

Yemen: Dealing with the COVID-19 Pandemic Alongside the World's Worst Humanitarian Crisis.

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ABSTRACT

There is an emerging impetus to improve emergency medicine (EM) in Yemen, beginning with the ongoing expansion of emergency medicine residency training, to the establishment of a professional association of emergency medicine and disaster preparedness and management named the Yemeni Association of Emergency Medicine and Disasters (YAEMD). However, over the past few decades, Yemen faced many difficulties that created further challenges in the development of an effective emergency medical care. This article explores the multiple factors that have led to the current crisis in which the already depleted Yemeni medical sector is faced with battling the COVID-19 pandemic, on top of many existing challenges. The paper examines the distinctive challenges that face Yemen's emergency departments, including epidemic diseases such as cholera, diphtheria, dengue and measles; the geopolitical impact of the ongoing civil war; and the daily threats of violence and homicide against emergency healthcare workers. Potential solutions are explored, including national and international efforts to properly allocate government funds and to implement universal health insurance plans. Further research is needed to investigate possible solutions for evaluating effective change in emergency medical services in Yemen.

Keywords: EM, Yemen; disasters, challenges, Emergency Medical Services; Crisis management; war.

INTRODUCTION

Yemen is a country in western Asia, located on the northern Indian Ocean, at the southern tip of the Arabian Peninsula. Bordered by the Red Sea and Arabian Sea (1), Yemen is surrounded by islands including Socotra, a UNESCO World Heritage Site, which lies about 620 miles off the eastern coast of Aden, the Yemeni capital. Centuries before a series of devastating wars hit the country, Yemen has been a fairly stable before the war (2,3). It was also a particularly powerful trading nation, exporting an array of spices and fragrances (2). Coffee was exclusively exported to the rest of the world through the port city of Al-Mokha, hence the name of the popular drink 'mocha'. The Republic of Yemen was official inaugurated in May of 1990 (4), when Northern Yemen, which includes the historic capital of Sana'a,

and Southern Yemen, which includes the city of Aden (currently the temporary capital), agreed to unite. Unfortunately, the unification did not create a lasting peace; religion, geography and history have all created barriers to stability and in 2011, conflict began when Ali Abdullah Saleh, the first President to have controlled Yemen after its merger, was forced to end his presidency following the Arab Spring. His successor Abdrabbuh Mansur Hadi was overthrown and forced to flee the country in September of 2014 when an armed group of insurgents from the Houthi movement gained control of the capital city of Sana'a. In March 2015, Saudi Arabia launched airstrikes on Yemen, endorsed by many countries including the United States and United Kingdom, in an attempt to improve the situation.

Instead, it escalated matters into a full-blown conflict. Yemen was left in shambles, almost completely destroyed. The aftermath of the war has been devastating, even prior to the arrival of the COVID-19 pandemic. The Yemeni people have faced a barrage of problems including hunger, widespread infectious diseases, lack of medical equipment and most recently, the COVID-19 pandemic as well as the ongoing war. Simply put, the situation has become a devastating humanitarian crisis. As a consequence of the ongoing war, only around 50% of Yemeni hospitals and medical facilities are in full working condition (5,6,7). The conditions in most hospitals are nowhere near full potential and even those that are operating are in dire need of essential equipment and proper funding. The war has already caused an estimated 233,000 deaths, including 131,000 from indirect causes such as lack of food, health services and infrastructure (8). Another harsh reality that the vulnerable people of Yemen must face is that they have no resources to help themselves. It is estimated that 24.3 million Yemenis, more than 80% of the population, currently require some form of humanitarian assistance (9). More than 70% of the population (20.5 million people) require assistance to access safe drinking water and sanitation, including 12.6 million people who are in acute need (10,11). In 2020, Yemen was ranked as the 179th country (out of 189) on the Human Development Index (12). Yemen is now having to battle the COVID-19 pandemic amid already challenging conditions that has seen outbreaks of other epidemic diseases including cholera (205,662 with 65 associated deaths, a CFR of 0.03% (9) from 1 January to 30 October 2020), diphtheria (5,801 probable cases and 326 associated deaths reported from 12 August 2017 to 27 September 2020 (14)), dengue (6,777 suspected cases recorded in 2020 (13)) and the highest number of measles cases in the world (a reported 1,744 cases, which is nearly double the amount of cases than the next highest country (8)). Ongoing rains threaten to worsen the situation at any time: Yemen is frequently impacted by natural disasters including drought, heavy rains, and floods – and the people face many problems such as hunger, infections, diseases and lack of equipment as well as, now, the COVID-19 pandemic. Simply put, the situation in Yemen has become a devastating humanitarian crisis. This article describes the challenges faced by the emergency physicians in Yemen in the midst of daily disaster and chronic crisis, and the current status of disaster preparedness, Emergency Medical Services (EMS). Prehospital care and training opportunities in emergency medicine within the country.

Experts in the field of emergency medicine authored this paper.

