

YEMEN

Heavy rainfall and flash floods

Briefing note – 23 April 2020

Heavy rains since April 13 led to flooding, displacement, severe infrastructure damage and casualties across Yemen. 14 governorates were affected. Sana'a city, Sana'a, Ma'rib, Aden, and Lahj governorates reported the most significant impact.

The floods have damaged civilian infrastructure: roads, bridges, electricity, and water networks. Preliminary information indicates at least 100,000 people were affected across the country between 13 and 21 April, with at least 15 deaths and 89 injuries reported. At least 7,000 people have been displaced. These numbers are likely to increase as humanitarian actors assess the impact.

IMPACT



Source: OCHA, WASH Cluster, CCCM Cluster, Operational actors in Yemen

Anticipated scope and scale

Heavy rainfall likely affected **more than a million people**. **100,000 are in need of assistance according to early assessments.**

Sana'a, Ma'rib, Ta'iz, and Dhamar will likely experience **heavy rain in the coming days**, aggravating the impact on infrastructure and hampering access to communities affected by flooding. **The rainy season in Yemen lasts from March to October.** More rainfall and flooding is expected across the affected areas. **Cholera, malaria, and dengue fever** is expected to increase in Yemen in the upcoming months in line with the rainy season.

Key priorities



+100,000
People in need of assistance



increased risks
of cholera, malaria, and dengue



severe damage
to houses and infrastructure

Humanitarian constraints

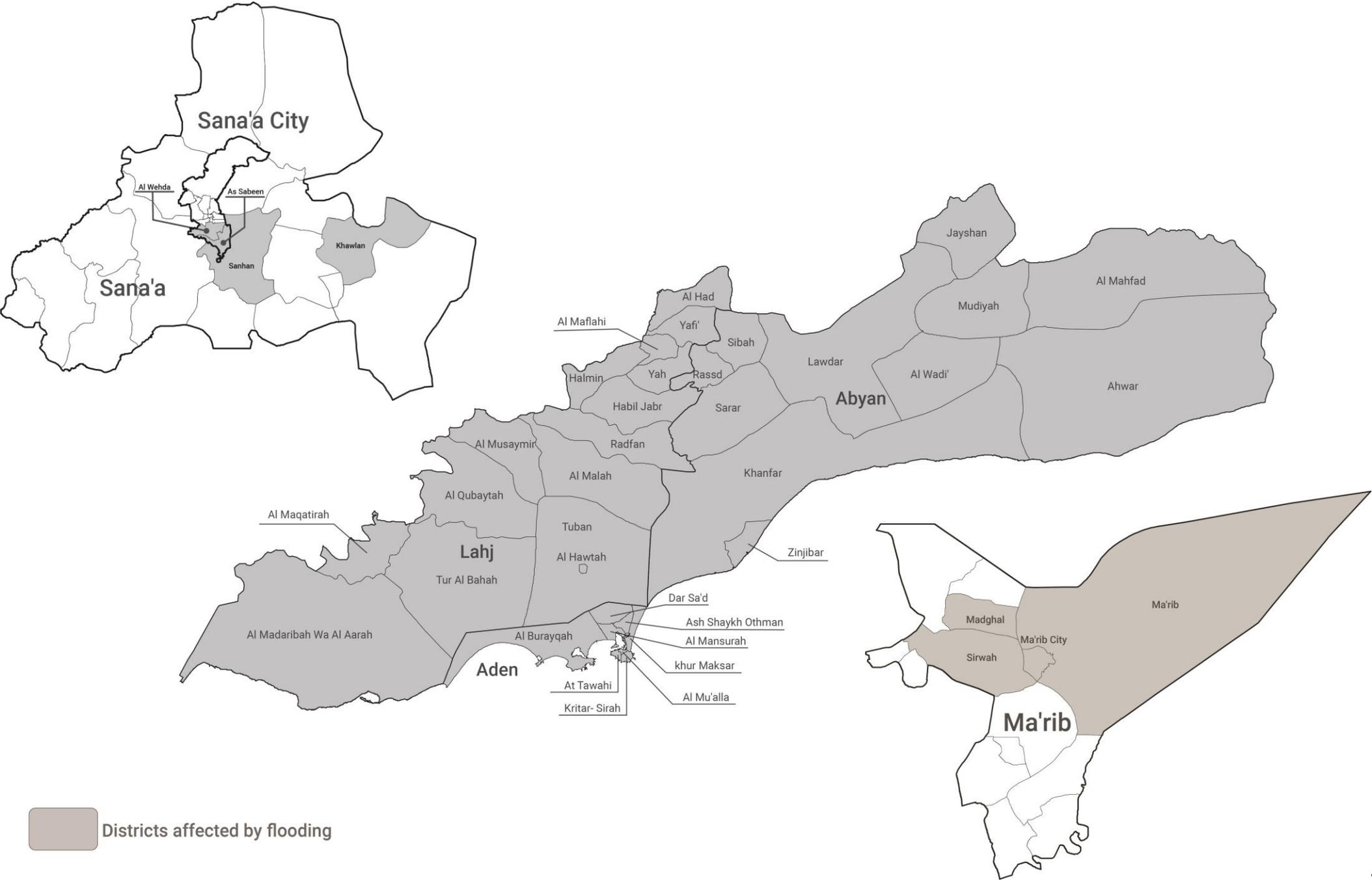


The flooding has caused destruction to roads, bridges, and blocked access to affected areas, which resulted in temporary disruption to humanitarian activities. Humanitarian movements are already difficult due to COVID-19 measures.

Limitations

This report is based on the preliminary assessments of various flood-affected areas. There is no consistency on the numbers reported in different assessments. Numbers are expected to change as assessments continue.

Affected areas in Sana'a, Sana'a city, Aden, Lahj, Abyan, and Ma'rib, governorates



