



## Health Crisis in Yemen during War

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### ABSTRACT:

Yemen has been besieged more than four years till date of today in a civil war that left nearly 10000 dead and pushed millions of them to the brink of starvation. The health care system in Yemen has deteriorated since the start of the war in March 2015. This continuous, unresolved crisis has led to a rise in preventable diseases and other health problems, such as infectious diseases, malnutrition, diarrhoea, and unnecessary organ loss and cholera ,Yemen's health workers are operating in impossible conditions due to the war thousands of people are sick, but there are not enough hospitals, not enough medicines, not enough clean water. These doctors and nurses are the backbone of the health response without them we can do nothing in Yemen and according to WHO, 32 hospitals and 11 polyclinics in Yemen are affected by the continuing war in the being of the war in Yemen .Malnutrition result of starvation, in which a person has an inadequate intake of calories, it may be related to a deficiency of one particular nutrient eg: vitamin C deficiency, or based on the war in Yemen the malnutrition is resulting of starvation and shortages of food, water this due to the war. Cholera An infectious disease characterized by intense vomiting and profuse watery diarrhea and that rapidly leads to dehydration and often death. Cholera is caused by infection with the bacteria *Vibrio cholerae*, which may be transmitted via infected fecal matter, food, or water. This disease is most common in places with poor sanitation, crowding, war, famine and Yemen under war from 2015 till 2019. Yemen's health workers are operating in impossible conditions. thousands of people are sick, but there are not enough hospitals, not enough medicines, not enough clean water. these doctors and nurses are the backbone of the health response without them we can do nothing in Yemen. Therefore, the paper aimed at examining the effects of war on the health care system in Yemen. It has objectives as; to assess the health crisis in Yemen, to provide measures for preventing the health care system from collapsing, and to provide ways of preventing people from dying of cholera and malnutrition. The results shows that more than 4 million people in Yemen are acutely malnourished, including 2 million children, this based on WHO in 2016. Almost 462,000 children suffering from severe acute malnutrition and at risk of life-threatening complications such as respiratory infections or organ failure and cholera. The paper recommend that for development to be achieved especially on the health sector, the war in Yemen should have to come to an end. This can bring improvement in the health care system as well as reduce most of the diseases.

**Key word:** health-care system, Malnutrition, cholera, Yemen crisis

### 1. INTRODUCTION

Yemen has been besieged for more than four years, in a civil war that left nearly 10,000 dead and pushed millions of them to the brink of starvation. The roots of the conflict are the uprisings of the so-called Arab spring of 2011, when a popular uprising forced Yemeni President Ali Abdullah Saleh, who was in power for a long time, to hand over to his deputy Abed Rabbo Mansour Hadi. The political transition was supposed to bring stability to Yemen, one of the poorest countries in the Middle East.

The military intervention in Yemen against the Huthis is a military operation in Yemen from a coalition of several Arab countries and is referred to as the "Arab Alliance in Yemen led by Saudi Arabia". The air strikes on the Houthis began on 25 March 2015. The operations began in response to a request from Yemeni President Abed Rabbo Mansour Hadi because of the Huthis attack on the interim capital of Aden.

Countries that are involved in the war against Yemen are Egypt, Morocco, Jordan, Sudan, United Arab Emirates, Kuwait, Qatar and Bahrain. Somalia has opened its airspace, territorial waters and military bases to the coalition for use in war.

The United States provided logistical support to this war also. It also accelerated the sale of arms to coalition countries. The United States and Britain deployed military personnel to the command and control center responsible for the Saudi-led air strikes in Yemen. Saudi Arabia called on Pakistan to join the alliance, but the Pakistani parliament voted to maintain neutrality. Pakistan has provided warships to help the coalition impose an arms embargo on Houthis. Due to all those bad conditions, the Health system collapsed in Yemen.

Health care system is the organization of people, institutions, and resources that deliver health care services to meet the health needs for target populations. In some countries, health system planning is distributed among



market participants. It is the total services offered by all health disciplines and the method to pay for them. The following are the purpose of health care system:

- i. Provide care for ill & injured
- ii. Health promotion
- iii. Illness & disease prevention
- iv. Levels of wellness

WHO is coordinating the humanitarian response to health issues with Yemen's Ministry of Health and 20 partner humanitarian organizations in Yemen, including the International Committee of the Red Cross (ICRC). WHO is committed to ensuring that all Yemenis continue to have access to health services, including those in the hardest-to-access areas," says Shadoul, "through the provision of emergency life-saving medicines, trauma kits, interagency emergency health kits, diarrhoeal disease kits and blood bank supplies which are urgently needed.<sup>(1)</sup>