When terrorists bombed a Yemeni hospital: A personal experience:

Life in Yemen has been tough for the physicians working in such complex conditions. Testimonies such as this only being to explain the challenges healthcare workers face daily: “After graduating medical school, I decided to become an emergency physician. I received many offers to work out of the country, but I decided to stay to help the Yemeni people – until I was one of the victims of a terrorist attack on the Defense Complex Hospital in the heart of the capital city of Sana’a, in December 2013. “It was a Thursday morning, a little after 9 am, when militants carried out a pre-planned terrorist attack on the hospital where I was working –the reasons behind the attack are unclear. It started with huge blasts, followed by many gunmen, some of whom were dressed in military uniform, storming in. They shot everyone in their way – nurses, doctors and patients. I remember seeing the looks on the faces of my colleagues. The militants were ruthless. Many of my close friends lost their lives. “At one point, I was extremely close to one of the militants but smoke from the blast concealed me. Our families back home were terrified. Coming home that day, I vividly recall walking in, covered in blood. My wife, daughters and extended family immediately began crying. I stood there, with blood dripping from my hands, head and neck. My family urged me to go to the hospital, but I refused as I knew there were many others in worse or more critical condition than I was, who needed immediate assistance. ‘I can wait’, I said to my family, but they forced me to go to the hospital. I had a large wound in front of my neck, very close to my trachea; the scar still remains. “My family and I decided it was best to move. So many unlucky ones did not come out alive: 52 lives were lost, to be exact. We felt unsafe (15,16).” Many other attacks – not all by terrorists – occur regularly. There were 120 separate incidents across 20 of Yemen’s 22 governorates between March 2015 and December 2018, including airstrikes, ground attacks, military occupation, assaults on healthcare workers and medical facilities and other violations such as looting and restrictions on humanitarian aid, according to analysis co-published by Physicians for Human Rights (PHR) and the Yemeni human rights group Mwatana.

Recently, a dentist was killed by civilians and hanged in the city center with his white coat on. All in all, healthcare providers are facing pressure from all the sides. They work in poorly equipped and understaffed facilities. They are underpaid. They face constant threats of violence and homicide. They fear that their facility could become a target for airstrikes at any time. They work with substandard or insufficient personal protective equipment (PPE). Understandably, many healthcare providers migrate. This increases pressure on the remaining staff. Many qualified physicians insist on remaining in despite the risks in the hope that one day, the situation will improve. They work hard to provide better healthcare for their people, irrespective of the difficulties and shortages they face.

Disaster preparedness/EMS: Current status in Yemen

The unstable political atmosphere in Yemen has seriously impacted the crucial field of disaster preparedness. Saleem et al conducted a study using the hospital emergency response checklist published by World Health Organisation (WHO) to compare disaster preparedness in 11 hospitals in Sana'a, between 2011 – the year in which civil unrest resulted in months of complete country-wide paralysis and a change of government – and 2013 (during the war) (17). The study found the baseline outcome to be generally unacceptable or insufficient, with no significant progress regarding hospital disaster preparedness between the two dates. Since then, the catastrophic impact of conflict and natural disasters have led to cuts in the budget of the Ministry of Health. Airstrikes on urban areas in particular are a serious challenge. Houses are falling apart from direct airstrikes or their aftermath. The victims of such attacks are rarely evacuated in ambulances: whatever vehicles are available are used. The country has only about 350 ambulances available through the Ministry of Health, public and private sector health facilities. These are used solely for inter-hospital transportation, without any robust coordination. With the exception of some donated ambulances and a few owned by the Ministry of Health, ambulance vehicles usually lack proper equipment. In mass casualty incidents – which are very common – it is not unusual for Yemeni physicians to receive victims who have been transported in private cars by people who were present at the scene. Furthermore, there are few formally qualified paramedics in the country: what ambulances that are available

are usually operated by non-healthcare personnel. To the best of our knowledge there is no formal training pathway approved or available for paramedics anywhere in the country. Out-of-hospital disaster preparedness is severely lacking (17) and the level of disaster preparedness training amongst medical staff is low according to a 2018 study that surveyed 531 Yemeni health professionals (18). Most respondents had heard about disasters, but only about one third had good knowledge of disaster management and 41% not been taught disaster preparedness at all, throughout their academic studies or professional careers. As of January 2021, there was no formal prehospital EMS in Yemen. There is no local equivalent of a 911 or 999 number to call in case of a medical emergency and no ambulance to send if there was such a number. EMS services are essentially absent from Yemen. The development of an EMS itself would aid the development of national disaster preparedness in general. Military services, the Ministry of Interior, the Ministry of Health, firefighters, and others need to be involved in emergency planning and training: the issue is multi-sectoral and cannot be addressed by the Ministry of Health alone. There is no policy in place to improve financial support to address this, or the lack of more basic health services and facilities, however. Disaster preparedness in Yemen has not received the attention it needs from the authorities, including proper funding and budget allocation (18). A formal training program needs to be introduced for all healthcare professionals and Emergency Medical Technicians (EMTs) including all staff in hospitals to overcome the current deficits (18).