Key characteristics

Key indicators	Sana'a governorate	Sana'a city	Ma'rib	Aden	Lahj
Areas affected	Sanhan and Khawlan districts	Al Wehdah and As Sab'in districts	Ma'rib, Ma'rib city, Sirwah, and Madghal districts	All districts	All districts
Population in need (from preliminary assessments)	est. 2,000 people (in Sanhan)	est. 4,000 people (3,500 in As Sab'in and 95 in Al Wehdah)	est. 37,000 people	est. 11,000 IDPs (assessments so far have only covered IDPs)	est. 30,000 IDPs (assessments so far have only covered IDPs)
Estimated population of the districts (HNO 2019)	Sanhan – 355,000 Khawlan – 30,000	Al Wehdah – 201,000 As Sab'in – 612,000	Ma'rib – 85,500 Ma'rib city – 117,000 Madghal – 15,000 Sirwah – 32,300	997,000	1,058,000
Flood- related casualties	No reports of injuries or deaths	Two deaths and no injuries reported	Seven deaths (5 females, 2 children), 85 injuries reported	Eight deaths including five children and four injuries	No reported injuries or death
Flood – related displacement	No displacement reported	3,900 people displaced to either mosques, schools or houses of relatives	3,000 people displaced to hotels in Ma'rib city	No data	No data
IDPs in the affected districts (DTM Round 37 – November 2018; RDT IOM 2019)	30,000 IDPs (25,500 as of 11/2018 + est. 4,000 new IDPs in 2019)	27,000 IDPs (20,000 as of 11/2018 + est. 7,000 new IDPs in 2019)	174,000 IDPs 116,000 as of 11/2018 + est. 11,000 new IDPs in 2019 + est. 47,000 new IDPs in 2020)	63,400 IDPs (60,000 as of 11/2018 + 3,400 new IDPs in 2019)	75,000 IDPs 69,000 as of 11/2018 + est. 6,000 new IDPs in 2019)
2020 Cholera suspected cases per governorate (WHO)	17,637 suspected cases	8,945 suspected cases	226 suspected cases	358 suspected cases	870 suspected cases
% of population in IPC 3–5 in affected districts (IPC 2019)	65%	70%	6% in Sirwah, 50- 75% in other districts	45 – 75%	60 – 81%
SAM + MAM (U5) 2019 caseload in the affected districts	15,170	25,800	12,500	70,000	77,000
Accessibility of affected districts (OCHA 2019)	Accessible	Accessible	Sirwah – hard to reach Other districts – accessible	Accessible	Al Qabbaytah – hard to reach Other districts - accessible

