



A TIPPING POINT FOR YEMEN'S HEALTH SYSTEM: THE IMPACT OF COVID-19 IN A FRAGILE STATE



MedGlobal

July 2020

**project
HOPE**

ABOUT MEDGLOBAL

MedGlobal is a humanitarian non-governmental organization working to serve communities by providing sustainable, innovative, and free health care services to refugees, displaced people, and vulnerable populations in crisis-affected areas, regions affected by climate change, fragile states, and low-resource settings. Launched in 2017, MedGlobal was established by a diverse group of doctors, nurses, and medics experienced in humanitarian medicine and emergency services to address the health needs of the most vulnerable across the world. We work in humanitarian emergencies with a focus on collaborations with local health organizations, capacity building for local health professionals, and providing humanitarian and medical assistance. MedGlobal currently supports local health care for vulnerable populations in Bangladesh, Colombia, Ecuador, Gaza, Greece, Iraq, Lebanon, Pakistan, Sudan, Syria, the United States, and Yemen. MedGlobal aims to create a world without health care disparity.

ABOUT PROJECT HOPE

For more than 60 years, Project HOPE has transformed the health and well-being of people and communities around the world. We work on the front lines of the world's health challenges, partnering hand-in-hand with communities, health care workers and public health systems to ensure sustainable change. HOPE's programs focus on empowering local healthcare workers with the knowledge and equipment to improve maternal, neonatal, and child health; fight infectious and non-communicable diseases; and respond to disasters and health crises. Throughout our history, Project HOPE has responded to more than 45 natural disasters, outbreaks, and humanitarian crises around the world. Project HOPE's response to COVID-19 has reached health care workers in more than 70 countries with training programs, equipment, and support.

MedGlobal and Project Hope have established a strategic alliance to build resilience through supporting local healthcare partners in fragile states, crisis-affected countries, and regions affected by climate change. Both are founding members of the Humanitarian Alliance for Yemen.

ABOUT THE CENTER FOR GLOBAL HEALTH AT THE UNIVERSITY OF ILLINOIS

The Center for Global Health at the University of Illinois at Chicago College of Medicine was founded in 2010 and aims to improve the health of populations around the world by training the next generation of global health leaders; by conducting collaborative, trans-disciplinary research that addresses critical global health threats; and by building the capacity of university and global health partners to respond to complex health issues. The CGH consists of core and affiliate faculty who are engaged in global health work in 15 countries in the areas of non-communicable diseases, mental health, women's and child health, surgery, ophthalmology, disaster preparedness, and emergency medicine.





ACKNOWLEDGEMENTS

Numerous health staff and Yemeni medical professionals contributed to this report through their expertise and information sharing. We particularly want to thank Dr. Nahla Arishi and Dr. Ahmad Al Saeedi for their expertise and contributions to this report, and Dr. Waleed Al Thujayri, Dr. Mohammed Karm, Dr. Kamal Ahemd, Dr. Jammal Al Jumae, and Dr. Abdu Fakaih for their work in spearheading MedGlobal's needs assessments in Yemen. We thank you all for your outstanding dedication to supporting the health care of those most in need in Yemen.

This report was authored by Kathleen Fallon, Policy and Advocacy Manager at MedGlobal, and Andrew Moran, Policy and Advocacy Intern at MedGlobal. Asma'a Dunia, Yemen Program Manager at MedGlobal, Emma Forte Sczudlo, Missions Coordinator at MedGlobal, and Kristina Varganova, Communications Advisor at Project HOPE, also contributed to this report. We also want to give special thanks to Rabih Torrbay, President of Project HOPE, Dr. Stevan Weine, Director of UIC's Center for Global Health, and Ambassador Nabeel Khoury for contributing to this report and providing their expertise. Special appreciation to Dr. Zaher Sahloul, President of MedGlobal, for initiating this report and participating with stewardship and authorship.

This report cites data about health workers in Yemen who have died reportedly from COVID-19. This list was compiled by a group of Yemeni medical professionals. Many people contributed to this ongoing list, though we especially want to thank Akram Ameen, Dr. Al Tayib, and Dr. Asam Al Qarduwa for compiling and providing detailed information, and Dr. Ghalia Almohanna for providing additional information.

MedGlobal gives special appreciation to Asma'a Dunia and Tayseer Alkarim, the current and previous MedGlobal Program Managers in Yemen, for their hard work and dedication.

MedGlobal gives special thanks to all of our donors, especially the Latter-day Saints Charities, who have supported our programs to provide medical care to vulnerable communities in Yemen. We give our deep appreciation to our partners in Yemen: Life Foundation for Relief and Development and Estijabah, and our international partners including Rahma Worldwide, Islamic Oasis, PIOUS Project, Pure Hands, UMR, and the Humanitarian Alliance for Yemen.

The situation throughout Yemen is dire as COVID-19 spreads, exacerbating the ongoing health emergency. We dedicate this report to all of the brave and committed health workers in Yemen who have passed away from COVID-19 and those who remain. We are committed to supporting and advocating for all Yemeni health workers as they risk their lives to treat others.



“A RACE AGAINST TIME.”

**“THE WORST-CASE SCENARIO WE HAVE
BEEN FEARING.”**

“TERRIFYING.”

**“A CRISIS IS OF CATAclysmic
PROPORTIONS.”**

**“COVID-19 IN YEMEN COULD SPREAD
FASTER, MORE WIDELY, AND
WITH DEADLIER CONSEQUENCES.”**

**- UN OCHA, WHO, and UNICEF leadership
describing the COVID-19 outbreak in Yemen**

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EXECUTIVE SUMMARY

As COVID-19 spreads worldwide, it hits vulnerable communities hardest. In Yemen, where the already weak health system has been destroyed by five years of conflict and acute vulnerabilities among the population are widespread, COVID-19 is exacerbating what was already the world's worst humanitarian crisis.

On April 10, the first confirmed case of COVID-19 in Yemen was reported in the Hadhramaut governorate. As of July 20, there have been 1,610 confirmed cases and 446 deaths from COVID-19 according to official reports¹. This amounts to around a **27% mortality rate of Yemenis who are confirmed to have COVID-19 - more than five times the global average and among the highest COVID-19 mortality rate in the world.**

In Yemen, more than 80% of the population is in need of humanitarian aid, with more than 50% in acute need. The widespread acute levels of vulnerability, as well as the low levels of immunity across the population and a collapsed health system, contribute to the particularly dire effects of COVID-19 in Yemen. At the same time, issues with accurate and country-wide reporting, shortages in testing, and barriers to accessing health care have led to certain underreporting of the COVID-19 caseload and mortality numbers.

The COVID-19 crisis is just one piece of a much larger health emergency in Yemen. Over the last five years, the health system in Yemen has effectively collapsed. Only half of Yemen's 5,056 pre-war health facilities are functional, and there is a widespread shortage of essential medical equipment. Since the conflict began in 2015, deaths in the medical community, a gradual exodus of medical personnel, and disruptions in higher education have resulted in a decline in skilled medical professionals in Yemen. Around 18% of the country's 333 districts have no doctors. Now, the COVID-19 outbreak is disproportionately harming one of Yemen's most critical human resources: health workers.

At the time of publication, there are at least 97 health workers - infectious disease experts, medical directors, midwives, pharmacists, and other critical medical professionals - who have died in Yemen reportedly from COVID-19.²

27% COVID-19 mortality rate in Yemen (five times global average)

This is a particularly overwhelming number in a country with a chronic shortage of medical professionals, made worse by the ongoing war. In this uniquely dire context, when one medical professional dies, the effect is exponential and extends to the entire community they would treat. Some of those who have died were senior members of the medical community who not only led their respective fields, but also taught younger generations of doctors and represented decades of institutional knowledge for which there is no substitution. Those who have passed include Dr. Yassin Abdul Warith, one of Yemen's leading epidemiologists; Dr. Salem Saleh Muhammad al-Omari, the head of the Department of Internal Medicine at the University of Aden; Dr. Arif Ahmed Ali, a public health specialist; and many more. The governorate with the most health workers who have died from COVID-19 on this list is Sana'a, with at least 38% of the total number. Over 13% of the total health workers on this list are pharmacists, underscoring that pharmacists are often the first point of contact for those with COVID-19 who think they have other diseases. At least 5 OBGYNs and midwives are listed as having passed away from COVID-19 - in a country where one out of every 260 women dies during pregnancy or childbirth, the effect of these losses will be devastating.

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.



¹ WHO. "Yemen: COVID-19 Epidemiological Update." Update from July 20, 2020.

<https://app.powerbi.com/view?r=eyJrIjoizJE2NzJjZDItNDgyZi00NDFlLWFiMjItNjA2MjIwMjYzODJkIiwidCI6ImY2MTBjMGI3LWJkMjQtNGl3OS04MTBjLTNkYzI4MGFmYjU5MCIsmMiOjh9>

² This data was compiled by a group of Yemeni doctors and health workers, who are tracking the deaths of their colleagues from COVID-19 or COVID-like symptoms. This number was reported on July 20, 2020. There are no official reports of the number of health workers who have died in Yemen from COVID-19.



