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THE COMPLICATIONS OF EMERGENCY MANAGEMENT IN THE SYRIAN CIVIL WAR

ABSTRACT: Naturally, emergency management structures are adapted for the major current health problems in the country. Before the conflict the four major health risks in Syria were dietary risks, high blood pressure, a high body mass index and smoking. Consequently, the two major health problems used to be ischaemic heart diseases and strokes before the outbreak of the war. However, the sudden change from normality to a conflict setting, as well as the use of a large variety of weaponry, entails serious problematics for local emergency structures and all involved personnel. Moreover, the Syrian conflict displays the use of high explosives as well as chemical ordnance. Consequently, the major constraints for the Syrian emergency management structures are characterised by a dangerous environment, the need for adaptation to new pattern of injuries, the need for funding new and additional medical material and consumables as well as the devastation of health care facilities. Moreover, health professionals are prone to suffer from general as well as mental health problems due to the stressful and cruel environment. In general, local emergency management structures in countries of peace are not aligned and prepared for the constraints of a full-scale armed conflict. Syrian health professionals need to adapt their emergency management plans frequently, in order to cope with the challenges of the conflict. At the time of writing, international assistance is inevitable in most parts of the country in order to provide minimal medical assistance.

KEYWORDS: Syrian civil war; armed conflict; mass casualty management; emergency management; Syria

INTRODUCTION

The Syrian Civil War

The Syrian civil war is an ongoing armed conflict in Syria with international involvement, killing more than 470,000 people since its beginning¹. Moreover, this conflict created more than 4.8 million Syrian migrants and refugees, adding tension and diversification in the neighbouring countries². Additionally, European countries are facing a large number of Syrian refugees and have to deal with the consequences of the influx³.

¹ Barnard, A. "Death Toll from War in Syria Now 470.000, Group Finds." *The New York Times*. http://www.nytimes.com/2016/02/12/world/middleeast/death-toll-from-war-in-syria-now-470000-group-finds.html?_r=0, Accessed on 13 Jun 2016.

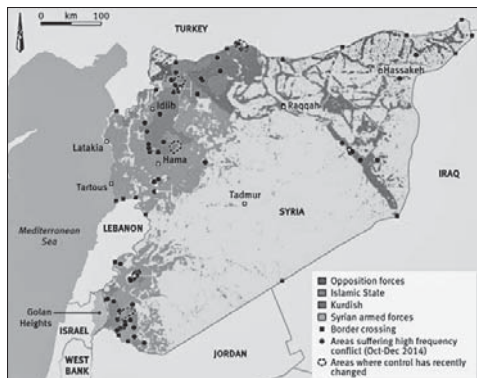
² "Global Conflict Tracker. Civil War in Syria." Council on Foreign Relations, <http://www.cfr.org/global/global-conflict-tracker/p32137#!/conflict/civil-war-in-syria>. Accessed on 13 Jun 2016.

³ Besenyő, J. "Not the Invention of Isis: Terrorists among Immigrants." *Journal of Sustainability Issues*. Vol. 5. No. 1. 2015. 5-20.

The Syrian civil war started in March 2011 within the context of the Arab Spring protests⁴. Initial protests were organised against the government of president Bashar al-Assad, and later escalated into a full scale armed conflict. The first protests started in January 2011 in Damascus, and demonstrators demanded democratic reforms, more freedom, end to corruption, and loosening of prison rules. Subsequent protests (started in April 2011) demanded the overthrow of the Assad government, and spread to more than 20 cities within the country⁵. The Syrian army answered with deadly military strikes, killing thousands of civilians. As a result, more and more protesters took up arms and formed opposition groups. Table 1 displays the timeline of the Syrian conflict.

Table 1 - *Timeline of the Syrian conflict*⁶

Time	Episode
January to July 2011	Initial protests in several cities
July to October 2011	Establishment of armed opposition groups and first confrontations with the Syrian military
from November 2011	Intensification of the fighting and escalation into a full-scale armed conflict
June 2014	Strong involvement of the Islamic State
September 2015	Intensification of international military involvement from various countries
February 2016 - present	First ceasefire talks and ongoing fighting



The Syrian civil war remains a multifaceted armed conflict with shifting allegiances and boundaries, receiving various influence from diverse armed groups⁷. International coalition groups, internal ethnic groups, tribal conflicts, jihadist groups, the Islamic State and several other parties of the conflict are acting in their own interests. Figure 1 shows an overview of the distribution of the parties of the conflict in the year 2015 and highlights the complexity of the situation within the country.

