in the field, pharmaceutical facilities, rescue stations, etc.), private organizations (professional organizations, hospitals, individual medical practices, pharmacies, pharmaceutical industry, paramedical offices, etc.), non-governmental organizations (Red Cross, Red Crescent, White-Yellow Cross, etc.). All such organizations shall collaborate and, where necessary, cooperate in resolving local or national health crisis situations or become involved at international level by providing assistance to other states or organizations, where necessary. Moreover, the domain of Human Medicine is integrated, through the new “One health”<sup>1</sup> concept, with Veterinary Medicine, Animal Husbandry, Agronomy and Environmental Protection.

The operational concept of the multi-domain operations is built on the premise that the joint force will not be able to assume uninterrupted superiority in any domain (land, sea, air, space and cyber) during future military operations (Fisher 2017). Thus, the multi-domain operation is an advanced concept of approaching military action, superior to the joint operation, able to optimize the way in which the military force must adapt to the specifics of new risks and threats to the security of states and alliances.

Regarding the possibilities of interconnecting the health system with future military operations in the Future Operating Environment, here are two different situations. Defensively, for the defence of the national territory or of an ally, one can collaborate and cooperate with the National Health System (of which the Military Sanitary Service is an integral part anyway) without restrictions, based on an integrative legislation. But in expeditionary operations, on the offensive in enemy territory, the medical support of the Host Country’s Health System cannot be fully relied upon, and this lack will have to be made up for by the remote support of own National or Allies’ Health Systems.

## **1. International security situation**

The international security environment is suffering from increasing volatility. This fact is evident at present in the vicinity of Romania through the unfolding of the open military conflict in Ukraine following its invasion by the Russian military forces. The character of volatility does not stop here, but also extends to the way in which international law is perceived and applied, in fact what the aggressor calls a “special military operation”, and the aggressed calls “war”. Although none of the states has legally filed a declaration of war, considering von Clausewitz's definition, “War is the continuation of politics by other means” (Clausewitz 1982)(67) and given the geopolitical context of the onset of aggression, there is a *de facto* war between two states. The volatility of the international security situation is reinforced by the historical conclusion drawn from the conduct of previous conflicts, according to which it is known how a war begins, but it is not known how it will end. Therefore, all the governments of the states of the world must be prudent in their reaction and the way of reporting to this conflict, especially those in the regional environment of the battlefield, as Romania is at present.

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<sup>1</sup> The concept refers to obtaining a collaborative, multisectoral and transdisciplinary approach – with expression at all levels, respectively local, regional, national and global – in order to achieve optimal results in health, recognizing the interconnection between humans, animals, plants and their common environment.

## 2. Possible types of warfare in the three classic combat environments

*Classical warfare* included battles on land, on water, and the air. *Modern warfare* can be waged through joint operations in the three domains: land, air and maritime, as in the two world wars and all that has followed so far, in which the three services are collaborating.

The current wars take place according to the US concept of “AirLand Battle”<sup>2</sup>, and their component units collaborate or cooperate within the Expeditionary Force. However, practical experience has shown that this hierarchical subordination is not effective in all cases. Since the last world war, but also in times closer to us, there have been situations of poor coordination of military actions, excessive number of casualties compared to military gains, error bombardment of some units (fratricide) etc.

However, the ways of waging war are changing. Thus, new weapons systems, new technologies, as well as the “Total War” requirements have emerged by involving civil authorities and even “innocent” local population in the conflict. The lessons learned on the battlefield show that at present the battles fought in the joint operations, as small independent wars or carried out simultaneously or concomitantly, within a strategic plan, are already obsolete. Meanwhile, other categories of forces have emerged, like: Special Forces, Missile-Nuclear Forces, Space Forces, etc., which complicate the combat situation, and the level of the concept of AirLand Battle no longer corresponds to reality, a fact confirmed on the battlefields from Iraq, Libya, Syria, Afghanistan, etc.

In 1991 and 2003, Iraq applied the strategy of joint operations land-heavy, using Soviet weapons and tactics, and was defeated. Although it is premature to draw conclusions, it seems that Russia is currently pursuing the same strategy as the armed battles that took place in the military operation in Ukraine, simultaneously in three directions of attack - in the north (Kyiv) in the east (Donbas) and in the south (Crimea and Azov Sea) - but without obvious success, despite its international superiority in terms of its military forces and means.