This report looks at how COVID-19 is exacerbating the already overwhelming health crisis in Yemen, using information from interviews with Yemeni health workers and MedGlobal's needs assessment across Al Hudaydah, Taiz, Aden, and Sana'a. It explores the complex health crisis, the impact of COVID-19, the most critical considerations for the COVID-19 response, key needs, and the potential long-term impact of this pandemic on Yemen. Based on information coming from health staff in Yemen, key considerations to inform the COVID-19 response are:

- Insufficient testing capabilities across the country.
- A lack of necessary infrastructure for COVID-19 prevention and management in nearly all hospitals, including substandard infection control measures, medical equipment, hospital administration, and triaging procedures.
- A lack of supplies for COVID-19 prevention and management, particularly ventilators, oxygen generators, and oxygen cylinders.
- The need for increased training for health personnel, particularly those staffing isolation units, in best practices and COVID-19 case management.
- The high infection rate and deadly effects of COVID-19 on health staff.
- Increasing threats and attacks on health workers, often by family members of COVID-19 patients, because of confusion and fear.
- Multi-year cuts to medical personnel salaries and

**97 health workers died
in Yemen reportedly
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incentives - most health staff have not received salaries for nearly two years.

- The immense shortage in necessary funding for the humanitarian response.
- The worsening economic crisis, which will likely increase the number of people in acute need.

We have identified several recommendations based on information from health teams in Yemen, including the following:

To INGOs and UN agencies:

- Scale up diagnostic and testing capabilities.
- Increase the provision of supplies for COVID-19 prevention and management, particularly oxygen supplies, PPE, and ventilators.
- Training for health workers on COVID-19 case management, infectious disease management, and prevention.
- Maintain core health services, particularly health care for non-communicable diseases, maternal and child health, and infectious disease management (particularly dengue, chikungunya, and diphtheria).
- Expand mental health and psychosocial support programming, particularly for medical staff, people who have recovered from COVID-19, and community health workers, to enhance coping strategies.
- Prioritize protection of the most vulnerable, particularly IDPs and refugees.
- Prioritize duty of care for health and humanitarian workers.

To the Yemen government and de facto authorities:

- Halt hostilities nationwide.
- Facilitate unhindered humanitarian access throughout the country and ensure respect for humanitarian principles.
- Strengthen reporting and detection systems.
- Prioritize supporting health care workers and their protection, including through consistent staff salaries.

To the U.S. government:

- Increase humanitarian assistance to all of Yemen based on the most critical needs.
- Reinstate membership in the WHO and support its response in Yemen.
- Prioritize a resolution to the conflict.

To all donor governments:

- Fully fund the Yemen Humanitarian Response Plan.
- Work to ensure health workers are supported and protected.

BACKGROUND

Health System Pre-2015

The armed conflicts in Yemen have led to the world's most extreme humanitarian crisis. However, even before the current conflict began in 2015, Yemen faced enormous challenges in its economic, health, and political sectors. Across the country, the health system lacked comprehensive health infrastructure and human resources, with poor and rural communities experiencing extremely poor health outcomes⁶. The concentration of hospitals and trained medical personnel in cities was a driver of major health disparities between urban and rural communities. While 80% of urban areas had accessible health services, only 25% of rural areas were covered by health services⁷. An estimated 40% of Yemenis, the majority of whom were poor women, had no access to health services before the conflict⁶. In 2010, despite existing treatments, lower respiratory infections, diarrheal diseases, and birth defects alone accounted for 43% of all mortalities in Yemen⁶. There was a clear shortage of female medical staff, particularly staff skilled in maternal and neonatal health. Public health facilities lacked 40% of the obstetricians and 95% of the neonatal nurses they required. As a result, only 22% of pregnant women had skilled assistance during delivery⁶.

Food and water insecurity also contributed to Yemen's poor health outcomes. In a country with no permanent rivers, Yemenis rely on groundwater aquifers to meet their water needs⁷. However, needs frequently exceeded supply and the unsustainable pumping of groundwater led to widespread shortages. Prior to 2015, only 56% of Yemenis in urban areas and 45% in rural areas had access to a water supply network¹². The effects of food insecurity, high poverty rates, and increased reliance on food imports pushed millions of Yemenis to the brink of famine. In 2010, an estimated 58% of all children under five were stunted, more than double the global average¹². Scarcities of food, water, and accessible health care were widespread in Yemen, but health care quality was slowly improving in the decades leading up to 2015. Yemen was on track to meet certain Millennium Development Goals, particularly those around lowering maternal and child mortality⁶. However, the multi-faceted armed conflict that began in 2015 devastated every aspect of Yemen's health sector and plunged the country deeper into crisis.



**4 out of 5 people
(24.1 million) in need of
humanitarian aid**



**15 million people in
acute need**



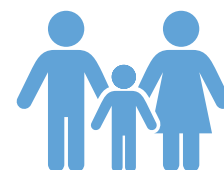
**19.7 million people in need
of healthcare**



**Only half of health facilities
are fully functional³**



**3.65 million Yemenis
internally displaced
since March 2015**



**16,601 families displaced at
least once in 2020⁴**



**142 attacks on medical
facilities in Yemen since
2015⁵**

³ WHO, "Situation Report Issue No.10, Yemen Update." October 31, 2019. <https://reliefweb.int/report/yemen/yemen-conflict-situation-report-issue-no-10-october-2019>

⁴ UNHCR, "Operational Update - Yemen." June 25, 2020. <https://reporting.unhcr.org/sites/default/files/UNHCR%20Yemen%20Operational%20Update%20-%2025JUN20.pdf>

⁵ United Nations, "Second attack on Al Thawra Hospital in 10 days threatens health services for hundreds of thousands of people in Taizz City." March 18, 2020. <https://reliefweb.int/sites/reliefweb.int/files/resources/HC%20statement-18%20March%202020-final.pdf>

⁶ The World Bank, "Yemen: Immediate Priorities for Post-Conflict Recovery of the Health Sector." March 20, 2017.

<http://documents1.worldbank.org/curated/en/349331508408515508/pdf/120530-WP-P159636-PUBLIC-Yemen-Health-Policy-Note-Input-to-PN-RA-edits.pdf>

⁷ Library of Congress, "Country Profile: Yemen." August 2008.

<https://www.loc.gov/rr/frd/cs/profiles/Yemen.pdf>

¹² The World Bank, "Poverty in Yemen." January 20, 2010. <https://www.worldbank.org/en/news/feature/2010/01/20/poverty-in-yemen>

The Conflict

The ongoing armed conflict in Yemen traces its origins to protests that began during the 2011 Arab Spring. President Ali Abdullah Saleh, who had controlled Yemen since its unification, was forced to step down and transfer power to his deputy, Abdrabbuh Mansour Hadi. President Hadi faced resistance and in September 2014 a Houthi armed group, Ansar Allah, took control of Sana'a, Yemen's capital and largest city. The group has been supported by Iran, among other nations. In response, President Hadi called on an international military coalition, notably led by Saudi Arabia and the United Arab Emirates, to intervene on his government's behalf. The military coalition, which is supported by the US, UK, and EU members, began launching airstrikes in Yemen in March 2015, thus beginning the current conflict in Yemen. Since then, all parties to the conflict have violated international humanitarian and human rights law. Prolonged instability has also led to the proliferation of armed groups.

Currently, Yemen is divided into areas of various political and military control, including government-held areas in Hadhramaut and the south; the Houthi de facto authority-held areas of northern Yemen, including Sana'a; and the pro-separatist Southern Transition Council-dominated territories, backed by the UAE, which currently includes Aden, the temporary capital of the Yemeni government.

Conditions in the country continue to deteriorate from the conflict, and attacks against civilian areas are ongoing. The conflict has killed more than 112,000 people¹⁵, led to at least 142 attacks on health facilities¹⁶, and created the world's most extreme humanitarian crisis. Despite several attempts at a ceasefire, the war in Yemen continues.

Humanitarian Crisis

The humanitarian crisis in Yemen is staggering. Over 80% of the population - 24.1 million people - require some form of humanitarian assistance, including 15 million with acute need. Millions of Yemenis lack access to potable water and sanitation, which can help fuel the rapid spread of infectious diseases. Beginning in 2017, Yemen has experienced the world's largest cholera outbreak, with a cumulative 2,188,503 total cases of cholera.¹⁷ The conflict has intensified food insecurity and poverty, and two thirds of Yemenis face famine.

The ongoing crisis in Yemen makes certain populations particularly vulnerable, including children, women, and groups that exist outside of Yemeni social and tribal structures. Women face challenges, both formal and informal, in accessing basic services due to higher rates of poverty, lack of mobility, and gender-based violence. The armed conflict and insecurity has resulted in the internal displacement of 3.65 million Yemenis.¹⁸ In addition to IDPs, there are 271,357 refugees in Yemen, 96% of whom are from Somalia.¹⁹ Refugees, migrants, and other marginalized communities also suffer disproportionately from violence, poverty, trafficking, and an inability to access basic services and support systems.²⁰



¹⁵ Crisis Group. "Rethinking Peace in Yemen." July 2, 2020. <https://www.crisisgroup.org/middle-east-north-africa/gulf-and-arabian-peninsula/yemen/216-rethinking-peace-yemen>

¹⁶ United Nations, supra 5

¹⁷ WHO EMRO. "Weekly Epidemiological Monitor." December 15, 2019. <https://applications.emro.who.int/docs/EPI/2019/22244220-2019-12-50.pdf?ua=1&ua=1>

¹⁸ UNHCR. "Yemen Sees Fresh Displacement After Five Years of Conflict." March 27, 2020.