According to the United Nations, more than 1.4 million people have been internally displaced and almost 80% of the population 21 million since March requires some form of humanitarian assistance. An estimated 7 million people, almost one third of the population, face hunger. The whole population may soon need humanitarian help says Boucenine pointing to the arms embargo mandated by the United Nations Security Council to stop weapon deliveries to the rebels. The resulting inspections of all imports means that commercial and humanitarian shipments by sea and air into Yemen are severely restricted. Recent outbreaks of malaria and dengue were unusually large, health officials say, because tap-water supplies have been disrupted and people are collecting water in containers, creating breeding grounds for mosquitoes. The distribution of mosquito nets and insecticide sprays has been hampered due to the lack of security.<sup>(1)</sup>

It has been almost four year since the conflict in Yemen broke out and humanitarian and health situation continues to deteriorate. Health services in particular have been gradually undermined and many health facilities are functioning amid serious shortage of health workers, medicines and medical supplies.<sup>(2)</sup> Based on the World health organization health facilities have been exposed to incidents of violence.

The health workers were killed also which has effect on the health systems. The most common disease spread in Yemen due to war are as follows:

- i. Malnutrition.
- ii. Cholera.
- iii. Measles.
- iv. C. Leishmaniasis.
- v. Dengue fever.
- vi. Meningitis.
- vii. Schistosomiasis.
- viii. Pneumonia.
- ix. Acute Flaccid Paralysis.
- x. Malaria

Even before the current crisis in Yemen, the country faced one of the highest rates of child malnutrition in the world, with more than one million children suffering from acute malnutrition<sup>(3)</sup>. Therefore, this paper aimed at examining the effects of war on the health care system in Yemen. This can be achieved with the following objectives:

- i. To assess the health crisis in Yemen.
- ii. To provide measures for preventing the health care system from collapsing.
- iii. To provide ways to prevent people from dying of cholera and malnutrition during war.

## 2. LITERATURE REVIEW

### A. Malnutrition

It can be a result of starvation, in which a person has an inadequate intake of calories, it may be related to a deficiency of one particular nutrient eg: vitamin C deficiency, or based on the war in Yemen the malnutrition is resulting of starvation and shortages of food, water this due to the war. More than 4 million people in Yemen are acutely malnourished, including 2 million children, this based on WHO in 2016. Almost 462,000 children suffering from severe acute malnutrition and at risk of life-threatening complications such as respiratory infections or organ failure.<sup>(3)</sup>

Since the escalation of the conflict in Yemen in March 2015, many health workers have been killed and injured. In addition, the health facilities have been partially or totally damaged. WHO calls on all



parties to protect health workers and facilities and recalls the United Nations Security Council Resolution 2286 (2016) demanding that all parties to armed conflict comply fully with their obligations under international law, including international human rights law, as applicable, and international humanitarian law.<sup>(4)</sup>

The health-care system in Yemen has deteriorated since the start of the war in March, 2015. Impairment exists at all levels of health services; from improper function of health-care facilities to a shortage of basic and life-saving needs, such as drugs, water, and fuel. This continuous, unresolved crisis has led to a rise in preventable diseases and other health problems, such as infectious diseases, malnutrition, diarrhoea, and unnecessary organ loss.<sup>(5)</sup>

In 2014–2015, WHO constructed and equipped the emergency building inside the hospital, which was later used by MSF for surgical operations. WHO also recently supported the hospital with fuel, essential medicines and intravenous fluids. The hospital was partially destroyed and all remaining patients and staff have been evacuated, according to MSF.

There were patients in surgery, in the maternity ward as well as newborns and other patients in the pediatric ward at time of the attack. Responding to the dire need for emergency medicines.<sup>(4)</sup>

Even before the current crisis in Yemen, the country faced one of the highest rates of child malnutrition in the world, with more than one million children suffering from acute malnutrition.<sup>(6)</sup> In Yemen the high-level meeting took place in New York focusing on food security, nutrition and health this is based WHO when they said that on 2016 In September.

Causes of malnutrition during war:

- i. shortages of food.
- ii. shortages of water.
- iii. Shortages of medicine
- iv. The main causes War

WHO-supported Therapeutic Feeding Centres in 11 governorates provide severely malnourished children with full treatment, medicines and milk at no cost.