Crisis impact

Heavy rainfall has been affecting Yemen since 13 April, leading to flooding, displacement, severe infrastructure damage, and casualties. Rainfall and flooding affected 14 out of 22 Yemeni governorates between 13 and 21 April. Sana'a, Sana'a city, Ma'rib, Aden, and Lahj governorates reported the most significant impact. According to preliminary information, at least 100,000 people are in need of assistance across the country with at least 15 deaths and 89 injuries reported. At least 7,000 people were displaced. These numbers are likely to change as humanitarian actors continue to assess the impact (OCHA 21 April 2020, sputniknews 22 April 2020, Echo 22 April 2020, CCCM Cluster 22 April 2020)

Northern Yemen witnessed heavy rain and flash floods over 13-18 April. At least 42,600 people are in need of assistance in Ma'rib, Sana'a city, and Sana'a governorates. Most affected areas were Sanhan and Khawlan districts in Sana'a governorate, Al Wehdah and As Sab'in districts in Sana'a city, and Ma'rib city, Al Wadi, Madghal and Sirwah districts in Ma'rib governorate. Ba'dan district in Ibb and Abs district in Hajjah governorate were also affected (OCHA 21 April 2020, ACAPS discussion with operation actors).

Nine people died and an estimated 85 were injured, including seven with severe injuries. The floods damaged civilian infrastructure: roads, bridges, electricity, and water networks. Severe damage to civilian houses and assets resulted in displacement of at least 7,000 people. Flooding destroyed tents and shelters in IDP sites, particularly in Hajjah, where flooding left approximately 2,800 people in need, while at the same time disrupting humanitarian distributions (Assessment by CSSW 15 April 2020, OCHA 21 April 2020)

In Sana'a governorate rainfall started on 13 April. Sanhan and Khawlan districts were severely affected. An estimated 328 families (around 2,000 people) are in need of assistance. All assessed people presented acute shelter and WASH needs due to infrastructure damage. Water and sanitation networks were damaged. Rain water mixed with sewage which resulted in water contamination and solid waste accumulating in the streets (ACAPS discussion with operational actors, OCHA 21 April 2020, WASH cluster April 2020).

In Sana'a city, As Sab'in and Al Wehdah districts were the most affected. Two people reportedly died in As Sabain district. At least 4,000 people are in need in these districts. The Supreme Council for the Management and Coordination of Humanitarian Affairs (SCMCHA) reported that 650 families (3,900 people) were evacuated and displaced to mosques, schools, or houses of relatives. The houses of the affected households were partially damaged, and their food stocks, furniture, mattresses, blankets, and clothes were damaged by water and mud. The poor quality of housing (traditional construction) and poor infrastructure and sanitation made the flooding worse (OCHA 21 April 2020, ACAPS discussion with operation actors)

In Ma'rib governorate, torrential rains, flooding, and a sandstorm which started on 15 April have affected an estimated 6,290 families (37,000 people) in four districts: Ma'rib city, Sirwah, Al Wadi, and Madghal. Seven people died (5 women, 2 children) and 85 were injured, including 7 severely injured. The majority of those affected are from displaced families living either in tents or in houses outside IDP sites, particularly around Ma'rib City. Some 5 -10% of those affected are estimated to originate from local host communities (OCHA 21/04/2020).

Massive impact on IDP sites was reported in Ma'rib. Up to 3,000 shelters were reported destroyed and over 1,200 damaged. Thousands of IDP tents were destroyed and supplies and NFIs were washed away by flooding (OCHA 21/04/2020).

A tropical storm affected southern Yemen on 21 April. Significant impact was reported in Lahj, Aden, Ta'iz, Ad Dali', Abyan, and Hadramawt. According to preliminary assessments, up to 64,000 IDPs alone were affected in these governorates. There were no estimates of the impact on the general population at the time of writing (CCCM cluster 22 April 2020).