<https://www.unhcr.org/en-us/news/latest/2020/3/5e7dba1e4/yemen-sees-fresh-displacement-five-years-conflict.html>

¹⁹ UNHCR, supra 4

²⁰ OCHA. "Humanitarian Needs Overview: Yemen." February 14, 2019. https://yemen.un.org/sites/default/files/2019-08/2019_Yemen_HNO_FINAL.pdf

HEALTH CRISES

Non-Communicable Diseases (NCDs)

The collapsing healthcare system in Yemen has left massive gaps in detection and treatment of non-communicable diseases (NCDs). Conditions that are typically treatable, such as diabetes, high blood pressure, asthma, epilepsy, kidney disease, and cancer, become increasingly deadly in the conflict-affected and low-resource setting of Yemen. Dr. Opada Alzohaili, a MedGlobal affiliated endocrinologist based in Michigan, commented on the scale of NCDs among the patients he treated in Yemen: “Most diabetic patients I treated during my MedGlobal medical mission in November 2019 had severely uncontrolled diabetes and poor adherence to diabetic diet.” More than one million people in Yemen with NCDs are unable to access life-saving treatment, including 35,000 people with cancer and 7,000 in need of dialysis.²¹ Even a temporary lapse in treatment can carry serious consequences for people with chronic conditions. NCDs alone were the cause of 39% of all deaths in Yemen in 2017, making them more deadly than conflict-related violence.²² The threat of COVID-19 poses additional risks as people with NCDs are more likely to become severely ill when infected with the virus.²³

Infectious Diseases

Lack of access to clean water and sanitation, the displacement of millions of people, and seasonal flooding create the ideal conditions in Yemen for the spread of communicable diseases. In 2019 alone, there were over 760,000 suspected cases of cholera, 25,000 cases of dengue, 1,600 cases of diphtheria, and nearly 10,000 suspected cases of measles.²⁴ Cholera in particular has been an ongoing crisis in Yemen since 2017, with a cumulative 2,188,503 total cases of cholera and 3,750 deaths in Yemen.²⁵ The rainy season and seasonal flooding increase the likelihood of another major cholera outbreak, as well as mosquito-borne diseases like malaria, dengue, and chikungunya. The risk of communicable disease is particularly high considering that more than 80% of the population lacks access to

“From the beginning to now there are people with COVID-19 who misidentify it as dengue or chikungunya diseases, which are endemic in Aden. This is because COVID-19 appeared in Aden in April, after a week of heavy rains and flooding, and some of the COVID-19 symptoms resemble dengue and chikungunya. Some of the sick did not request medical care until after they arrived at an advanced stage of COVID-19. This also played a big role in its spread.”

- Dr. Nahla Areeshi, Aden



²¹ WHO, supra 3

²² WHO. “WHO Yemen annual report 2017.” March 28, 2018.

http://applications.emro.who.int/docs/YEM/WHO_Annual_rep_yemen_2018_16944_EN.pdf?ua=1

²³ WHO. “Information note: COVID-19 and NCDs.” March 23, 2020.

https://www.who.int/docs/default-source/inaugural-who-partners-forum/covid-19-and-ncds---final---corr7.pdf?sfvrsn=9b65e287_1&download=true

²⁴ WHO, supra 3

²⁵ WHO EMRO, supra 17

clean drinking water. Dengue fever and chikungunya present a unique challenge in the time of COVID-19, as both diseases are characterized by symptoms that are similar to those caused by COVID-19. Health workers in Yemen have indicated that in April and May, they witnessed people postpone medical care because they misidentified their illness as dengue or chikungunya, when in fact they had contracted COVID-19.

Mental Health

The conflict in Yemen has led to widespread mental health and psychosocial needs amongst children and adults. However, the country lacks even basic community-based mental health services to address these needs. Shortages of mental health professionals, financial resources, and the ongoing conflict are major obstacles. There is a chronic shortage of medical professionals who focus on treating mental health. As of 2016, there were only .2 psychiatrists and .4 psychologists per 100,000 people working in the mental health sector.²⁶ COVID-19 is increasing the severity and prevalence of mental health and psychosocial needs in the general population and amongst health care providers in particular. Front-line health workers would benefit greatly from training in psychological first aid and stress reduction techniques to monitor and manage both their patients' mental health and their own.

Malnutrition

A lack of access to adequate nutrition is widespread in Yemen. Yemen depends heavily on imports to feed its population, importing 80 to 90% of its staple food. As a result, Yemenis are greatly impacted by disruptions in supply chains and global markets caused by COVID-19.²⁷ Food prices have been rising across Yemen since the COVID-19 pandemic began. This directly impacts the over 15.9 million Yemenis in need of urgent food assistance.²⁸ Prolonged malnourishment has significantly weakened the immune systems of millions of Yemenis, leaving them particularly vulnerable to severe diseases. Children are hit the hardest by malnutrition in Yemen - over two million children under five are malnourished, including approximately 325,000 who suffer from life-threatening severe acute malnutrition.²⁹ Over 45% of children under



five in Yemen are stunted, with chronic malnourishment causing permanent harm to their physical and cognitive development. A recent UNICEF report makes a stark predication that an additional 30,000 Yemeni children could develop life-threatening severe acute malnutrition in the last six months of 2020, with the overall number of malnourished children under five increasing to 2.4 million.³⁰

²⁶ WHO. "Global Health Observatory data repository." April 25, 2019. <https://apps.who.int/gho/data/node.main.MHHR?lang=en>

²⁷ OCHA, supra 18

²⁸ UNICEF. "Yemen five years on: Children, conflict and COVID-19." June 26, 2020. <https://reliefweb.int/report/yemen/yemen-five-years-children-conflict-and-covid-19>

²⁹ UNICEF, supra 28

³⁰ UNICEF, supra 28

Reproductive, Maternal, and Newborn Health

In Yemen, over one million pregnant women are malnourished, jeopardizing their health and the health of their babies.³¹ They are at higher risk of dangerous deliveries and poor postpartum health outcomes. The maternal mortality data in Yemen is shocking - one out of every 260 women in Yemen now dies in pregnancy or childbirth.³² One of every 37 newborn babies dies within the first month of life.³³ These mortality rates have risen since the beginning of the conflict in 2015, and pregnant women and babies are now amongst the most vulnerable populations in Yemen. With half of all health facilities in Yemen nonfunctional, there is an overwhelming lack of access to critical maternal health services, and only three out of every 10 births take place in regular health facilities.³⁴ In 2017, public health facilities lacked 40% of the obstetricians and 95% of the neonatal nurses they required.³⁵ Most obstetricians in Yemen are not trained in surgical procedures other than caesarian sections. Across all hospitals, there is a shortage of Neonatology Intensive Care Units and neonatologists on staff. MedGlobal has been committed to responding to the need for qualified midwives, OBGYNs, and maternal and child health specialists. Dr. Lia Harris, a MedGlobal affiliated pediatrician based in Canada, organized two training courses for midwives in Hadhramaut and Marib in November 2019: "I was involved in training 54 Yemeni midwives, including 13 trainers who can pass on their skills, on the Helping Babies Breathe technique. The trainers and trainees were outstanding and so well prepared." One of the midwives reflected on applying the course skills the day after the training: "One day after attending the course with Dr. Lia, we had a case in which the mom was pushing for two hours. There was vital heart stress, fetal bradycardia. When the baby was delivered, I started the steps of Helping Babies Breathe. Thank Allah, the baby started crying."

"The lack of systems, training, and protocols combined with shortage of medications, surgical and medical supplies lead to unnecessary complications among patients."

- Dr. Susanah Fernandez, surgeon from Spain and Scotland who joined the MedGlobal surgical team response in Hadhramaut and Marib in 2019

Health System Destruction

Over the last five years, the health system in Yemen has collapsed. Only half of Yemen's 5,056 pre-war health facilities are functional, and many of the functional facilities lack adequate medical equipment and supplies. The WHO has documented 142 attacks on medical facilities in Yemen since 2015.³⁶ Since the conflict began in 2015, there has been a dwindling number of skilled medical professionals. There are no doctors in 18% of districts across the country. Staffing shortages at functional hospitals have left 53% without general practitioners and 45% without specialists. Nationally, there are only 10 healthcare workers for every 10,000 people, less than half of the WHO benchmark for basic health coverage.³⁷ As a result, only 20% of health facilities are capable of treating chronic conditions such as cancer, diabetes, high blood pressure, and kidney disease. Lack of access to mental healthcare constitutes another major crisis with only 40 psychiatrists serving a country of 30 million people who have been exposed to the traumas of war, disease, and hunger.³⁸

Infection Control

The vast majority of hospitals in Yemen lack infection control departments, committees, and epidemiologists. There are very few trained infection control nurses. Lab



³¹ UNFPA. "UNFPA Response in Yemen Monthly Situation Report." May 19, 2020. https://www.unfpa.org/sites/default/files/resource-pdf/UNFPA_Yemen_-_Monthly_SitRep_04_April.pdf

³² UNICEF. "One woman and six newborns die every two hours from complications during pregnancy or childbirth in Yemen." June 14, 2019. <https://www.unicef.org/press-releases/one-woman-and-six-newborns-die-every-two-hours-complications-during-pregnancy-or>

³³ UNICEF, supra 32

³⁴ UN News. "Yemen: maternal and newborn health 'on the brink of total collapse', UNICEF alerts." June 14, 2019. <https://news.un.org/en/story/2019/06/1040531>

³⁵ The World Bank, supra 6

³⁶ United Nations, supra 5

³⁷ WHO. "Global key messages." January 2014. https://www.who.int/workforcealliance/media/key_messages_2014.pdf

³⁸ WHO, supra 22

directors in hospitals largely lack information about the incidence and prevalence rates of certain infections in their hospitals, and there is a complete lack of baseline surveillance data around infections. Dr. Kwan Kew Lai, a US-based infectious disease expert and Harvard medical faculty physician who joined a MedGlobal medical mission to Hadhramaut and Marib in November 2019, reflected on her hospital practices: “There is a lack or inadequate number of sinks in all patient care areas, and soap. In the male surgical ward of about 30 patients, there is one sink in the nursing office with no soap. It is therefore not conducive to hand-washing in between patients. In fact, a doctor plainly admitted that he only washed his hands after he finished seeing all the patients.” She commented on the general need for doctors and nurses to enhance practices such as washing their hands and changing gloves in between seeing patients.

