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Female Health Networks in Yemen: an Examination of the Impact of Conflict on Health Infrastructure and the Role of Women in Yemen's Health System

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Female Health Networks in Yemen: an Examination of the Impact of Conflict on Health
Infrastructure and the Role of Women in Yemen's Health System

Senior Project Submitted to
The Division of Social Studies of Bard College

by
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Annandale-on-Hudson, New York

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Abstract:

This project aims to establish the existence of informal community female-led health networks within Yemen and understand the functions of these health networks and how they have been impacted by the ongoing internal conflict in the country. Female health networks exist globally in both informal and formal sectors. But, the extent to which female health networks function and their importance is unique to Yemen, and there has been no scholarly work focusing on this phenomenon. This paper will use the information gained from 52 interviews with Yemeni women and available literature to understand the current formal and informal health systems in Yemen. I found that informal community female-led health networks have been strengthened to support communities that lack adequate health systems and have evolved instinctively as a necessary response to provide mutual aid. Women from all sects of life participate in these networks and have taken on roles that are unsubsidized in order to aid in the maintenance of community health. Women in Yemen have organized effectively to create a profusion of support networks across the country at various levels to improve the quality of life for other women and Yemeni society at large. In regions that experience heightened levels of conflict and health infrastructure destruction, informal community female-led health networks have grown and are more heavily relied upon by other women and the community.

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Introduction

Conflict is known to negatively impact health systems, health infrastructure, and access to care.¹ Military strikes targeting health facilities can have both acute and long-term effects on health systems. Supply chain interruptions can impact the distribution of food and water as well as limited supplies of essential medicine and medical equipment.² The current conflict in Yemen began in 2014 as the Houthi rebels, an Islamist political and armed movement, also known as Ansar Allah, took control of the capital city of Sana'a.³ In 2011, Yemenis joined the Arab Spring uprisings, protesting against autocratic rule. In response to the political instability, the Gulf Cooperation Council (GCC) Initiative removed the long-time autocrat from power, President Ali Abdullah Saleh, and temporarily avoided a civil war. This initiative to quell national frustration did not address the elite rivalries or the corrupt political economy but did result in a new president, Abd Rabbuh Mansur Hadi, being appointed. The National Dialogue Conference (NDC) was convened to construct a new constitution, but negotiations ended in 2014 with none of the core political agreements being met, and the preservation of the power and corruption of old regime elites.⁴

Tensions had been rising between the Houthi rebel group and the Abd Rabbuh Mansur Hadi-led government, and in July of 2014, the government ended its fuel subsidy program. This fuel subsidy cut threatened to thrust hundreds of thousands of Yemenis into poverty and

¹ Ugalde, A, E Selva-Sutter, C Castillo, C Paz, and S Cañas. "Conflict and Health: The Health Costs of War: Can They Be Measured? Lessons from El Salvador," July 15, 2000. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1118168/#:~:text=Studies%20assessing%20the%20health%20impact,%2C%20disabilities%2C%20infant%20mortality%2C%20and>.

² Druce, Philippa, Ekaterina Bogatyreva, Frederik Francois Siem, Scott Gates, Hanna Kaade, Johanne Sundby, Morten Rostrup, et al. "Approaches to Protect and Maintain Health Care Services in Armed Conflict – Meeting SDGs 3 and 16." Conflict and Health. BioMed Central, January 29, 2019. <https://conflictandhealth.biomedcentral.com/articles/10.1186/s13031-019-0186-0>.

³ Alley, April. "Yemen's Houthi Takeover." International Crisis Group. International Crisis Group, October 4, 2016. <https://www.crisisgroup.org/middle-east-north-africa/gulf-and-arabian-peninsula/yemen/yemen-s-houthi-takeover>.

⁴ Alley, April. "Yemen's Houthi Takeover." International Crisis Group. International Crisis Group, October 4, 2016. <https://www.crisisgroup.org/middle-east-north-africa/gulf-and-arabian-peninsula/yemen/yemen-s-houthi-takeover>.

exacerbate food insecurity within the country. In response, mass protests were calling on the administration to resign, and this political unrest was encouraged by the Houthi tribal leader Abdul Malek al-Houthi.⁵ The Houthis were excluded from the Hadi-led government, and after weeks of anti-government civilian protests, they took advantage of the growing opposition by advancing South and taking over the capital city of Sana'a in September 2014.⁶ This escalation in the conflict between the Houthi rebels and the Hadi-led government marked the beginning of the internal war that continues today. The conflict intensified with the involvement of Saudi Arabia in 2015, which helped form a coalition to back Hadi, and an air campaign was launched to assert dominance and push back against Houthi control.

High levels of violence have had devastating impacts on healthcare in Yemen; much of the health infrastructure has been demolished, all warring parties have targeted healthcare workers, and essential supplies are limited. To understand the impacts of the conflict on the health of the Yemeni population, the history of Yemen must be considered with factors that led to the devastating war that continues today. The Republic of Yemen today is only 31 years old, but the history of the Yemen region stretches back 3,000 years.⁷ Yemen is broken up into governorates and then further into districts. These governmental borders do not necessarily capture the distribution of communities due to society being tribally structured with members from the same tribe living among multiple districts and governorates in a region.

⁵ Ghobari, Mohammed. "Tens of Thousands of Yemeni Houthis Protest against Fuel Reform, Government." Reuters. Thomson Reuters, August 18, 2014. <https://www.reuters.com/article/us-yemen-protests/tens-of-thousands-of-yemeni-houthis-protest-against-fuel-reform-government-idUSKBN0GI10420140818>.

⁶ "Yemen War: 5 Years since the Houthis' Sanaa Takeover." Yemen war. Aljazeera, September 2019. <https://www.aljazeera.com/news/2019/9/21/yemen-war-5-years-since-the-houthis-sanaa-takeover>.

⁷ "History of Yemen." Encyclopædia Britannica. Encyclopædia Britannica, inc. Accessed April 26, 2021. <https://www.britannica.com/place/Yemen/History>.

As Yemen experiences soaring rates of conflict, famine, inadequate access to health resources, and economic insecurity, there has been a growth and strengthening of what I am defining as informal community female-led health networks. These *mutual aid* networks represent women coming together to help support each other without seeking any compensation, a concept that became famous in the 19th century by the Russian anarchist and historian Peter Kropotkin.⁸⁹ Kropotkin argued that natural selection led to mutual aid instead of competition, and thus societies practicing mutual aid thrived.¹⁰ Community health in Yemen has been largely supported by informal community female-led health networks where women link together to educate each other, provide healthcare, share resources, connect women with some of the few remaining hospitals, peacemaking, and basic resource distribution. It is known that female health networks exist globally in both informal and formal sectors. Still, the extent to which female health networks function and their importance are unique to Yemen, and there has been no scholarly work focusing on this phenomenon in Yemen.¹¹ Unfortunately, the exceptionally high levels of violence make traveling to Yemen to study these informal community female-led health networks, but through phone calls and Zoom meetings, this paper will use the information gained from 52 interviews and available literature to understand the current health infrastructure in Yemen and the role of health networks within the country.

⁸ Kinna, Ruth, and Thomas Swann. "This Anarchist Thinker Helps Explain Why We Feel so Driven to Help Each Other through the Coronavirus Crisis." *The Conversation*. *The Conversation*, January 14, 2021. <https://theconversation.com/this-anarchist-thinker-helps-explain-why-we-feel-so-driven-to-help-each-other-through-the-coronavirus-crisis-134494>.

⁹ Kinna, Ruth. "Kropotkin's Theory of Mutual Aid in Historical Context." *International Review of Social History* 40, no. 2 (1995): 259–83. doi:10.1017/S0020859000113227.

¹⁰ Dugatkin, Lee Alan. "The Prince of Evolution: Peter Kropotkin's Adventures in Science and Politics." *Scientific American*. *Scientific American*, September 13, 2011. <https://www.scientificamerican.com/article/the-prince-of-evolution-peter-kropotkin/#:~:text=Natural%20selection%2C%20Kropotkin%20argued%2C%20led,selection%20had%20favored%20such%20actions>.

¹¹ "Five Women Inform Workers Share Their Challenges in Accessing Health Services." WIEGO. WIEGO, April 2016. <https://www.wiego.org/blog/five-women-informal-workers-share-their-challenges-accessing-health-services>.

To examine how the conflict began and how it has impacted the health system in Yemen; Chapter 1 will provide a brief history of Yemen and a summary of how the current conflict has unfolded. Chapter 2 examines the historical health infrastructure, current health infrastructure, and the impact of the conflict on women and child health. Chapter 3 details the interviews conducted with Yemeni women and provides evidence for the existence of informal community female-led health networks. This research confirms the existence of female health networks in Yemen and details their importance throughout the country. These informal community female-led health networks have become an essential part of the health system and are increasingly relied upon as health infrastructure has been damaged throughout the conflict. The women within the groups act in a form of spontaneous mutual aid without profit seeking motives in order to improve the health of their communities and aid in the improvement of population health in Yemen. In the future, post-conflict Yemen, it is essential that alongside infrastructure development is the linking of the formal sector with these informal health networks in order to integrate them into a new health system.

Women have spearheaded the efforts on the ground to mediate inter-tribe conflicts, mediate conflicts over public resources, to address poor living conditions, and to work with humanitarian aid groups to ensure that those most at risk receive aid.¹² Women remain responsible for sustaining their families and communities and addressing the devastating effects of conflict. Women have been essential in the de-escalation of violence and field data from the UN shows that in governorates where women have historically engaged in peacebuilding, they have continued to play this role since the start of the current conflict in 2014.¹³ They have helped

¹² “WOMEN AS PEACEBUILDERS IN YEMEN .” Yemen Report . SOCIAL DEVELOPMENT DIRECT, June 2018. http://www.sddirect.org.uk/media/1571/sdd_yemenreport_full_v5.pdf .

¹³ “Women in Conflict Resolution and Peacebuilding in Yemen.” United Nations. United Nations, 2019. <https://yemen.un.org/en/15853-women-conflict-resolution-and-peacebuilding-yemen>.

in the distribution of aid, maintaining local services where the government has been absent or inadequate, addressing the psychological impact of violence, promoting peace, mediating between armed parties, and contributing to economic recovery.¹⁴ Since the beginning of the conflict, women have become more economically active as they move into positions vacated by men who have left to engage in the conflict, been injured, or killed. There has been evidence that women's roles in Yemen are starting to change and that traditional gender roles may be shifting.¹⁵ Roles have shifted due to many men and boys leaving the home to participate in the conflict and many have been injured or killed; this has led to more women taking on roles that traditionally were male-dominated. Women in these new positions still face substantial hardships in terms of social exclusion, lack of mobility, and limited access to resources.¹⁶ Women have become an essential part of the sustainment of community services and structures, creating their own networks on the ground in Yemen to support each other and their communities and have become essential to Yemen's health infrastructure.¹⁷

¹⁴ "WOMEN AS PEACEBUILDERS IN YEMEN ." Yemen Report . SOCIAL DEVELOPMENT DIRECT, June 2018. http://www.sddirect.org.uk/media/1571/sdd_yemenreport_full_v5.pdf .

¹⁵ "Women in Conflict Resolution and Peacebuilding in Yemen." United Nations. United Nations, 2019. <https://yemen.un.org/en/15853-women-conflict-resolution-and-peacebuilding-yemen>.

¹⁶ "Conflict and Gender Relations in Yemen ." Yemen Gender Report . CARE International, OXFAM Great Britain, or the Gender Standby Capacity Project, November 2016. <https://www.care-international.org/files/files/YemenGenderReport171116.pdf> .

¹⁷ "WOMEN AS PEACEBUILDERS IN YEMEN ." Yemen Report . SOCIAL DEVELOPMENT DIRECT, June 2018. http://www.sddirect.org.uk/media/1571/sdd_yemenreport_full_v5.pdf .

Chapter One: A Brief History of Yemen and the Current Conflict

Yemen is located at the southwestern corner of the Arabian Peninsula. It has long been referred to as fertile Arabia due to the fertile western mountains, but water scarcity has become a more significant problem in the past few decades. The depletion of the aquifer in the Sa'ada basin, one of the northern governorates of the country, accelerated social differentiation where wealthy landowners can afford to drill deep wells, and the average citizen's shallow wells dry up. Access to aquifers has an enormous impact on agriculture which is the primary sector of the economy.¹⁸

The Republic of Yemen was formed in 1990 when the Yemeni Arab Republic (YAR, northern Yemen) and the People's Democratic Republic of Yemen (PDRY, southern Yemen) united after 22 years of conflict and border disputes.¹⁹ Before unification, one political figure who continued to play an outsized role in the current conflict in Yemen is president Ali Abdullah Saleh, the president of YAR, who advocated for unification. YAR president Ali Abdullah Saleh who came into power in 1978, and PDRY general secretary Ali Salim al-Bidh started working jointly on border-crossing initiatives. In 1989, the two countries reached an agreement to draft a united constitution and unity was declared in May of 1990. The unification of the YAR and PDRY began on an unstable footing with disagreements on how the nation's various ministries would be run and what aspects from each of the previous countries would stay, and what would be adapted. The countries had previously run with different economic systems, the PDYR being a socialist economy, and the YAR being a free market system, and unification required the south to change very rapidly. Although the unification caused substantial disruption to people all over

¹⁸ Lackner, Helen, and Abulrahman Al-Eryani. "Yemen's Environmental Crisis Is the Biggest Risk for Its Future." The Century Foundation. The Century Foundation, December 15, 2020.

<https://tcf.org/content/report/yemens-environmental-crisis-biggest-risk-future/>.

¹⁹ Dunbar, Charles. "The Unification of Yemen: Process, Politics, and Prospects." *Middle East Journal* 46, 1992. <http://www.jstor.org/stable/4328466>.

the country, there was minimal anti-United Yemen sentiment in the country, and Ali Abdullah Saleh transitioned from the president of the YAR to president of the new Republic of Yemen.²⁰ During this period, the group Ansar Allah gained power, this group consisted of imams, Muslim leaders, promoting Zaydism- a sect of Shi'a Islam, who were primarily located in northern Yemen and had been repressed while under the YAR.²¹ In 1993 parliamentary elections were held for the 301 Chamber of Deputies seats, with 123 going to members of Saleh's General People's Congress, 56 to the Yemeni Socialist Party (YSP) and the Islah or Yemeni Grouping Reform Party winning 62 with the remainder of seats going to smaller parties or independents. Although elections took place with few barriers, the YSP leader, and Yemeni Vice President al-Bayd left Sana'a due to the loss. They began to rally their constituents in Aden, angered by the military presence of northern troops in the south and the control possessed by president Saleh. Instability erupted again in 1994, consisting of a series of skirmishes between the former YAR army and the former PDRY military divisions in the north. These aggravated encounters soon advanced into a fully-fledged civil war which lasted for seventy days and consisted of conventional warfare between the government forces, led by president Ali Abdullah Saleh and the separatist southern army fighting in the name of the Yemeni Socialist Party (YSP). The Republic of Yemen government won a military victory over the southern separatists in July of 1994.²² The short civil war resulted in renewed power at the hands of president Saleh and the General People's Congress-Islah coalition. In 1997, parliamentary elections were held again, with General People's Congress winning the majority of seats, followed by Islah and the YSP.

²⁰ Montgomery, Marcus. "A Timeline of the Yemen Crisis, from the 1990s to the Present." Arab Center Washington DC. Arab Center, February 2021.

http://arabcenterdc.org/policy_analyses/a-timeline-of-the-yemen-crisis-from-the-1990s-to-the-present/.

