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MEDICAL EMERGENCIES

How Yemen's healthcare has been destroyed

The Houthi assault on Marib, the last government stronghold in north Yemen, is the latest volley in a vicious seven year civil war that has left Yemen's healthcare system in tatters and its population facing starvation, report **Geetanjali Krishna** and **Sally Howard**

Geetanjali Krishna, Sally Howard

They arrive at Marib General Hospital every day in their hundreds: adults and children wounded by the ongoing conflict in Yemen. The war has intensified since September, when Iran-backed Houthi rebels launched an assault on the last city in northern Yemen still controlled by the internationally recognised government of Abdrabbuh Mansur Hadi.

On a typical day in October the hospital treated a pregnant woman with blast injuries to her chest, a child with multiple shrapnel wounds, and a 2 month old baby with a traumatic brain injury caused by Houthi missile fire.

"Médecins Sans Frontières (MSF) is concerned about the impact of the conflict on the civilian population during the recent escalations," says Allen Murphy, MSF project coordinator for Marib, where the organisation's medical staff support government facilities.

Patients arrive at the 120 bed government hospital malnourished and with infectious diseases including diphtheria, cholera, and covid-19, now in its third wave.

"Marib is hosting more than 70% of Yemen's internally displaced people, which puts huge pressure on healthcare services," says Basheer Al-Selwi, head of the International Committee of the Red Cross' health response in Yemen. In this conflict hotspot, Houthis have been indiscriminately firing on civilians¹ in a campaign to consolidate their grip on the country's north, according to Human Rights Watch. Forty makeshift refugee camps have now been set up on the city's outskirts.

Marib is the latest epicentre in a humanitarian crisis in Yemen that the UN has called the "worst in the world"² and which, according to the US based Armed Conflict Location and Event Data Project, has caused more than 100 000 deaths.³

"I'd rather die of covid"

The Houthis, an Islamist political and armed movement that emerged in northern Yemen in the 1990s, seized territory including the capital Sana'a in 2014.

A Saudi led coalition, backed by the US and UK, intervened to stop the Houthis, who have an alliance with Iran. Episodic airstrikes by this coalition have destroyed Yemen's water systems, electricity network, and sanitation systems, and have killed or injured more than 18 000 civilians. A sea, land, and air

blockade instituted by the Saudi led coalition has made it difficult for fuel and medical supplies to reach the country, meaning organisations such as Unicef and MSF have to use their own small planes to bring medical supplies to the country.

For several months in 2021, the emergency ward of Al-Thawra General Modern Hospital, Yemen's largest medical facility, was unable to source spare parts to repair its ultrasound machines. Delayed supplies of vaccines have interrupted the childhood immunisation programme. Air strikes have targeted poultry farms, fish hatcheries, and pomegranate farms, and the blockades have led to starvation as food supplies and diesel for food transportation cannot make it through.

"A large number of people in Yemen are suffering from severe malnutrition," says Aisha Jumaan, a public health professional who has been sending covid-19 testing reagents, medicines, and medical equipment to hospitals around the country as president of Yemen Relief and Reconstruction Foundation. "We've had families tell us very specifically that they would rather die of covid because it's a faster death than by starvation," she says.

Malnutrition is perhaps the most pressing public health concern in Yemen. Blockades and crop failures caused by drought have left nearly half the country's population undernourished. Around 90% of Yemenis are fed by imported foods,⁴ and in 2019 the UN declared Yemen to have the world's largest food security crisis driven primarily by conflict.

Current estimates suggest that 16.2 million Yemenis have insecure food supplies, and millions live in famine-like conditions.⁵ Of the 45 000 internally displaced people who have arrived in Marib since September, says MSF, one in 10 is malnourished and 2% are severely malnourished.

Ahmed Mahat says that many of the undernourished patients presenting at clinics have a secondary condition, such as malaria, measles, or cholera. Unicef has confirmed several outbreaks of polio, and suspected cholera cases passed 200 000⁶ in 2020.

