Cholera Continues to Claim Lives of Yemenis

**INTRODUCTION**

The two previous Issues of the Yemen Socio-Economic Update focused on poverty and costs of war. This Issue on cholera outbreak sheds light on the third rib of the triangle of poverty, fear and disease that threatens the lives of Yemenis.

Yemen is currently facing the world’s worst cholera outbreak, which has rapidly spread to the entire country except Socotra. A cumulative 780,886 suspected cholera cases have been reported since April 27, 2017\(^{(1)}\). Despite the low-risk fatality rate at the national level (0.27%), the epidemic has raised the human costs on the most vulnerable Yemenis, especially children (under the age of 15) and elders (over 59) who together accounted for 63.7% of deaths\(^{(2)}\).

Accumulation of garbage, exhaustion of the health system, limited access to clean water and malnutrition prevalence are the main factors behind cholera outbreak. It is likely that at least 50% of the barriers that have disrupted the health, water and hygiene systems and exacerbated deprivation are linked to the fiscal crisis that led to the suspension of operational costs and employee salaries, In conjunction with a funding gap as of 15 August 2017\(^{(8)}\).

In light of the experiences of other states such as Haiti, the epidemic could last for years. This requires expanding the integrated cholera interventions and mobilizing urgent support to prevent putting the lives of more Yemenis at risk.

**FACTS AND INDICATORS**

- **Over YER 385 / USD**
  The parallel exchange rate early October 2017.

- **11.9 %**
  The Inflation rate (end of period) in 2016

- **20.7 million**
  people in need of humanitarian assistance in 2017.

- **2.9 million**
  people displaced (IDPs & returnees) as of June 2017.

- **6 in 10**
  people are food insecure in March 2017.

- **173,419 teachers**
  have not received salary since October 2016.

- **24.3 million**
  90% of the population lack access to public electricity.

**CURRENT CHOLERA STATUS:**

- The cumulative number of cholera suspected cases was 780,886, with 2,137 associated deaths during April 27-October 1, 2017. However, the Case Fatality Rate has been reduced to 0.27% – below the emergency threshold (1%)\(^{(3)}\).

- Children under 15 represent 49.9% of total suspected cases and 32% of the deaths while those aged over 59 represent 31.8% of fatalities\(^{(2)}\).

- **Hodeida, Amanat Al-Asimah, Hajja and Amran governorates combined accounted for 41.1% of total suspected cases and 52.1% of total deaths. Raymah governorate continues to report the highest case fatality rate (0.93%)\(^{(1)}\).**

**CHOLERA OUTBREAK FACTORS:**

- The health system was not capable to respond to cholera even before the salary crisis. In 16 out of 23 governorates, only 43% of the functioning health facilities have full services to treat communicable diseases and there isn’t even a single doctor in health facilities in 49 out of 267 districts\(^{(2)}\).

- The accumulation of garbage and unimproved water sources are major factors of cholera outbreaks. About 54.1% of households had access to improved drinking water sources in 2016\(^{(4)}\) compared to 91% in the Eastern Mediterranean Region\(^{(5)}\).

- Yemen was ranked among the seven worst countries worldwide in malnutrition indicators in 2016\(^{(6)}\). Given that malnutrition weakens children’s immune system against cholera, treating them becomes a double challenge.

**FINANCING REQUIREMENTS:**

- The salary bill and operating expenses in the public budget are equivalent to $307.2 million in the health sector, $186 million in water and sanitation and $50.2 million in cleaning funds annually\(^{(7)}\).

- The funding available for the cholera Response plan is approximately $148 million, accounting for 58% of the funding requirements as of October 2017. The funding available for the cholera-related sectors in the revised humanitarian response plan is $257.1 million, representing 71% of the financing requirements as of 15 August 2017\(^{(8)}\).
First: Current Cholera Status:

**Definition of Cholera:**
“Cholera is an acute diarrhoeal infection caused by ingestion of food or water contaminated with the bacterium Vibrio cholera. It can kill within hours. Every year, there are an estimated 3 to 5 million cholera cases and 100,000 to 120,000 deaths due to cholera in the world”\(^{(9)}\).