²¹ Schmitz, Charles. "The Huthi Ascent to Power." Middle East Institute. Middle East Institute, April 26, 2021. <https://www.mei.edu/publications/huthi-ascent-power>.

²² "YEMEN HUMAN RIGHTS IN YEMEN DURING AND AFTER THE 1994 WAR." Human Rights Watch. Human Rights Watch/Middle East, October 1994. <https://www.hrw.org/publications>.

Unfortunately due to the General People's Congress's majority, they chose to rule alone causing Islah to become the major opposition party in parliament.²³ During the election in 1999, Ali Abdullah Saleh was reelected in the country's first direct presidential elections, and this time the term was lengthened to last for seven years, and president Saleh focused on improving relations with Saudi Arabia, signing a border demarcation agreement in 2000 called the Treaty of Jeddah.²⁴

The relationship between the Republic of Yemen and the U.S.A. changed in 2001 after the September 11 attacks on the World Trade Center by Al Qaeda. President Saleh flew to Washington D.C. days after the terror attacks and pledged Yemen's full support for George W. Bush's *War on Terror*, but brushed aside the nation's political stances; growing Yemeni nationalism, anti-American sentiment, and the increased power held by Yemeni militant Islamists.²⁵ When the Bush administration invaded Iraq in 2003, Hussein Badreddin al-Houthi, the founder of the current Houthi group, preached Zaydism and began to hold anti-government and anti-American demonstrations.²⁶ Hussein Badreddin al-Houthi founded the current Houthi group, starting in the 1990s when he led Shabab al-Mu'minin to promote Zaydism in the north, where the beliefs had faded after centuries of strong Zaydis control in the region. Hussein Badreddin al-Houthi gained popularity by critiquing the alliance between Saleh and the United States and led a revolt against the Yemeni government in 2004. Hussein Badreddin al-Houthi died at the end of the revolt. Still, his father Badr al-Din al-Houthi and brother Abd Malik

²³ "War of Secession and Political Unrest." Encyclopædia Britannica. Encyclopædia Britannica, inc. Accessed April 26, 2021. <https://www.britannica.com/place/Yemen/War-of-secession-and-political-unrest>.

²⁴ Montgomery, Marcus. "A Timeline of the Yemen Crisis, from the 1990s to the Present." Arab Center Washington DC. Arab Center, February 2021.

http://arabcenterdc.org/policy_analyses/a-timeline-of-the-yemen-crisis-from-the-1990s-to-the-present/.

²⁵ "War of Secession and Political Unrest." Encyclopædia Britannica. Encyclopædia Britannica, inc. Accessed April 26, 2021. <https://www.britannica.com/place/Yemen/War-of-secession-and-political-unrest>.

²⁶ Schmitz, Charles. "The Huthi Ascent to Power." Middle East Institute. Middle East Institute, April 26, 2021. <https://www.mei.edu/publications/huthi-ascent-power>.

al-Houthi took over the Houthi group and conflict between them and President Saleh's government forces continued, culminating in 2010 when the Houthi rebel group survived an onslaught of Saudi and Yemen militaries. Widespread anger towards Saleh and the Yemeni government due to their support for Americans and the mistreatment they perceived resulted in a larger population supporting the Houthi rebels as resistance to the Saleh regime.²⁷

Yemen has experienced political instability for more than ten years, made visible in 2010 and 2011 with massive protests following the Arab Spring, resulting in the ousting of President Ali Abdullah Saleh. The new President, Abd Rabbuh Mansur Hadi, began a two-year transition period where Yemen experienced increasing internal violence. Yemen remained deeply divided under President Hadi as tensions grew between the new president, and the Houthi rebels and Islamist militants from Al- Qaeda.²⁸ In July of 2014, the government ended its fuel subsidy program, which thrust hundreds of thousands of Yemenis into poverty resulting in mass protests calling on the administration to resign.²⁹ The Houthi rebels took advantage of the widespread anger directed toward the government and forcefully took control of the capital Sana'a causing President Hadi to flee the country.³⁰ This marked the beginning of the violent conflict between the Houthi rebels, backed by their previous enemy, president Saleh, versus the new government, led by Hadi and the Saudi-led coalition. The Houthi rebels and Saleh united due to the shared adversary, President Hadi, who was perceived as a Saudi Arabian stooge. Through the alliance,

²⁷ Schmitz, Charles. "The Huthi Ascent to Power." Middle East Institute. Middle East Institute, April 26, 2021. <https://www.mei.edu/publications/huthi-ascent-power>.

²⁸ "Transfer of Power to Abd Rabbuh Mansur Hadi." Encyclopædia Britannica. Encyclopædia Britannica, inc. Accessed April 26, 2021. <https://www.britannica.com/place/Yemen/Transfer-of-power-to-Abd-Rabbuh-Mansur-Hadi>.

²⁹ Ghobari, Mohammed. "Tens of Thousands of Yemeni Houthis Protest against Fuel Reform, Government." Reuters. Thomson Reuters, August 18, 2014. <https://www.reuters.com/article/us-yemen-protests/tens-of-thousands-of-yemeni-houthis-protest-against-fuel-reform-government-idUSKBN0GI1O420140818>.

³⁰ Montgomery, Marcus. "A Timeline of the Yemen Crisis, from the 1990s to the Present." Arab Center Washington DC. Arab Center, February 2021. http://arabcenterdc.org/policy_analyses/a-timeline-of-the-yemen-crisis-from-the-1990s-to-the-present/.

the Houthis benefited from the military loyalty that Saleh maintained and was able to get broader support throughout the north of Yemen.³¹ The Houthis claim that their central goal is to revive Zaydi traditions and ideologies, including the belief consistent with a Shiite ideology that the Prophet Muhammad cousin Ali should succeed Muhammad as head of the Muslim community. Zayd, the 5th imam under these beliefs founded Zaydism, which believes only blood relatives are eligible to serve as religious leaders or imams. Many of these blood relatives were based in Sa'dah and from these lineages came the Houthi leader, Hussein Badreddin al-Houthi, who sought to protect the Zaydi region of north Yemen from state control.³² The Houthis are supported by the Hashed, Bakeel and Khawlan tribes in Yemen, and is made up of a core Sa'dah faction, the Houthi jihadis, who are Houthis' fighters in the war motivated by radical religious interpretation analogous to Salafi jihadis and Zaydi dogmatists who believe that they are practicing a purer form of Islam perfected by their ancestors.³³

The Saudi-led coalition comprises Sunni-majority states including; Bahrain, Egypt, Jordan, Kuwait, Morocco, Senegal, Sudan, the United Arab Emirates, France, Germany, the United States, and the United Kingdom.³⁴ Although there have been varying levels of conflict within Yemen for decades, the current full-scale military conflict between the Houthi rebels and the Saudi-led coalition on behalf of President Hadi is different due to the Houthi takeover of much of Sana'a and currently the northern areas within Yemen, military division, and Saudi

³¹ Riedel, Bruce. "Who Are the Houthis, and Why Are We at War with Them?" Brookings. Brookings, December 18, 2017.

<https://www.brookings.edu/blog/markaz/2017/12/18/who-are-the-houthis-and-why-are-we-at-war-with-them/>.

³² Abdullah, Khaled. "Who Are Yemen's Houthis?" The World from PRX. Reuters, September 2018.

<https://www.pri.org/stories/2018-12-14/who-are-yemen-s-houthis>.

³³ Al-Hamdani, Sama'a. "Understanding the Houthi Faction in Yemen." FOREIGN POLICY ESSAY. Lawfare, January 30, 2020. <https://www.lawfareblog.com/understanding-houthi-faction-yemen>.

³⁴ Robinson, Kali. "Yemen's Tragedy: War, Stalemate, and Suffering." Council on Foreign Relations. Council on Foreign Relations, February 2021. <https://www.cfr.org/backgrounder/yemen-crisis>.

intervention.³⁵ Saudi Arabia's outsized role in the conflict is due to their claim that the Houthis rebels are directed, armed and financed by Iran, but the Houthis deny this claim. The Houthis central goal is to create chaos, maintain their current control over much of northern Yemen, and continue to push for greater land control with hopes of having total power over the country. The Hadi and Saudi-led coalition is primarily focused on taking back the country and returning Hadi as president.³⁶

Since 2015, there have been 22,701 air raids, 18,569 civilian casualties, 8,759 of those resulting in civilian deaths, and a growing population of internally displaced people, currently estimated to be around 3.3 million.³⁷³⁸ The conflict has devastated the country and has impacted every vital sector. The country's infrastructure has collapsed; power outages occur often, water supply is irregular, sanitation is subpar, irrigation has become a severe threat as flooding occurs more frequently, and agricultural services have been hindered.⁴⁰ In rural areas, only 22% of the population is connected to partially functioning public water networks, and in urban areas, 46% is reliant on partially functioning public water networks.⁴¹ Less than 55% of the population has access to safe water and basic sanitation and half of the population struggles to find or buy

³⁵ Robinson, Kali. "Yemen's Tragedy: War, Stalemate, and Suffering." Council on Foreign Relations. Council on Foreign Relations, February 2021. <https://www.cfr.org/background/yemen-crisis>.

³⁶ Al-Dawsari, Nadwa, Laila Lutf al-Thawr, and Samuel Ramani. "For Yemen's Houthis, the Status Quo Is the Key to Power." Middle East Institute. Middle East Institute, April 26, 2021.

<https://www.mei.edu/publications/yemens-houthis-status-quo-key-power>.

³⁷ "Yemen Data Project" Yemen Data Project. Open Society Foundations. Accessed April 26, 2021.

<https://yemendataproject.org/>.

³⁸ "Yemen Operation." Global Focus. UNHCR, 2021. <https://reporting.unhcr.org/node/2647>.

³⁹ "Republic of Yemen - Country Engagement Note for the Period FY20-FY21 : Yemen ." World Bank. World Bank, April 2019.

<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/757121557938303017/yemen-country-engagement-note-for-the-period-fy20-fy21>.

⁴⁰ El Bcheraoui, Charbel, Aisha O. Jumaan, and Michael Collison. "Health in Yemen: Losing Ground in War Time." Globalization and Health. US National Library of Medicine- National Institutes of Health, April 25, 2018.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5918919/>.

⁴¹ "Goal 6: Clean Water and Sanitation: UNDP in Yemen." UNDP. UNDP, 2020.

<https://www.ye.undp.org/content/yemen/en/home/sustainable-development-goals/goal-6-clean-water-and-sanitation.html>.

enough clean water to drink daily.⁴² A total collapse of essential infrastructure has led to the deterioration of population health, especially women and child health.⁴³ The conflict has led to widespread food insecurity and the UN estimates that 80% of the population is at risk of hunger and disease.⁴⁵ Food security is further impacted by the worsening of poverty, affecting 71%-78% of Yemenis.⁴⁶ Yemen is hurtling towards a catastrophic famine fueled by the shattered economy, where millions are unable to afford food and other essential resources. Access to food is also controlled by the warring parties and has repeatedly been used as a weapon of war. Another factor that has worsened the food insecurity crisis is that almost 90% of food is imported. Thus, it is challenging to physically distribute the food within the country because of the damaged infrastructure.⁴⁷

Since the conflict began, there has been a rapid increase in Yemenis forced to flee their homes. It is estimated that over 3.6 million people have been displaced internally due to the conflict.⁴⁸ Along with the massive internal displacement of Yemenis, there are also 280,000 refugees who live in Yemen from the Horn of Africa. They are even more vulnerable to violence

⁴² Whitehead, Frederika. "Water Scarcity in Yemen: the Country's Forgotten Conflict." *The Guardian*. Guardian News and Media, April 2, 2015.

<https://www.theguardian.com/global-development-professionals-network/2015/apr/02/water-scarcity-yemen-conflict>

⁴³ Matthew Fuss. "Increasing Health Care Access in Yemen Through Community-Based Health Insurance." *Indiana Journal of Global Legal Studies* 23, no. 2 (2016): 795-818. doi:10.2979/indjglolegstu.23.2.0795.

<https://www.jstor.org/stable/10.2979/indjglolegstu.23.2.0795>

⁴⁴ Doubek, James, and Mary Louise Kelly. "As Yemenis Starve, Humanitarian Relief Group Pleads For International Help." NPR. NPR, March 1, 2021.

<https://www.npr.org/2021/03/01/972530322/as-yemenis-starve-to-death-humanitarian-relief-group-pleas-for-international-hel>

⁴⁵ "Overview." World Bank. World Bank, March 2021. <https://www.worldbank.org/en/country/yemen/overview>.

⁴⁶ "Overview." World Bank. World Bank, March 2021. <https://www.worldbank.org/en/country/yemen/overview>.

⁴⁷ "6 Troubling Facts About the Looming Famine in Yemen." World Food Program USA. World Food Program, August 8, 2019. <https://www.wfpusa.org/articles/6-troubling-facts-about-the-looming-famine-in-yemen/>.

⁴⁸ United Nations High Commissioner for Refugees. "Shortfall Threatens Critical Aid for Nearly One Million Displaced Yemenis and Refugees." UNHCR. UNHCR. Accessed April 26, 2021.

<https://www.unhcr.org/en-us/news/briefing/2020/4/5ea7ecd84/unhcr-shortfall-threatens-critical-aid-nearly-million-displaced-yemenis.html>.

and insecurity. Women make up three-quarters of internally displaced Yemenis.⁴⁹ There are also large numbers of migrants, around 100,000 each year, who arrive in Southern Yemen from the Horn of Africa (mainly Ethiopia) to trek north into Saudi Arabia.⁵⁰

Yemen has endured over six years of conflict between the Houthi rebels and government forces backed by the Saudi-led coalition. The Saudi-led coalition has launched air campaigns against the Houthi rebels and their central goal is for Hadi to be back in power over all of Yemen. There have been 22,701 coalition air raids since 2015, which have all been led by Saudi Arabia on behalf of Hadi.⁵¹ Saudi Arabia has played one of the most prominent roles in the conflict thus far and is extremely invested in decimating the Houthis. The UAE is also a significant player as they have contributed tens of thousands of ground troops in support of Hadi.⁵²

There has been an additional movement throughout the past six years of extreme conflict; the Southern separatists against the Houthi rebels and the Hadi Saudi-led coalition, with their central goal being an independent Southern Yemen to be separated from the North. Many of the members of this group are former members of the former People's Democratic Republic of Yemen (PDRY, southern Yemen) and blame the conflict on the north and hope that separation will result in peace. Hadi has allied with the Southern Transitional Government and has claimed that he will share power equally with them in a postwar Yemeni Government.⁵³ The US

⁴⁹ Beuze, Jean-Nicolas. "Women Struggle to Get by as Yemen Conflict Hits Six-Year Mark - Yemen." ReliefWeb. OCHA Services, March 2021.

<https://reliefweb.int/report/yemen/women-struggle-get-yemen-conflict-hits-six-year-mark>.

⁵⁰ Al-Ansi, Abdulrahman. "The African Refugees and Migrants Trapped inside Yemen's War." Reuters. Thomson Reuters, June 20, 2020.

<https://www.reuters.com/article/us-refugee-day-yemen-africans/the-african-refugees-and-migrants-trapped-inside-yemens-war-idUSKBN23R09S>.

⁵¹ "Yemen Data Project" Yemen Data Project. Open Society Foundations. Accessed April 26, 2021.

<https://yemendataproject.org/>.

⁵² Robinson, Kali. "Yemen's Tragedy: War, Stalemate, and Suffering." Council on Foreign Relations. Council on Foreign Relations, February 2021. <https://www.cfr.org/background/yemen-crisis>.