On 21 April, the Internationally Recognised Government of Yemen declared Aden a disaster area, following heavy flooding. All districts were affected but Crater, Al Mu'alla, At Tawahi and Khur Maksar districts reported the most significant impact. Eight people died as a result of flooding, including four children. Authorities reported severe damage to roads and houses. An estimated 11,000 displaced people living in IDP sites were affected (sputniknews 22 April 2020, Echo 22 April 2020, CCCM Cluster 22 April 2020).

All districts of Lahj were affected. significant impact was reported in Radfan and al Habalin districts. An estimated 30,000 IDPs living in displacement sites were affected. The impact of the flooding is still unknown. Assessments are ongoing. (ACAPS discussion with operational actors, CCCM Cluster 22 April 2020)

At least 23,000 IDPs were affected in Ta'iz (10,000 people), Ad Dali' (6,000 people), Hadramawt (3,900 people), Al Maharah (1,800 people) and Abyan (1,600). Assessments to identify the most urgent needs are ongoing (CCCM Cluster 22 April 2020).

Displacement: Flooding has caused displacement of at least 7,000 people in Sana'a city and in Ma'rib governorate. The majority of flood-affected people in Ma'rib governorate are displaced people who were living in IDP sites.

An estimated 650 families (3,900 people) in Sana'a city have been either displaced or evacuated to schools, mosques, or houses of relatives. In Ma'rib, an estimated 500 families (3,000 people) have been evacuated to hotels in Ma'rib city (OCHA 21 April 2020). Main needs reported by the displaced are food, shelter, and NFIs such as mattresses. (Assessment by Executive unit 15 April 2020, assessment by CSSW 15 April 2020)

Shelter: All affected areas reported severe damage to houses and urgent needs of shelter support and NFI kits (such as mattresses and blankets). Houses and furniture were either

completely or partially destroyed by rainfall and the influx of water and mud. Fragile makeshift structures and IDP shelters such as tents were most vulnerable. Shelter damage left people living in partially damaged houses or sleeping in the open.

Abyan reported particularly high numbers of completely damaged shelters in IDP sites. In Ma'rib, thousands of IDP tents were destroyed. Around 2,900 shelters were destroyed and 1,300 shelters damaged.

Food: Flooding damaged people's food supplies. Many shops and local markets reported loss of stocks in the floods. Preliminary assessments suggest that all affected people are in urgent need of food assistance (ACAPS discussion with operational actors).

Seasonal flooding has a huge impact on livelihoods and agriculture. Affected people reported loss of livestock and crop damage. These losses are likely to have an impact on food insecurity and malnutrition. 20 million people are food insecure in Yemen, including 10 million who are suffering from extreme levels of hunger (HNO 2019).

WASH: The floods have caused damage to the water system in most of the affected areas. Many families have reported damage to underground reservoirs where drinking water and sewage have mixed due to flooding. Solid waste has accumulated in streets and pathways and mixed with sediment, flood water, and sewage causing restrictions to movement. There is a high risk of disease due to contamination of houses and furniture with human waste (WASH Cluster April 2020).

Health: Flooding has caused contamination in houses in Sanhan district, Sana'a governorate. Water wells contaminated with flood water and sewage pose a great risk for cholera (ECHO 22 April 2020)

Protection: Many displaced people in Ma'rib governorate reported the loss of identification cards, birth certificates and marriage certificates. The documents were washed away by the floods. (Assessment by CSSW 15 April 2020)

Vulnerable groups affected

IDPs living in displacement sites were especially vulnerable, as their shelters could not withstand such severe weather conditions.

Children play in the flooded areas, putting them at risk of drowning and making them vulnerable to diseases. Up to 25% of currently reported suspected cholera cases are children under the age of five (WHO).

Humanitarian and operational constraints

The flooding caused destruction to roads, bridges, and blocked access to affected areas, which resulted in temporary disruption of humanitarian activities. Accessing the affected areas was particularly difficult due to stagnant water and residue blocking passage. This

resulted in temporary disruption in humanitarian distributions (for example in Hajjah) and hampered assessments (ACAPS discussion with operational actors) Water trucking in rural areas was difficult due to saturation of fragile unpaved roads.