**Spread of Cholera at the National Level:**
The spread of cholera in Yemen has gone through two phases (Figure 1). The first phase began from mid-October 2016 to late March 2017. The number of cholera suspected cases reached 24,504, with 143 associated deaths (with a Case Fatality Rate (CFR) of 0.44%)\(^{(15)}\). This means that 99.56% of people with suspected cholera who access health services are surviving. The number of reported cases declined between mid-March and mid-April 2017. The cholera prevention and control at this phase could be attributed to the limited prevalence of cholera and good capacities of the fragile health system supported by relevant international humanitarian organizations.

**Phase 2:** Began in 27 of April 2017, where cholera has spread rapidly and unprecedentedly. This phase coincided with a strike of sanitation workers to demand salary payment, mild rainfall and deterioration of health and water systems. Since then, cholera has become one of the most serious epidemics in Yemen. The cumulative number of cholera suspected cases reached 780,886 during April 27 - October 1, 2017, increasing at an average of 4,942 a day\(^{(1)}\). During the same period, cholera has claimed 2,137 lives\(^{(1)}\). On a positive note, the nationwide case fatality rate has been reduced to 0.27% – far below the emergency threshold (1%)\(^{(1)}\).

Despite the rapid spread of cholera in the second phase, which peaked in week 26 (early July 2017), the epidemic curve has declined gradually thereafter due to the attempts of the health system to absorb the unexpected shock of the epidemic and the serious response of the relevant parties through the health and WASH interventions including garbage collection, establishment of additional cholera treatment centers (CTC), water chlorination, raising community awareness. This gives us hope that it’s possible to eliminate cholera by uniting the efforts of the relevant official authorities, community entities and INGOs.

![Weekly Epidemic curve](source: WHO, Electronic Disease Early Warning System: [http://www.emro.who.int/yem/yemeninfocus/situation-reports.html](http://www.emro.who.int/yem/yemeninfocus/situation-reports.html)).

**Most affected groups:**
According to WHO data, cholera has affected both children and adults, but the attack rates are higher among the most vulnerable groups, precisely children under the age of 18, who represent about 56.3% of total suspected cases (Figure 2). Malnourished children, pregnant women and people living with other chronic health conditions are at greater risk of death. Therefore, about 63.7% of total deaths are children under the age of 15 years and people aged 60 years and older\(^{(2)}\).

By gender, figure (3) indicates that 50% of suspected cases reported are male and 50% are female. This means that cholera is not gender sensitive and affects both males and females almost equally.
Geographical prevalence of cholera:

Cholera has rapidly spread to 22 of the country’s 23 governorates, infecting 305 out of 333 districts, or 92% of districts, during about five months\(^1\). Figure (4) indicates that the four governorates with the highest cumulative suspected cases are Hodeida, Amanat Al Asimah, Hajja and Amran, which together accounted for 41.1% of all cholera cases while the four governorates with the highest deaths number are Hajja, Hodeida, Ibb and Taizz which together accounted for 52.1% of the total cholera death\(^1\). With regard to the case fatality rate (CFR) in governorates, the ratios vary from governorate to another over time but in general Raymah governorate continues to report the highest case fatality rate (0.92%)\(^1\).

At district level, 3 districts were identified as urgent priority, 73 districts as high priority and 228 districts as low priority in Mid-August. The disease continued to see increased trend in cases in a total of 81 districts, notably in Lahj, Hajja and Amran governorates\(^10\). The limited access to health facilities, safe water and sanitation makes matters worse.

Priority Districts

Figure (4) Number of cholera suspected cases and associated deaths by Governorate Cumulative (27/04/2017 to 1/10/2017)

Second: Cholera Outbreak Factors:

In August 2017, a quick interview was conducted with the Cholera Response Coordinator at the UNICEF country office Dr. Naqibullah Safi. He pointed out that the main factors behind the cholera outbreak were the inability of the health system to respond quickly to the epidemic, limited access to safe water and sanitation and prevalence of malnutrition. Below is a detailed review of these factors:

### 1. Exhaustion of the health system:

During a cholera outbreak, the health system needs to devote additional resources to the care of cholera patients to stop its spread. This often leads to a temporary breakdown in routine maternal and child health services because priority is given to cholera patients. In Yemen, the health system was already fragile during the pre-war period. Making matters worse, the health system has undergone severe shocks during the war, in coincidence with a high pressure on health facilities to treat war victims.