## 3. Multi-domain operations in the Future Operating Environment

The paradigm of future wars, conceived by the US Army, is that of the integrated use of all military forces and civilian agencies, as well as all technical and scientific means, in the focused effort to defeat the adversary. This paradigm is, in fact, another modern variant of total warfare, which targets the armed forces, population, fighting technique, economy and finances of the opponent and, intentionally or unintentionally, of the neutrals. In this regard, the speech of the former US President George Bush Jr., who reiterated Stalin’s phrase “whoever is not with us is against us”, appears as pertinent.

Currently, the strongest armed forces have specific capabilities for land, maritime, air, space, information, electromagnetic and cyber operations, so in total there are seven components (five domains and two environments) with a multitude of subdivisions and which also require civilian support for their proper functionality. Or, the coherent functioning of these subdivisions requests a human, technical, material and other complexity, which should be integrated correctly and quickly in the chain of command, control, communication, computers and information (C4I) of an armed force. So, collaboration is no longer enough, but there is also a need for cooperation of those structures that, although different, have a common goal or a single mission. In order to achieve this functional goal, as conceptualized by US Army specialists, there is the need to exist a unique, temporary constituted, adapted and appropriate command function for that multi-domain

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<sup>2</sup> Concept of the beginning of the 21st century, which involves the use of electronic weapons in operation and combat for all categories of forces, in the five environments of operations, as well as new concepts of conducting modern military actions.

operation (Cucinschi 2021) (140-151). But the command, although must be unique and hierarchical, based on logical and competent decisions (Tudorache 2021) (56-61)

The Defence Staffs of the military forces are task organised, including augmentation, according to the needs of the mission, and the human and technical forces are constituted in Task Forces of units and large units formed of pre-existing elements and equipped according to existing possibilities. This is what General Averescu did, *avant la lettre*, in the World War I, when he reorganized the Romanian Armed Forces and resumed the offensive.

Currently, the complexity of military capabilities requires different orders for battle (ORBATs) at a higher level, which should include or exclude additional means necessary for a Multi-Domain Operation's Task Force and, if necessary, immediately obtain inter-agencies support. This was always difficult to accomplish in practice. Military forces must include all participating arms and services, including the health service (with military doctors, paramedics, military pharmacists, military veterinarians, psychologists, etc.) to participate in the commander's decision process and to the organization of medical-pharmaceutical logistics.

Efficiency in multi-domain military operations is achieved with flexibility and creativity, but in the rigid context of the armed forces hierarchy. In fact, in the asymmetric conflicts, the guerrilla warfare and the partisan war were successful precisely because of the flexibility of tactics (hit-and-run) and the allocation of force, the principle being later taken over in the actions of the special forces.

We believe that it is also necessary to adapt the Allied concept of multi-domain operations to national specificity in order to successfully participate in the next war, which the current history and volatility of the security environment show us that the question is not whether but when it will happen.

#### **4. Bio-medical involvements**

War is won by imposing own will on the enemy, either morally by reducing its will to fight, or physically by human and material losses that nullify his combat power. For this, military equipment of all services are used: conventional (knives, firearms and explosives), unconventional (CBRNE, CIMIC, INFOOPS, PSYOPS) and modern (cosmic, informational, electromagnetic, cybernetic, etc.). All these types of weapons cause human and/or material losses of varying intensity, depending on the purpose and possibilities of the moment.

Overall, depending on the intensity of casualties, a minor war can be considered an epidemic of poly-trauma, and a major one a pandemic of poly-trauma. Depending on the situation, health damages can be various injuries in combat or out of it (accidents), acute or chronic diseases, infections, intoxications, irradiation, mental illness, etc., which in extreme cases can lead to the death of the affected military or civilians. By default, the war will lead directly or indirectly to total human losses (dead, wounded, shipwrecked, prisoners, missing), most of which will be of medical causes (recoverable or unrecoverable) that the health service must deal with. If the existing forces and means are insufficient for the implementation of medical countermeasures, other units, the higher echelon or the civil-military cooperation (CIMIC) element in the field of profile are used.

#### **5. Bio-medical effects and organizational countermeasures**

Attacks on the living force (humans and/or animals, or plants) will cause deaths, injuries, illness, famine, and social and economic disorganization, but the material means, including equipment, remain relatively functional. So the force preparing a multi-domain operation will attack properly, with appropriate medical countermeasures. As a result of this type of live force

attack, the opposing party will suffer massive losses and its sanitary service must be strengthened, both on the front line and in the depth of the military dispositive.