⁵³ Robinson, Kali. "Yemen's Tragedy: War, Stalemate, and Suffering." Council on Foreign Relations. Council on Foreign Relations, February 2021. <https://www.cfr.org/background/yemen-crisis>.

government has continued to support Hadi via Saudi Arabia by providing weapons but dampened support after the murder of Jamal Khashoggi in 2018. In February of 2021, President Joe Biden halted the sale of arms to Saudi Arabia and the UAE but continued operations against Al Qaeda in the Arabian Peninsula.⁵⁴⁵⁵ Although Biden has not yet initiated any drone/airstrikes in Yemen, the American government's central goal is to target AQAP leaders and to continue to protect American interests in the region.⁵⁶⁵⁷

⁵⁴ Myre, Greg, Merrit Kennedy, and Vanessa Romo. "U.S. Intelligence: Saudi Crown Prince Approved Operation To Kill Jamal Khashoggi." NPR. NPR, February 26, 2021. <https://www.npr.org/2021/02/25/971215788/biden-administration-poised-to-release-report-on-killing-of-jamal-khashoggi>.

⁵⁵ Doucet, Lyse. "Yemen War: Joe Biden Ends Support for Operations in Foreign Policy Reset." BBC News. BBC, February 5, 2021. <https://www.bbc.com/news/world-middle-east-55941588>.

⁵⁶ "America's Counterterrorism Wars." New America. New America, 2020. <https://www.newamerica.org/international-security/reports/americas-counterterrorism-wars/the-war-in-yemen/>.

⁵⁷ Macias, Amanda. "This War Has to End' - Biden Halts U.S. Support for Offensive Military Operations in Yemen." CNBC. CNBC, February 5, 2021. <https://www.cnbc.com/2021/02/04/biden-will-announce-end-of-us-support-for-offensive-operations-in-yemen.html>.

Today, most of Yemen's northern provinces and the capital Sana'a remain under the control of the Houthis, and devastating conflict continues to plague the country (Figure 1).⁵⁸⁵⁹

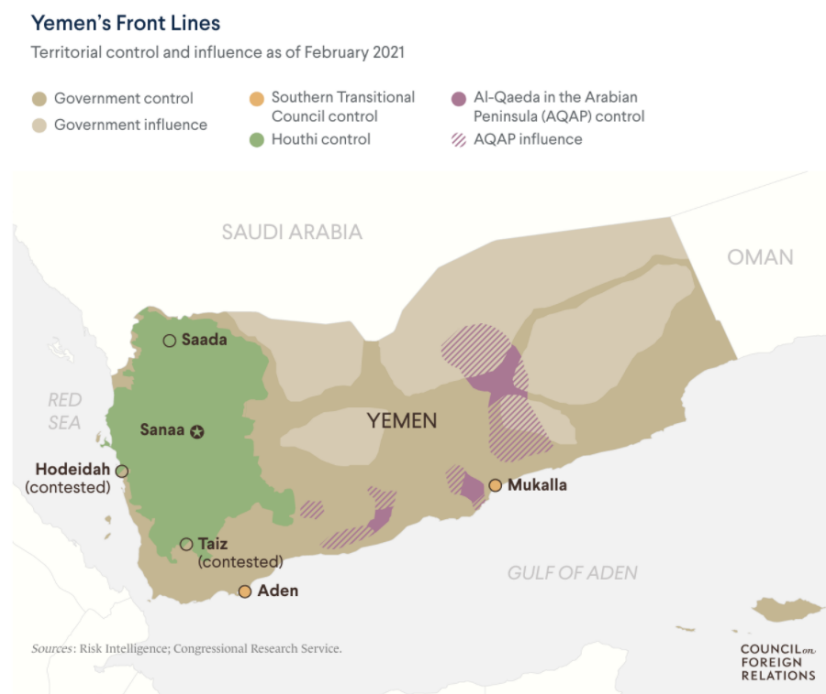


Figure 1. *Yemen's Front Lines*. Created by Council on Foreign Relations. A map of Yemen showing the current territorial control by the Government, or Hadi and Saudi-led coalition, the Houthis, the Southern Transitional Council (STC), and Al-Qaeda in the Arabic Peninsula (AQAP) as of February 2021.

⁵⁸ Baron, Adam. "Mapping the Yemen Conflict." ECFR. European Council on Foreign Relations, October 19, 2015. <https://ecfr.eu/special/yemen/>.

⁵⁹ Robinson, Kali. "Yemen's Front Lines" Council on Foreign Relations. Council on Foreign Relations, February 2021. <https://www.cfr.org/backgrounder/yemen-crisis>.

Chapter Two: Yemen's Healthcare System

Yemen's Historical Health Infrastructure

From 1967 to 1990, Yemen was split into the People's Democratic Republic of Yemen (PDRY), socialist backed, and the Yemen Arab Republic (YAR), backed by the majority of Western governments. The unification in 1990 included the liberalization of the healthcare system, but the previous systems were allowed to continue partially: the PDRY's publicly-funded system and the YAR's private health system. By the 2000s the government encouraged a market approach, and the majority of citizens used the private sector. This shift reduced the public health budget and negatively affected Yemen's most impoverished citizens in rural areas. The shift to private healthcare made it much harder for people in rural regions to access essential medical services, due to costs, and disincentivized private health suppliers to expand their hospitals beyond cities. Health service access in Yemen has always been concentrated in urban areas and this has not changed, resulting in many rural areas having minimal or no access to essential health services without traveling long distances.⁶⁰

A 2003 study from the University of Southampton in the United Kingdom that examined access to and application of reproductive health-related medical knowledge, found that in Yemen, one of the main problems encountered in Yemen was the diversity of foreign medical training due to the absence of a coordinated national medical system.⁶¹ This study also examined women's access to medical care and knowledge and found that there is both a social dimension

⁶⁰ Matthew Fuss. "Increasing Health Care Access in Yemen Through Community-Based Health Insurance." *Indiana Journal of Global Legal Studies* 23, no. 2 (2016): 795-818. doi:10.2979/indjgloglegstu.23.2.0795.

⁶¹ Geyoushi, Bohaira E., Zoë Matthews, and R. William Stones. "Pathways to Evidence-Based Reproductive Healthcare in Developing Countries." *BJOG: An International Journal of Obstetrics and Gynaecology*. Elsevier, May 6, 2003. https://www.sciencedirect.com/science/article/pii/S1470032803029811?casa_token=7Iqpjcro4MAAAAAA%3AaMnv2AjXoVJwfu_b1e1VOftpjBGjdBV-WGzuJ5u1tybt4gkyU7jrsE6QstNjc_UfBjQHV9p4LYw.

that inhibits free mobility as well as financial constraints. In Yemen, culturally, it is less common for women to independently travel and within some families, free movement is restricted.⁶²

Health care in Yemen prior to the conflict was governed centrally by the Ministry of Public Health and Population, at the governorate level by the Governorate Health Offices, and locally by District Health Offices.⁶³ The government healthcare system, run by the Ministry of Public Health and Population, in Yemen is made up of four different entities; primary healthcare units, district hospitals, general hospitals and specialist referral hospitals, and then there are private hospitals in addition. Unfortunately, there has long been a general lack of confidence in the government healthcare system, especially in the primary health units, so patients often sought out care from governorate or national hospitals first and patients with more money utilize the private health sector for care. It is also very common for physicians within the government healthcare system to take additional bribes in return for improved care which has further undermined the system as a whole. Yemen created the District Healthcare System (DHS) in 2002 to deliver primary healthcare through community-based services using mobile clinics and district hospitals. The main goal of this system was to improve access to medical services for rural communities and build up community-based services, but there was never enough funding to properly implement the programs. This program failed due to the absence of proper management.⁶⁴ Many public sector doctors turned to job opportunities in the private health services sectors. The number of private health centers was quickly increasing from 167 private

⁶² Geyoushi, Bohaira E., Zoë Matthews, and R. William Stones. "Pathways to Evidence-Based Reproductive Healthcare in Developing Countries." *BJOG: An International Journal of Obstetrics and Gynaecology*. Elsevier, May 6, 2003.

https://www.sciencedirect.com/science/article/pii/S1470032803029811?casa_token=7Iqqjcro4MAAAAAA%3AaMnv2AjXoVJwfu_b1e1VOftpjBGjdBV-WGzuJ5u1tybt4gkyU7jrsE6QsfNjc_UfBjQHV9p4LYw.

⁶³ Qirbi, Naseeb, and Sharif A Ismail. "Health System Functionality in a Low-Income Country in the Midst of Conflict: the Case of Yemen." OUP Academic. Oxford University Press, April 11, 2017. <https://academic.oup.com/heapol/article/32/6/911/3591753>.

⁶⁴ Matthew Fuss. "Increasing Health Care Access in Yemen Through Community-Based Health Insurance." *Indiana Journal of Global Legal Studies* 23, no. 2 (2016): 795-818. doi:10.2979/indjglolegstu.23.2.0795.

health centers in 2002 to 746 private health centers in 2012.⁶⁵ Employees at private health centers would earn roughly five times more than the same position at a government health service center and thus, the public sector was disadvantaged and there continues to be unofficial fees requested by government healthcare providers who are chronically underpaid and under-equipped.⁶⁶

Yemen's health infrastructure before the beginning of the conflict in 2014 was already facing expanding challenges and inadequate funding and resources. As of 2015, only 50 percent of the Yemeni population had access to healthcare.⁶⁷ The health system was already fragile and heavily reliant on private, out-of-pocket financing, and there was already widespread food insecurity and water supply shortages.⁶⁸

The Impact of Internal Conflict of the Health of Yemenis and the Health Infrastructure

Since 2015, health infrastructure in Yemen has deteriorated. Currently, 19.9 million out of Yemen's 29 million people are without adequate access to healthcare.⁶⁹ More than 50 percent of hospitals and health facilities in Yemen continue to be closed or functioning partially.⁷⁰ Many aid organizations that have provided essential support and aid have been forced to withdraw or suspend operations due to the heightened levels of conflict and inability to provide aid due to blockades. Some of the aid organizations affected include; MSF which has had to suspend operations repeatedly due to violence, International Rescue Committee, Islamic Relief, and

⁶⁵ Matthew Fuss. "Increasing Health Care Access in Yemen Through Community-Based Health Insurance." *Indiana Journal of Global Legal Studies* 23, no. 2 (2016): 795-818. doi:10.2979/indjgloglegstu.23.2.0795.

⁶⁶ Matthew Fuss. "Increasing Health Care Access in Yemen Through Community-Based Health Insurance." *Indiana Journal of Global Legal Studies* 23, no. 2 (2016): 795-818. doi:10.2979/indjgloglegstu.23.2.0795.

⁶⁷ El Bcheraoui, Charbel, Aisha O. Jumaan, and Michael Collison. "Health in Yemen: Losing Ground in War Time." *Globalization and Health*. US National Library of Medicine- National Institutes of Health, April 25, 2018. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5918919/>.

⁶⁸ Qirbi, Naseeb, and Sharif A Ismail. "Health System Functionality in a Low-Income Country in the Midst of Conflict: the Case of Yemen." OUP Academic. Oxford University Press, April 11, 2017. <https://academic.oup.com/heapol/article/32/6/911/3591753>.

⁶⁹ "Overview." World Bank. World Bank, March 2021. <https://www.worldbank.org/en/country/yemen/overview>.

⁷⁰ Physicians for Human Rights. "Yemen: Attacks on Health." PHR newsletter. PHR, January 2019. https://phr.org/wp-content/uploads/2019/01/Jan_2019-Newsletter_FINAL.pdf.

UNICEF.⁷¹ One difficulty faced by humanitarian organizations is that many countries have suspended funding for assistance programs in areas occupied by the Houthi rebels because the group, also known as Ansar Allah, is a designated Foreign Terrorist Organization which disallows the delivery of humanitarian aid.⁷² Understanding the impacts of the conflict is difficult due to very few consistent and updated reports being published. In 2018, the Journal of Conflict and Health reviewed attacks on health care facilities in several different conflicts and reported that for Yemen, they had recorded a total of 93 attacks on health facilities, with the majority of these attacks occurring very often between 2015-2016.⁷³ As of 2019, the number of attacks on medical facilities was estimated to be more than 130 and we can assume that that number has continued to grow.⁷⁴ The reduction of services to health facilities is also due to direct attacks from both warring parties on general infrastructure, including roads, water supplies, and electricity.⁷⁵

The core governance over public health systems has deteriorated and the current health system is only functioning due to the WHO and partner organizations.⁷⁶ The majority of Yemeni health workers in the public sector have worked without pay for over four years and many have

⁷¹ Physicians for Human Rights. “Yemen: Attacks on Health.” PHR newsletter. PHR, August 2019. https://phr.org/wp-content/uploads/2019/08/PHR-August_2019-Yemen-Newsletter.pdf.

⁷² Press Release. “24 Million Yemenis at Catastrophic Humanitarian Risk Following New U.S. Terrorist Designations of Ansar Allah, Warns IRC.” International Rescue Committee (IRC). IRC, January 11, 2021. <https://www.rescue.org/press-release/24-million-yemenis-catastrophic-humanitarian-risk-following-new-us-terrorist>.

⁷³ Briody, Carolyn, Leonard Rubenstein, Les Roberts, and Eamon Penney. “Review of Attacks on Health Care Facilities in Six Conflicts of the Past Three Decades.” Conflict and Health . BioMed Central , 2018. <https://core.ac.uk/download/pdf/161459879.pdf>.

⁷⁴ Magdy, Samy. “Report: Over 130 Attacks on Medical Facilities in Yemen War.” AP NEWS. Associated Press, November 14, 2019. <https://apnews.com/article/8cae880768a849158756a03deefc1ce2>.

⁷⁵ Qirbi, Naseeb, and Sharif A Ismail. “Health System Functionality in a Low-Income Country in the Midst of Conflict: the Case of Yemen.” OUP Academic. Oxford University Press, April 11, 2017. <https://academic.oup.com/heapol/article/32/6/911/3591753>.

⁷⁶ Qirbi, Naseeb, and Sharif A Ismail. “Health System Functionality in a Low-Income Country in the Midst of Conflict: the Case of Yemen.” OUP Academic. Oxford University Press, April 11, 2017. <https://academic.oup.com/heapol/article/32/6/911/3591753>.

stopped working.⁷⁷ Doctors working for private hospitals have been receiving a more constant level of pay due to the cost of care being much higher at these facilities. Many doctors work primarily at private hospitals and take on shift at public hospitals when they can spare the pay in order to provide care to those unable to afford the steep prices of the private sector.⁷⁹

This is due to falling public expenditures as the government has lowered spending and due to many aid organizations scaling back their funding and roles within the country.⁸⁰ Both sides of the conflict, the Houthis and the Saudi-led coalition, have targeted health infrastructure, medically necessary imports, aid, and healthcare personnel.⁸¹ It is extremely worrisome that fewer and fewer medical personnel in a country that continues to face high levels of violence and insecurity.

The conflict has had dire consequences for those living in Yemen; not only is the population at extreme risk due to armed conflict, but the population has been exposed to many risk factors that are driving deaths and disability. The main causes of deaths as of 2019 include neonatal disorders, conflict and terror, ischemic heart disease, congenital disabilities, road injuries, diarrheal diseases, stroke, lower respiratory infections, iron deficiency, and Malaria.⁸² Yemen has seen a surge of vaccine-preventable diseases, including Cholera, Measles, and Polio

⁷⁷ WHO. "Health System in Yemen Close to Collapse." World Health Organization. World Health Organization, September 30, 2015. <https://www.who.int/bulletin/volumes/93/10/15-021015/en/>.