Even prior to the salary crisis and the recent cholera outbreak, the health system was on the verge of collapse. This is confirmed by the findings of the Health Services and Resources Availability Mapping System, carried out in 16 out of the country’s 23 governorates during March-June 2016 and published in October 2016, which indicated that the health system was functioning at less than half capacity. Only 45% out of 3,507 health facilities are still working with full capacity, while the rest have stopped functioning completely or partially due to war damages to 274 health facilities, shortage of medical staff, scarcity of fuel and medicines and lack of medical supplies

Table (1) shows a significant reduction in the coverage of public health services. For example, it was found that each health center covers an average of 36,340 people, while it should cover no more than 20,000 people in a context of humanitarian crises. The average number of beds (6.2 beds per 10,000 people) was below the benchmark of 10 beds per 10,000 people. With regard to health workers, the number averaged at 17 health workers per 10,000 people while there should be 22 health workers in a context of humanitarian crises. Out of 267 districts surveyed, there were no doctors in 49 districts and less than two doctors in health facilities in 42% of districts.

**Table (1) Population coverage with health services in a context of humanitarian crises**

<table>
<thead>
<tr>
<th>National standard / International benchmark</th>
<th>Average for 16 governorates</th>
<th>Level of coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health units (1 per 1,000-5,000 people)</td>
<td>9,885</td>
<td>Red</td>
</tr>
<tr>
<td>Health centers (1 per 5,000-20,000 people)</td>
<td>36,340</td>
<td>Red</td>
</tr>
<tr>
<td>District hospitals (1 per 60,000-150,000 people)</td>
<td>150,190</td>
<td>Yellow</td>
</tr>
<tr>
<td>Health workers (at least 22 per 10,000 people)</td>
<td>17.03</td>
<td>Red</td>
</tr>
<tr>
<td>Beds (at least 10 per 10,000 people)</td>
<td>6.2</td>
<td>Red</td>
</tr>
</tbody>
</table>

Source: MoPHP and WHO, Service Availability and Health Facilities Functionality in 16 Governorates, October 2016.

With respect to service availability, Figure (5) indicates the level of availability of communicable disease services in governorate-level health facilities in descending order. In general, only 43% of the functioning health facilities have full services to treat communicable diseases while 40% of functioning facilities provide these services partially and 17% don’t provide these services at all. All of the foregoing facts confirm that the health system was not capable for rapid and early response to the cholera epidemic even before the liquidity crisis, which contributed to the prevalence of the epidemic.

**Figure (5) Availability of Communicable diseases services in health facilities by governorate (%)**

Source: MoPHP and WHO, Service Availability and Health Facilities Functionality in 16 Governorates, October 2016.
2. Limited access to water and sanitation:

Yemen is among the top five poorest countries worldwide in Freshwater\(^{(10)}\). While 91% of the population of the Eastern Mediterranean Region had access to improved drinking water sources in 2015\(^{(5)}\), only 54.1% of Yemeni households were able to access drinking water from an improved water source in 2016 (Figure 6)\(^{(4)}\). This means that about 1 in every 2 Yemenis uses an unimproved drinking water source. Given that the unimproved water resources, including the free water provided by philanthropists which are the main source of water for the poor, are a major factor of cholera; it’s necessary to expand the humanitarian support to provide improved and safe drinking water to people to control the epidemic.

![Figure(6) Proportion of population using improved drinking-water sources (%), 2015](image)


Similarly, Yemen is still lagging behind in the use of improved sanitation. In 2013 (pre-war), only 52.5 of Yemeni households had access to improved sanitation facilities\(^{(11)}\), compared with 78% in the Eastern Mediterranean Region in 2015\(^{(5)}\). There is a significant difference in the use of improved sanitation facilities in rural areas (39.4%) and urban areas (92.3%) in Yemen\(^{(11)}\). The difference was greater across wealth quintiles. The use of improved sanitation facilities was nearly universal among the richest quintile (96%) compared to only 5% for the poorest\(^{(11)}\).