The impact of covid-19

With Yemen already facing starvation and diseases associated with deprivation, the impact of covid-19 has been hard to assess.

The official covid-19 death toll of 1649 excludes countless deaths that took place at home in individuals with no

formal diagnosis, owing to the scarcity of tests and hospital beds. Authorities in the north of the country, where most Yemenis live, have not released data on infections. Abdul Malik Al-Houthi, the Houthi leader, said in a televised speech in March 2020 that the virus was an “American conspiracy.”⁷

“The statistics are very deceiving,” says Jumaan. “Barely 50% of the health system is functioning, leaving many people without access to healthcare and many covid cases undocumented.” During the initial stages of the pandemic, Yemenis worried about covid-19 infection overwhelmed the country’s already beleaguered health infrastructure. Now they are presenting late.

MSF’s head of mission in Yemen, Ahmed Mahat, told *The BMJ* that late presentation is a key problem in the country’s third wave of covid-19. “Patients are very sick when they arrive at healthcare facilities and this is because the pillars of community risk and community management are not working,” he says. MSF’s clinics have treated 2000 covid patients since the third wave in August.

At the time of writing, less than 1% of Yemen’s 30.5 million people have received one dose of a covid-19 vaccine, and just 0.05% are fully vaccinated, though a joint World Health Organization/Unicef programme hopes to reach 3.3 million (10% of the population) by early 2022. In the north, an estimated 90% of healthcare workers remain unvaccinated. Distrust of authorities has resulted in low uptake even among medical professionals, says Mahat.

Mike Adeyemi, MSF’s medical coordinator in the capital Sana’a, fears that, against Yemen’s backdrop of misinformation, outbreaks of other infectious diseases, and a low rate of vaccination against covid-19, a surge of the delta or omicron variants is a strong possibility.

Medical emergency

An estimated 20.1 million people in Yemen lack access to basic healthcare. Health facilities are frequently damaged or destroyed by the conflict: 120 attacks were made on medical facilities and personnel between March 2015 and December 2018, and a hospital run by MSF was destroyed in 2015.⁸

Compounding the problem is a lack of staff. According to WHO, in 2014 the country had 5.25 doctors per 10 000 people (by comparison, in the same year Saudi Arabia had 25.65). The 2018 Stockholm agreement⁹ between parties in the conflict set out to assure healthcare workers they would be paid, but many have not, and have left the profession or sought work in the Gulf States, leading to a healthcare brain drain, says Al-Selwi. “Yemen’s health workers have not been paid salaries since August 2016,” Jumaan says.

The covid-19 pandemic prompted international aid donors to reduce spending, and the cuts have hit Yemen hard. To avert widespread famine, the UN hoped to raise \$3.85bn from more than 100 governments and donors at a virtual pledging conference in March 2021, but received just \$1.7bn. UN Secretary General António Guterres described the reduced donations as a “death sentence” for Yemenis.¹⁰

Mahat says medics are feeling this withdrawal of funds in primary care. Clinics no longer receive donations for fuel and therefore have no cold chain capacity for vaccinations: they are also unable to provide services after nightfall. “Many patients who cannot find treatment in primary care are coming directly to already overwhelmed hospitals,” he says. “We are short of almost a billion dollars when it comes to providing basic primary care needs.”

A “lack of oversight by UN and partner agencies on the ground” means that the aid response is not meeting population needs, he says. “There’s little attention paid to quality of care or tracking of necessary medical supplies.”

Ali A Al-Mudhwahi, a medic working in Sana’a, says Yemen’s patchy, aid funded healthcare is not viable in the long term. “I am concerned about the government’s ability to take [on] healthcare financing responsibilities,” he says. “This requires lifting the [Saudi-led] siege instead of allocating unsustainable funding.”

For Jumaan, putting an end to the blockade is the first step. “This will allow the flow of new medical equipment, aid, and food supplies into the country,” she explains. “It will bring down the price of fuel and in turn this will bring down the prices of food and medicine.”

Competing interests: We have read and understood *The BMJ*’s policy on declaration of interests and have no relevant interests to declare.

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