⁷⁸ Editorial. "The Humanitarian Cost of Yemen's Crumbling Health System." *The Lancet Haematology*. The Lancet, December 2018. [https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026\(18\)30198-4/fulltext](https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026(18)30198-4/fulltext).

⁷⁹ "Propping Up Yemen's Health System Without Pay." Doctors Without Borders - USA. MSF international, September 28, 2017. <https://www.doctorswithoutborders.org/propping-yemens-health-system-without-pay>.

⁸⁰ Qirbi, Naseeb, and Sharif A Ismail. "Health System Functionality in a Low-Income Country in the Midst of Conflict: the Case of Yemen." OUP Academic. Oxford University Press, April 11, 2017. <https://academic.oup.com/heapol/article/32/6/911/3591753>.

⁸¹ "Withering Life." Mwatana for Human Rights. Mwatana, July 30, 2019. <https://mwatana.org/en/withering-life2018/>.

⁸² "Yemen." Institute for Health Metrics and Evaluation. IHME, September 20, 2017. <http://www.healthdata.org/yemen>.

due to vaccination rates falling from 70-80% pre-war to around 50% in 2015.⁸³ In response to a Measles outbreak, the Ministry of Public Health and Population and the WHO and UNICEF carried out a door-to-door vaccination campaign and successfully vaccinated 90% of target children. Although these estimates seem comprehensive in addressing the Malaria outbreak, the World Health Organization (WHO) has statistics that show that only 30 districts in Yemen, out of the total 333 districts have gotten more than 95% measles (MCV1) coverage which is roughly 9% of all districts in Yemen. The vaccination rates are better for DTP3, or the diphtheria-tetanus-pertussis vaccine, improved with 179 districts out of the 333 having more than 80% coverage which is about 54% of the districts.⁸⁴

Starting in 2016 and continuing into 2020, there was a large Cholera outbreak and vaccination campaigns were set up to address the rising cases.⁸⁵ Even with attempts to improve sanitation, establish treatment access, vaccinate, deliver supplies, and distribute public health guidance, there have been 2,316,197 cases recorded from 2016 to January 2020 and suspected to be more with a case fatality rate, or the proportion of people who die among the total number with Cholera, of 0.17%.⁸⁶⁸⁷ Globally in 2017, Yemen accounted for 84% of all suspected Cholera cases reported and for 41% of cholera-attributed fatalities.⁸⁸

⁸³ Raslan, Rasha, Skye El Sayegh, and Sana Chams. "Re-Emerging Vaccine-Preventable Diseases in War-Affected Peoples of the Eastern Mediterranean Region—An Update." *Front Public Health*. Front Public Health- NIH, October 2017. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5661270/>.

⁸⁴ "Immunization Country Profile- Yemen." World Health Organization. World Health Organization, October 2020. https://apps.who.int/immunization_monitoring/globalsummary/countries?countrycriteria%5Bcountry%5D%5B%5D=YEM&commit=OK.

⁸⁵ Raslan, Rasha, Skye El Sayegh, and Sana Chams. "Re-Emerging Vaccine-Preventable Diseases in War-Affected Peoples of the Eastern Mediterranean Region—An Update." *Front Public Health*. Front Public Health- NIH, October 2017. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5661270/>.

⁸⁶ "Cholera Epidemic in Yemen: 2020 Update." The Global Alliance Against Cholera (G.A.A.C), July 28, 2020. [https://www.choleraalliance.org/en/ressources/news/cholera-epidemic-yemen-2020-update#:~:text=According%20to%20the%20World%20Health,governorates%20of%20Yemen%20\(3\)](https://www.choleraalliance.org/en/ressources/news/cholera-epidemic-yemen-2020-update#:~:text=According%20to%20the%20World%20Health,governorates%20of%20Yemen%20(3)).

⁸⁷ "Cholera Situation in Yemen, January 2020 - Yemen." World Health Organization. WHO, 2020. <https://reliefweb.int/report/yemen/cholera-situation-yemen-january-2020>.

⁸⁸ "Weekly Epidemiological Record." World Health Organization Geneva. WHO, September 21, 2018. <http://apps.who.int/iris/bitstream/handle/10665/274654/WER9338.pdf?ua=1>.

Standard immunizations, which in Yemen take place at the hospital, schools, and home visits, have become more difficult, resulting in increasing rates of preventable diseases and childhood disease.⁸⁹ The major causes of death for children under 5 include pneumonia, neonatal pneumonia, prematurity, birth asphyxia, sepsis and other infections, congenital abnormalities, diarrhea, measles, and injuries.⁹⁰ Although it is much harder to understand the impact of conflict on non-communicable disease burden, the limited data collection suggests that the prevalence of cardiovascular disease and cerebrovascular diseases have increased between 2010-2015.⁹¹ In 2010, the prevalence of cardiovascular disease was found to be 3.93, and in 2015 was a prevalence of 5.18. For cerebrovascular disease the prevalence of was found to be 0.37 in 2010, and a prevalence of 0.45 in 2015.⁹²

The Saudi-led coalition has continued to tighten restrictions on medical imports into the Houthi-controlled regions of Yemen, cutting off hundreds of thousands of civilians from adequate care and resources.⁹³ Throughout Yemen, there have been mass shortages of blood and the Saudi-led coalition has bombed blood banks in their airstrikes.^{94,95} Hospitals are unable to get new equipment and resources and according to Yemen's Health Ministry, 92-95 percent of

⁸⁹ Editorial. "The Humanitarian Cost of Yemen's Crumbling Health System." *The Lancet Haematology*. The Lancet, December 2018. [https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026\(18\)30198-4/fulltext](https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026(18)30198-4/fulltext).

⁹⁰ "Eastern Mediterranean Region- Yemen." World Health Organization. World Health Organization. Accessed April 26, 2021. <http://www.emro.who.int/child-adolescent-health/data-statistics/yemen.html>.

⁹¹ Qirbi, Naseeb, and Sharif A Ismail. "Health System Functionality in a Low-Income Country in the Midst of Conflict: the Case of Yemen." OUP Academic. Oxford University Press, April 11, 2017. <https://academic.oup.com/heapol/article/32/6/911/3591753>.

⁹² Qirbi, Naseeb, and Sharif A Ismail. "Health System Functionality in a Low-Income Country in the Midst of Conflict: the Case of Yemen." OUP Academic. Oxford University Press, April 11, 2017. <https://academic.oup.com/heapol/article/32/6/911/3591753>.

⁹³ Physicians for Human Rights. "Yemen: Attacks on Health." PHR newsletter. PHR, August 2019. https://phr.org/wp-content/uploads/2019/08/PHR-August__2019-Yemen-Newsletter.pdf.

⁹⁴ Editorial. "The Humanitarian Cost of Yemen's Crumbling Health System." *The Lancet Haematology*. The Lancet, December 2018. [https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026\(18\)30198-4/fulltext](https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026(18)30198-4/fulltext).

⁹⁵ Nugali, Noor. "Arab Coalition in Yemen Confirms Sanaa Blood Bank Was Bombed by Mistake." Arab News. Arabnews, October 3, 2019. <https://www.arabnews.com/node/1563311/middle-east>.

medical devices in hospitals are nonfunctional.⁹⁶ The Houthi militia has also taken part in the destruction and devastation of healthcare throughout Yemen and has repeatedly imposed blockades repeatedly at the expense of the local populations' medical needs and dramatically impacting food security.⁹⁷ In 2015 the Houthi militant group blockaded the city of Taiz, diverting aid and food supplies and limiting any access of humanitarian groups into the region. The Houthis also put high taxes on all imports into the region to help finance their military efforts.

The United Nations has described the situation as the worst humanitarian crisis in the world, and there are few indications that anything will improve soon.⁹⁸ With both the public and private healthcare systems in shambles in Yemen, women have emerged as the last remaining network to support the country's wounded and diseased, but the conflict has also hit women the hardest.⁹⁹

Impact of the Conflict on Maternal & Child Health

The conflict in Yemen has decimated health infrastructure and those most vulnerable throughout the conflict are women and children. Yemen's Maternal Mortality Rates (MMR) remain high at an estimated 164 deaths per 100,000 live births. To compare Yemen to other countries, it stands 134 out of 186 countries in terms of their MMR.¹⁰⁰ Yemen's MMR has steadily fallen and in 2001, there were an estimated 301 deaths per 100,000 live births, in 2015,

⁹⁶ Physicians for Human Rights. "Yemen: Attacks on Health." PHR newsletter. PHR, August 2019. https://phr.org/wp-content/uploads/2019/08/PHR-August_2019-Yemen-Newsletter.pdf.

⁹⁷ Karasik, Theodore, and Giorgio Cafiero. Report. Middle East Institute, 2017. Accessed April 26, 2021. <http://www.jstor.org/stable/resrep17611>.

⁹⁸ McKernan, Bethan. "Health Workers Targeted at Least 120 Times in Yemen Conflict – Report." The Guardian. Guardian News and Media, March 18, 2020. <https://www.theguardian.com/world/2020/mar/18/health-workers-targeted-at-least-120-times-yemen-conflict>.

⁹⁹ "4 Ways the War in Yemen Has Impacted Women and Girls." Crisis Watch- International Rescue Committee . IRC, December 20, 2019. <https://www.rescue.org/article/4-ways-war-yemen-has-impacted-women-and-girls>.

¹⁰⁰ "Maternal Mortality Ratio Yemen (National Estimate, per 100,000 Live Births)." Data. World Bank, 2018. <https://data.worldbank.org/indicator/SH.STA.STNT.ME.ZS?locations=YE>.

the MMR dropped to an estimated 169 deaths per 100,000 live births. The MMR has fallen at a slower rate since the conflict began, but Yemen still continues to see progress.¹⁰¹

According to the UNICEF regional director for the Middle East and North Africa, Yemen is a “living hell” for children due to the violence, limited access to clean water and food, and high risk of severe acute malnutrition.¹⁰² Some of the initial health impacts of the internal conflict included a decrease in vaccine coverage in children, increases in diarrheal diseases, increases in global acute malnutrition and stunting in children under five years of age, increases in anemia, and an increase in child mortality from 53 deaths per 1000 live births in 2013 to 56.8 deaths per 1000 live births in 2016.¹⁰³ Looking more specifically at vaccine coverage, a study by JMIR Public Health Surveillance found reductions in the penta-3 vaccine, Bacillus Calmette–Guérin (BCG) vaccine, and measles vaccine and the reduced coverage was worse in governorates that witnessed armed confrontations.¹⁰⁴ Penta-3 vaccine coverage was at 82% in 2012, 88% in 2014, and 84% in 2015. The BCG vaccine dropped from 73% in 2014 to 49% in 2015. Measles vaccine coverage was 70% in 2012, 75% in 2014, and 66% in 2015.¹⁰⁵

More women were reported to be underweight, higher rates of severe malnutrition, and an increase in maternal mortality.¹⁰⁶ Maternal mortality increased in all Yemeni governorates

¹⁰¹ “Yemen Maternal Mortality Ratio, 1960-2020.” Knoema. World Data Atlas , 2020.

<https://knoema.com/atlas/Yemen/Maternal-mortality-ratio>.

¹⁰² Editorial. “The Humanitarian Cost of Yemen’s Crumbling Health System.” *The Lancet Haematology*. The Lancet , December 2018. [https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026\(18\)30198-4/fulltext](https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026(18)30198-4/fulltext).

¹⁰³ “The DHS Program.” The DHS Program - Country Main. DHS.

https://www.dhsprogram.com/Countries/Country-Main.cfm?ctry_id=46.

¹⁰⁴ Torbosh A, Al Amad MA, Al Serouri A, Khader Y. “The Impact of War in Yemen on Immunization Coverage of Children Under One Year of Age: Descriptive Study.” *JMIR Public Health Surveillance*. JMIR, October 23, 2019. <https://publichealth.jmir.org/2019/4/e14461/>.

¹⁰⁵ Torbosh A, Al Amad MA, Al Serouri A, Khader Y. “The Impact of War in Yemen on Immunization Coverage of Children Under One Year of Age: Descriptive Study.” *JMIR Public Health Surveillance*. JMIR, October 23, 2019. <https://publichealth.jmir.org/2019/4/e14461/>.

¹⁰⁶ El Bcheraoui, Charbel, Aisha O. Jumaan, and Michael Collison. “Health in Yemen: Losing Ground in War Time.” *Globalization and Health*. US National Library of Medicine- National Institutes of Health, April 25, 2018. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5918919/>.

between 2013 and 2016. The national average was 213.4 deaths per 100,000 live births in 2016, a 1.3% increase from 2013.¹⁰⁷ Diseases including Cholera, Diphtheria, Measles, Tuberculosis, and HIV continue to spread with either constant growth or maintained prevalence.¹⁰⁸

The health sector in Yemen has been decimated, but overall life expectancy has continued to increase, but at a slower rate; with a life expectancy from birth of 65.23 in 2010, 66.01 in 2015, and 66.28 in 2021.¹⁰⁹ We also see continued improvement in infant mortality with it declining continuously, but at a slower rate with very little change at 43.27 deaths per 1,000 live births in 2014 and 42.73 deaths per 1,000 live births in 2020.¹¹⁰ Although infant mortality rates have improved, they should have been lower; the 2015 target for infant mortality rate was 27.2 per 1000 live births, and that year, the actual rate was 43.26 deaths per 1,000 live births.¹¹¹ The failure to achieve this goal can be attributed to an increase in babies born to mothers suffering acute malnutrition.¹¹²

Over 20 million Yemenis are classed as food insecure by the World Bank, this has led to increases in acute malnutrition, and now more than 2 million children are malnourished and 69% of the population is food insecure.¹¹³ Malnutrition includes undernutrition, where a person does

¹⁰⁷ El Bcheraoui, Charbel, Aisha O. Jumaan, and Michael Collison. "Health in Yemen: Losing Ground in War Time." *Globalization and Health*. US National Library of Medicine- National Institutes of Health, April 25, 2018. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5918919/>.

¹⁰⁸ El Bcheraoui, Charbel, Aisha O. Jumaan, and Michael Collison. "Health in Yemen: Losing Ground in War Time." *Globalization and Health*. US National Library of Medicine- National Institutes of Health, April 25, 2018. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5918919/>.

¹⁰⁹ "Yemen Infant Mortality Rate 1950-2021." *MacroTrends*. MacroTrends, 2021. <https://www.macrotrends.net/countries/YEM/yemen/infant-mortality-rate>.

¹¹⁰ "Yemen Infant Mortality Rate 1950-2021." *MacroTrends*. MacroTrends, 2021. <https://www.macrotrends.net/countries/YEM/yemen/infant-mortality-rate>.

¹¹¹ "Yemen Infant Mortality Rate 1950-2021." *MacroTrends*. MacroTrends, 2021. <https://www.macrotrends.net/countries/YEM/yemen/infant-mortality-rate>.

¹¹² Romanello, Michele. "Measurement and Correlates of Child Mortality in Yemen." *Open Access Library Journal*. Open Access Library, October 31, 2018. <https://www.oalib.com/articles/5299911#.YItkZ31KidY>.