**Symptoms of malnutrition:**

- i. lack of appetite or interest in food or drink.
- ii. tiredness and irritability.
- iii. inability to concentrate.
- iv. always feeling cold.
- v. loss of fat, muscle mass, and body tissue.
- vi. higher risk of getting sick and taking longer to heal.
- vii. longer healing time for wounds

**Prevention of malnutrition during war:**

To prevent malnutrition, people need to consume a range of nutrients from a variety of food types. they should be a balanced intake of carbohydrates, fats protein, vitamins and minerals as well as plenty of fluid and specially water but the crisis in Yemen people are not able to find a food, there are some people have the leaves of the tree. so it is very difficult to help for prevent the malnutrition in Yemen since four years.

**Treatment of malnutrition during war:**

The healthcare provider will prepare a targeted care plan, with specific aims for treatment. But in the country which is under war, there will not normally be a feeding program with a specially planned diet, and there are not possibly some additional nutritional supplements because of the country under very bad situation.

## **B. Cholera**

An infectious disease characterized by intense vomiting and profuse watery diarrhea and that rapidly leads to dehydration and often death. Cholera is caused by infection with the bacteria *Vibrio cholerae*, which



may be transmitted via infected fecal matter, food, or water. This disease is most common in places with poor sanitation, crowding, war, famine and Yemen under war from 2015 till 2019.

Cholera, other contagious diseases such as diphtheria are spreading in the country. In a country where supplies and medical care are scarce, a lack of access to drinking water doesn't bode well for the ongoing health crisis.<sup>(7)</sup>

#### Causes of Cholera:

*Vibrio cholerae*, the bacterium that causes cholera, is usually found in food or water contaminated by feces from a person with the infection. Common sources include:

- i. Municipal water supplies
- ii. Ice made from municipal water
- iii. Foods and drinks sold by street vendors
- iv. Vegetables grown with water containing human wastes
- v. Raw or undercooked fish and seafood caught in waters polluted with sewage

When a person consumes the contaminated food or water, the bacteria release a toxin in the intestines that produces severe diarrhea. It is not likely you will catch cholera just from casual contact with an infected person.<sup>(8)</sup>

#### Symptoms of Cholera:

Symptoms of cholera can begin as soon as a few hours or as long as five days after infection.<sup>(8)</sup> But sometimes they are very serious *specially in places there are war*, people infected have severe watery diarrhea accompanied by vomiting, which can quickly lead to dehydration. Cholera is highly treatable, but because dehydration can happen quickly. The following are the signs and symptoms of dehydration:

- i. Rapid heart rate
- ii. Loss of skin elasticity (the ability to return to original position quickly if pinched)
- iii. Dry mucous membranes, including the inside of the mouth, throat, nose, and eyelids
- iv. Low blood pressure
- v. Thirst
- vi. Muscle cramps.<sup>(8)</sup>

If not treated, dehydration can lead to shock and death in a matter of hours due to the collapse health system because of the war many cause died from 2015 till 2018 and also this year many patients in the hospitals .

#### Treatment and Prevention Cholera:

Although there is a vaccine against cholera, the CDC and World Health Organization don't normally recommend it, because it may not protect up to half of the people who receive it and specially in this days which the country is under war ,the financial is not good because of the war. The Yemenis patient can protect themselves and them family by using only water has been boiled or water has been disinfected or bottled water. Should use Brushing your teeth and Washing your face and hands also by boiled water or disinfected for cooking also. You should also avoid raw foods, including the following:

- i. Unpasteurized milk and milk products
- ii. Raw or undercooked meat or shellfish
- iii. Fish caught in tropical reefs, which may be contaminated
- iv. Unpeeled fruits and vegetables

There are vaccines known as oral cholera vaccinations (OCVs) provided by the world health organization(WHO) which is giving as a two-dose regimen. The vaccines are now internationally accepted as tools for the control of epidemic and endemic cholera. It is a global stock- pile of these vaccines, managed by the International Societies of the Red Cross and Red Crescent, UNICEF, the WHO, and Doctors without Borders , with the WHO as the secretariat, and funded by Gavi, the Vaccine Alliance, has been in operation since 2013.<sup>(2)</sup>

This was before the war but it was in the conflict of the station in Yemen, Since September 2016, government employees, including health staff, have not been receiving regular salaries, resulting in shortages of staff reporting to work at public health facilities. On the other hand, most Yemeni citizens are not able to afford health services from the private sector.<sup>(9)</sup> The cholera outbreak has affected of Yemen's 23 governorates, with Al Jawf recently reporting confirmed cholera cases. However, the danger of spread is still present, as other governorates remain at high- risk of infection transmission, due to the conflict situation, as well as population movement.