This makes poor people more vulnerable to diseases and epidemics. Yemen is a country with high mortality rate due to unsafe water and sanitation services and lack of hygiene, which reached 13 cases per 100,000 populations in 2012. Thus, Yemen is among the six worst countries out of 21 countries in the Eastern Mediterranean Region\(^{(5)}\).

According to estimates of the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), 15.7 million Yemenis do not have access to clean water\(^{(12)}\), sanitation and hygiene. The accumulation of garbage on streets every now and then, particularly during strikes of sanitation workers, contributes to disease outbreaks. Thus, the fatality rate related to unsafe water, sanitation and hygiene, which is a major factor of cholera outbreaks, is on the rise. In fact, cholera is affecting an average of 4,942 Yemenis per day\(^{(11)}\).

![Figure(7) Mortality rate attributed to exposure to unsafe WASH (water, unsafe sanitation and lack of hygiene) services (per 100,000 population), 2012](image)

3. Prevalence of malnutrition:

Malnutrition has been a chronic problem in Yemen for decades. However, it has now become a serious threat to millions of Yemenis and a threat to the future of human and economic development. Almost one in two children under the age of five suffers from stunting and 16.3% suffers from acute malnutrition (wasting). These are high and critical rates that place Yemen among the seven worst states on the Global Malnutrition Map\(^6\).

Malnutrition blunts children growth and intellect, thus reflecting negatively on their productivity and income in the future. According to the Global Nutrition Report (GNR) 2016, the economic losses due to nutritional negligence are estimated at about 10% of Gross Domestic Product (GDP)\(^6\). Malnutrition is increasing every day as a result of the worsening economic and humanitarian crises in the country. Figure (8) shows that malnutrition ranged between 25.2% in Hodeida and 5.6% in Sana’a respectively in 2016. On the other hand, the figure (9) indicates that the prevalence of stunting and wasting is higher in the 50 countries classified by the Organization for Economic Co-operation and Development (OECD) as “fragile states” compared to other non-fragile states. Yemen is characterized as a fragile state where stunting and wasting rates among children are higher than the average fragile states.

Hundreds of thousands of Yemeni children and mothers are at risk of acute malnutrition’s complications, including illness and death. Thus, diagnosing and treating a malnourished child who is at the same time infected by cholera represent a double challenge and require special treatment and health care\(^13\). Similarly, malnourishment weakens children’s immunity system against cholera, which explains the high percentage of cholera cases and deaths among children in Yemen. Thus, the elimination of cholera requires an integrated approach that takes into account the problem of malnutrition.

Third: Cholera Funding Requirements:

Public social and development spending programs have been halted due to the liquidity crisis in the public budget. In the light of the experiences of other states, such as Haiti, cholera may last several years. It is unlikely to control this fatal epidemic without restoring the sectors that are closely related to cholera, particularly health and WASH. The following is a preview of the requirements in the public budget and the Revised Humanitarian Response Plan to operate these sectors, as follows:

Public budget and cholera:

1. **Health requirements in the public budget:**

   Scarcity of financial resources is a key issue that has been a major challenge to the health system in Yemen. For example, public spending on health did not exceed 4% of the total public expenditures in 2014, compared to 8.8% in the Eastern Mediterranean Region and 11.7% in the world on average (figure 10). Despite the limited public spending on health in Yemen, about 52,723 health workers have not received payment since late 2016\(^14\), and maintenance and operating expenses have stopped as well. This has severely affected the continuity and quality of communicable disease services and other health services.
According to the final accounts of the 2013 public budget, the spending on the health sector was YER113.7 billion (equivalent to $307.2 million), of which 39.6% to wages and salaries and 21.7% to operational costs (table 2). These amounts reflect the minimum requirements of the health sector, which is suffering from declining supply of health services and growing demand for healthcare at the same time.

### 2. Water and Sanitation Requirements in the Public Budget:

The most significant emerging obstacles hindering access to improved water, sanitation and hygiene services are the physical damage to water and sanitation facilities in several parts of the country; inability of the public budget and local authorities to provide maintenance, fuel and operational expenses; nonpayment of employees working in relevant facilities and decline in revenues of the Water and Sanitation Corporation and inability of consumers to pay water bills.