Some humanitarian organisations reported challenges accessing affected communities due to limitations on movement and problems acquiring permits from authorities to conduct assessments (OCHA 16 April 2020, IOM February 2020)

Yemen is already facing access constraints due to bureaucratic impediments and insecurity. Humanitarian access is particularly difficult in northern Yemen where humanitarian organisations face increasing access restrictions such as bureaucratic impediments, interference to humanitarian operations, delaying and denying permits to access areas in need, and a lack of assessments.

Humanitarian movements are particularly difficult right now due to COVID-19 measures. The Government of Yemen in the south and the Houthi authorities in the north introduced several measures to prevent the spread of the virus, such as partial curfews and limits on travelling across governorates. Some organisations have also reduced activities due to the risk of the spread of corona virus. (ACAPS discussion with operational actors, Al Masdar 14 April 2020).

Aggravating factors

Rainy season

The rainy season in Yemen lasts from March to October. The southern uplands (Ibb, Al Bayda, Ad Dali', and highlands in Abyan, Ta'iz, and Lahj) report the highest levels of rainfall with an annual average of 561 mm. The central highlands (Amran, Sana'a, Dhama, and the highlands of Sa'dah, Hajjah, Al-Mahwit and Ma'rib) experience the most rain between March to May and July to August (FEWSNET 31/01/2015).

Southern coastal areas from Hajjah to Al Maharah are generally hot and dry and do not have a distinct rainy season. However, heavy rainfall occurs sporadically in these areas and often leads to flash flooding due to weak infrastructure and a lack of preparedness.

Sana'a, Ma'rib, Ta'iz and Dhamar will likely experience heavy rain in the upcoming days, which is likely to aggravate the impact on infrastructure and hamper response efforts and access to communities affected by flooding.

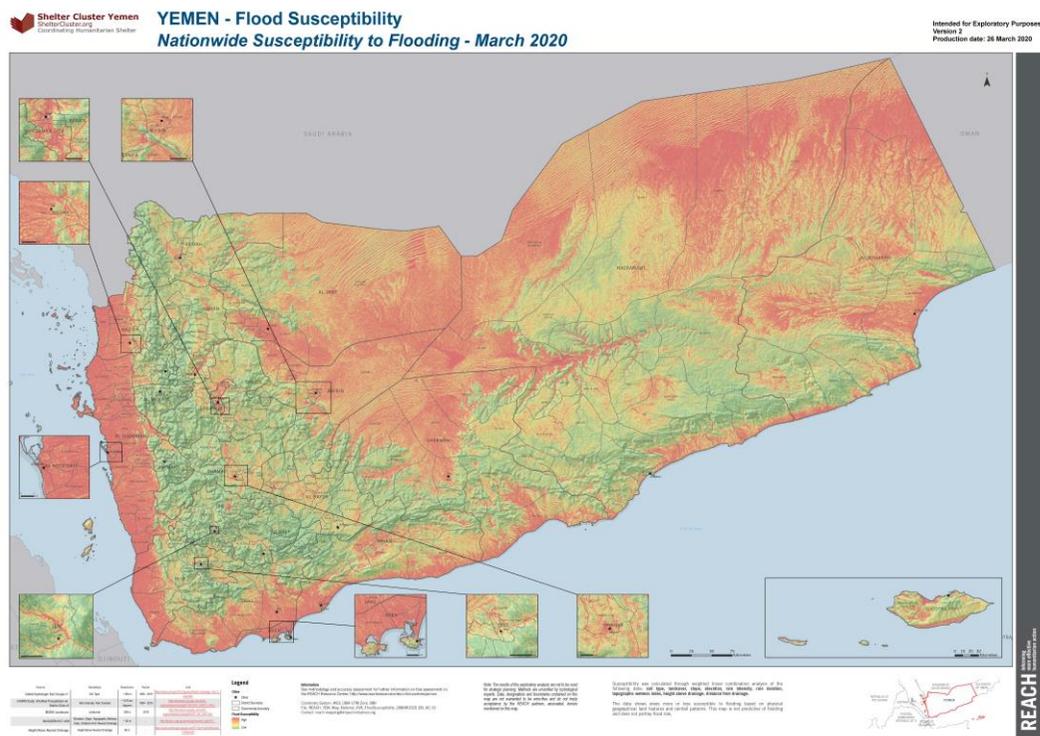
Flood susceptibility and previous flooding

Based on the physical land features and rainfall patterns, areas most susceptible to flooding in Yemen are coastal and central areas of Hajjah, Al Hodeidah, Ta'iz, Lahj, Aden, and Abyan, as well as wadi areas in Ma'rib, Shabwah, and Al Jawf.