Emergency medicine specialty training and education

Emergency Medicine (EM) is a recent specialty in Yemen. The first EM program was implemented in the country in early 2004: the Arab Board of Health Specialties (ArBHS) program, which has an accredited center in Al-Thawrah Modern General Hospital (TMGH). The program itself was established in 1999(1). In 2020, the Yemeni Board of Emergency medicine (YBEM) was finally established, using an identical program to ArBEM. It provides wider opportunities for training in EM, while retaining the quality of training seen in ArBEM and the residency program itself is well constructed by the ArBHS EM committee. In addition, the Yemeni Board for Medical Specializations (YBMS) established a 1-year diploma in EM in 2013, in order to help

provide qualified EM physicians for rural areas. Training was conducted in TMGH, a level 1 trauma center, with high exposure to multi-specialty patients seeking treatment at the hospital. At the time of writing, there is one other training center available for EM and YBMS is working on opening at least one more EM training center in the near future.

The birth of YAEMD

EM is still gaining recognition by medical authorities around the world, but Yemen took its first steps towards this in 2004 when ArBMS approved the TMGH residency program, which is approved by YBMS. On the 10th of December 2013, shortly after the terrorist attack on the Sana'a Defense Military Complex Hospital, a group of EM physicians established the Yemeni Association of Emergency Medicine and Disasters (YAEMD), a locally approved professional, non-profit, non-governmental organization. It includes not only board-certified and non-board-certified EM physicians, but also nursing staff, physician assistants, and respiratory therapists. YAEMD's goals are to promote and advocate EM as a specialty in Yemen, to encourage scientific research and provide scientific, financial and moral support for research and continuing education (CME) programs related to the field of emergency and disaster medicine. YAEMD communicates with international associations and participates in scientific cooperation agreements. It is recognized by the Yemeni Ministry of Health and the Ministry of Social Affairs and Labor and has been a full member of the International Federation for Emergency Management (IFEM) since Jan. 2014 – one of the first few regional organizations to have membership. It has 170 registered members, to date, and held its first annual international conference in Sana'a – the Yemeni International Conference for Emergency Medicine (YICEM19) – on 28-29th January 2019. Unfortunately, many of Yemen's home-trained EM specialists have since migrated to nearby countries looking for better and safer working conditions. The remaining EM specialists who have stayed in Yemen endure mediocre facilities, struggling administrations and uncertainly over when or even if salaries will be paid. They are usually overworked to undercompensated.

The future of EM in Yemen and suggested solutions

Sustaining emergency and disaster medicine

capabilities and practicing emergency medicine in the face of a growing population, a multitude of disasters, markedly declining resources, and financial restraints presents significant challenges to healthcare staff who remain in Yemen – but despite everything, Yemeni emergency medicine providers do manage. National efforts center on improving the entire healthcare system: within this, emergency care is of paramount importance and must be given high priority in such discussions. The nation needs to work at identifying gaps and flaws in emergency care systems as it develops its healthcare system as a whole. Yemen's EMS troubles are inherently due to an overall underfunded and under-resourced healthcare system. From the lack of EMS vehicles to EMT personnel, the country has far fewer emergency medical services compared with neighboring countries. In a country with scarce budget allocated to the health sector at all, the lack of resources, the impact on poorly compensated emergency medicine staff and physicians, and the depletions of the workforce due to mass outward migration of qualified professionals, the results are inevitable.

Additionally, there are significant gaps in the amount of formal research being conducted. This impacts not only on emergency medicine but on healthcare as whole. Areas such as chronic diseases also need to be studied within the local population in order to direct Yemen's healthcare efforts to where they will be most effective but basic data on the efficacy of emergency work is lacking, such as wait times and patient flow. Yemen's healthcare system focuses more on curative medicine, with inadequate focus towards preventive medicine. Revisions to the healthcare system, fortification of PHC (primary health care) facilities, guaranteed universal insurance plans and a greater emphasis toward preventive medicine (the current system is too focused towards treatment and cure than prevention) may reduce some of the challenges facing emergency departments across the country.

CONCLUSION

The political situation and ongoing conflict has created a complicated landscape for the emergency medical profession. Nonetheless, great strides have been made to ensure continued improvements in the field in spite of the obstacles created by the COVID-19 global pandemic but Yemen's budding emergency medicine services are in need of attention, development and support. The country is presently facing an emergency situation from all directions: conflict, natural disasters

and the global pandemic; there has never been a more appropriate time to focus on the key challenges and direct resources from the national and international community into healing and restoring Yemen to ensure its strength and resilience into the future.

Conflict of interest statement

None declared

Key Abbreviations

WHO: World Health Organization

UN: United Nations

ED: Emergency Department

ER: Emergency Room

EMS: Emergency Medical Service(s)

EMT: Emergency Medical Technician

ICU: Intensive Care Unit

GP: General Practitioner(s)

ArBEM: Arab Board of Emergency Medicine

ArBHS: Arab Board of Health Specializations

YBMS: Yemeni Board for Medical Specializations

TMGH: Althawra Modern General Hospital

MOH: Ministry of Health

YAEMD: Yemeni Association of Emergency Medicine and Disasters

YICEM19: Yemeni International Conference for Emergency Medicine 2019

OSCE: Objective Structured Clinical Examination

CME: Continuing Medical Education

PPE: Personal Protective Equipment

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