¹¹³ "Republic of Yemen - Country Engagement Note for the Period FY20-FY21 : Yemen ." *World Bank*. World Bank, April 2019. <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/757121557938303017/yemen-country-engagement-note-for-the-period-fy20-fy21>.

not eat enough food causing them to have wasting syndrome/acute malnutrition, and also includes micronutrient deficiencies, which is when a person does not get enough important vitamins and minerals.¹¹⁴ Malnutrition can cause adverse health effects, notably a weakening of the immune system, wasting syndrome, stunting in children due to chronic malnutrition, and increased rates of non-communicable diseases.¹¹⁵ Although malnutrition is caused by insufficient food intake, the root cause is both directly and indirectly linked to the control of infectious diseases.¹¹⁶ UNICEF has found that malnutrition is impacted by the state of political, environmental and economic affairs.¹¹⁷

The conflict in Yemen has disproportionately impacted women, partially due to the patriarchal structure of society and worsened by the lack of bargaining power women have and the lack of individual resources. Gender inequality has worsen in Yemen since the conflict began which is measurable using the World Economic Forum's gender gap index, which compares the average income earned by women relative to the income earned by men, and also takes into account the country's GDP, Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment. According to the gender gap index, Yemen is the very last with a rank of 153 out of 153 countries for the Global Gender Gap and has a score of 0.494 on a scale of 0.0 to 1.0.¹¹⁸ One stark example of gender imbalances in Yemen is visible

¹¹⁴ "Malnutrition: Emergencies and Disasters." World Health Organization. World Health Organization, January 2020.

<https://www.who.int/news-room/q-a-detail/malnutrition-emergencies-and-disasters#:~:text=In%20emergencies%2C%20people%20are%20at,diseases%20that%20can%20be%20fatal>.

¹¹⁵ Saunders, John, and Trevor Smith. "Malnutrition: Causes and Consequences." *Clinical medicine* (London, England). Royal College of Physicians, December 2010. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4951875/>.

¹¹⁶ Spears, Dean, Arabinda Ghosh, and Oliver Cumming. "Open Defecation and Childhood Stunting in India: An Ecological Analysis of New Data from 112 Districts." *PLOS ONE*. Public Library of Science, September 16, 2013. <https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0073784>.

¹¹⁷ "Unravelling the Nutrition Complex." CHILDREN FIRST: THE STORY OF UNICEF, PAST AND PRESENT. UNICEF, n.d. <https://sites.unicef.org/about/history/files/Child-First-CH-03-p063-090-unravel-nutrition-complex.pdf>.

¹¹⁸ "Global Gender Gap Report 2020." World Economic Forum. World Economic Forum, 2019. http://www3.weforum.org/docs/WEF_GGGR_2020.pdf.

in literacy rates where only 35% of women are literate, compared to 73% of men. This gender gap index is useful when constructing a timeline of gender differences in Yemen; Yemen ranked 115th in 2006 compared to the current 153 for gender gap as a whole. Even more stark is the change from the 48th ranking in 2006 for health and survival which has gone down to 129th in 2020.¹¹⁹ This fall from 115th global ranking for gender gap in 2006 to the current 153 in 2020 can be attributed to limited economic opportunities for women, women are absent from political life, less than half of women participate in the labour force, and women have minimal educational attainment and literacy.¹²⁰

Women have faced social inequity in Yemen for a long time, which is highly correlated with poorer health outcomes. Approximately 67% of women face gender violence in their lifetime in Yemen, which is very high compared to the 33% globally. Only 44% of births are attended by skilled personnel compared to the global average of 72% of births among rural mothers and 90% among urban mothers.¹²¹ Another health disparity faced by women in Yemen is antenatal care; defined as more than four visits for women between 15-49, where only 25% of women are able to access this care. Antenatal care and skilled attendants at birth are incredibly important for maternal and child health and are essential in preventing the biggest problems that can occur during birth which include prematurity, fetal growth restriction, congenital abnormalities, or asphyxia and maternal death.¹²² It is essential that general doctors and

¹¹⁹ “Global Gender Gap Report 2020.” World Economic Forum. World Economic Forum, 2019. http://www3.weforum.org/docs/WEF_GGGR_2020.pdf .

¹²⁰ “Global Gender Gap Report 2020.” World Economic Forum. World Economic Forum, 2019. http://www3.weforum.org/docs/WEF_GGGR_2020.pdf .

¹²¹ “Global Gender Gap Report 2020.” World Economic Forum. World Economic Forum, 2019. http://www3.weforum.org/docs/WEF_GGGR_2020.pdf .

¹²² EBCOG Scientific Committee. “The Public Health Importance of Antenatal Care.” Facts, views & vision in ObGyn. Universa Press, 2015. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4402443/>.

obstetricians work with midwives, nurses, and community health workers to provide adequate antenatal care for vulnerable groups.

The social inequity that women face in Yemen is highly visible. When a woman falls ill or needs medical assistance, it is customary that she is accompanied to health facilities by a male chaperone and is only seen by a female health worker.¹²³ This alone is not a problem, but when female health care workers are limited and access to medical assistance and education is challenging to attain, women become highly vulnerable. Severely understaffed hospitals rely on unlicensed doctors, which have resulted in heightened rates of ectopic pregnancies going unnoticed, fetal infections being misdiagnosed, and maternal and infant mortality increasing.¹²⁴

A local gynecologist, Nasreen Al-Haj, describes an agonizing situation she witnessed: “The worst case I have ever seen was of a mother bleeding profusely, but there was no blood at the blood bank. Her family was forced to shuttle between hospitals to get blood for her”.¹²⁵ Women are frequently forced to seek out education about reproductive health due to the lack of female doctors, specifically in rural areas. Women have become more reliant on elderly women in the community for information and help during childbirth and when seeking assistance during illness.¹²⁶ Some aid organizations have sent foreign medical professionals to fill the gap, but the

¹²³ “Urgent Funding Needed to Protect Health and Safety of Women and Girls in Yemen amidst COVID-19.” UNFPA Yemen. UNFPA, May 6, 2020. <https://yemen.unfpa.org/en/news/urgent-funding-needed-protect-health-and-safety-women-and-girls-yemen-amidst-covid-19-0>.

¹²⁴ Editorial. “The Humanitarian Cost of Yemen's Crumbling Health System.” *The Lancet Haematology*. The Lancet, December 2018. [https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026\(18\)30198-4/fulltext](https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026(18)30198-4/fulltext).

¹²⁵ Editorial. “The Humanitarian Cost of Yemen's Crumbling Health System.” *The Lancet Haematology*. The Lancet, December 2018. [https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026\(18\)30198-4/fulltext](https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026(18)30198-4/fulltext).

¹²⁶ Al-deen, Nuria Shuja. “Narrowing the Gender Gap in Yemen A Gender Analysis.” Relief Web. International Rescue Committee, 2019. <https://reliefweb.int/sites/reliefweb.int/files/resources/finalyemengenderassessmentreport2020.pdf>.

majority of Yemeni aid groups have switched their focus toward educating women about health to promote a more sustainable solution.¹²⁷

Informal Community Female-led Health Networks

Women in Yemen have faced inadequate access to healthcare and the government has routinely underfunded reproductive healthcare. Due to these gaps in the healthcare system, there have been grass-roots attempts by women to access healthcare necessary. Increased support for midwife training, especially in rural communities has been crucial for women throughout Yemen and the reliance on these teachings has formed into an informal female-run community health network system that runs today.¹²⁸ Many women in Yemen do complete their education through high school, but few continue to University.¹²⁹ The conflict has limited access to university education and it has become increasingly difficult for all students to continue education at all levels, especially in rural regions. Educating males has become the priority for many Yemeni families; this only exacerbates the negative impacts of war on women in Yemen and could increase the gender inequality in the region.¹³⁰

These informal community female-led health networks are built upon informal female communities and have been strengthened due to increased reliance on them to function in a health care context as the conflict has continued. There has been no formal research regarding

¹²⁷ Al-deen, Nuria Shuja. "Narrowing the Gender Gap in Yemen A Gender Analysis." Relief Web. International Rescue Committee, 2019.

<https://reliefweb.int/sites/reliefweb.int/files/resources/finalyemengenderassessmentreport2020.pdf>.

¹²⁸ Penney, Debra S, and Jeanne Raisler. "Meeting Women's Health Needs in Yemen: a Midwifery Perspective." *Journal of Midwifery & Women's Health*. Elsevier, June 1, 2000.

<https://www.sciencedirect.com/science/article/abs/pii/S1526952399000057#!>

¹²⁹ Sharaf, Mohammed. "For Yemeni Women, the Path to Universities Gets Tougher - Al-Fanar Media." Al-Fanar Media. Al-Fanar Media, August 19, 2019.

<https://www.al-fanarmedia.org/2019/08/for-yemeni-women-the-path-to-universities-gets-tougher/>.

¹³⁰ Sharaf, Mohammed. "For Yemeni Women, the Path to Universities Gets Tougher - Al-Fanar Media." Al-Fanar Media. Al-Fanar Media, August 19, 2019.

<https://www.al-fanarmedia.org/2019/08/for-yemeni-women-the-path-to-universities-gets-tougher/>.

these community female health networks, but the existence of informal maternal care has been documented globally. One example is traditional birth attendants which have been very effective in improved referral and links with the formal health care system.¹³¹

Conflict in Yemen has forced international aid to shift from promoting social programs that address women to delivering essential humanitarian aid. It is imperative that funding for reproductive health is not cut off or deprioritized, even during times when the masses also require primary care and medical attention.¹³² The United Nations Population Fund (UNFPA) is instrumental in providing the aid and funding that many women rely on. The UNFPA's funding is targeted towards reproductive health services and facilities.¹³³ As of May 2020, only 20 percent of health facilities provide maternal and health services. This is mainly due to staff shortages, lack of supplies, inability to meet operational costs or damage due to the conflict.¹³⁴¹³⁵

Child health is very closely linked to maternal health and maternal education.¹³⁶ This link is stronger in developing countries due to inadequate health facilities and unequal access. The significant determinants of a young child/infant's well-being are the mother's health, prenatal

¹³¹ Bergström, Staffan, Elizabeth Goodburn. "The role of traditional birth attendants in the reduction of maternal mortality." *Safe motherhood strategies: a review of the evidence*. 2001. <http://dspace.itg.be/bitstream/handle/10390/2654/2001shsop0077.pdf>

¹³² Ott, Haley. "48,000 Yemeni Women Could Die Giving Birth as UN Starts Shutting Down Maternity Services Due to Funding Gap." CBS News. CBS Interactive, May 15, 2020. <https://www.cbsnews.com/news/coronavirus-news-un-maternity-wards-in-yemen-are-out-of-money/>.

¹³³ "Urgent Funding Needed to Protect Health and Safety of Women and Girls in Yemen amidst COVID-19." UNFPA Yemen. UNFPA, May 6, 2020. <https://yemen.unfpa.org/en/news/urgent-funding-needed-protect-health-and-safety-women-and-girls-yemen-amidst-covid-19-0>.

¹³⁴ "Urgent Funding Needed to Protect Health and Safety of Women and Girls in Yemen amidst COVID-19." UNFPA Yemen. UNFPA, May 6, 2020. <https://yemen.unfpa.org/en/news/urgent-funding-needed-protect-health-and-safety-women-and-girls-yemen-amidst-covid-19-0>.

¹³⁵ "Conflict and Gender Relations in Yemen ." Yemen Gender Report . CARE International, OXFAM Great Britain, or the Gender Standby Capacity Project, November 2016. <https://www.care-international.org/files/files/YemenGenderReport171116.pdf> .

¹³⁶ Population Reference Bureau. "Healthy Mothers and Healthy Newborns: The Vital Link." Population Reference Bureau, April 2002. <https://www.prb.org/healthymothersandhealthynewbornsthevitalink/>.

and delivery care, birth spacing, and the mother's nutrition throughout her life. One study found that preceding birth interval, family size, birth type, breastfeeding status, source of drinking water, mother education, mother income, area of residences, and father education are significantly associated with under-five mortality.¹³⁷ Based on this study, I would argue that in a patriarchal society where women are the primary caretakers of a child until they are adults, a mother's well-being would be essential for child survival and success. In the case of Yemen, where there is a massive lack of healthcare services, inadequate access to hospitals and education, and violent conflict, a child's survival is contingent on the mother's safety, knowledge, and health.¹³⁸ If a woman is unable to access healthcare and has been stripped of her access to education, she becomes entirely reliant on fellow women in her community. Although women in Yemen are highly dependent on men for economic stability, there is a very stark separation between men and women in social contexts and thus, women play a determining role in the creation of a social safety net, an educational network, and a supportive network for each other. This mutual aid that women have for each other in Yemen has allowed them to persevere and has built the framework for informal community female-led health care.

Impact of COVID-19 on Health in Yemen

COVID-19, caused by severe acute respiratory syndrome coronavirus 2, is a respiratory illness that spreads through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. The spread of COVID-19 began in Wuhan, China in December of 2019 and has become one of the most deadly pandemics in history with more than 127 million cases

¹³⁷ Gebretsadik, Solomon, and Emmanuel Gabreyohannes. "Determinants of Under-Five Mortality in High Mortality Regions of Ethiopia: An Analysis of the 2011 Ethiopia Demographic and Health Survey Data." *International Journal of Population Research*. Hindawi, December 8, 2016. <https://www.hindawi.com/journals/ijpr/2016/1602761/>.

¹³⁸ Garbarski, Dana. "The Interplay between Child and Maternal Health: Reciprocal Relationships and Cumulative Disadvantage during Childhood and Adolescence." *Journal of Health and Social Behavior* 55, no. 1 (2014): 91-106. Accessed April 26, 2021. <http://www.jstor.org/stable/43186882>.

confirmed and over 2.78 million deaths. The first case of COVID-19 in Yemen was announced on April 10th, 2020 in Hadramout.¹³⁹ The risk of a large outbreak in Yemen is extremely high due to the ongoing war, political instability, and the fragile health system.¹⁴⁰ There are already concomitant outbreaks of cholera, dengue, and diphtheria, and massive problems regarding health infrastructure and access to clean water.¹⁴¹ A study examining Yemen's healthcare system capabilities surveyed healthcare workers and found that 93.9% of healthcare workers believed that Yemen's healthcare system does not have the resources or capability to manage a COVID-19 outbreak. Government hospitals were also less prepared than private hospitals and NGO hospitals. There is a lack of training regarding COVID-19 in healthcare facilities and no financial support. Some measures to mitigate the spread of COVID-19 including limiting the number of visitors, social distancing, mask wearing, hand cleaning, and temperature checks were implemented, but diagnostic devices, mechanical ventilators, protective equipment, and financial aid are needed.¹⁴² The current total COVID-19 cases in Yemen is 3,973 with 833 deaths recorded thus far, but it is very likely that the scale of the epidemic is far greater than represented.¹⁴³ Because the mortality rate is 20%, which is far higher than the mortality rate for COVID-19 in other countries, the number of cases reported is likely to be an underestimate due to a lack of

¹³⁹ "UN Office of the Resident Coordinator and Humanitarian Coordinator for Yemen The Ministry of Health in Aden Confirms the First Case of COVID-19 in Yemen." 2020.

https://reliefweb.int/sites/reliefweb.int/files/resources/HC%20Statement_COVID-19_First_Case.pdf.

¹⁴⁰ Zawiah, Mohammed, Fahmi Y Al-Ashwal, Ramzi Mukred Saeed, Mohammed Kubas, Sara Saeed, Amer Hayat Khan, Syed Azhar Syed Sulaiman, and Rami Abduljabbar. "Assessment of Healthcare System Capabilities and Preparedness in Yemen to Confront the Novel Coronavirus 2019 (COVID-19) Outbreak: A Perspective of Healthcare Workers." *Frontiers in public health*. Frontiers Media S.A., July 28, 2020.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7399068/>.

¹⁴¹ "Health Cluster Yemen ." *Health Cluster Bulletin*. Health Cluster Yemen, January 2019.

<https://www.who.int/health-cluster/countries/yemen/Yemen-Health-Cluster-Bulletin-Jan-2019.pdf> .