Figure 1 - *Parties of the conflict in the Syrian civil war, 2015*⁸

⁴ Rogers, L. et al. "Conflict Background." I am Syria. <http://www.iamsyria.org/conflict-background.html>, Accessed on 13 Jun 2016.

⁵ Besenyő, J. and Marsai, V. "The First Anniversary of the "Arab Spring" - What Kind of Changes Have Taken Place since Then?" *Tradecraft Review, Periodical of the Military National Security Service*. Vol. 2. Special Issue. 2012. 5-16.

⁶ "Syria Profile – Timeline". BBC News, <http://www.bbc.com/news/world-middle-east-14703995>, Accessed on 14 June 2016.

⁷ Sadosky, P., Shrivastava, A., Price, M. and Steorts, R. C. "Blocking Methods Applied to Casualty Records from the Syrian Conflict." Cornell University Library. 2015. <https://arxiv.org/pdf/1510.07714.pdf>

⁸ Guha-Sapir D. et al. "Civilian Deaths from Weapons Used in the Syrian Conflict." *BMJ*. Vol. 351. No. 4736. 2015. 1-5.

Warfare

The Syrian civil war shows a large variety of weaponry. Small arms, grenades, anti-tank weapons, anti-aircraft weapons, mortars, large artillery, aerial bombing, tanks, as well as various explosives are in use⁹. Moreover, the Syrian conflict has demonstrated the use of chemical weapons¹⁰. Several attacks with sarin and chlorine gas have been reported in the course of the conflict¹¹. The largest-scale use of nerve gas sarin happened in August 2013, killing more than 1,400 people¹². Moreover, various sources document the use of “barrel bombs” by the Syrian military. Barrel bombs, dropped from helicopters, are non-conventional bombs loaded with nails and shrapnel to cause additional injuries after detonation¹³.

This conflict also shows various violations of international humanitarian law and several healthcare facilities have been targeted intentionally¹⁴. One of the most severe incidents was reported in the north of Syria (the city of Aleppo), when four rockets hit the hospital Al-Quds in the eastern part of the city¹⁵. Another recent attack happened in June 2016, when two hospitals (Al-Bayan trauma facility and Al-Hakim paediatric hospital) in the Aleppo region were attacked¹⁶. At the time of writing, both medical facilities are destroyed and out of operation.

The parties of the conflict now apply more often besieging tactics. It is estimated that about 46 communities are under siege and completely blocked from all types of assistance and goods¹⁷. Also the movement of ill or injured persons can be restricted. One example, highlighting this type of warfare, is the siege of Yarmouk camp. Yarmouk is a Palestinian refugee camp in the south of Damascus, suffering from an ongoing siege since July 2013¹⁸. Humanitarian assistance as well as medical emergencies are not accepted to these regions.

⁹ "Islamic State Crisis: Coalition Weaponry." BBC News, <http://www.bbc.com/news/uk-29349918>, Accessed on 16 Jun 2016.

Harress: Ch. "Syrian Civil War: New Russian Weapons Sent to Assad's Forces." *International Business Times*. <http://www.ibtimes.com/syrian-civil-war-new-russian-weapons-sent-assads-forces-2101610>, Accessed on 16 Jun 2016; Fisk, R. "Syria Civil War: State-of-the-Art Technology Gives President Assad's Army the Edge." *Independent*. <http://www.independent.co.uk/news/world/middle-east/syria-civil-war-state-of-the-art-technology-gives-president-assad-s-army-the-edge-a6898741.html>, Accessed on 16 Jun 2016.

¹⁰ Pita, R. and Domingo, J. "The Use of Chemical Weapons in the Syrian Conflict." *Toxics*. Vol. 2. No. 3. 2014. 391-402.

¹¹ Sparrow, A. "Syria: Death from Assad's Chlorine." *The New York Review of Books*. Vol. 62. No. 9. 2015. 1-6.; Rosman, Y. et al. "Lessons Learned from the Syrian Sarin Attack: Evaluation of a Clinical Syndrome through Social Media." *Annals of Internal Medicine*. Vol. 160. No. 9. 2014. 644-649.

¹² Blanchard, Ch. M., Humud, C. E. and Nikitin, M. B. "Armed Conflict in Syria: Overview and U.S. Response." Congressional Research Service, 2014.

¹³ *Aleppo Abandoned. A Case Study on Health Care in Syria*. New York: Physicians for Human Rights. 2015.