In principle, the group should have a medical trained soldier, a trained shooter equipped with a sanitary bag, the platoon has a medical graduate with a medical kit, the company has a sanitary non-commissioned officer, the battalion has a general practitioner and a medical team, the regiment has a medical formation (infirmary, medical shelter) with a military chief of staff plus a general practitioner and a dentist, the brigade has a field hospital, and the division has another field hospital and a healthcare company to transport the wounded and sick both ways, from the field to hospital.

In the event of multi-domain operations, in our opinion, ROL 1, 2 and 3 field hospitals will have to be prepared, as well as to have specialized means for evacuation (land, air or naval) in stages and destinations, as appropriate. Field hospitals that are basically designed as surgical hospitals (for the wounded) will need to be able to be quickly transformed into hospitals of other specialties, as appropriate: internal medicine, infectious diseases, particularly dangerous infectious diseases, intoxications, burnt, irradiation, ophthalmology, psychiatry, etc. The Medical Directorate will have to be prepared at least one such hospital, as a model of organization and endowment in case of need, with staff in covering the respective specialties (military or civilian hospitals). In extreme cases, hospitalization wards, hospital bases and inland hospitals may be re-established to treat and recover the wounded and sick from their own forces, but also allies or enemies (as prisoners). Otherwise, it would be, by absurd, to re-establish the Ottoman Army's patriarchal units, which after the battle killed all wounded personnel so that they would no longer suffer.

Lack of specialist doctors can cause serious problems with functionality. For example, at the deployment of the Romanian Campaign Hospital no. 100 in the 1991 Gulf War in Saudi Arabia, no toxicologist was available, as the Iraqi army had chemical weapons and the toxicologist was replaced by a civilian-trained chemist. Each field hospital needs two anaesthetists, but there are also civilian hospitals that have only one and when the person goes on leave or is ill, they no longer operate in that medical establishment. As an emergency formula, it has been proposed to classify dentists as anaesthetists, because they currently perform dental anaesthesia (!?). As an example, the nuclear submarines of the great powers, in case of surgical emergency, have an operating room, where the general practitioner of the ship operates "first hand", the non-commissioned officer "second hand" and the chief engineer of the ship is "anaesthetist" because he supervises the medical monitors (!?). The situation seems ridiculous and in real cases could become dramatic, but in medicine no patient should remain untreated, no matter what the situation, who is or what forces and means we have.

If all the medical countermeasures in the Theatre of Operations are adequate and timely, the medical losses are minimal. But here also counts how the plan of the joint or multi-domain operation is conceived, in order to avoid the possible unnecessary over-mortality, both in defence and in offense. The hospitalized wounded and sick must be recovered for combat (fit combatant), or at least for work (unfit combatant or unfit for military service), and if not possible for life (unfit military service with evidence or war invalidity).

## **6. Military epidemiology**

In multi-domain operations, more than in any other combat action, there will be an "epidemic of poly-trauma" exacerbated "in waves" in accordance with their own and the enemy's combat actions, with the specifics of diseases through the weapon systems used: conventional, unconventional, modern or combined. Depending on the operational management of the multi-domain operation, the human losses, implicitly also the sanitary ones, will be more important or reduced.

Combat actions will cause, directly or indirectly, a large number of traumas, infectious diseases, intoxications, irradiation, associated lesions, combined lesions, which in extreme cases can be in epidemic form to own forces, to the forces of the opponent, to neutrals and/or in the civilian population, possibly also epizootic in domestic and/or wild animals. Characteristic of any epidemic is the epidemiological chain, with the three main links:

a) **The source**, which may be natural, namely the sick person or animal (case zero) from which the contagious pathogen spreads, or artificial (weapon/CBRNE agent or other, genetic weapons) from which the chemical, biological or radioactive cloud leaves;

b) **The route of transmission** may be natural, through sick or contaminated people or animals, contaminated environment (soil, water, air, food, water, objects), or artificial with aerosols, living vectors for biological agents, contaminated objects (food, water, objects including letters, parcels);

c) The receptor, namely **the receptive population**, may be composed of humans and/or animals (or plants) that do not have physical, chemical or biological protection against the pathogen.