¹⁴² Zawiah, Mohammed, Fahmi Y Al-Ashwal, Ramzi Mukred Saeed, Mohammed Kubas, Sara Saeed, Amer Hayat Khan, Syed Azhar Syed Sulaiman, and Rami Abduljabbar. "Assessment of Healthcare System Capabilities and Preparedness in Yemen to Confront the Novel Coronavirus 2019 (COVID-19) Outbreak: A Perspective of Healthcare Workers." *Frontiers in public health*. Frontiers Media S.A., July 28, 2020.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7399068/#B4>.

¹⁴³ "Yemen: WHO Coronavirus Disease (COVID-19) Dashboard With Vaccination Data." World Health Organization. World Health Organization, 2021. <https://covid19.who.int/region/emro/country/ye>.

testing facilities. One detrimental impact of COVID-19 in Yemen is that there has been an increase in healthcare workers who have quit their jobs due to fear of infection.

Women are at extreme risk as COVID-19 spreads in Yemen as many have become the head of their household and face worrisome economic conditions if they are unable to support their families by falling ill. Women are also more likely to work in settings that have more people around including care work, small food businesses, handcrafts, and education.¹⁴⁴ The UN has found that in conflict settings, further crises like pandemics, have a disproportionate impact on women and girls.¹⁴⁵ There is also an increased likelihood of gender based violence in Yemen and globally during this pandemic due to the restrictions on movement, worsened by the conflict, and have diminished access to information and support services.¹⁴⁶

In March 2021, Yemen received its first shipment of vaccines through the COVAX program.¹⁴⁷ COVAX is the vaccine section of the Access to COVID-19 Tools (ACT) Accelerator, a partnership between CEPI, Vaccine Alliance, UNICEF, and the WHO, which aims to help provide global equitable access to the COVID-19 vaccine.¹⁴⁸ Yemen received 360,000 doses of the AstraZeneca COVID-19 vaccine and the country hopes to launch a vaccination campaign soon. Unfortunately, this is not enough to mitigate the spread of COVID-19 and MSF has

¹⁴⁴ “In Yemen, Women Face Added Challenges Posed by COVID-19 amidst Ongoing Armed Conflict.” UN Women. UN, July 29, 2020. <https://www.unwomen.org/en/news/stories/2020/7/feature-yemen-covid-amidst-armed-conflict>.

¹⁴⁵ “Priorities for Gender Equality in Yemen’s COVID-19 Response.” UN Women . UN, May 12, 2020. https://www2.unwomen.org/-/media/field%20office%20arab%20states/attachments/publications/2020/05/yemen%20response%20covid-19_action%20brief.pdf?la=en&vs=2651 .

¹⁴⁶ “Priorities for Gender Equality in Yemen’s COVID-19 Response.” UN Women . UN, May 12, 2020. https://www2.unwomen.org/-/media/field%20office%20arab%20states/attachments/publications/2020/05/yemen%20response%20covid-19_action%20brief.pdf?la=en&vs=2651 .

¹⁴⁷ GAVI, UNICEF , and WHO. “Yemen Receives 360,000 COVID-19 Vaccine Doses through the COVAX Facility [EN/AR] - Yemen.” ReliefWeb. WHO, March 31, 2021. <https://reliefweb.int/report/yemen/yemen-receives-360000-covid-19-vaccine-doses-through-covax-facility-enar>.

¹⁴⁸ “COVAX.” World Health Organization. World Health Organization, 2020. <https://www.who.int/initiatives/act-accelerator/covax>.

reported an influx of patients critically ill from COVID-19.¹⁴⁹ COVAX plans to send Yemen 1.9 million doses of COVID-19 vaccines in 2021, and those doses are needed as soon as possible.¹⁵⁰ The logistical problems in actually storing and distributing the vaccine poses a plethora of problems, but COVAX hopes that with the help of Aid organizations on the ground, distribution will be possible.

Current Health Infrastructure in Yemen

The current state of the healthcare system in Yemen is dire. It is difficult to get current data on the precise hospitals that are functioning and the number of healthcare workers as the situation is constantly changing and conflict continues to make regions of the country inaccessible to aid groups. As of summer 2020, we have data that suggests that 18% of the country does not have access to doctors and there are about 10 doctors per 10,000 people.¹⁵¹ The shortages of qualified staff throughout the country is partially due to the attacks of medical providers, the lack of salaries, and the barriers to educational attainment.¹⁵² It is estimated that only half of the total 5056 health facilities are operational and all health facilities lack basic equipment and supplies including limited supplies of ventilators, oxygen, protective equipment.¹⁵³ According to the WHO, there are a total of 2,227 health facilities currently

¹⁴⁹ Reuters Staff. "Yemen Gets First COVID-19 Vaccines but Is 'at the Back of the Queue.'" Reuters. Thomson Reuters, March 31, 2021.

<https://www.reuters.com/article/us-health-coronavirus-yemen-vaccine/yemen-gets-first-covid-19-vaccines-but-is-at-the-back-of-the-queue-idUSKBN2BN1J4?il=0>.

¹⁵⁰ "Yemen: Arrival of COVID-19 Vaccines a 'Game Changer' ." UN News. United Nations, March 31, 2021. <https://news.un.org/en/story/2021/03/1088782>.

¹⁵¹ Looi, Mun-Keat. "Covid-19: Deaths in Yemen Are Five Times Global Average as Healthcare Collapses." The BMJ. British Medical Journal Publishing Group, July 27, 2020. <https://www.bmj.com/content/370/bmj.m2997>.

¹⁵² "Yemen Hospitals on the Brink of Closure as Health System Collapses Leaving 8 Million Children without Access to Healthcare - Yemen." ReliefWeb. Disasters Emergency Committee, December 19, 2016. <https://reliefweb.int/report/yemen/yemen-hospitals-brink-closure-health-system-collapses-leaving-8-million-children>

¹⁵³ Looi, Mun-Keat. "Covid-19: Deaths in Yemen Are Five Times Global Average as Healthcare Collapses." The BMJ. British Medical Journal Publishing Group, July 27, 2020. <https://www.bmj.com/content/370/bmj.m2997>.

functioning that are spread across 16 governorates.¹⁵⁴ With the limited number of health facilities and health workers, there is also an unequal concentration of health workers in certain governorates and thus access to health services is extremely difficult in less populous regions of the country.

¹⁵⁴ “Health Cluster Yemen .” Health Cluster Bulletin. Health Cluster Yemen, June 2020..
<https://www.who.int/health-cluster/countries/yemen/Yemen-Health-Cluster-Bulletin-June-2020.pdf?ua=1>

Chapter Three: Women filling the gaps through a Non-Monetized System of Mutual Aid

The purpose of the study is to gain a better understanding of the healthcare networks in Yemen and the impact of conflict on healthcare. The goal of the interviews was to ascertain whether or not informal community female-run health networks exist in Yemen and the extent to which they provided care, and their importance. These interviews were also conducted to ascertain in these informal community female-run health networks are a form of mutual aid, people spontaneously helping each other and organizing without seeking reward.

I hope to understand how knowledge about health and wellbeing is communicated in Yemen, how medical care is sought out, how reproductive health is taught, who women confide in when they are sick or at risk, and the networks that support women. These interviews were conducted to ascertain whether informal community female-led health networks exist and how they are organized. A key goal is to discern whether or not these networks are a form of *mutual aid*, as Kropotkin described, where people come together to help each other without seeking any compensation. These interviews provide insight into the lives of women in a war torn country and allow for a better understanding of healthcare in Yemen and specifically the sources from which women learn about health and where they seek medical assistance.

Methods:

Recruitment of participants:

Eligibility criteria for interview recruitment includes identifying as a female, over age 18, speaks conversational English. They must have lived in Yemen for more than 10 years, preferably with some knowledge about how conditions have changed after 2015. Women who

left Yemen prior to 2014, may still participate, but these interviews were focused on health care prior to the conflict to provide historical understanding of the health situation.

I recruited participants by contacting acquaintances, friends, family, public figures, and universities in Yemen. Many of the participants were recruited via previous interviewees who gave me contact information for possible participants. I did not recruit any participants that are in the process of applying for asylum due to the potential risks. I received informed consent with the participants via a signed consent form acknowledging that they are fully informed about the proposed interview, the participant's roles in decision-making, a discussion of the alternatives to the proposed interview, the risks of the proposed interview were discussed, and an elicitation of the patient's preference (usually by signature or via a virtually signable document).

Limitations:

These interviews are not representative of women in Yemen, as only 52 were conducted which is a very small sample size. The women in these interviews were from 20 of the 22 total governorates, but do not reflect the entire population's experiences. The interviews only provide individual experiences that can be drawn from to think more broadly about female health in Yemen and the phenomena of spontaneous mutual aid. The women interviewed do not provide a representative population in terms of income and access as they were all educated (completed secondary school), english speaking, had internet and phone service, and were safe enough to be able to communicate with me. This limitation indicates that I may underrepresent the levels of conflict experienced and the true devastation of the conflict. Misinterpretation of the questions is a possible limitation as I did not have an arabic translator with me during interviews and many of the women interviewed only spoke conversational English.

The respondent's answers can be affected by the reactions of the interviewer and interviewees may have felt pressured to provide a certain account based upon this. Interview studies provide less anonymity, which is a big concern for many respondents- even in this scenario where all interviewees are made fully anonymous to all but myself. In interviews, some common limitations also include deliberate lying, unconscious mistakes, responses to misunderstood questions, inability to remember some details, unnecessary probing, and recording errors.

Interviews:

The interviews were conducted via Zoom, and were recorded in the instances where I received explicit consent to do so. I also interviewed via phone call in instances where internet access was inconsistent or due to the participant's preference. In cases where the participant was willing, I did follow-up interviews after talking to other participants when additional questions arose. Participants will only be identified by pseudonyms due to the nature of this research and the possible impact of participating on their personal safety and the safety of their families. Participants were free to leave the study at any time.

The interviews were conducted over several months, starting on October 11th, 2020 through February 2021. I conducted a total of 52 interviews with 46 participants from every governorate except Al-Mahrah and Socotra. These interviews are in no way representative of the experiences of women across all of Yemen, but they do help give a glimpse into the life of women in the country.

The interviews are separated by governorate so that differences that are unique to each region of Yemen are captured in the discussion about health care and health access. The

interviews will be broken up into Federal Regions; Azal Region, Saba Region, Janad Region, Tihama Region, Aden Region, and the Hadramout Region.

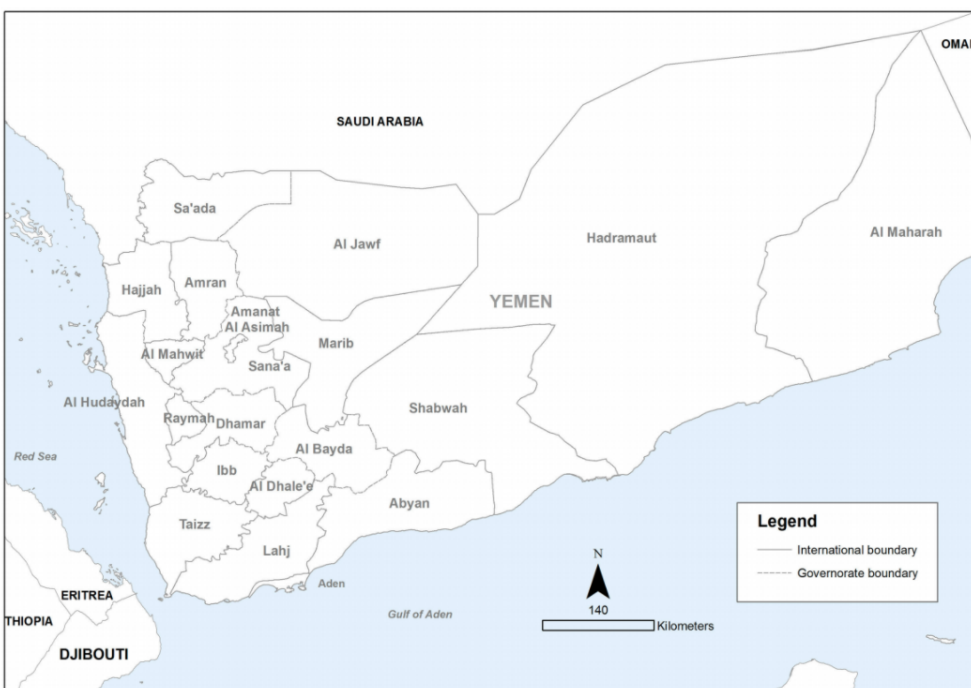


Figure 2. *Map of Yemen showing administrative boundaries and locations of governorates.* Created by Joseph Maada Korsu Kandeh and Lalit Kumar. From *Developing a Relative Ranking of Social Vulnerability of Governorates of Yemen to Humanitarian Crisis*

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¹⁵⁵ Maada Korsu Kandeh, Joseph, and Lalit Kumar. "Developing a Relative Ranking of Social Vulnerability of Governorates of Yemen to Humanitarian Crisis." *International Journal of Geo- Information*. United Nations Office for the Coordination of Humanitarian Affairs, March 31, 2015. https://www.researchgate.net/publication/282351212_Developing_a_Relative_Ranking_of_Social_Vulnerability_of_Governorates_of_Yemen_to_Humanitarian_Crisis.

Azal Region; Amran, Capital city of Sana'a, Dhamar, Sa'dah, Sana'a.

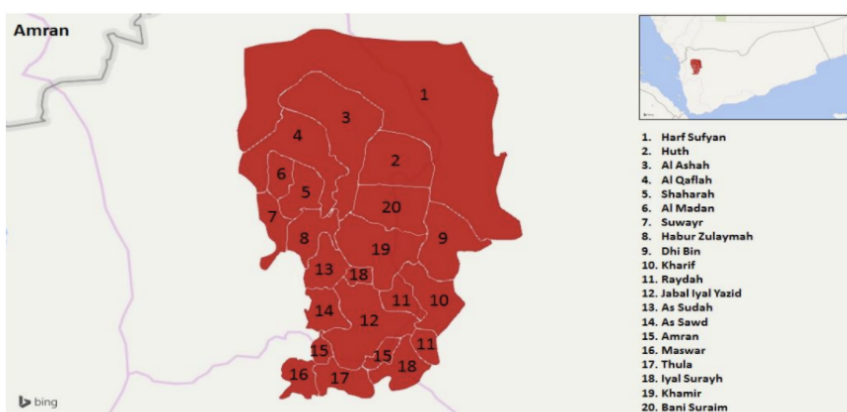


Figure 3. Map of Amran Governorate showing administrative boundaries and locations of districts. Created by Berghof Foundation.

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Amran: Amran has experienced a total of 452 air raids with 124 targeted at military sites, 181 being targeted at nonmilitary sites, and 147 with unknown targets.¹⁵⁷ One of the biggest threats in Amran is the lack of basic services and this is contributing to the growing number of internally displaced Yemenis. Amran is a district that has experienced high rates of Cholera and women have relied upon informal community female-led health networks for information, reproductive health, and these networks allow for women to get resources from the formal medical sector. In this governorate the health networks function as an intermediary for women between them and the formal health sector.