High-magnitude flooding often leads to agricultural losses (crops, fruit trees), death of animals caught in high floodwater surges, and destruction of infrastructure, such as irrigation and rural roads. The damage done by floods is exacerbated by ongoing desertification and land degradation. Flooding has a direct impact on food insecurity and water shortages (REACH 12/09/2019, International Food Policy Research Institute 2011).

In March 2020, heavy rain and flash floods affected Aden, Lahj, Abyan, Tai'z, Ad Dali', Al Maharah and Hadramawt governorates. Flooding in March was most severe in Crater, Al Mu'alla and Ash Shaykh Othman districts in Aden, where severe damage to infrastructure and casualties were reported. An estimated 28,000 displaced people in 60 IDP sites in the seven governorates were affected by flooding. Water and electricity networks were damaged, leading to power cuts. Sewage and drainage systems were severely damaged as well.

In 2019, at least 130,000 people were affected by flooding between June and August, and at least 17,000 IDP households (around 101,000 displaced people) in September / October (OCHA). Most affected areas in 2019 were Hajjah, Al Hodeidah and Al Mahwit.



Yemen – Flood Susceptibility, source: REACH March 2020

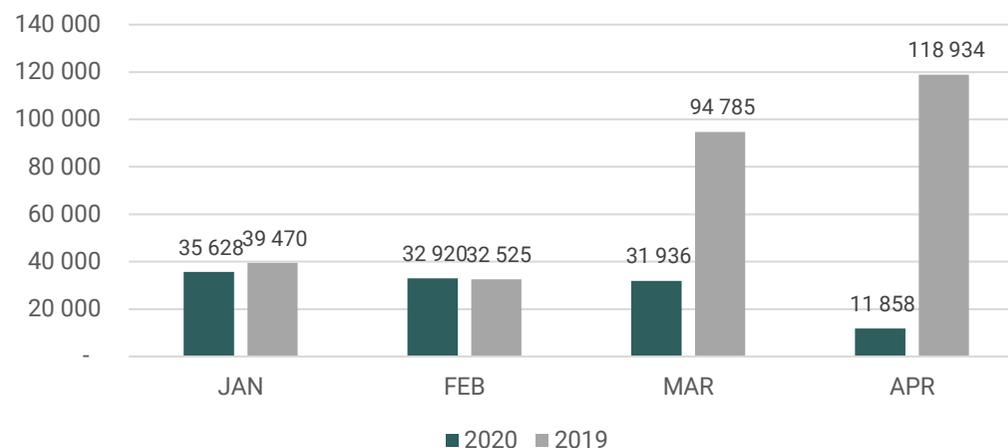
Health risks

Damage to water and sanitation infrastructure leads to water contamination and shortages of clean potable water, which exacerbates the spread of diseases such as cholera, malaria, and dengue fever.

Cholera is expected to increase in Yemen in the coming months in line with the rainy season. The highest risk of cholera transmission was identified for Sana'a, Ta'iz, and Dhamar. The risk of transmission is increased by seasonal factors (rainfall, flooding), Ramadan (April 23 – May 23), when people gather and share food, and the potential impact of COVID-19 measures, if sick people have to quarantine in confined spaces with others. Quarantine centers are of particular concern, as they do not have adequate WASH facilities (ACAPS discussion with operational actors, 04/2020).

However, so far the impact of cholera was much lower than in 2019. Over 112,000 suspected cholera cases with 28 deaths (CFR 0.03%) were reported between 1 January and 16 April 2020. This constitutes less than 50% of suspected cases reported in the same timeframe in 2019 (237,500 suspected cases and 514 deaths). As of early April, the trend of cholera cases in Yemen was decreasing and both the case fatality rate (CFR) and the attack rate were considerably lower compared to 2019. However, this could increase with the onset of the rainy season.