Hospital Administration and Equipment

Hospital administration is one of the weakest areas of the healthcare system in Yemen, as is common in many fragile states. Corruption is rampant, communication is poor within hospital departments, and decision-making processes are ineffective. Dr. Ahmed Ebeid, an anesthesiologist from Oregon who joined a MedGlobal medical response to Marib and Hadhramaut in 2019, commented: “There are no clear clinical and management protocols in most departments. In anesthesia, for example, these protocols should address areas of anesthesia practice such as confirmation of intubation, difficult intubation pathways, managing emergencies such as rapid desaturation or cardiac arrest. Hospital administrations don’t support the anesthesia departments with tools to help provide safe anesthesia, like monitors with heart rhythm and end tidal CO2. The anesthesia staff need training on resuscitation. Following successful resuscitation there is no system in place to allow for ICU care with proper protocols to manage the critically ill patients.”

Additionally, the medical equipment is generally worn-down and substandard. Dr. Suhail Sharif, a surgical oncologist based in Texas who joined two MedGlobal surgical responses to Marib and Hadhramaut in 2019, commented: “The resources in the hospitals are limited and the equipment is older. Most hospitals have only the most basic technology, medical equipment, surgical instruments, anesthesia, operating room equipment, and laboratory equipment.” Dr. Zaher Sahloul, MedGlobal President and an Assistant Professor from the University of Illinois in Chicago who joined four MedGlobal medical response trips Marib, Hadhramaut, and Aden, commented:



“There is also an alarming deficiency of infectious control measures in the ICU and shortage of oxygen, ventilators, blood gas machines, and life-saving medications including antibiotics and sedatives.”

“Triage in the outpatient settings and Emergency Department is problematic. There is no training on proper triaging process, a shortage of qualified nurses, and lack of integration of nurses into a team.”

- Dr. Ekaterina Kurlygina, emergency room specialist from Russia who joined the MedGlobal medical team response in Hadhramaut in 2019

SITUATION DURING COVID-19

COVID-19 is spreading rapidly across Yemen. Of those confirmed to have COVID-19, approximately 27% have died - which is five times the global average mortality rate.⁴⁰

On April 10, the first confirmed case of COVID-19 in Yemen was reported in the Hadhramaut governorate. As of July 20, there have been 1,610 confirmed cases and 446 deaths from COVID-19. Men make up approximately 75% of reported cases.⁴¹ One striking aspect of the COVID-19 distribution in Yemen is that the number of those who have died from COVID-19 between the age range 45 - 59 and 60+ is nearly identical. This distribution is younger than the majority of COVID-19 deaths in other settings, in part because Yemen has one of the lowest life expectancies in the world, and fewer than 4% of the population is over 65.⁴² However, this also adds to the impression that the true number of COVID-19 victims is much higher, and that older people who pass away from the virus are dying in their homes without seeking treatment. On June 24, the UN Under Secretary General for Humanitarian Affairs Mark Lowcock reiterated this notion, saying: "People are now dying alone in their homes."⁴³

As mentioned, the actual prevalence and mortality of COVID-19 in Yemen is likely much higher than official reports indicate. Barriers to accurate and country-wide reporting, shortages in testing, and delays in care-seeking behavior, among other factors, account for the discrepancy between official reports and the suspected large-scale outbreak.

"The coronavirus infection of health staff has led to so many deaths of doctors and health workers in Yemen. A coronavirus outbreak in Yemen, whose population suffers from malnutrition and weak immunity, will have such a negative impact."

- Dr. Ahmad Al Saeedi, Marib



**1,610 total reported
COVID-19 cases in
Yemen as of July 19**



**446 deaths from COVID-19 in
Yemen as of July 19**



**27% mortality rate - 5 times
the global average**

⁴⁰ OCHA, "Under Secretary-General for Humanitarian Affairs and Emergency Relief Coordinator, Mark Lowcock, Briefing to the Security Council on the humanitarian situation in Yemen," June 24, 2020. <https://reliefweb.int/report/yemen/under-secretary-general-humanitarian-affairs-and-emergency-relief-coordinator-mark-28>

⁴¹ WHO, supra 1

⁴² Wilson Center, "COVID-19 Tunnel Vision in Arabia: Yemen's Regional Crisis in the Midst of a Global Pandemic," May 27, 2020. <https://www.wilsoncenter.org/article/covid-19-tunnel-vision-arabia-yemens-regional-crisis-midst-global-pandemic-0>

⁴³ OCHA, supra 40

- The official WHO epidemiological updates for Yemen do not include the northern governorates controlled by de facto authorities. As of May 18, these areas had reported only four cases of COVID-19 and one death, but it is presumed that transmission is widespread in the north.⁴⁴

- The availability of testing in Yemen is thus far incredibly low. So far, there have only been 4,855 tests performed throughout the country, a rate of 162 tests per one million people.⁴⁵

- Reports from health workers indicate that many people are delaying seeking health care until they are critically ill, if at all. The stigma of COVID-19 and the lack of access to testing or broader healthcare play a role in shaping care-seeking behavior. The current mortality data does not include those who have died from COVID-19 without accessing a hospital, and the caseload data of course excludes those with COVID-19 who have not sought testing or treatment.

Now that COVID-19 is spreading throughout Yemen, there are fears that its effects could be unparalleled.

A recent study from the London School of Hygiene and Tropical Medicine predicts that up to 11 million people in Yemen could become infected, with between 62,000 and 85,000 deaths, in an eventual worst-case scenario.⁴⁶



**25 operational
isolation units**



**6 labs with COVID-19
testing capacity**



**4,855 confirmed tests
conducted in Yemen
as of July 18⁴⁷**



**21,600 testing
kits distributed
as of July 18**



**710 ICU beds
as of July 18⁴⁸**

⁴⁴ Hincks, J. "Yemen Officially Has One of the Middle East's Lowest COVID-19 Counts. In Reality, the Virus Is Spreading Unseen and Unchecked." TIME. May 25, 2020. <https://time.com/5843732/yemen-covid19-invisible-crisis/>

⁴⁵ WHO, supra 1

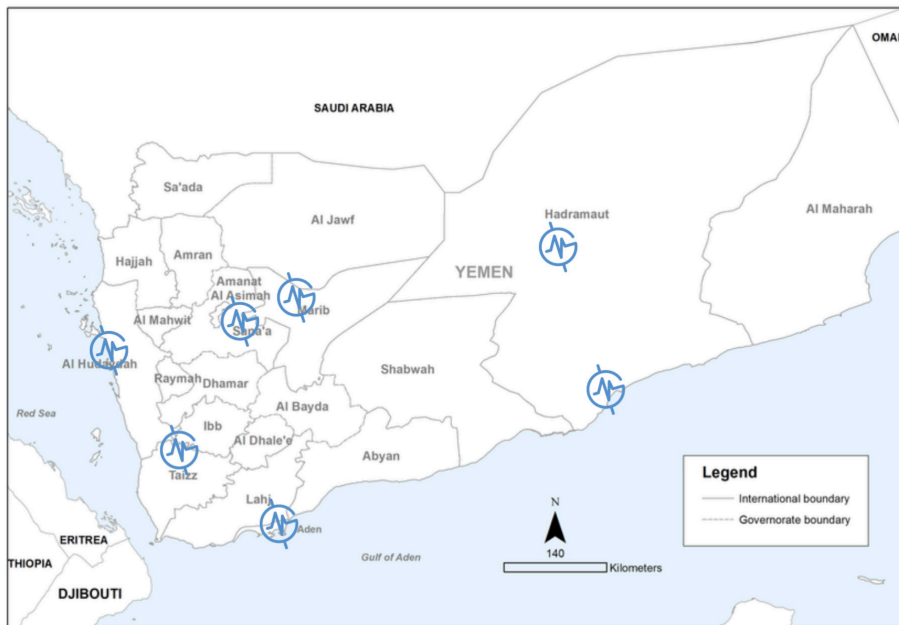
⁴⁶ UK Department for International Development (DfID). "UK calls for drastic action in Yemen as coronavirus infections reach one million." June 18, 2020. <https://www.gov.uk/government/news/uk-calls-for-drastic-action-in-yemen-as-coronavirus-infections-reach-one-million>

⁴⁷ WHO, supra 1

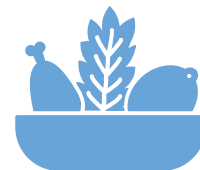
⁴⁸ OCHA. "Yemen COVID-19 Preparedness and Response Snapshot." July 18, 2020.