Raja is a woman in her mid-fifties who has lived in Amran for her entire life, growing up in Dhi Bin and later moving to Al-Harf, a district north of her when she was 15. Raja finished

¹⁵⁶ "Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

¹⁵⁷ "Yemen Data Project" Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

her secondary education in Al-Harf and got married when she was 19. Raja decided not to work, but studied Qur'an and spent most of her time with children at the local mosque teaching Qur'an recitation and proper prayer. Raja found herself interacting with an informal community health network when she became pregnant with her first child and wanted to understand more about pregnancy and what the birthing process would entail. Al-Harf does have a hospital and several small clinics but most of the women that year were choosing to have home births because the hospital has recently lost its main female doctor. Raja's mother had a hospital birth and thus did not know how women did home births, so Raja was forced to ask her friends about who she should talk to in order to give birth at home and so that her baby would be healthy. After talking to the women she knew for a few months, a friend of hers introduced her to a woman named Sama who lived south of her near a more mountainous village called Ajmar. Sama had learned from her mother how to give birth at home and gained information from her father-in-law, a doctor in Huth, a neighboring directorate within Amran. Sama learned about the importance of nutrition during pregnancy and exercise, she knew how to check for crowning, how to guide the baby, when the mother should push, how to help get babies out during birth by coaxing one shoulder at a time. Sama also told Raja about how after the baby is delivered and wrapped in a clean cloth, Raja would then have to deliver the placenta. Raja gave birth to a healthy boy with the assistance of Sama and also had Sama assist for the births of her following three children which she also had at home.

Lina is a woman in her early thirties who lives in Habur Zulaymah, a district within Amran to the west and borders Hajjah. Lina explained that she felt as though her role within society was very different from other women her age because she was unmarried. Lina is the primary wage-earner in her family, as her father died in 2015, and her mother stays home. Lina

describes herself as lucky because her family never forced her to get married and respected her choice not to, she also believes that they have allowed her to make this choice because her mother relies on her for support. Although Lina does not describe having interactions about reproductive health, she explains to me that she works with and facilitates meeting for women throughout her districts focused on spreading information about cholera. Cholera is very prevalent in Amran and the attack rates have been particularly high in her governorate, especially during 2017 when there was an outbreak.¹⁵⁸ Lina explains that she would meet with female groups and tell them about the importance of using clean water, boiling water, handwashing with soap, ensuring waste does not go into any bodies of water, and not cleaning clothes where freshwater is sourced. The female group that Lina interacts with is made up of women within her tribe, Hashid, and is organized by female leaders within the tribe as well as women who have gone to university. These female groups are part of a broader informal community female-led health network and link together with other female groups within their tribe as well as groups of women from neighboring tribes. Lina was aware of how to prevent cholera because her father had been in a teenagers when a cholera outbreak occurred and had taught her some of the essential sanitation practices that helped prevent infection. When I asked Lina if she would describe her work with other women to reduce the spread of cholera as working within a informal community female-led health network, she agreed and said that they personally described it as an education community, but that they focused on health and safety. Lina explained that she would not be this involved if she was married, but that she has the time to travel and see women within Habur Zulaymah and in the district below her of As Sudah. Lina interacted with UNICEF health workers in 2016 during a severe cholera outbreak who told her to

¹⁵⁸ “YEMEN: Amran Governorate - Cholera Attack Rate with Population and Functionality of Water Source.” WASH cluster. Water Projects Database 2010-2011, June 2017. https://reliefweb.int/sites/reliefweb.int/files/resources/yem_amran_wash_cholera-attack-rate_a3_en_0.pdf.

use bleach mixed with water for cleaning and encouraged her and others to get vaccinated and continue to get revaccinated every two years. Lina encouraged her friends to travel to Hubar, the nearest city, in order to get a vaccine from the only health center in Habur Zulaymah. In many ways, Lina runs an informal female-led health network where she brings together women to spread education about important health practices and also links women to resources like local clinics and transportation to travel to the main health center. In Yemen, due to the inadequate health system that is currently in place, these informal community female health networks help bridge the gaps and provide essential health information and resources to those in need.

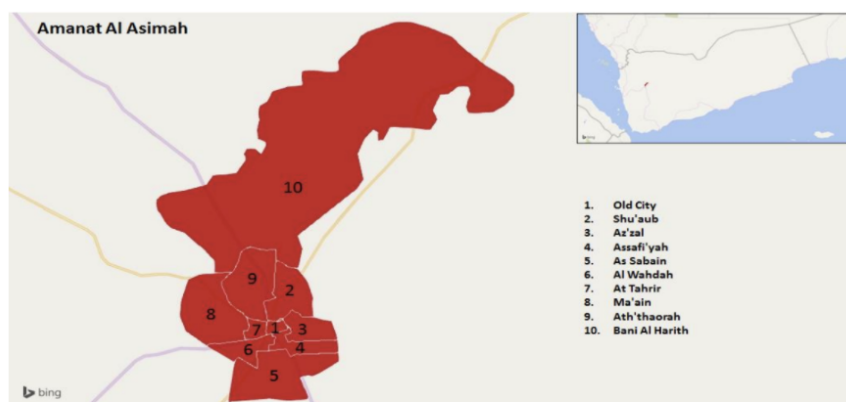


Figure 4. *Map of Capital City of Sana'a showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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Capital City of Sana'a: Health services are available and Sana'a has 6 large hospitals as well as more smaller health facilities. Much of the sewage system in the city and water services have been damaged due to air strikes and 70% of households in the city do not have access to potable water. The capital city of Sana'a is the home base for the Houthi rebels and is the main territory

¹⁵⁹ "Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

they gained control over back in 2015.¹⁶⁰ The city of Sana'a has experienced a total of 2568 air raids with 1027 targeted at military sites, 759 being targeted at nonmilitary sites, and 782 with unknown targets.¹⁶¹ In the Capital city of Sana'a, the main, governmental, hospital health infrastructure has remained functional, although quality care can still only be attained at private hospitals. In the capital, informal community female-run health networks still exist and function largely as a safety net for women who can not afford to seek out formal medical care.

I interviewed two women from the city of Sana'a, this included Safa and Adhara. Safa grew up between Aden and Sana'a, immigrating to the USA in 2016. Due to her unique experience living between regions of Yemen, she is able to compare the two health systems. Safa describes the health infrastructures in Sana'a to be the best in Yemen. Sana'a has both Private and Public Hospitals and for both, the payment is typically out of pocket, but private hospitals are more expensive. Safa described an odd situation where most doctors would work at both the private and the public hospital and would go between the two. This is a result of the lack of salaries and the inadequate pay, so doctors rely on more wealthy patients who pay in full and also try to maintain services at the public hospitals in order to meet the basic needs of society. Being a doctor in Yemen is a highly respected profession and within Sana'a, many of the doctors are women. All of Safa's uncles and aunts work in hospitals and she describes doctors in Yemen as being far better in terms of quality of care, than those in America. Safa describes doctors as being extremely invested in the health of their patients and doing everything possible to improve the health of families and help them gain access to essential medications. There are limits to how much care doctors in Yemen can provide due to the lack of essential supplies and equipment such

¹⁶⁰ "Yemen War: 5 Years since the Houthis' Sanaa Takeover." Yemen war. Aljazeera, September 2019. <https://www.aljazeera.com/news/2019/9/21/yemen-war-5-years-since-the-houthis-sanaa-takeover> .

¹⁶¹ "Yemen Data Project" Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

as limited supplies of blood pressure measuring equipment, oxygen supply, blood supply, scalpels, x-ray machines, defibrillators, anesthesia machines, EKG machines, patient monitors, and many more. One of the biggest problems for those who fall ill is that because the health insurance system in Yemen has collapsed, all care is paid out of pocket directly to the physician- the prices have not gone up, but employment throughout Yemen has fallen and many families can not afford to access care. Along with job losses, many sectors of the economy have not received wages, this group is most notable made up of educators, both elementary and secondary school teachers and university professors. Many others in governmental jobs have not received wages since 2015 and this was the motivating factor for Safa's family to leave Yemen in 2016 when her father, a professor, no longer was getting paid.

Safa had a limited interaction with informal community female-led health networks due to the adequate health system that remained in place while she was in the city of Sana'a. But she does explain how central female-led networks are in Yemen due to the country's culture. In Yemen, most domains of life are gendered and knowledge is passed on by generation to the subsequent female generations. Grandmothers hold the most power and knowledge in this system and are cared for by the younger generations of women within the family. Grandmothers within the community also all come together to inform the actions of women in the community and to spread information. These female networks play a very protective function for younger women in the community and also act as a mediary when disputes occur between women and especially when intermarital disputes occur. Women are able to rely on these networks for protection and resources and thus this structure can also be used as an informal health network, especially for maternal and child health as these women are typically the ones that help you birth your children. In the city of Sana'a, Safa believes that most women did go to the hospital for

childbirth, but for the poor and for women in villages, it is the norm for childbirth to occur in the home.

Adhara grew up outside of the city of Sana'a, in the district of Nihm, but moved into the city when she was 14 to attend a private secondary school in Shu'ub, a district within the capital city. Adhara's family encouraged her to finish secondary school and when she decided she wanted to go to Sana'a University, she was encouraged. Adhara went to Sana'a university for three years and studied within the language department to obtain a degree in Arabic and English with hopes of teaching at the private secondary school she attended. Adhara described the hospitals in the city of Sana'a to be adequate for care but added that they were quite expensive and that many of her friends could not afford to go. Due to the high costs of the formal medical system, Adhara relies heavily on other women in her community and described a friend who was a pharmacist that was able to obtain medications for cheaper prices. Adhara agreed that this network was an informal community female-run health network that filled in the gap so that women could obtain medical information and medicine. Adhara describes a multitude of small female networks that interacted with each other to obtain resources and knowledge required and explains that all of the women in the city of Sana'a were in some way connected to each other through leaders of each group. This vast informal female network existed long before the conflict, but Adhara describes her increased reliance on it since 2015. The informal community female health network has grown in order to fill the growing gap where medical care and information can not be attained by many women through the formal sector.

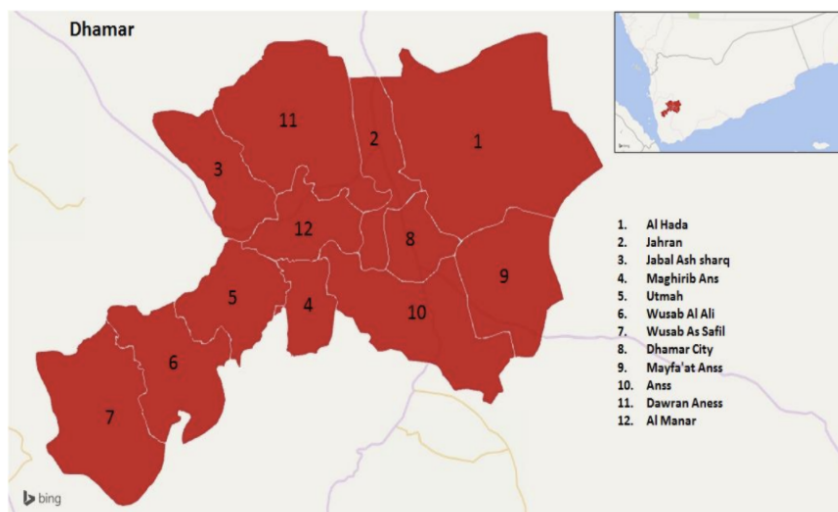


Figure 5. *Map of Dhamar Governorate showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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Dhamar: Dhamar has experienced a total of 200 air raids with 73 targeted at military sites, 84 being targeted at nonmilitary sites, and 26 with unknown targets.¹⁶³ In Dhamar, informal community female-run health networks function as part of a larger regional network, helping spread essential health information and providing health resources when possible to those unable to access hospitals and clinics.

Qadira is from Thebaq Zabeed within Anss in the Dhamar governorate and had a very positive experience with the health infrastructure in her district. Anss has one of the seven fully-functioning hospitals in Dhamar. Qadira describes her interactions with female health groups as an essential part of the informal healthcare system that acts as an intermediary between women in villages and health resources located in other regions. Networks of women help

¹⁶² “Mapping of Local Governance in Yemeni Governorates.” Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

¹⁶³ “Yemen Data Project” Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

distribute resources to those in need and have provided Qadira with medicine and health education many times.

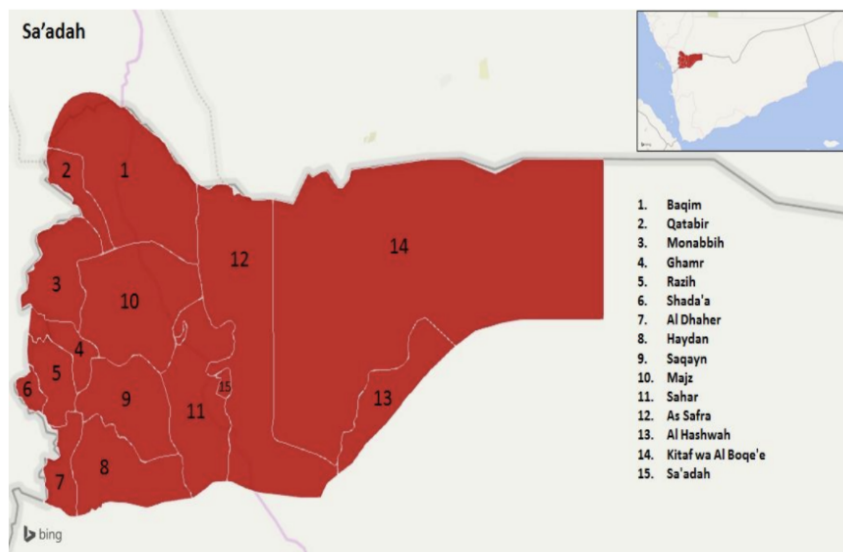


Figure 6. *Map of Sa'adah Governorate showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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Sa'adah/ Sa'ada: Prior to the beginning of the war, the Houthi rebels had a strong presence in the Sa'adah governorate, considered their native province, and have maintained control of the region thus far.¹⁶⁵¹⁶⁶ Sa'adah has the highest levels of conflict and has experienced 5254 airstrikes with 805 targeted at military sites, 1761 being targeted at nonmilitary sites, and 2688 having unknown targets.¹⁶⁷ In Sa'adah, informal community female-run health networks are essential to

¹⁶⁴ "Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

¹⁶⁵ "Saada, Yemen." Crisis Group. International Crisis Group, April 22, 2021. <https://www.crisisgroup.org/trigger-list/iran-us-trigger-list/flashpoints/yemen>.

¹⁶⁶ Baron, Adam. "Mapping the Yemen Conflict." ECFR. European Council on Foreign Relations, October 19, 2015. <https://ecfr.eu/special/yemen/>.

¹⁶⁷ "Yemen Data Project" Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

healthcare. This governorate has faced extreme infrastructure damage and these networks provide the majority of essential medical care and knowledge.

I was able to interview three women from Sa'adah, the first of which was Yashira. Yashira lives in Al Hashwah in the Sa'adah governorate and describes her relation violence in Sa'adah. Sa'adah is not only the location of the highest levels of violence within Yemen in the past 6 years, but has also been a region that has experienced high levels of violence in the early 2000s. The Houthi rebels have had a presence in Sa'adah since their formation and the group has been in sporadic conflict against the Yemeni government. The government's inability to stamp out the Houthis in their early days was also due to the vulnerabilities in Yemen's new government and has allowed for terror groups like Al-Qaeda (AQAP) to grow. Yashira and herfamily have been fortunate to live in one of the few areas within Sa'adah without extreme levels of violence and her family has often feared that they could get displaced as dynamics in the conflict as it develops. Yashira notes that she is incredibly reliant on other women in her community to access health information due to the risks of traveling and the lack of hospitals and clinics nearby.