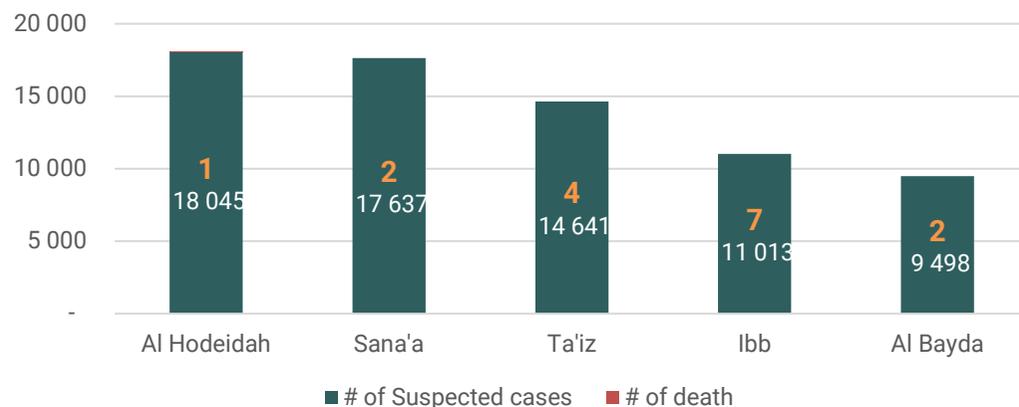
Cholera suspected cases trend 2019/2020 as of 16 April 2020



Source: WHO access 22/04/2020

Governorates registering the highest suspected caseloads of cholera so far in 2020 are: Al Hodeidah, Sana'a, and Ta'iz. Ta'iz, Ibb, Dhamar, and Sana'a governorates registered increasing attack rates in March 2020, increasing the probability of higher caseloads in the upcoming weeks.

Governorates with highest cholera suspected cases and deaths in 2020



Source: WHO access 22/04/2020

Standing water caused by heavy rainfall can act as breeding sites for mosquitoes, increasing potential exposure of the disaster-affected population to infections such as dengue fever and malaria Flooding may initially flush out mosquito breeding, but it comes back when the waters recede. The lag time is usually around 6-8 weeks before the onset of a malaria epidemic (WHO accessed 22/04/2020).

A significant increase in dengue cases was observed in December 2019. Up to 37,000 cases of dengue were reported in Yemen between January and March 2020, almost 450% more than in the same timeframe of 2019 (6,759 cases). Almost all Yemeni governorates report dengue cases. In recent weeks, the trend of dengue cases was decreasing. **Suspected malaria was one of the main leading causes of mortality in Yemen towards the end of March** (EIDEWS 29 March 2020).

COVID-19

As the first case of COVID-19 was reported in Hadramawt in April 2020, the likelihood of the disease spreading is high and the impact could be catastrophic. It is likely there are already more infected people in Yemen that have not been detected. Flooding might exacerbate the spread of disease due to water contamination and crowded conditions, hampering self-isolation.

However, the overwhelming focus of the response on COVID-19 risks hampering response and preparedness for other hazards. Some of the cholera kits and resources have already been repurposed for COVID-19. Although humanitarian actors report that the current level of preparedness for cholera increases is adequate, the Yemeni health system could become easily overwhelmed in the event of parallel outbreaks.

At least 80% of health services provided through the response is at risk due to funding shortfalls (OCHA 20/04/2020). Yemen's infrastructure has been devastated by five years of conflict, leaving little capacity to respond. Only 51% of health centres are fully functional. There is limited medicine, equipment and personal protective equipment available and only three testing sites (Sana'a, Aden, and Al Mukalla). Read more on COVID-19 risk in Yemen here.

Ongoing conflict and new displacement

Current flooding affected areas which witnessed increased conflict and displacement in the last three months. Since the beginning of 2020 violence has been increasing across multiple locations in Yemen, including in Sana'a, Ma'rib, Al Jawf, Al Hodeidah, Ad Dali', and Ta'iz governorates.