¹⁴ *Health Care in Danger. Meeting the Challenges*. Geneva: International Committee of The Red Cross, 2015.

¹⁵ "Syria: Al Quds Hospital Death Toll Rises to 55." Médecins Sans Frontières. <http://www.msf.org/en/article/syria-al-quds-hospital-death-toll-rises-55>

¹⁶ "Deadly Aleppo Airstrikes Damage Two Syrian Hospitals." Physicians for Human Rights. <http://physicians-forhumanrights.org/press/press-releases/deadly-aleppo-airstrikes-damage-two-syrian-hospitals.html>, Accessed on 17 Jun 2016.

¹⁷ "Siege Warfare in Syria Revives Debate over Ancient Tactic." Mail Online, <http://www.dailymail.co.uk/wires/ap/article-3450576/Siege-warfare-Syria-revives-debate-ancient-tactic.html>, Accessed on 16 Jun 2016.

¹⁸ Al-Ali, I. "The Siege of Yarmouk Camp". *Journal of Palestinian Refugee Studies*. Vol. 4. No. 1. 2014. 43-48.

EMERGENCY MANAGEMENT

Emergency management before the war

Local emergency management systems are usually aligned to the current predominant health problems of the country¹⁹. Before the conflict the four major health risks in Syria were (I) dietary risks, (II) high blood pressure (III) a high body mass index and (IV) smoking²⁰. Due to these risks, the two major pre-conflict health problems used to be ischaemic heart diseases and strokes²¹.

The predominant health problems were mostly covered by local medical staff and the Syrian Arab Red Crescent as part of the Red Cross and Red Crescent Movement. Comparable to western countries, the local Red Crescent organisation (Syrian Arab Red Crescent) is responsible for the coverage of both immediate and long-term needs. The activities include: emergency response, disaster preparedness, community-based health care as well as first aid training and activities²². These activities are mostly performed by volunteers and some permanent staff. In Syria emergency management is performed by the Syrian Arab Red Crescent, upholding the headquarters in the capital Damascus, and an additional fourteen branches within fourteen different governorates²³. These fourteen sub branches are divided into 75 smaller sub branches. Together with local health facilities, emergency centres and hospitals the country possessed an effective emergency management system to respond to the needs in peacetime. Consequently, there was no need for emergency management structures to receive training in mass casualty management.

Emergency management during the war

After the outbreak of the conflict in 2011, the health challenges changed significantly²⁴. Because of the ongoing fighting and especially the use of explosive devices, new patterns of injuries emerged. Injuries now include multiple trauma, gunshot wounds, and various injuries to the extremities²⁵. Nowadays the number one health risk in Syria was replaced by the “consequences of the conflict”, leaving dietary risks and high blood pressure in second and third position²⁶.

However, local management systems were not able to adapt to these constraints as fast as the conflict evolved. Hospitals as well as the local Red Crescent organisation were still trained

¹⁹ *Mass Casualty Management Systems. Strategies and Guidelines for Building Health Sector Capacity. Health Action in Crises, Injuries and Violence Prevention.* Geneva: World Health Organization, 2007.

²⁰ "Global Burden of Disease Profile: Syria." 4. Seattle: Institute for Health Metrics and Evaluation, 2010.; Nasreddine, L., Mehio-Sibai, A., Mrayati, M., Adra, N. and Hwalla, N. "Adolescent Obesity in Syria: Prevalence and Associated Factors." *Child Care Health and Development* Vol. 36. No. 3. 2010. 404-413.

²¹ *Syrian Arab Republic: WHO Statistical Profile 2012.* 3. Geneva: World Health Organization, 2012.

²² "The Movement. National Societies. National Societies Key Facts." International Federation of Red Cross and Red Crescent Societies. <http://www.ifrc.org/en/who-we-are/the-movement/national-societies/>, Accessed on 16 Jun 2016.

²³ "About us." Syrian Arab Red Crescent. <http://sarc.sy/about-us/>, Accessed on 16 Jun 2016.

²⁴ Sen, K., Al-Faisal, W. and Al-Saleh, Y. "Syria: Effects of Conflict and Sanctions on Public Health." *Journal of Public Health.* Vol. 35. No. 2. 2012. 195-199.

²⁵ Kerallah, M. et al. "Health Care in Syria before and During the Crisis." *Avicenna Journal of Medicine.* Vol. 2. No. 3. 2012. 1-3.