<https://reliefweb.int/report/yemen/yemen-covid-19-preparedness-and-response-snapshot-18-july-2020-enar>

MEDGLOBAL'S WORK IN YEMEN



Over 5,500 patients treated
from 2017 to June 2020



3,830 IDPs supported
with nutritious food baskets in 5 IDP
camps in Al Hudaydah



4 medical, surgical, and training
response trips in addition to
ongoing health operations



14 hospitals supported in 6
governorates of Yemen

In 2017, MedGlobal and Project HOPE leadership visited Yemen to assess the medical needs of vulnerable populations and begin providing training and care at health facilities. Since then MedGlobal has been supporting health facilities with medical supplies, equipment, and training, as well as supporting communities of internally displaced persons (IDPs) with nutritious food distributions. MedGlobal has supported 14 hospitals in six governorates of Yemen - Aden, Hadramaut, Al Hudaydah, Marib, Taiz, and Sana'a - with capacity building and medical infrastructure. By training local health care providers, and ensuring they have the equipment and supplies needed to work, MedGlobal promotes comprehensive health care services for the most vulnerable populations in Yemen.

Provision of Medical Supplies

Through June 2020, MedGlobal has spent more than **\$11 million on medical and surgical supplies and equipment**, including gift-in-kind medications, to health facilities in Yemen. MedGlobal has distributed numerous critical medicine and medical supplies, including ultrasound machines, cardiac equipment, surgical supplies, consumables, and hospital beds. MedGlobal is proud to partner with other humanitarian and health organizations inside of Yemen, including Rahma Worldwide, Life Foundation for Relief and Development, Catholic Medical Mission Board, PIOUS Projects, and Islamic Oasis in supply delivery to local health facilities and to deploy medical teams, with ongoing support from Latter-day Saints Charities.

Medical, Surgical, and Training Responses

MedGlobal deployed four international medical teams to Yemen between 2017 and 2019. Thirty medical professionals - including Dr. Jacques Bérès, the co-founder of Médecins Sans Frontières (Doctors Without Borders) - from eight different countries provided patient consultations and trained local health workers. MedGlobal's medical and surgical volunteers have performed over 1,500 patient consultations at health facilities in the four governorates of Marib, Al Jawf, Hadhramaut, and Aden. Services included outpatient and inpatient internal medicine in different subspecialties, surgery, pediatrics, obstetrics and gynecology, critical care medicine, emergency medicine, and optometry. MedGlobal has provided more than 250 surgical consultations and 150 surgeries.

MedGlobal has trained over 150 health workers in key medical techniques, including disaster management, Point of Care Ultrasound use, resuscitation, management of non-communicable diseases, maternal health practices,

emergency medical triage, critical care, surgical techniques, and infection control. Dr. Neda Farzan, an emergency and disaster medicine specialist from California who joined MedGlobal's medical response to Hadhramaut and Marib in 2019, commented: "We use a 'train-the-trainer' model, which equips trainees to become trainers for subsequent courses in their local communities. This model is more sustainable than a traditional model, where trainers are deployed repeatedly to teach courses." MedGlobal's largest training courses have focused on Helping Babies Breathe, the resuscitation technique to reduce neonatal mortality, and Point of Care Ultrasound (POCUS) use, an efficient and portable imaging modality that can be particularly useful in emergency and resource-limited settings.

Nutrition and Food Security

In addition to the broader health crisis in Yemen, the conflict has led to a crisis of malnutrition. The World Food Program estimates that 15.9 million people wake up hungry every day in Yemen, and that in the absence of food assistance, that number would go up to 20 million.⁴⁹ Since 2017, MedGlobal has supported particularly vulnerable populations in Yemen, such as IDPs, through our Nutrition



⁴⁹ World Food Programme. "Yemen." Accessed June 2020. <https://www.wfp.org/countries/yemen>

and Food Security Program. In June 2020 alone, MedGlobal distributed nutritious food baskets to 732 households (over 3,830 people in total) to five IDP camps in Al Hudaydah: Al Alaili Camp, Al Gashah Camp, Ben Jabber Camp, Al Waerah Camp, and Al Hima Camp.

COVID-19 Response

Since COVID-19 spread to Yemen, MedGlobal has supported local hospitals in multiple regions with thousands of masks and Protective Personal Equipment (PPEs) in coordination with our local partners Rahma Worldwide and Life Foundation. MedGlobal has scaled up its COVID-19 related support while continuing to fund core health services and nutrition programs. Beginning in April, MedGlobal distributed PPE, medical supplies, and medical equipment needed for COVID-19 patient management and infection prevention and control to health facilities in Aden. This included over 20,000 PPE items, 78 oxygen cylinders, and 80 bottles of disinfectant. The hospitals that MedGlobal has supported during this particularly challenging time were selected based on WHO Health Cluster and Ministry of Health recommendations, and needs assessments collected by MedGlobal's local team.

MedGlobal is currently in preparation to scale up its distribution of PPE and sanitation supplies into other governorates, including Marib, Taiz, Al Hudaydah, and Hadhramaut. Additionally, Project HOPE and MedGlobal have partnered to source and distribute 50 oxygen cylinders to the Health Department in Marib. MedGlobal is in the process of locally procuring and distributing large quantities of PPE, oxygen cylinders, and other critical medical supplies and equipment for hospitals and COVID-19 isolation facilities in Taiz, Al Hudaydah, and Hadhramaut.

PROJECT HOPE'S RESPONSE TO YEMEN CRISIS

Project HOPE in coordination with the Center for Human Rights and Humanitarian Studies at the Watson Institute of Brown University has developed a COVID-19 training program that has implemented remote training around the world using a training-of-trainers methodology. The training covers topics such as Infection Prevention and Control, Surveillance and Contact Tracing, Diagnosis and Management, Risk Communication and Public Health Messaging. The training is also available as an eLearning available for self-guided study in low-bandwidth environments. The training materials have already reached more than 26,000 frontline responders to COVID-19 and Yemen is among the top countries accessing the eLearning.



METHODS

In June 2020, MedGlobal's Yemen field team coordinated the collection of COVID-19 needs assessment questionnaires related to COVID-19 from two hospitals in from each of these four governorates (eight hospitals in total): Al Hudaydah, Taiz, Aden, and Sana'a. The needs assessment was broken down by categories outlined by the United Nations High Commissioner for Refugees (UNHCR)⁵⁰ and included: (1) Infection prevention and control, (2) Risk communication and community engagement, (3) Epidemiological surveillance, rapid response, and case investigation, (4) Case management, (5) Protection monitoring, and (6) Country-level coordination, planning, and monitoring. Upon receiving the completed needs assessments, the MedGlobal team assessed responses to identify key needs related to COVID-19. In addition to the needs assessments, MedGlobal collected qualitative data from interviews about COVID-19 and the broader health crisis with 10 medical professionals from Al Hudaydah, Taiz, Aden, Sana'a, and Marib. This information, as well as data and information from the Health Cluster, is shaping MedGlobal's ongoing operational response in Yemen, and informed the Key Considerations for the COVID-19 Response, Key Needs, and Recommendations sections of this report.



⁵⁰ UNHCR. "Coronavirus emergency appeal UNHCR's preparedness and response plan." March 25, 2020. http://reporting.unhcr.org/sites/default/files/UNHCR%20COVID-19%20Appeal%20-%20March%202020.pdf#_ga=2.200771757.20264904771584370373-788612303.1580339500

KEY CONSIDERATIONS FOR THE COVID-19 RESPONSE

Insufficient Testing Capabilities

For a population of 30 million people, there are only six labs equipped with PCR machines which allows for COVID-19 testing capacity, in Sana'a, Al Hudaydah, Taiz, Aden, and two in the Hadhramaut governorate. Only 21,600 testing kits have been distributed in Yemen as of July 18.⁵¹ Even with the PCR testing capacity, testing in a setting like Yemen faces acute obstacles - frequent power outages, as seen throughout Yemen, can compromise the stability and performance of the temperature-sensitive RT-PCR reagents.⁵² PCR testing is also very technique-sensitive and requires expertise for interpretation of results, which is less likely to be achieved in Yemen given the limited opportunities for training.⁵³ For the governorates in Yemen without PCR machines, such as Marib, COVID-19 diagnoses and case management becomes even more challenging. In certain cases, samples are sent to the neighboring governorate of Hadhramaut for PCR testing. However, the transport of samples is extremely difficult - it involves at least a six to ten hour drive on the poor road network, partially destroyed from five years of conflict, with dozens of armed checkpoints.⁵⁴ These COVID-19 patients are often dead or recovered before the testing results have come in.⁵⁵

Lack of Supplies for COVID-19 Prevention and Management

The struggling health system in Yemen does not have the capacity or resources to manage a large-scale COVID-19 outbreak. In addition to much needed health facility equipment, such as additional ICU beds and PCR machines, there is a major shortage of PPE, necessary to keep medical staff and community health workers safe, and ventilators and oxygen generators, necessary to keep those with severe COVID-19 cases alive. On June 19, a 43 ton shipment of hospital and lab supplies facilitated by the UN was able to enter Yemen, which included six additional PCR machines, 426 ventilators, and over one million PPE items; however, supplies are needed at a much larger scale and in an ongoing way to tackle this crisis.