Therefore, the war in Yemen has increased the risks of cholera spreads in the country. Yemen is a country with one of the highest rates of population growth in the world. It is also the country with the highest rate of exhaustion of water sources in the Middle East. Sana'a is the only capital city in the world that may run out of water within the next decade<sup>(10)</sup>

The war in Yemen has completely decimated the health care system. More than half of the people have little access to basic health care, and less than 45% of the hospitals work and the health personnel cannot cope with the needs.<sup>(7)</sup>

Houthi-controlled governorates, compared to 15.4% of cases and 10.4% of deaths in government-controlled governorates. The attack rate was 17.0 per 1000 population in Houthi-controlled areas compared with 10.0 per 1000 population in government-controlled areas, while the case-fatality rate was 0.46% in Houthi-controlled areas compared to 0.30% in government-controlled areas<sup>(11)</sup>



Figure 1:

According to WHO, 32 hospitals and 11 polyclinics in Yemen are affected by the continuing war. Of particular importance is the shortage of fuel to run the generators needed for the storage of blood, vaccines, and drugs. According to UNICEF<sup>(5)</sup>



Figure 2: The vaccinate children has put 2.6 million children younger than 15 years at risk of measles. Furthermore, with 1.8 million children at risk of malnutrition, the risk of child death is expected to rise if the health system continues to collapse<sup>(7)</sup>

It is tragic that the shortage of safe water and proper sanitation has led to the reappearance of dengue fever. By Aug 31, 2015, 6320 cases of dengue fever had been reported, with a peak in the weekly number of new cases of 421 cases recorded in the 33rd week of the war. The number of cases of pneumonia, polio, and malaria has also risen<sup>(12)</sup>

*should use antibiotics* which kill the bacteria, are not part of emergency treatment for mild cases. *Antibiotics* can reduce the duration of diarrhea by half and also reduce the excretion of the bacteria *and the antibiotics* helping to prevent the spread of the disease.

At the end of June, 2017, UNICEF and WHO released a statement declaring that Yemen is “facing the worst cholera outbreak in the world”<sup>(11)</sup>

The World Health Organization (WHO) is scaling up efforts to meet health needs in Yemen through the health service delivery mechanism known as the Minimum Service Package. This is the first time since the start of the crisis in Yemen that WHO has partnered with the Agency<sup>(12)</sup>



Figure 3: Yemen’s health system is on the brink of collapse due to health and non-health factors impacting accessibility and delivery of health services.

### 3. METHODOLOGY

The paper is a descriptive research that uses secondary data. The data were obtained from journal articles and reports of WHO and UNICEF.

### 4. RESULT

More than 4 million people in Yemen are acutely malnourished, including 2 million children, this based on WHO in 2016. Almost 462,000 children suffering from severe acute malnutrition and at risk of life-threatening complications such as respiratory infections or organ failure .

Since the escalation of the conflict in Yemen in March 2015, many health workers have been killed and injured. In addition, the health facilities have been partially or totally damaged. WHO calls on all parties to protect health workers and facilities and recalls the United Nations Security Council Resolution 2286 (2016)



demanding that all parties to armed conflict comply fully with their obligations under international law, including international human rights law, as applicable, and international humanitarian law.

The health-care system in Yemen has deteriorated since the start of the war in March, 2015. Impairment exists at all levels of health services; from improper function of health-care facilities to a shortage of basic and life-saving needs, such as drugs, water, and fuel. This continuous, unresolved crisis has led to a rise in preventable diseases and other health problems, such as infectious diseases, malnutrition, diarrhoea, and unnecessary organ loss.