²⁶ *Syrian Arab Republic: Who Statistical Profile 2012.* WHO.

and equipped for the major pre-conflict health problems. Additionally, the infrastructure of the country and local power structures were heavily disrupted. Emergency organisations needed to reorganise to adapt to the circumstances of an armed conflict. Especially health care facilities suffered from the civil war and in 2015 more than 58 % of 113 public hospitals were either destroyed or only partly functioning²⁷. Many hospitals in Syria (especially in the cities of Aleppo and Damascus) have been established underground to be protected from bombs and mortar attacks. This approach proved to be successful to increase the security of the clinics, however, most of these facilities are too basic to handle mass casualty emergency and perform proper emergency management²⁸. Many underground hospitals do not possess adequate medical equipment and suffer from the lack of experienced and specialised personnel²⁹. Obviously, the local emergency management system is not capable to cover all emerging health constraints due to the conflict. For example, necessary vaccination campaigns cannot be covered by the Syrian Arab Red Crescent and must be addressed by other organisations (e.g. the World Health Organization). However, the task of emergency management remains on the shoulders of the Syrian Arab Red Crescent as well as local health care professionals. Even more importantly, the survival rate of the wounded in action can be improved by a proper pre-hospital care³⁰. Especially the survival of victims of major trauma can be improved by proper pre-hospital care interventions such as endotracheal intubation, ventilation, and intercostal drainage³¹. Below, the constraints of emergency management within the Syrian civil war will be discussed.

Constraints for emergency management during the war

Various reasons cause tension to the Syrian health system. Some of them are: sanctions and embargoes, a general lack of resources, a changing pattern of injuries, violence against health care, displaced people, low accessibility as well as an unstable security situation³². Most of these constraints have a direct, and some of them an indirect influence on emergency management. Moreover, health staffs are influenced by the parties of the conflict to prioritise their own fighters. Health workers working under such harsh conditions generally suffer from anxiety, depression, and exhaustion³³. Below the predominant constraints for the work on the field will be discussed.

²⁷ *Regional Situation Report, September 2015. WHO Response to the Syrian Crisis*. Geneva: World Health Organization, 2015.

²⁸ Attar, S. "Field Hospitals in Syria." *The Lancet*. Vol. 383. No. 9914. 2014. 303.

²⁹ Attar, S. "The Hell of Syria's Field Hospital." *The New England Journal of Medicine*. Vol. 374. No. 23. 2016. 2205-2207.

³⁰ Coupland, R. M. "Epidemiological Approach to Surgical Management of the Casualties of War." *BMJ*. Vol. 308. No. 6945. 1994. 1693-1697.

³¹ Davis, P. R., Rickards, A. C. and Ollerton, J. E. "Determining the Composition and Benefit of the Pre-Hospital Medical Response Team in the Conflict Setting." *JR Army Med Corps*. Vol. 153. No. 4. 2007. 269-273.

³² *Syria and Countries Affected by the Conflict: Humanitarian Situation, Needs and Response*. Geneva: The International Red Cross and Red Crescent Movement, 2014.

³³ Attar, S. "Crisis in Syria: An Orthopaedic Surgeon's Perspective." *American Academy of Orthopaedic Surgery*. <http://www.aaos.org/Default.aspx?ssopc=1>, Accessed on 17 Jun 2016.

Dangerous environment

Due to the nature of their work, emergency management professionals as well as paramedics and other health staff have to expose themselves to unsafe areas to conduct their duties. The Syrian civil war has a drastic impact on health staff and by November 2015 as many as 48 members of the Syrian Arab Red Crescent have lost their lives on duty³⁴. Moreover, general violence against health care staff and medical institutions seem to be on the rise in the Syrian conflict and various reports have documented attacks against health care facilities³⁵.

The adaptation to the new pattern of injuries

The nature of injuries, now appearing in the conflict, is far away from the usual field of activities before the war³⁶. Shrapnel, barrel bombs, airstrikes, mortars and landmines cause devastating harm to the body. The human corpus is often disfigured and found in terrible health states. This places tremendous pressure on emergency management staff since their experience and education were adapted to cardiovascular diseases and small scale emergencies (e.g. car accidents). These types of war injuries would even be challenging in a functioning health system, but now treatment has to be provided in a fully escalated armed conflict. Because of this pressure on health workers, a high level of trauma amongst them is already recognisable³⁷.