Critical Shortage of Oxygen and Ventilators

In most hospitals in Yemen, there is a significant shortage of oxygen supplies, namely oxygen cylinders and generators. Oxygen is the mainstay of treatment for patients admitted with severe or critical COVID-19 symptoms. Many patients with respiratory failure due to COVID-19 pneumonia require high flow oxygen, which uses a large volume of oxygen compared to other methods of oxygen delivery. There is an absence of the delivery devices for high flow oxygen in almost all hospitals in Yemen. About 5% of patients with COVID-19 in countries with strong health systems require admission to the Intensive Care Units (ICU) - however, in Yemen, there are only 380 ICU ventilators in the entire country. Most hospitals in Yemen are not equipped with large oxygen generators and depend on oxygen cylinders instead. These supplies will be depleted quickly if the number of COVID-19 patients who need hospitalization increases. A shortage of these supplies could also increase the mortality rate of COVID-19 patients with severe COVID pneumonia or respiratory failure.



⁵¹ Humanitarian Country Team. "Yemen COVID-19 Preparedness and Response Snapshot." June 27, 2020. https://reliefweb.int/sites/reliefweb.int/files/resources/Yemen_COVID_Weekly_Snapshot_28%20June.pdf

⁵² Dhabaan, GN, Al-Soneidar, WA, Al-Hebshi, NN. (2020). Challenges to testing COVID-19 in conflict zones: Yemen as an example. *Journal of Global Health*, 10(1): 010375. DOI: 10.7189/jogh.10.010375

⁵³ Dhabaan, supra 52

⁵⁴ Tahrir Institute for Middle East Policy. "COVID-19 in Yemen: A detonated bomb." June 24, 2020. <https://timep.org/commentary/analysis/covid-19-in-yemen-a-detonated-bomb/>

⁵⁵ Tahrir Institute for Middle East Policy, supra 54

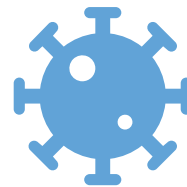
Deadly Effects of COVID-19 on Health Staff

Particularly at the beginning of the COVID-19 outbreak in Yemen, the complete lack of PPE and safety measures put medical staff and community health workers at great risk of contracting COVID-19. In many areas, there were no dedicated ambulances for COVID-19 patients or clear guidelines in place for COVID-19 management.

COVID-19 has had a dire and disproportionate impact on health workers. There are at least 97 health workers - infectious disease experts, medical directors, midwives, pharmacists, and other critical medical professionals - who have died in Yemen reportedly from COVID-19. In a country where there are fewer than 10 health workers for every 10,000 people - less than half of the WHO benchmark for basic health coverage⁵⁶ - the effect of the death of every medical professional has an exponential effect. The human toll of one doctor's death extends to the community they would have treated, who now are left without access to health care.

Pharmacists face a particularly high risk of infection from COVID-19. Pharmacies are often used as a first point of

care for people who are ill. According to Dr. Nahla Arishi, the deputy director of pediatrics at a hospital in Aden, some Yemenis infected with COVID-19 misdiagnose their symptoms and attempt to treat themselves with "medications from pharmacies, and do not request medical care until after they are at an advanced stage of COVID." This puts both pharmacists and their customers at serious risk. The growing lack of doctors and functioning hospitals in Yemen is likely increasing the dependence of local communities on pharmacists. As more pharmacists are infected or die from COVID-19, the disease will spread further, and as pharmacies close, communities may lose access to medicine and health advice.



97 health workers have died in Yemen reportedly from COVID-19



Dr. Yassin Abdul Warith

Dr. Yassin was a preeminent epidemiologist in Yemen who spent more than five decades combating various epidemics, including cholera, Rift Valley fever, diphtheria, and malaria. He played a leading role in the development of field epidemiology in Yemen and often guided the health sector's response to outbreaks. Prior to his death from COVID-19, Dr. Yassin traveled to isolation centers to assess needs and trained rapid response teams.⁵⁷

Dr. Razan Anwar Mahmoud

Dr. Razan ran the al-Shifa Medical Center and consulted at other medical centers in downtown Marib. Originally from Syria, Dr. Razan was an obstetrician-gynecologist with a degree from the Faculty of Medicine at Damascus University. After a period of suffering from several diseases, she ultimately died from COVID-19.⁵⁸



Dr. Salem Saleh Muhammad al-Omari

Dr. Salem was one of the founding members of the Department of Internal Medicine at the Faculty of Medicine and Health Sciences of the University of Aden. He taught thousands of medical students during his time as a professor and was a leading mind in the field of internal medicine.⁵⁹

⁵⁶ WHO, supra 37

⁵⁷ WHO, "In Yemen, 'Hero' Epidemiologist Succumbs to COVID-19," June 20, 2020, <http://www.emro.who.int/yem/yemen-news/in-yemen-hero-epidemiologist-succumbs-to-covid-19.html>

⁵⁸ Zaman al-Wasl, "The Death of a Syrian Doctor in Yemen as a result of Coronavirus," June 11, 2020, <https://www.zamanalwsl.net/news/article/124671/>

⁵⁹ University of Aden, "al-Omari," June 7, 2020, <http://adenmed-fmhs.net/NDetails.aspx?contid=2345>

Cuts to Medical Staff Salaries and Incentives

In addition to the heightened risk of contracting COVID-19 while treating patients in hospitals, medical staff face another serious issue: most doctors in Yemen have not been paid a salary in up to two years. For the last several years, the WHO has been paying “incentives” to thousands of medical staff throughout Yemen as a short-term measure, as the government in south Yemen and de facto authorities in the north were not regularly paying civil servants.⁶⁰ However, as of mid-April, the same week that the COVID-19 crisis started in Yemen, the WHO had to cut these incentive payments for 10,000 health workers in the country. The new danger of COVID-19 coupled with the cuts to salaries and incentive payments has led to a wave of resignations. In June 2020, groups of medics at hospitals began to go on strike, calling for better treatment and accommodation that allows them to physically distance from their families.

Funding Cuts

The UN has referred to the immense gap in necessary humanitarian funding as “a funding crisis of gargantuan proportions.”⁶¹ The overall 2020 Yemen Humanitarian Response Plan is only 18% funded as of July 8.⁶² After five years of conflict, major donor governments are reducing their funding commitments and follow through, and dozens of UN programs are rolling back their operations. At the High-Level Pledging Event in Riyadh on June 2, only \$1.35 billion of the \$2.41 billion needed to cover essential humanitarian services for the remainder of 2020 was pledged, leaving a funding gap of more than \$1 billion.⁶³ The Yemen Health Cluster estimates that without additional funding, 59% of health projects in Yemen will close by September, with an additional 41% of health projects closing by December.⁶⁴

Worsening Economic Crisis

Yemen’s economy is in crisis, with fuel exports drying up, remittances being lost, and the Yemeni rial rapidly depreciating against foreign currencies. Since the COVID-19 pandemic began, there has been an 80% decrease in remittances sent by the Yemeni diaspora community, particularly Yemenis working abroad in Saudi Arabia.⁶⁵ The COVID-19 crisis has also led to a further drop in the demand for and prices of Yemen’s fuel exports, leading to further rial depreciation. The economic crisis is worsening at the same time as major cuts in donor government support to humanitarian assistance. Inside Yemen, this is complicating the COVID-19 response, with a severe fuel shortage in the northern governorates hindering the transport for medical supplies and the powering of generators, and intensifying the acute needs of the population.

“The medical and surgical staff have low morale due to the war, lack of training, and low salaries. However, they are truly motivated and want to see their conditions improve. That is the most frustrating thing for me, because they genuinely love what they do and want to make healthcare better in their country. All they need is resources.”

- Dr. Suhail Sharif, US-based surgical oncologist who led MedGlobal surgical response to Marib and Hadhramaut in 2019



⁶⁰ Slemrod, A, Parker, B. “UN cuts extra pay for health workers in Yemen just as COVID-19 hits.” The New Humanitarian. May 7, 2020. <https://www.thenewhumanitarian.org/news/2020/05/07/coronavirus-health-yemen-unpaid-world-health-organisation-cuts>

⁶¹ CSIS. “Crisis and Survival Amidst COVID-19 in Yemen.” April 29, 2020. <https://www.csis.org/analysis/online-event-crisis-and-survival-amidst-covid-19-yemen>

⁶² OCHA. Financial Tracking Service. Accessed June 30, 2020. <https://fts.unocha.org/appeals/925/summary>

⁶³ OCHA. “Yemen Situation Report.” July 1, 2020. <https://reliefweb.int/sites/reliefweb.int/files/resources/Situation%20Report%20-%20Yemen%20-%20203%20Jun%202020%281%29.pdf>

⁶⁴ Health Cluster Yemen. “Health Cluster Minutes.” June 16, 2020.

⁶⁵ OCHA, supra 63

KEY NEEDS

This table outlines needs that were identified through the MedGlobal needs assessment and Health Sector updates. Needs are categorized based on UNHCR's six priority needs and areas of intervention.