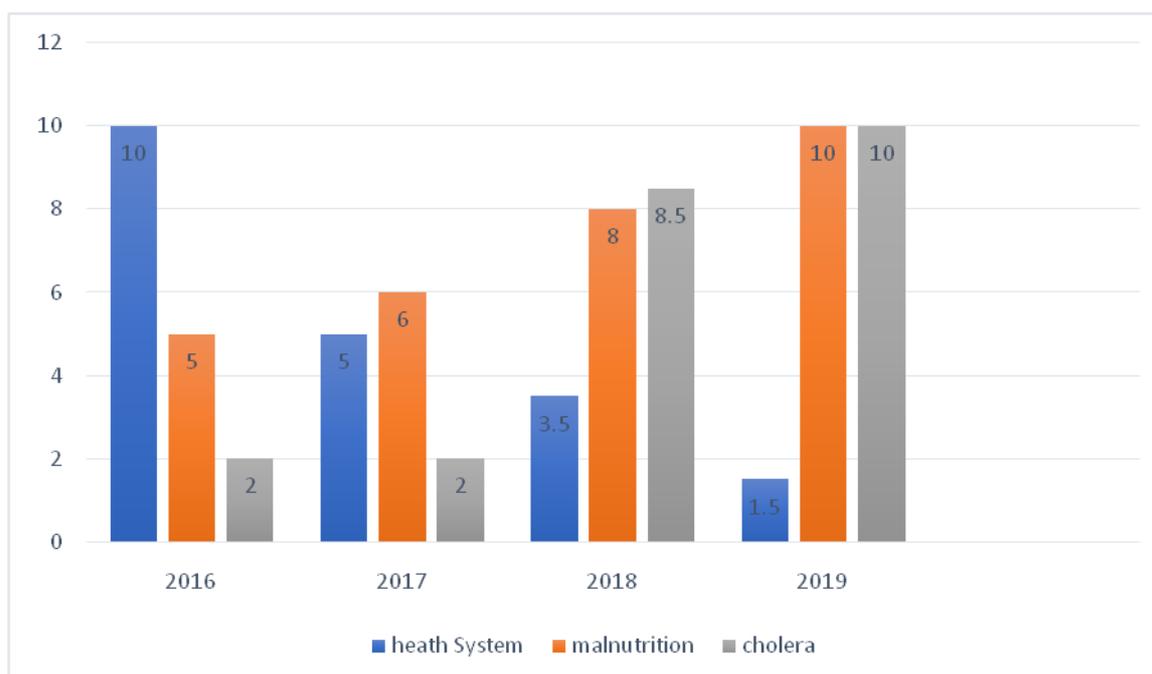


Figure 4: Distribution of the health system collapsing and the malnutrition and cholera disease spreading

In 2014–2015, WHO constructed and equipped the emergency building inside the hospital, which was later used by MSF for surgical operations. WHO also recently supported the hospital with fuel, essential medicines and intravenous fluids. The hospital was partially destroyed and all remaining patients and staff have been evacuated, according to MSF.

There were patients in surgery, in the maternity ward as well as newborns and other patients in the pediatric ward at time of the attack. Responding to the dire need for emergency medicines.

## 5. CONCLUSION AND RECOMMENDATIONS

For the final conclusion Yemen has been besieged more than four years till date of today in a civil war that left nearly 10,000 dead and pushed millions of them to the brink of starvation. The roots of the conflict are the uprisings of the so-called Arab spring of 2011, the health system begins to collapse from here as a result of a popular uprising which forced the Yemeni President Ali Abdullah Saleh who was in power for a long time to hand over to his Deputy Abed Rabbo Mansour Hadi.

The political transition was supposed to bring stability to Yemen, one of the poorest countries in the Middle East and the disease spread and as well collapse of the health system which gives the crisis to the health in Yemen day by day till today the health system in very bad station. The military intervention in Yemen against the Huthis is a military operation in Yemen from a coalition of several Arab countries and is referred to as the "Arab Alliance in Yemen led by Saudi Arabia". The air strikes on the Houthis began on 25 March 2015. The operations began in response to a request from Yemeni President Abed Rabbo Mansour Hadi because of the Huthis attack on the interim capital of Aden. The Arab Countries that are involved in the war against Yemen are Egypt, Morocco, Jordan, Sudan,



United Arab Emirates, Kuwait, Qatar and Bahrain. Somalia has opened its airspace, territorial waters and military bases to the coalition for use in war.

They give more problems to the country because, they destroyed hospitals by killing the staff and stopping the supply of medicines. Health services in particular have been gradually undermined and many health facilities are functioning amid serious shortage of health workers, medicines and medical supplies. Based on the World health organization health facilities have been exposed to incidents of violence. The health workers were killed also which effect on the health systems. This lead to the spread of most common diseases in the country. Therefore, the paper provided the following recommendations:

- i. The war in Yemen have to be ended at the first instance, this can open a platform for assistance from both within and outside the country.
- ii. There should be an improvement to the health care system especially in making availability of vaccines against diseases such as cholera, malnutrition etc.
- iii. There should be a self-preventive measures by the Yemenis and their family through boiling water, regular brushing of teeth, washing of face and hands with boiled water, avoid taking raw foods which include unpasteurized milk and milk products raw or undercooked meat or shellfish fish caught in tropical reefs, contaminated unpeeled fruits and vegetables.
- iv. There is need for people to consume a range of nutrients from a variety of food types. they should have a balanced intake of carbohydrates, fats protein, vitamins and minerals.

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