As of mid-April, ground fighting continued throughout the country. Houthis continued clashing with the internationally-recognised Government of Yemen (IRG) forces in western Ma'rib and Ad Dali'. Forces loyal to the Southern Transitional Council (STC) and the IRG clashed throughout Abyan, Aden, Lahj, Shabwah, and Socotra. Tensions remain very high in southern governorates as of late April with different armed factions consolidating forces and trading blame for ineffective response to the flooding (ACLED 18/04/2020, Debrief 21/04/2020).

Close to 36,000 people (9,000 households) have fled conflict affected areas in the Ma'rib and Al Jawf governorates since late January 2020. IDPs have mainly moved into Ma'rib City, Ma'rib Al Wadi, Medghal and Sirwah districts in Ma'rib governorate (IOM 13/04/2020).

New and existing IDPs in Ma'rib were already in need of humanitarian assistance, in particular shelter. Most of them were displaced multiple times. Ma'rib governorate was already hosting over 750,000 IDPs from previous conflicts as of November 2018 (IOM 03/2019).

Funding

As Houthis continue to restrict humanitarian access, humanitarian organisations face increasing funding shortfalls due to access restrictions (bureaucratic impediments, interference in humanitarian operations, delaying and denying permits to access areas in need) and a lack of assessments. In March 2020, the US announced it would withhold funding to north Yemen unless the Houthis allow greater access, leading to a scale down in some programs.

On 27 March 2020, WFP announced cutbacks on food aid in line with the USAID partial suspension of aid to Houthi controlled areas. An estimated 8.5 million people in northern Yemen dependent on monthly food assistance are facing a 50% reduction in assistance. This will reduce access to food assistance among flood affected and food insecure populations and increase the magnitude and severity of acute food insecurity in northern Yemen.

Some 31 out of 41 major UN programmes will likely start to close in the next few weeks due to funding shortages. The closure of humanitarian programmes risks decreasing WASH, food, and shelter support to populations affected by floods. At least 80% of health services provided through the response are at risk (OCHA 20/04/2020).

Information gaps and needs

- Lack of information on the impact of flooding in the south on the general population. Assessments on the south currently available to ACAPS have only focussed on IDPs
- Lack of information on the numbers of people displaced due to flooding
- Lack of information on the levels of internal displacement in Sana'a and Sana'a city governorates

Lessons learnt

- Floods are not short-term events. The impact of a flood can last for a considerable time even when a flood is of short duration. The consequences of the loss of assets, shelter, and livelihoods and the deaths of economically active household members can endure for many years (Alnap 2014).
- Engagement with local authorities is critical. While the engagement of the community and of local authorities is often identified as a critical factor in humanitarian action, it is of particular relevance in flood relief operations. That is because of the long-term nature of many flood impacts and because many of the measures required for effective risk reduction require intervention by the local authorities (Alnap 2014)
- Quick WASH response in flood events can limit the outbreak and spread of diseases (WASH Cluster 2009)
- Quick provision of shelter for flood-affected people can help to limit disease outbreaks and make community spaces such as education facilities, which have been used to shelter displaced people, available again (WASH Cluster 2009)
- Needs assessments should incorporate existing knowledge and be flexible and coordinated. Needs assessment and data collection are difficult in Yemen due to conflict and bureaucratic access constraints. In flooding in particular, needs assessments may be constrained by access difficulties. It is important to use existing information to make well-founded assumptions on the needs and capacities of the affected population. While needs assessments are necessary, they should be flexible to adapt to what agencies already know as well as local context and constraints (ALNAP 2014).
- Economically vulnerable people are most at risk of death during flooding. Poverty and vulnerability to disasters are intertwined and mutually reinforcing. After five years of conflict Yemenis have largely depleted their savings and lost their main sources of income. In 2014, 48% of the population fell below the poverty line, of whom 75% were rural and 25% urban. Following five years of conflict, the World Bank estimated between 71-78% of the Yemeni population (a minimum of 21 million people) had fallen below the poverty line at the end of 2019 (World Bank 30/03/2020). Targeting the most economically vulnerable communities should be a priority (ALNAP 2014).