Of **the total population** in the area, some are exposed to the nuisance or attack and, in the absence of physical protection (gas mask, CBRN protection equipment, fixed or mobile shelter with filter ventilation, makeshift shelter, or makeshift means of protection, as appropriate), many will be **contaminated** or damaged by biological, chemical or radiological agents.

It is very important to determine, quickly and accurately, if there was a CBRN attack and what kind of attack, which area is affected, with which vectors the harmful agent was transmitted, the number of exposed and to estimate the number of contaminants. Exposed and contaminated people/animals and plants will be immediately subjected to total, partial, sanitary decontamination treatment (as appropriate) in cooperation with CBRN units. In the case of civilians, the decontamination action will be carried out through the Inspectorates for Emergency Situations (which have Civil Protection units, Fire-fighters and Mobile Emergency Service for Resuscitation and Extrication – SMURD), and its own staff and patients in health units, through the care of the Anti-Epidemic Laboratory (if it has the strength and means).

The environmental samples are analysed by the CBRN fixed or mobile protection laboratory, and the samples from contaminated, sick, deceased, animals, drinking water, food and sanitary-pharmaceutical materials are analysed by the Preventive Medicine Laboratory. For biological agents of war or bioterrorism, the evidence identified in the field or in health facilities must be confirmed at the Microbiological Expertise Laboratory of the National Institute for Medical-Military Research-Development “Cantacuzino”, as there will be international legal implications.

It can be assumed that in total the losses will be higher than in the classic operations and the classic medical facilities (provided in the regulations) involved in the medical chain will not be able to cope with the peak needs. A new approach will probably be needed, with the strengthening of advanced medical facilities, with predominantly direct evacuation to destinations (with short-circuiting “evacuation stages”) to civilian and military hospital facilities inside, behind the front or even internationally. For this, it will be necessary to coordinate the Sanitary Services of the force categories and CIMIC through an integrated Sanitary Directorate, temporary during the operation. This structure, currently non-existent, should include at least one military physician from each force category as well as specialists for surgery, internal medicine, para-clinic, operational medicine, preventive medicine, dentist, veterinarian, pharmacist, medical lawyer, medical logistics, and medical-military scientific research.

## 7. Side effects of combat actions

Combat actions in the multi-domain operation can also have side effects on the civilian population in the area or even outside the area of operations. Some examples: the accidental bombing of a village in Belarus during the fighting in Ukraine (2022), a village in Bulgaria during the bombing in Yugoslavia (1999) or the bombing of the prison in Ploiesti (1944), to refer only to incidents in European theatres of operations.

The side effects are also manifested in the veterinary, zoo-technical, phyto-sanitary and agricultural fields. By reducing the source of food of animal and/or plant origin, economic losses and even famines occur, and contaminated beings will later become so-called “natural sources of disease”. Examples include the invasion of Colorado beetles in Romania (which attacks potato crops) or the “depleted” uranium from anti-tank piercing projectiles in Yugoslavia and Italy, which passes as a toxic substance in plants consumed by animals and humans.

Even hospitals or other health facilities, protected or unprotected by specific insignia, have been attacked by tactical error or with intent, which in international law applicable during military conflicts constitute war crimes. Sometimes the health objectives can be used by the belligerents to deceive the enemy, which is a “trick” and is not accepted as a legal method of war. But as French say: “*a la guerre comme a la guerre*” (in war is as in war), but international justice does not seem to have a predilection to punish the winners, but sometimes the losers, only.

The environment can be biologically, chemically and/or radioactively contaminated for a long time, and land decontamination measures involve significant forces and means, so high costs, which no one is willing to finance, so the former war zone is left to decontaminate naturally over time.

Obviously, if there is a component of geophysical warfare (precipitation, floods, drought, earthquakes, landslides, tsunamis, etc.), there will be other side effects that affect the entire population of the area, not just the troops of opposing forces.

## 8. Possible medical countermeasures in multi-domain operation

### *General medical prophylaxis countermeasures (pre-exposure):*

- training of doctors and, in particular, military doctors to know the effects of weapons and CBRN agents;
- establishing an adequate concept of medical intervention within the multi-domain operation;
- staffing of units and major staffs with specialists in the medical field with medical-military training;
- writing appropriate manuals, instructions and regulations;
- health instruction of the staff involved for first aid and pre-exposure, intra-exposure and post-exposure prophylaxis;
- endowment with sanitary-pharmaceutical equipment and materials of the medical teams participating in the multi-domain operation;
- establishing the sanitary logistics, on variants, and of the sanitary-pharmaceutical supply and re-supply chain;
- the existence of reserve sanitary-pharmaceutical forces, means and stocks on the national territory;
- specific training of medical staff before leaving for the mission;
- vaccination, revaccination and/or administration of prophylactic drugs to staff in risk groups (health personnel, CBRN defence, scouts, staff, etc.);
- any other necessary measures depending on the situation.

***Specific prophylactic medical countermeasures (post-exposure):***

- active supervision of the staff, directly and through the medical staff from the subunits;
- permanent contact with commanders on a professional line;
- information from any source;
- collection of biological samples, primary processing and identification and assumption diagnosis for referral to the identification laboratory (laboratory diagnosis);
- estimating the exposed, contaminated and sick population for the application of post-exposure prophylaxis therapy (antibiotics, antidotes, etc.);
- medical supervision, isolation, quarantine or hospitalization of suspects and patients;
- specific diagnosis and treatment, outpatient or in field facilities or in hospitals;
- adequate evacuation of seriously ill patients, by destination;
- medical supervision of those healed for complete recovery;
- writing reports for knowledge of medical statistics and specific diseases;
- medical-military scientific research and dissemination of lessons learned, separately on the secret and non-secret chain.

Obviously, depending on the specific situation and the stage of exposure, other medical countermeasures can be taken, depending on the needs and possibilities.

The medical countermeasures applied in joint operations are provided in the specific regulations, but as regards MDOs there is also the need of medical and non-medical countermeasures applied for the prevention, limitation and recovery after cosmic, electromagnetic and/or cybernetic actions. As an example, medical and paramedical facilities must be protected, including from cyberattacks, which can disrupt their activity and cooperation between medical structures and microstructures.

## **9. Non-medical countermeasures in multi-domain operation**

Due to the diversity and high volume of specific risks and injuries, the strengths and means of the pharmaceutical industry, including health logistics, may not be sufficient at some point. In this situation, an integrated action will be needed to support the health service with political, military, social, economic, legislative, coercive, etc. means. Therefore, collaboration and cooperation are key elements in the success of this type of action.

While the collaboration must be designed at national or international level and executed in a complex, multilateral, multidisciplinary manner, as the case may be, the cooperation is reflected in the joint action in the field of all existing forces and means, according to a pre-established algorithm and adapted to the existing situation and integration with the other forces involved: logistics, CBRN defence, special forces, transport, etc., both military and civilian.

The optimal functioning of the medical provision stages (pre-exposure, intra-exposure, post-exposure) implies the organization and reorganization of the military and civil service, the complementarities of the state National Health System (departmental and non-departmental) with the private one and NGOs. Also, the principle of civil-military cooperation (CIMIC) must ensure their integration (difficult to achieve in practice, see competition for SMURD), with integration and functional separation, according to the situation and the scheduling (prioritization) of activities.

In our opinion, the human resource must be expanded according to the concrete needs, with specialized and non-specialized forces, reservists and volunteers mobilized and incorporated during the critical period. In parallel, specific means must be provided: material and financial resources, stocks, sources of supply and replenishment, etc. including for health, which has been shown to be vital not only for conducting multi-domain operations, but also for public health in peacetime. Moreover, all these extensions of forces and means, reallocations and re-subordinations must comply with specific regulations (procedures, legislation, regulations, etc.),



which are flexible enough and which are exercised in time to be adaptable and effective in various possible situation.

## Conclusions

For Romania, the multi-domain operations exceed the national strategic level. They can be carried out within the Alliance, respectively NATO or in a multinational coalition, only. Participation in this type of operation also involves risks for national forces through human and material losses, respectively health losses.

The Military Health Service has an important role to play in reducing loss of life, maintaining physiological fighting capacity, monitoring health, and also in the prevention, diagnosis and treatment of the sick and wounded, and in recovering the military strength and expertise of individual fitness aptitudes.

Therefore, the participation of the Military Health Service, and implicitly of the National Health System, as well as other military and civilian components, in multi-domain operations is important for maintaining the fighting capacity of the staff, for caring for the sick and wounded, for coordinating medical countermeasures in operational situations. It contributes to the success of the operation by minimizing health losses and ensuring a minimum of psychological comfort to the military involved, thus, to create favourable conditions for the human factor.

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