Because of the use of explosive weapons, Syrian health professionals have to deal with mass casualty emergencies. In the first years, health teams on-site used to work in accordance with a "load and go" (also called scoop and run) philosophy. When applying this technique, health teams aim to bring the patient to hospital as fast as possible with little pre-hospital intervention³⁸. Nowadays, more and more triage techniques are applied and over-triaging becomes less frequent. In general, during armed conflicts over-triage should be avoided as much as possible to allocate the minimal medical assistance as best as possible³⁹.

Funding and additional material

As soon as the conflict escalated, the workload increased drastically. One year after the outbreak of the fighting, the Syrian Arab Red Crescent requested more than 10 million USD in order to cover their current needs⁴⁰. At that time (2012), the most urgent needs were

³⁴ Syrian Arab Red Crescent *Situational Report November 2015*. Damascus: Syrian Arab Red Crescent, 2015.

³⁵ *Health Care in Danger. Meeting the Challenges*. ICRC

³⁶ Abbara, A. et al. "The Effects of the Conflict on Syria's Health System and Human Resources for Health". *World Health and Population*. Vol. 16, No. 1. 2015. 87-95.

³⁷ Rubenstein, L., Fallon, K. and Sahloul, Z. "Syrian Medical Voices from the Ground: The Ordeal of Syria's Healthcare Professionals." Syrian American Medical Society (SAMS). <https://www.sams-usa.net/foundation/>, Accessed on 17 Jun 2016.

³⁸ Al-Shaqsi, S. "Models of International Emergency Medical Service (Ems) Systems". *Oman Medical Journal*. Vol. 25. No. 4. 2010. 320-323.

³⁹ Atiken, P. and Leggat, P. "Emergency Medicine - an International Perspective. Considerations in Mass Casualty and Disaster Management". InTech. 2012. 143-182. <http://www.intechopen.com/books/emergency-medicine-an-international-perspective/considerations-in-mass-casualty-and-disaster-management>, Accessed on 16 Jun 2016.

⁴⁰ "Syrian Red Crescent Fighting Perceptions of Partiality. The Inside Story on Emergencies". <http://www.irin-news.org/report/95204/analysis-syrian-red-crescent-fighting-perceptions-partiality>, Accessed on 17 Jun 2016.

ambulance cars, mobile clinics, staff costs as well as general health materials. Throughout the conflict and until today those necessities remain the same.

Devastation of infrastructure and lack of personnel

The devastation of the infrastructure led to a collapse of the general health care system. About 78 % of public ambulances are out of service and therefore the activities of emergency management are seriously hindered⁴¹. Moreover, power and water supply failures are leading to secondary health hazards, in addition to war injuries.

Due to the conflict, a large number of healthcare professionals left the country. This exodus becomes obvious in the city of Aleppo where from the initial 2,000 physicians (pre conflict) only less than 100 remained after the outbreak of the conflict⁴². Consequently, unqualified persons are forced to perform medical procedures as well as emergency management tasks⁴³.

CONCLUSION

Local emergency management structures in countries of peace are not aligned and prepared for the constraints of a full-scale armed conflict. Naturally, emergency structures are aligned to the major current health problems in the country. The sudden change from normality to a conflict setting entails serious problematics for emergency structures and all involved personnel. The adaption to new pattern of injuries, the dangerous environment, the destroyed infrastructure, a lack of personnel as well as the need for funding and additional materials are the major constraints. Moreover, health professionals are prone to suffer from health problems due to the stressful and cruel environment. It becomes obvious that countries at war often have to adapt their emergency management structures. Independently from the governing body, emergency management plans should always include the following points:

- Clear chain of commands
- A funding plan
- Stockpiles of resources necessary for urgent treatment
- Identification of national experts and their involvement in decision making process
- Enabling the communication with international actors to collaborate with them
- Enabling the communication between state offices within the country

The Syrian civil war, just as many other conflicts around the world, displays the need for training to handle blast injuries and gunshot wounds. Moreover, triage management education after incidents with explosive ordnance is in high demand. Lastly, the Syrian Arab Red Crescent displays a high need of mental health training to tackle the adverse conditions in a better way.

⁴¹ Attar, S. "Syria's Humanitarian Crisis." *Journal of Bone and Joint Surgery*. Vol. 96. No. 9. 2014. 74-79.

⁴² Coutts, A. and Fouad, F. M. "Response to Syria's Health Crisis: Poor and Uncoordinated." *The Lancet*. Vol. 381. No. 9885. 2013. 2242-2243.

⁴³ Alahbad, F. et al. "Syrian's Alternative to a Health Care System: Field Hospitals." *Avicenna Journal of Medicine*. Vol. 4. No. 3. 2014. 51-52.

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