To ensure the continuity of this vital sector, it is important to pay salaries of water, sanitation and cleaning funds workers on a regular and sustainable basis, which amount YER21,892 million (equivalent to $59.2 million) and cover the necessary operational costs which amount YER12,025 million (about $32.5 million) annually (table 3).

### 3. Malnutrition requirements in the public budget:

Figure (11) indicates that unlike many other countries worldwide, Yemen’s public budget doesn’t devote direct resources to nutrition even during the pre-war times. This has negatively impacted on nutrition in the country. Now, the public budget expenditures, including salaries of public employees, have been suspended and this requires increased donor support to nutrition programs, particularly in Tihama area.
Funding requirements of the Humanitarian Response Plan:

A total of $254 million is required to implement activities outlined in the integrated cholera response plan during May-December 2017 (table 4). The plan seeks to implement emergency interventions in health, water, sanitation and communication to control the cholera outbreak and prevent further spread. As of October 2017, only about $148 million was available, representing 58% of the funding requirements.

Humanitarian INGOs, WHO and UNICEF in particular, are exerting significant efforts to control the cholera outbreak, including water chlorination; establishment of cholera treatment centers and oral rehydration centers; training health workers and raising cholera awareness. However, the level of the outbreak has exceeded the expectations and capacities of humanitarian NGOs operating in Yemen. As of October 1, 2017, the actual number of suspected cholera cases (780,886) had far exceeded the expected number in the plan (535,226) by the end of 2017(15). Thousands of Yemenis are still falling ill every day with symptoms of cholera. In contrast, only 58% of the target number of oral rehydration corners (ORCs) in the plan have been established. Active partner organizations are present in less than half of the cholera-affected districts.

This requires expanding the integrated cholera interventions and mobilizing donor support not only to bridge the funding gap in the Cholera Integrated Response Plan, but also to cover the funding gap of the revised 2017 Humanitarian Response Plan in the cholera-related sectors, particularly health, water, sanitation, hygiene and nutrition (figure 12).

<table>
<thead>
<tr>
<th>Sector</th>
<th>Million USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASH</td>
<td>145.262</td>
</tr>
<tr>
<td>Health</td>
<td>108.791</td>
</tr>
<tr>
<td>Total cholera</td>
<td>254.053</td>
</tr>
</tbody>
</table>

Table (4) Funding requirements of the Integrated Cholera Response Plan during May-December 2017


When people are infected with cholera, they incur direct healthcare costs, including the cost of medicines, transportation to hospital, and hospital stays. There are also indirect costs such as the loss of cholera patients or deaths’ contribution to the economy. The cost of cholera may extend to other sectors of the economy, such as tourism and food exports, which have been already devastated in Yemen due to the ongoing war.

The poorest households are most vulnerable to cholera infection and its economic repercussions due to the lack of hygiene and poor immunity of the already-malnourished children, in addition to the lack of health insurance and shortage of savings, which hinder people’s access to healthcare services. When a cholera patient dies, especially if he or she is a breadwinner, children often drop out of school to help support the remaining family members. This leads to the “poverty trap” from which people are not able to escape, sometimes for multiple generations. To avoid the economic and human losses of cholera, there should be integrated interventions to control cholera, including the provision of oral cholera vaccine (OCV).
Response Framework:

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>🔍</td>
<td>Reinforce early warning and disease surveillance to ensure timely reporting of cases, laboratory confirmation and response mechanism</td>
</tr>
<tr>
<td>📈</td>
<td>Improve cases management and infection control practice to reduce mortality at health facility level</td>
</tr>
<tr>
<td>📋</td>
<td>Strengthen risk communication campaigns</td>
</tr>
<tr>
<td>💢</td>
<td>Improve infection control and WASH activities</td>
</tr>
<tr>
<td>🚛</td>
<td>Enhance logistics and supplies for outbreak control and future preparedness</td>
</tr>
<tr>
<td>👥</td>
<td>Ensure incident command system at national governorate and district level</td>
</tr>
</tbody>
</table>

Source: UN HTC, Presentation on Cholera Response Updates, August 2017.

Key References:

Annex:

Cholera transmission control system in Haiti: