



When COVID hit the country-Yemen, which has the world's greatest humanitarian crisis

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When COVID hit the country-Yemen, which has the world's greatest humanitarian crisis

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Abstract:

Yemen left in shambles and is almost completely destroyed. The aftermath of the war was devastating, let alone the spread of the CoronaVirus. The people there are left to fend for themselves and face many problems such as hunger, an ongoing war, infections, diseases, lack of equipment and most recently the CoronaVirus. All together a humanitarian crisis. Only around 50% of the hospitals and the facilities are in fully working conditions, even at that rate, the conditions of those hospitals are nowhere near their full potential and need the necessary equipment and money.

Keywords: Yemen,COVID-19,war,humintrian crisis

Background

To begin, Yemen is a country which stands in Asia. Specifically, it is located directly south of the Arabian Peninsula's tip [1]. Much of pre-war Yemen included many plains and upland deserts as well as highlands. Coincidentally, many of these landmarks were located near the Red Sea. Additionally, Yemen is

surrounded by a significant number of islands, one of the more substantial and most utilized islands is Socotra and it extends about 620 miles on the eastern side of Aden. The area of Yemen is 527,970 square kilometers [1]. Yemen consists of 21 governorates – Abyan, Aden, Al-Baidha, Aldhalae, Al-Hodeida, Al-Jawf, Al-Mahrah, Al-Mahwit, Amran, Dhamar, Hadramout, Hajjah, Ibb, Lahj, Mareb, Reimah, Sadah, Sana'a, Sana'a City, Shabwah, and Taiz – each government has its own local health departments that report to the central Ministry of Public Health and Population (MOPHP). Ages ago, before a devastating destruction of war hit, Yemen was particularly powerful in many trades and was often trading many spices and fragrances. Coffee was first refined in Yemen, as it was regarded as an extremely important source. In summary, before Yemen became war torn it was an angelic country with breathtaking views, however Yemen is now one of the poorest countries not only in the Middle East but also in the world. In a political matter, The Republic of Yemen first became official in May 1990. This occurrence became known when Northern Yemen, the capital of Sanaa and Southern Yemen, also known as Aden, both agreed to Unite. More specifically, Yemen is divided into two functions and each part has two jobs. Northern Yemen's responsibility is controlling politics and being the political capital. On the other hand, Southern Yemen controls economics. Nevertheless, there were many obstacles that caused a division in the country such as social, geography and history, which plays a role in some of the current violence. As a result, the formal conflict first began in the spring of 2011 [2]. The Former original president named Abdullah Saleh, (he controlled Yemen after it merged) had to end his presidency and pass it onto another man named Abd rabbuh Mansour Hadi. His presidency hit a rocky road when he faced backlash about his new ideas surrounding southern Yemen, and in September 2014 a Houthi armed group gained control of Sana'a due to their powerful and fast-paced rebellion. Instead of stepping up, President Hadi fled from the country, and the citizens were left without a president and leader

[2]. After a while, Mansour Hadi introduced the military, which was endorsed by many places such as the United States and United Kingdom. The military launched myriad airstrikes in Yemen in March of 2015 as they believed this would support the situation [3]. However, the airstrikes only escalated the situation, eventually leading to full-blown conflict. This situation was mainly due to a corrupt government to begin with. After the Houthi army attacked and the president retaliated with more violence, Yemen was left in shambles and was almost completely destroyed. Unfortunately, the country which suffered for decades from poverty and corruption was torn by civil war instead of heading toward development and poverty eradication. The aftermath of the war was devastating alone, but on top of this the country had to deal with the spread of the Coronavirus. The people there are left to fend for themselves and face many problems such as hunger, an ongoing war, infections, diseases, lack of equipment and most recently the Coronavirus. All together this is the world's worst humanitarian crisis.

Current situation:

Trying to quell the impact of a pandemic is difficult to begin with and this difficulty is only exacerbated when you compound the unpredictability of the SARS-CoV-2 virus with societal instability. Yemen is a country that is war-torn and arguably experiencing the world's greatest humanitarian crisis [4]. It is estimated that nearly 80% of the population requires some form of humanitarian assistance [4,5]. Per UN estimates, more than 15,000 people were killed or injured. Twenty-two million Yemenis remain in need of assistance, eight million are at risk of famine, and one million persons were infected in the cholera outbreak. Prior to 2015, only 56% of Yemenis in urban areas, and 45% in rural areas, had access to a water supply network [4,5]. In 2019, per the Human Development Index, Yemen was ranked as the 177th country (out of 189) [6]. In 2019, the UN estimated that 24.1 million

people—almost 80% of the total population—was “at high risk” of hunger and disease, of whom roughly 14.3 million were in bad need of emergent humanitarian assistance [5,6]. The World Bank wrote: "poverty is projected to remain high with over three quarters of the population in 2019 living below US\$3.20 PPP a day, and approximately half of the population living below US\$1.90 PPP a day [6]. In 2020, UNICEF had appealed for 535 Million dollars for the Yemen Humanitarian Action for Children (HAC). Unfortunately, the collected amount was only 183 million with a deficit around 65% [7] Those numbers indicate that Yemen will need continuous flow for fund assistance to secure the essential life supplies and reconstruction during the post conflict era. The COVID-19 crisis is just one part of the whole health emergency in Yemen. Since 2015, the health system in Yemen has frankly collapsed. Only 50% of Yemen's 5,056 pre-war health facilities are functional, and on top of this there is a widespread shortage of essential emergency medical equipment [5,8]. Since the conflict began in 2015, the number of health care workers has sharply dropped. This is likely due to deaths in the medical community, either due to injury or infection, a gradual exodus of medical personnel to look for safety, and disruptions in higher education that have resulted in a decline in skilled medical professionals in Yemen [5,8]. The current estimation states that 18% of the country's 333 districts have no doctors [4,5]. Now, the COVID-19 outbreak is aggressively exhausting the remains of Yemen's most non-replaceable human resources: health workers [5]. These are some statistics based on the ongoing war. Only around 50% of the hospitals and facilities are in fully working conditions, even at that rate, the conditions of those hospitals are nowhere near their full potential, and are in need of necessary equipment and money [4,5]. Recently, there have been 156 attacks (recorded) on these facilities and around 100,000 men and women have been severely injured or died (due to war as it worsens). Moreover, Yemen is not only battling Covid-19 and a catastrophic war but also other diseases. As of October

7, 2018, the WHO estimates a cumulative total of 1,236,028 reported cases of cholera to have occurred in Yemen since the beginning of the outbreak in April, 2017 [9]. 2556 of these cases have been fatal, yielding a case fatality rate of 0.21% [9]. Since the start of the COVID-19 pandemic the whole world has been suffering. The health care system in many developed countries, such as Italy and France, could not withstand the sudden increase in the demand for medical care. Since it was hard for a well-established health care system to deal with the pandemic, it was impossible for the fragile health care system in Yemen to withstand the impact of the pandemic. Here are some of the challenges:

1. Malfunctioning of necessary infrastructure for COVID-19 prevention and management in nearly all hospitals
2. Insufficient testing capabilities across the country which obscure the accurate estimate for morbidity and mortality rate
3. A lack of supplies for COVID-19 treatment. In example, medical supplies such as ventilators and oxygen.
4. The abrupt shortage of trained health care workers, either due immigration or due to mortality during duty
5. The confusion, and lack of clear mass awareness about COVID-19, created an extra load on the health care system in the form of threats to healthcare workers and their families
6. The fund deficit in the healthcare budget extends not only to the shortage of supplies but also to salary reduction and potential downsizing.

In July of 2020, Yemen suffered from heavy rain fall and flooding across the country. The floods washed away houses, schools, sanitation facilities and health care centers. The loss of sanitation facilities lead to contamination of drinking water and a shortage of supplies of clean drinking water. The result of this contamination was a sharp increase in the incidence of cholera, dengue fever and

malaria. UNICEF has estimated that by the first week of August, field reports indicated that 160,216 people have been affected by floods in 32 districts in Yemen and are in need of immediate assistance [7]. Per WHO, "In 2019 an estimated 5.2 million children under 5 years died mostly from preventable and treatable causes. Children aged 1 to 11 months accounted for 1.5 million of these deaths while children aged 1 to 4 years accounted for 1.3 million deaths. Newborns (under 28 days) accounted for the remaining 2.4 million deaths". (16). In addition, malnutrition has a profound effect across the country. On July 22, the United Nations made a statement indicating that nearly 40% of Yemen's population would succumb to food insecurities within the next 6-months [10]. On top of this, nearly 18% of the country's districts have no physicians and only half of all the health facilities in Yemen are operational, and those that are functioning are experiencing a vast shortage of ventilators and oxygen [10]. It is estimated that nearly 80% of the population requires some form of humanitarian assistance. In August of 2020, UNICEF stated that "As of 31 August, 1,983 COVID-19 officially confirmed cases, and 572 associated deaths and 1,197 recovered cases were reported in Yemen, with a 28.8 percent CFR" which means that one out four confirmed cases in Yemen resulted in death [10]. The CFR in Yemen is five times the global average [5,10]. If we add to our consideration that the screening and diagnosis process in Yemen is not the best that we can ask for. There is a severe shortage of testing facilities. The confirmed cases are only from the southern eleven governorates because the testing situation in the northern governorate is vague. The higher numbers of confirmed cases in the countries around Yemen raise the suspicion about the numbers coming from Yemen health authorities. The defective testing process in addition to poor preventive measurements increase the risk of having silent transmission and undetected mortality [10]. Within Yemen, there are currently six central public health laboratories, and only four of these have the capability of conducting COVID-19 testing with reverse

transcriptase polymerase chain reaction (RT-PCR) [11]. Four testing facilities in a country of almost 30 million people is clearly insufficient to meet the acute needs of the inhabitants relative to the pandemic. On top of this, Yemen also relies heavily on outside resources, specifically the World Health Organization (WHO), which further exacerbates the limited response to the pandemic due to limitations on international travel. Agencies that offer aid to Yemen have also experienced turmoil, as they are often subjected to harassment, detention, and have seen their acquisition of permits impeded [11]. Further complicating this fundamental issue is that the skill set needed to properly execute RT-PCR testing is very exclusive, meaning that most people will not have been properly trained on the technique needed to perform the test, or have the foundational knowledge required to interpret the results [11]. The working conditions for healthcare professionals in Yemen is antagonizing the pandemic to become even more dire as there is a lack of funding for healthcare workers as well as a shortage of personal protective equipment (PPE). These healthcare workers are either being forced to work without proper equipment, or they are simply working for free. Some have not received pay in nearly 2 years. Another challenging aspect, with regards to containing the coronavirus outbreak in Yemen, is that the current civil unrest makes organized healthcare extremely challenging [12,13]. It is estimated that around 3.6 million people have been involuntarily displaced from their homes [3]. This coupled with unsafe living conditions creates a landscape that is very fragile for controlling any threat, let alone a pandemic [4,14].

All the above-mentioned challenges aggravate the load and add more obstacles to delivering essential, and proper, healthcare service to a population in need. Without a strong and comprehensive response to mitigate the effects of COVID-19 and suppress its transmission, the numbers of COVID-19 deaths, including amongst doctors, is expected to rise rapidly and lead to deadlier and longer-lasting consequences than in most other countries [5,10]. If the current unrest in

Yemen is not able to be halted, it will be extremely difficult to make any meaningful progress. Therefore, it is imperative that this becomes a focal point for international agencies across the globe. Also, if a second wave were to develop it would be catastrophic for Yemen. The country is not currently built to be able to withstand even minor inconveniences, so a second insult of COVID-19 would potentially prove to be even more fatal than the first wave. This is mostly due to the vast amount of destruction that has already taken place, as well as the extensive damage that has been done to the healthcare system. Subsequently, Yemen has seen a drop in their vaccination rates since the start of the war in 2015 [15]. If people are unvaccinated, it promotes a situation for developing multiple diseases, a recipe for disaster.

Conclusions/Needs to be done urgently :

To truly overcome the current humanitarian crisis in Yemen, there will need to be an internal restructuring of the healthcare system. There are far too few physicians to meet the population demands, and there is not enough laboratory support to aid in making correct diagnoses. This problem extends to the current issue, the COVID-19 pandemic. Healthcare workers are not afforded the proper amount of PPE, making their jobs immensely difficult and often forcing these workers to quit their jobs. However, it is also a formidable task for aid agencies to operate within Yemen and offer things such as PPE. This is in large part due to the current civil unrest currently taking place, creating a landscape of chaos for both citizens of Yemen and those who are trying to offer support.

The availability of functioning medical facilities in Yemen is scarce. Increasing the number of operating hospitals and laboratories will be necessary to help Yemen get through its current crises. Having the appropriate tests to detect COVID-19 is also extremely important. As mentioned above, only a few laboratories in Yemen have the capabilities of running RT-PCR, and the number of people trained to do so is also very limited. Therefore, it would be beneficial to provide the country with more immunological assays such as antigen detection kits. These kits need far less experience and training to operate, and would be a great

resource to have in areas of the country that are hard to reach or currently experiencing conflict.

It is known that contaminated water is a breeding ground for disease, therefore it is imperative that clean water becomes a viable and ready option for Yemenis. Too few people have this luxury, which is simply inhumane. The best way to combat this issue would be to establish a clean water source from within the country itself, however the current war makes this quite challenging. Two possibilities are for aid agencies to bring in mass quantities of clean water, or they could try to distribute filtering devices.

If the current political unrest can be lessened, then the WHO and other international agencies should focus their resources towards helping Yemen renovate and expand its facilities, reconstruct its road network and increase the number of medical workers as well as offering the proper amount of PPE. A potential solution is designated safe areas where there is cease-fire. Though this would take an agreement between two competing entities, it would offer the people of Yemen a place where they could receive medical attention without outside distractions. This would also allow medical facilities to remain free from damage.

Abbreviations

COVID-19: coronavirus disease of 2019.

MOPHP: Ministry of Public Health and Population

HAC: Yemen Humanitarian Action for Children

WHO: World Health Organization

RT-PCR: reverse transcriptase polymerase chain reaction

UN: United Nations

UNICEF - United Nations International Children's Emergency Fund

ETHICAL CONSIDERATIONS

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Consent for publication

Not applicable

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Non Applicable

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Authors contribution:

1Mohammed Alsabri, MD, Is the corresponding and senior author proposed the project, contributed to the conception, formulation and drafting of the article, participated and supervised the elaboration at every step of the paper writing process and is responsible for coordination of the study and communication with all co-authors.

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