Infection Prevention & Control	Provision of hygiene kits, antiseptics, and disinfectants
	Personal protective equipment (PPE) for health staff, especially in the rural areas
	Full staffing of isolation units with trained staff
	Effective use of the sterilization system and prevention measures, particularly during movement between hospital departments
Risk Communication and Community Engagement	Health awareness campaigns for vulnerable populations
Epidemiological Surveillance, Rapid Response, and Case Investigation	Strengthening of the reporting and early detection systems, particularly in de facto authority controlled areas
	Additional PCR machines and CT machines in public hospitals to increase COVID-19 testing and diagnostic capacity
	Improved estimates on febrile respiratory disease (FRD) frequencies (data on suspected cases) at a community level
Case Management	Support for local health care providers as they treat patients (e.g. telemedical platforms to connect local providers with pulmonologists and emergency medicine specialists)
	Provision of oxygen generators and/ or cylinders in hospitals and isolation facilities, depending on the facility's need
	Additional trainings for medical staff on case management
	Ventilators for those who need assistance breathing
	Free or inexpensive medicines, including antibiotics and blood thinners
Protection Monitoring	Mental health and psychological support (MHPSS) for local health care providers and vulnerable populations (note: across all governorates surveyed by MedGlobal, MHPSS was noted as fully unavailable)
	Messaging and programming to prevent and address social stigma associated with COVID-19
	Integration of protection programming, particularly related to interpersonal violence, in the health communications strategy (note: MedGlobal's assessment found that women and people facing interpersonal violence are having difficulty seeking help)
	Prioritize programming for IDPs
Country-Level Coordination, Planning, and Monitoring	Strengthened coordination for establishing isolation centers
	Building the capacity of health providers to diagnose COVID-19 at the national and subnational levels, in both government and de facto authority controlled areas
	Medical staff salaries or "incentives" in public hospitals, in both government and de facto authority controlled areas

LONG TERM IMPLICATIONS

The COVID-19 pandemic underscores the uniquely dire issues faced by fragile and conflict-affected states like Yemen, namely the transition of a short-term emergency into long-term instability. In February 2020, before the COVID-19 virus had spread into the global pandemic, Yemen was one of seven countries that met the World Bank criteria of a fragile and conflict-affected state with a high intensity conflict.⁶⁶ Elements of a fragile and conflict-affected state are: “the formal state typically has a low capacity to deliver basic services, to respond to demands and to impose security. It often does not have full or exclusive authority over its territory and is competing with other groups for legitimacy to exercise state powers.”⁶⁷

Before the armed conflict began in 2015, Yemen was the poorest country in the Middle East and North Africa, with the lowest human development indicators in the region. It is now on track to become the poorest country on earth. In 2014, the percentage of people living below the poverty line was 47%. If the conflict continues, that number is expected to reach 79%, with 65% living in extreme poverty, by 2022.⁶⁸ The current economic crisis in Yemen could

“Yemen has lost a lot of its great men and women who were academics, judges, doctors, and engineers. We will need a long time for Yemen to recover. Who can replace them?”

- Dr. Nahla Areeshi, Aden

lead to an even more chronically vulnerable population, with the cycles of poverty and poor health affecting communities in Yemen for generations. A growing body of research indicates that a sudden spike in an economic crisis - such as the 35% rise in food prices in Yemen since the outbreak of COVID-19 - can intensify or prolong violence in a fragile state.⁶⁹

The health system in Yemen was fragile before the conflict, and has effectively collapsed since 2015. Attacks on health care infrastructure and degradation from conflict have led to only half of medical facilities being fully functional in Yemen, and have devastated human resources in the



⁶⁶ The World Bank. “Classification of Fragile and Conflict-Affected Situations.” February 27, 2020. <https://www.worldbank.org/en/topic/fragilityconflictviolence/brief/harmonized-list-of-fragile-situations>

⁶⁷ Al Jazeera. “Yemen to Become World’s Poorest Country if War Continues: UN.” October 10, 2019. <https://www.aljazeera.com/news/2019/10/yemen-world-poorest-country-war-continues-191010112703109.html>

⁶⁸ OCHA, *supra* 63

⁶⁹ U.S. Institute of Peace. “Don’t Leave Fragile States Behind in the Fight Against Coronavirus.” March 31, 2020. <https://www.usip.org/publications/2020/03/dont-leave-fragile-states-behind-fight-against-coronavirus>

health sector. In 2014, before the conflict, foreign medical professionals made up around 25% of the health workforce.⁷⁰ However, within the first few months of the conflict and bombing campaigns in 2015, 95% of these foreign medical professionals had left the country.⁷¹ Now, COVID-19 is leading to deaths of many health workers, and disincentivizing others from working at health facilities with a lack of salary and adequate protective measures. Dr. Jacques Bérès, a prominent French war surgeon and the co-founder of Médecins Sans Frontières (Doctors Without Borders), who joined a MedGlobal surgical response in Hadramout and Marib in 2019, reflected: “The challenge of rebuilding Yemen’s health sector is not merely an issue of funding health facilities. New generations of doctors need to be trained, and they are now losing their educators to COVID-19.” The medical community in Yemen has already lost several of its most senior members, the founders and leaders of their fields. At a time when comprehensive and coordinated health care is more important than ever, the health system in Yemen is splintering further. COVID-19 is putting extreme pressure on the existing

health system capacity, while undermining communities’ trust. This could be the tipping point that causes a complete breakdown of Yemen’s public health systems. In the short-term, COVID-19 poses a terrifying threat to Yemen’s population, particularly as the country’s malnourished population has among the world’s lowest immunity levels. The UN has warned that Yemen faces a worst-case scenario, speculating that the COVID-19 death toll could surpass that of war, disease, and malnutrition from the last five years.⁷² Additionally, the need to invest in the COVID-19 response may divert scarce resources away from other lifesaving health responses, such as responses for cholera and dengue. In the long-term, the destroyed health system and dismantled health workforce, further weakened by the COVID-19 impact, will have even greater indirect effects. The lack of medicine, supplies, and health care could lead to even higher mortality rates from illnesses easily treated in other countries, like NCDs, and a greater spread of vaccine-preventable disease. Health disparities will become more pronounced. Funding that could have gone to health systems strengthening will inevitably be devoted to a cycle of emergency responses. The current health system is already edging towards the brink of collapse, and the effects of COVID-19 will have an exponential effect.



⁷⁰ Physicians for Human Rights. ““I ripped the IV out of my arm and started running”: Attacks on Health Care in Yemen”. March 18, 2020. <https://phr.org/our-work/resources/i-ripped-the-iv-out-of-my-arm-and-started-running-attacks-on-health-care-in-yemen/>

⁷¹ Physicians for Human Rights, supra 70

⁷² Brookings Institution. “Yemen and COVID-19: The pandemic exacts its devastating toll.” June 19, 2020. <https://www.brookings.edu/blog/future-development/2020/06/15/yemen-and-covid-19-the-pandemic-exacts-its-devastating-toll/>.

RECOMMENDATIONS

Based on the input of local MedGlobal staff and Yemeni medical professionals and MedGlobal volunteers' experience in Yemen, MedGlobal has identified several recommendations for the COVID-19 crisis response. Here are our recommendations for hospitals administrations, health focused NGOs and UN agencies working in Yemen, the Yemen government and de facto authorities, the US government, and all donor governments.

“COVID-19 shook countries with advanced health systems and services. What will it do to a country like Yemen that has lived in the shadow of war for five years?”

- Dr. Nahla Areeshi, Aden

To hospitals administrations:

- **Prioritize protection of staff.** Health workers are risking their own health to treat patients during this COVID-19 pandemic. They must be supported with sufficient PPE, as well as training of the proper use of PPE, and hand sanitizer as a priority.
- **Facilitate ongoing staff training.** Hospital administrators should have proper training on basic hospital functions, and medical staff should be properly trained on a wide range of topics, including biomedical ethics, proper communication with families of critically ill patients, triaging, and clinical management of COVID-19 patients should be provided to all medical staff members involved in hospital care. This is a critical moment where proper training can be life-saving for staff and patients. This is a critical moment where proper training can be life-saving for staff and patients.
- **Update clinical protocols.** Hospital departments should establish and update clinical protocols, especially protocols for the management of COVID-19 patients using locally-available laboratory and radiographic tests and medications. COVID-19 best practices should be implemented in all health facilities, including facility mapping for social distancing and a limit on the number of patients in waiting rooms.
- **Invest in infection control.** All hospitals should consider housing an infection control department and hiring trained infection control nurses. Infection control committees should be considered, which would include members from hospital administrations; laboratory directors; pharmacists; directors of nursing, ICU medicine, and surgery; and environmental services. The committees could meet monthly to discuss pertinent issues around infection control, such as an increase of infections in certain geographic areas. It is also important to provide adequate sanitation measures in all hospitals - such as waterless sanitizer gels at the entrance to each hospital room and proper waste management - and to enforce policies of staff hand washing during patient care.
- **Provide COVID-19 education materials to patients.** Communication materials providing COVID-19 related information and techniques for prevention should be available to patients at all hospitals.



“When the crisis in Yemen ends, when its economy improves, when the living conditions improve for citizens, the health situation will improve.”

- Dr. Nahla Areeshi, Aden

To INGOs and UN agencies:

- **Scale up diagnostic and testing capabilities.** Additional PCR machines and CT machines are needed in public hospitals to increase COVID-19 testing and diagnostic capacity, as well as adequate training for those who interpret results.
- **Increase the provision of supplies for COVID-19 prevention and management.** Additional PPE is critical and needed for all health staff in Yemen, particularly those in rural areas. Ventilators, oxygen generators, and oxygen cylinders are particularly needed in hospitals and isolation units.
- **Training for health workers.** Additional training for medical staff is needed with a focus on case management, particularly for those working in isolation units, and COVID-19 diagnosis. Remote training may be required, including the utilization of remote instructions on low-bandwidth, self-guided eLearning courses or telemedicine.
- **Maintain core health services.** In addition to the COVID-19 response, it is important that all core primary health services, including vaccinations and maternal and child care, are available and widely accessible.
- **Expand mental health programming.** Mental health and psychological support (MHPSS) for local health care providers and vulnerable populations is key. In particular, there is a need for interventions to address the mental health effects of this pandemic, widespread fear, and social isolation in a culturally-salient manner. Health workers would benefit greatly from training in psychological first aid and stress reduction techniques to monitor and manage both their patients' mental health and their own.
- **Prioritize protection of the most vulnerable.** The COVID-19 pandemic is exacerbating the suffering and isolation of the most vulnerable, including IDPs, survivors of interpersonal violence, detainees, the elderly, and persons with disabilities. Health organizations should center the needs of the most vulnerable populations and ensure that they are able to access health services.
- **Prioritize duty of care for health and humanitarian workers.** A priority should also be placed on duty of care for health and humanitarian workers, with their protection

needs centered. All organizations that support frontline staff should internalize principles of duty of care, the obligation to provide a reasonable standard of care for staff engaging in dangerous work. Frontline health and humanitarian workers must be supported by PPE and other protective measures.

To the Yemen government and de facto authorities:

- **Halt hostilities nationwide.** All parties should agree to a nationwide ceasefire, which would allow a humanitarian response to COVID-19, widespread malnutrition and starvation, and other health crises. All parties to the conflict should immediately halt attacks against civilians and civilian areas.
- **Facilitate unhindered humanitarian access.** All parties must allow safe, rapid, and unhindered access for humanitarian supplies and personnel throughout Yemen, and there should be an unwavering support for humanitarian principles.
- **Strengthen reporting and detection systems.** It is critical that reporting and early detection systems are strengthened. Building the capacity of health providers to diagnose COVID-19 is essential at the national and subnational levels.



RECOMMENDATIONS

- **Prioritize supporting health workers and their protection, including through consistent staff salaries.** Incentives and salaries are necessary to support Yemeni health professionals, who are inherently risking their lives to respond to this unmitigated COVID-19 crisis. In June 2020, groups of medics at hospitals began to go on strike, calling for support and accommodation that allows them to physically distance from their families. These calls must be taken seriously. Health workers must be provided compensation, particularly during this time of crisis, ideally with additional hazard pay to compensate for the risk of exposure. The families of health workers who have been incapacitated or died due to COVID-19 should be supported financially as well.
- **Prioritize staff salaries.** Incentives and salaries are necessary to support Yemeni health professionals, who are inherently risking their lives to respond to this unmitigated COVID-19 crisis. In June 2020, groups of medics at hospitals began to go on strike, calling for support and accommodation that allows them to physically distance from their families. These calls must be taken seriously.

To the US government:

- **Increase humanitarian assistance to all of Yemen based on the most critical needs.** There is now a major funding gap for UN and NGO led programs, including health programs. The US should scale up its funding commitments and speedy follow through to the 2020 Yemen Humanitarian Response Plan. USAID should ensure that humanitarian and health organizations have adequate resources to respond to COVID-19 in all of the areas with the greatest need.
- **Reinstate membership in the WHO and support its response in Yemen.** The US administration has announced it will be withdrawing from the WHO, which would come into effect in July 2021. It is critical that this policy is reversed, for the health of U.S. citizens facing the COVID-19 pandemic, as well as the incredibly vulnerable communities in fragile states like Yemen. The WHO is leading the COVID-19 response globally, and overseeing critical aspects in Yemen.

- **Prioritize a resolution to the conflict.** Once the war, bombings, and armed violence ends, public health issues and health governance can be more effectively addressed. The US and other permanent members of the UN Security Council must call for an end to armed conflict in Yemen and put the full weight of their diplomatic efforts to accomplish this end. Such efforts should include an immediate pause of countries supplying weapons - which continue to kill civilians - to all parties to the conflict.

To all donor governments:

- **Fully fund the Yemen Humanitarian Response Plan.** The 2020 HRP is only 18% funded as of July 8. Donor governments should all increase their funding commitments and ensure payment on existing commitments. If this major funding gap is not made up, the human toll and destabilizing effect will be immense. A particular emphasis should be placed on the direct funding of Yemeni NGOs supporting frontline humanitarian and health workers. All donor governments should emphasize the importance of duty of care among their on-the-ground partners, and should lead by example in their funding of PPE and other protective line items.
- **Ensure health workers are supported.** Donor governments should work with the WHO and the Yemen Ministry of Health to scale up funding for short-term incentives through the WHO or INGOs, and advocate that the Yemen government and de facto authorities prioritize health staff salaries during this unparalleled crisis.

ANNEX - HEALTH WORKERS WHO HAVE DIED REPORTEDLY FROM COVID-19

This list was compiled by a group of Yemeni doctors and medical students, who are keeping track of their colleagues who have died reportedly from COVID-19 and updating the list on an ongoing basis. Not all of the health workers on this list were tested for COVID-19, which means that it cannot be confirmed that their cause of death was COVID-19; however, all of these health workers died from COVID-like symptoms which their medical colleagues believe to have been COVID-19. MedGlobal is not listing the names of these individuals who have passed away as it is not able to obtain consent from the families of each health worker.

Governorate	Specialty/Position
Abyan	1. Director of the Bureau of Health
	2. Director of Laboratory Department
	3. Pediatrician
Aden	4. Dentist
	5. Dentist
	6. Emergency Specialist
	7. Health Worker
	8. Internist
	9. Internist
	10. Internist
	11. Lab
	12. Microbiologist
	13. Midwife
	14. Midwife
	15. Midwife
	16. Nurse
	17. Obstetrician-gynecologist
	18. Orthopaedist
	19. Pediatric Advisor
	20. Pharmacist
	21. President of the Department of Internal Medicine at Aden University
	22. Public Health Professional
	23. Radiologist
Al Bayda	24. Health Worker
Dhale	25. Director
Dhamar	26. Health Worker
	27. Health Worker
	28. Nurse
Hadhramaut	29. Director

ANNEX - HEALTH WORKERS WHO HAVE DIED REPORTEDLY FROM COVID-19

Hajjah	30. Health Worker
Al Hudaydah	31. Dermatologist
	32. Health Worker
	33. Pediatrician
Ibb	34. Dentist
	35. Health Worker
	36. Pediatrician
Marib	37. Health Worker
	38. Obstetrician-gynecologist
	39. Pharmacist
Al Mahwit	40. Health Worker
	41. Pharmacist
Sa'dah	42. Health Worker
Sana'a	43. Community Medicine
	44. Dentist
	45. Director
	46. Director
	47. Director
	48. Director
	49. Director
	50. Endoscopist
	51. Epidemiologist
	52. General Surgery
	53. Health Supply Director (Former)
	54. Health Worker
	55. Health Worker
	56. Health Worker
	57. Health Worker
	58. Intensive Care Doctor
	59. Internist
	60. Internist
	61. Medical Device Sterilization
	62. Medical Labs
	63. Nurse

ANNEX - HEALTH WORKERS WHO HAVE DIED REPORTEDLY FROM COVID-19

Sana'a	64. Nurse
	65. Nurse
	66. Nurse
	67. Nurse
	68. Optometrist
	69. Orthopaedist
	70. Pediatric Advisor
	71. Person Responsible for Moving Samples
	72. Pharmacist
	73. Pharmacist
	74. Pharmacist
	75. Pharmacist
	76. Pharmacist
	77. President of the Lab Department
	78. President of the Operations Department
	79. Radiologist
	80. Urologist
Shabwah	81. Orthopaedic Surgeon
Taiz	82. Director
	83. General Surgeon
	84. General Surgeon
	85. Optometrist
	86. Pharmacist
	87. Pharmacist
	88. Pharmacist
Governorate Unknown	89. Radiologist
	90. Facial and Jaw Surgeon
	91. Health Worker
	92. Health Worker
	93. Health Worker
	94. Nurse
	95. Nurse
	96. Pharmacist
	97. Pharmacist

THANK YOU

MedGlobal wants to thank the medical volunteers who participated in medical, surgical, and training response trips to Yemen:

Ahmed Ebeid, Anesthesia, USA

Alex Bonnel, Hospitalist, POCUS Trainer, USA

Nour Akhras, Pediatrics and Infectious Disease, USA

John Kahler, Pediatrics, USA

Imran Akbar, Anesthesia, USA

Suhail Sharif, Surgical Oncology, USA

Opada Alzohaili, Endocrinology, USA

Jacques Beres, War Surgery, France

Paul Eun, Obstetric and Gynecology, USA

Faiz Hussain, Internal Medicine, USA

Lia Harris, Pediatrics, Canada

Nahreen Ahmed, Pulmonary and Critical Care,
POCUS Trainer, USA

Neda Farzan, Emergency and Disaster Medicine, USA

Susanah Fernandez, Surgery, Spain

Tajammul Hussain, Oncology, USA

Mohamad Ikhtiyar, Orthopedic Surgery, Syria

Ekaterina Kurlygina, Emergency Medicine, Russia

Kwan Kew Lai, Infectious Disease, Malaysia, USA

Mohamad Asfour, Optometry, Canada

Marc Roussel, Photographer, France

Fahim Aref, Director of Pious Project, USA

Lubna Hussain, Pediatrics, USA

Tayseer Alkareem, MedGlobal Yemen Program
Manager (2019-2020), Syria





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