Farah is from the Sa'adah district where there have been high levels of remote violence; airstrikes and high levels of on the ground fighting. Farah explained that although her family is not particularly supportive of either warring party privately, they outwardly show support for the Houthis in order to protect their personal safety in a region so dominated by the Houthi rebels with historical support for the group. The main hospital in Sa'adah has only been functioning partially and Farah and her mother stay inside as much as they can to avoid any possibility of violent confrontations.

Alaa lives in the district of Haydan, Sa'adah and her family is in the process of moving to the capital city of Sana'a. Alaa's brothers have been recruited as Houthi rebel fighters and the family is extremely worried about their safety. Within Sa'ada, there have been so many airstrikes, the majority carried out by the Saudi-led coalition, that many civilians who have witnessed familial deaths due to these attacks have sided with the Houthi rebels. Alaa's family hopes to move to Sana'a to be safer and to allow for Alaa's two younger brothers to attend secondary school. Alaa describes her situation as being incredibly isolating as she can not visit her friends alone and has been unable to attain an education beyond 10th grade.

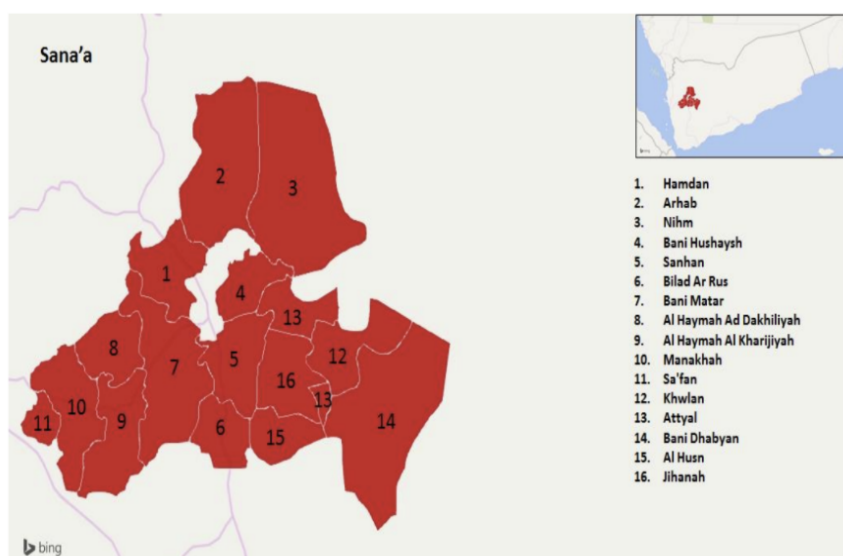


Figure 7. Map of Sana'a Governorate showing administrative boundaries and locations of districts. Created by Berghof Foundation.

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Sana'a: The Houthis took control over Sana'a in 2015 and the governorate has experienced 2568 airstrikes with 1027 targeted at military sites, 759 being targeted at nonmilitary sites, and 782

¹⁶⁸ "Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

having unknown targets.¹⁶⁹ This governorate has experienced less medical infrastructure damage than some governorates, but women in rural regions of the governorate rely on informal community female-led health networks to provide adequate information and healthcare access. Two of the women interviewed governorate have taken on leading roles within these networks to ensure that accurate information was being exchanged and supported vaccine distribution efforts.

Abdia and her mother Dunia live in Nihm, a district north of the capital city. This district does not have a main hospital but does have several smaller clinics. Dunia chose to not travel to the capital city of Sana'a when she was going to give birth to Abdia because she did not want to risk having her daughter in the car during the multi hour care journey. Dunia gave birth in her home with her mother and some of the older women from the village with her to assist in the birth. Dunia said she would have preferred to give birth in a hospital, but the distance made that impossible and she traveled to baby Abdia to the hospital after she was born to ensure her health. Abdia was able to attend private school in the capital city of Sana'a and finished her secondary school. When she moved back to Nihm, she took on a central role in the female health networks and made sure that the medical advice being exchanged was based in fact.

Reem is from Al-Haymah Ad Dakhiliyah and there is one partially well functioning hospital in her district. She works as a teacher at an elementary school and has not been paid a salary since 2016. For Reem, the most important thing for her is that she encourages her students to finish their secondary education so that they can help provide for their families. Reem explains that she has seen fewer children continuing with their studies beyond elementary school since the conflict began. The conflict has hugely impacted the economy and many Yemenis are unable to

¹⁶⁹ "Yemen Data Project" Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

find work opportunities, so they rely on their children entering the workforce as soon as possible to help add to the family's income. Saba described a very similar phenomenon in her district of Sa'fan. Saba has been sending her children to school throughout the conflict, but has noticed that far fewer children are in classes and worries that it will impact Yemen in the future. Saba also places huge importance on literacy and hopes that her children will be able to attend university in the future. For adults in Yemen, the literacy rate is around 70% but when broken down by gender, the male literacy rate is around 83% and the female literacy rate is around 68%. Saba got a degree in Arabic from the University of Sana'a and explains that literacy and the ability to read and look up information has allowed her to play a large role in community health. Saba works with the local schools in order to make sure vaccines are being given and has educated the teachers there about how to look for symptoms of common diseases in order to prevent transmission and also in order to help families attain medical care for their children when it is needed.

Sadia is a young woman from Sanhan, the district south of the capital city of Sana'a and her family has had a really hard time due to the conflict. Her husband was a doctor at a hospital in their district, but the hospital he worked for closed and all neighboring hospitals offered him jobs, but with no salary. He has been working as a school teacher the past four years, but Sadia described the situation as unstable and worries about their financial stability in the future. Many of her friends have moved out of Yemen and she and her husband are considering looking for jobs in Egypt. Sadia's experiences were really disheartening for me to hear because the health needs of the Yemeni population are vast, but many of the doctors providing this care can not sustain themselves either.

Malika is a woman from Bani Hushaysh, a central district in Sana'a. The region she lives in is predominantly filled with khat farmers and Malika blames the crop for the food insecurities faced by the country today. Khat is a shrub grown all over Yemen that is chewed and is a cathinone stimulant drug. Yemeni farms have switched to producing khat due to the huge increase in income made from selling the leaves and also due to the minimal efforts in cultivation. Malika describes khat as being a part of everyday life for many men in Yemen and is chewed daily by a high proportion of the population. Because so many farmers have switched to khat cultivation, the amount of vegetables, grains, and fruits being produced has dropped. Yemen has always relied on imports to meet food demands, but the decrease in locally produced food has worsened the situation. Food instability has also been worsened due to the blockading of roadways and the decreased economic opportunity in the country that has impacted many Yemenis abilities to purchase food. Malika has been fervently against khat, but these views are not commonplace in Yemen, mainly because khat has become a large part of Yemeni culture, especially during celebrations.

Saba Region; Al Bayda Governorate, Al Jawf Governorate, Marib Governorate

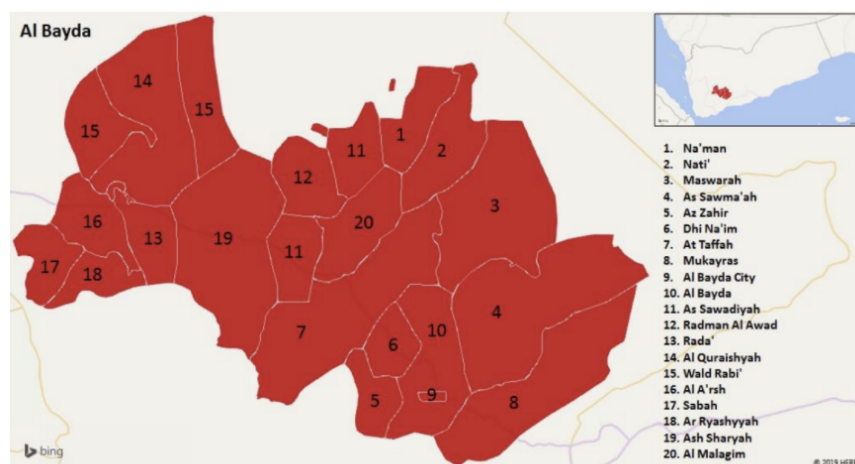


Figure 8. Map of Al Bayda Governorate showing administrative boundaries and locations of districts. Created by Berghof Foundation.

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Al-Baydha/ Al-Bayda: In Al-Bayda, the war has damaged 64 schools and is located within the control of the Houthi rebels. 59% of households in the governorate do not have ready access to potable water and sanitation systems only exist in Al-Bayda city and in Rada'a. Al-Bayda has experienced a total of 581 air raids with 307 targeted at military sites, 112 being targeted at nonmilitary sites, and 162 with unknown targets.¹⁷¹ In Al-Bayda, women have found it extremely hard to access adequate medical care due to the presence of Al-Qaeda and the Islamic State in Yemen. The existence of informal community female-led health networks dates back at least to the 1970s and likely existed prior to then as well. Unfortunately, in the case of Al-Bayda, women have both witnessed a destruction of health infrastructure and have been able to organize to

¹⁷⁰ "Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

¹⁷¹ "Yemen Data Project" Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

improve health due to the presence of terror groups- this indicated that along with conflict, Al-Qaeda and ISY have a negative impact on community and female health.

Nawra, a woman from a northern district of Al-Bayda, said that she and her family were less impacted by the conflict between the Houthi rebels and the Saudi-led coalition and more concerned with the fighting between Al-Qaeda (AQAP) and the Islamic State (ISY). AQAP is much more powerful in Yemen, but in the Qayfa area of Al-Bayda, ISY has been gaining power. Nawra describes the situation as very dire for the local population and explains that when AQAP is in charge, women can not be out after dark, women can not travel alone, women can not travel to school, and men have to be very careful about who they are affiliated with and also refrain from leaving the house after dark. Nawra describes the occupation of these two terror groups as a feeling of isolation. The conflict between AQAP and ISY has caused many civilian deaths and Nawra exclaimed that she hoped her family could move northwest to Sana'a. Women within the area controlled by AQAP are unable to move freely and thus, many women refrain from seeing each other and the support network for women has crumbled. It is a dire situation because there are only three hospitals that remain open and they all would require travel to reach. The hospitals are located in Rada'a, Al A'rsh, and one in Al-Bayda and with travel being extremely unsafe, most of the community in Radman Al Awad, the district where Nawra lives, do not visit the hospital. When asked about the existence of female health networks, Nawra explains that she used to meet with women in her village every week and they would all chat and tell each other about health and safety practices, but since 2017, those meetings have stopped.

Oamra lives in the city of Al-Baydha within the governorate of Al-Bayda. She also mentioned the chaos that has been happening the past 4 years in the region due to AQAP and ISY conflicts, but her daily life has not been affected to the same extent as neither terror group is

within her district. Oamra was not involved with informal community female health networks until after her second child was born in 2015, but mentioned that her mother had interacted with other women to help with births and vaccination programs. After her second child, Oamra became friends with a groups of women with young children and would join them for tea twice a month. Oamra describes the tea meetings as being focused around raising children and exchanging homeopathic remedies for common colds as well as exchanging knowledge about cholera, measles and pneumonia. She recalls being encouraged by women in the group to go get her children vaccinated and herself.

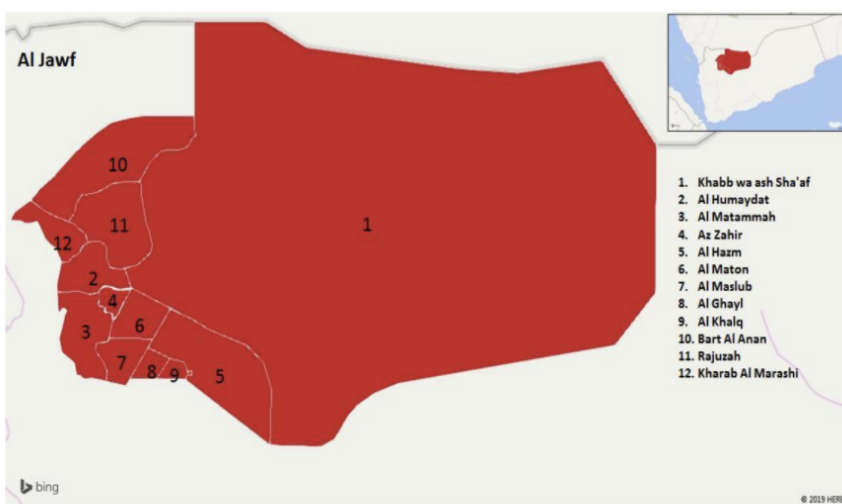


Figure 9. Map of Al Jawf Governorate showing administrative boundaries and locations of districts. Created by Berghof Foundation.

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Al- Jawf: This governorate is in a high conflict region and has experienced a total of 1311 air raids with 367 targeted at military sites, 256 being targeted at nonmilitary sites, and 688 having unknown targets.¹⁷³ Many clashes between the Houthis and the Saudi-led coalition have occurred

¹⁷² “Mapping of Local Governance in Yemeni Governorates.” Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

¹⁷³ “Yemen Data Project” Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

in Al-Jawf and in early 2020, the Houthi rebels made significant gains in Al-Jawf and took control of Hazm. It is estimated that more than 39,900 people have been internally displaced into the Marib Governorate and large scale fighting has remained constant.¹⁷⁴ In Al-Jawf, women are reliant on informal community female-led health networks to access information about child health and the networks have been working to ensure that accurate medical information is spread and that women are able to network within the group to access resources.

I interviewed two women from Al-Jawf; Ulima and Thana. Ulima lives in Al-Hazm, the capital of the Al-Jawf governorate and has feared for her life immensely over the past year in particular. The Houthis took over the city in February of 2020 and conflict levels have remained high. Ulima, who deals with type 2 diabetes, has witnessed large changes in the health infrastructure in Yemen, especially in her region. Ulima has to make sure she is eating healthy, exercising often, and monitoring her blood sugar, but out of these diabetes type 2 managing practices, Ulima has had a very hard time keeping up her exercise levels. Ulima explained to me that she loves to go on long walks, but since 2015, and especially in 2020, she feels that she can not walk alone and refrains from leaving her house for long periods of time. The constraints put upon her daily life are quite difficult and Ulima also refrains from travelling to the hospital unless necessary. She described her reliance on fellow women in her community to pick up her Metformin medication, especially when her local clinic runs out, which happens more frequently now. Ulima describes the network of women she relies on starting when she was in secondary school and consisting of multiple generations of women. They helped raise their children

¹⁷⁴ “ACAPS Briefing Note: Yemen - Escalation of Conflict in Al-Jawf and Marib Governorates .” Yemen: Cholera Outbreak - Oct 2016. Assessment Capacities Project, March 24, 2020. <https://reliefweb.int/report/yemen/acaps-briefing-note-yemen-escalation-conflict-al-jawf-and-marib-governorates-24-march>.

together, networked to gain information regarding the prevention of diseases, and now rely on each other to access essential resources during the heightened levels of conflict.

Thana lives in the district of Bart Al Anan in a small village of Hajan. Thana grew up in this village, she moved to the city of Sana'a for her secondary education and lived with her aunt there until she was 18. After graduating, she returned to Hajan and got married to a livestock farmer. Thana describes never having easy access to medical facilities and that the three hospitals within traveling distance stop functioning in 2016. Thana's experiences in Sana'a informed her opinion that the healthcare in Bart Al Anan was inadequate. She also explained that she took on the role of educator for many of the women in her community since she was fortunate enough to have an effective education through secondary school and most of the women in her village never finished elementary school. Thana participated as a lead in the informal community health network and informed women about their menstrual cycle, debunked dangerous myths, and learned from elder women in the village how to help with childbirth and bought medical books to read and teach the women about. Thana did not work a formal job, but describes being busy every day teaching her children and visiting impoverished women in the village to provide food and medicine.

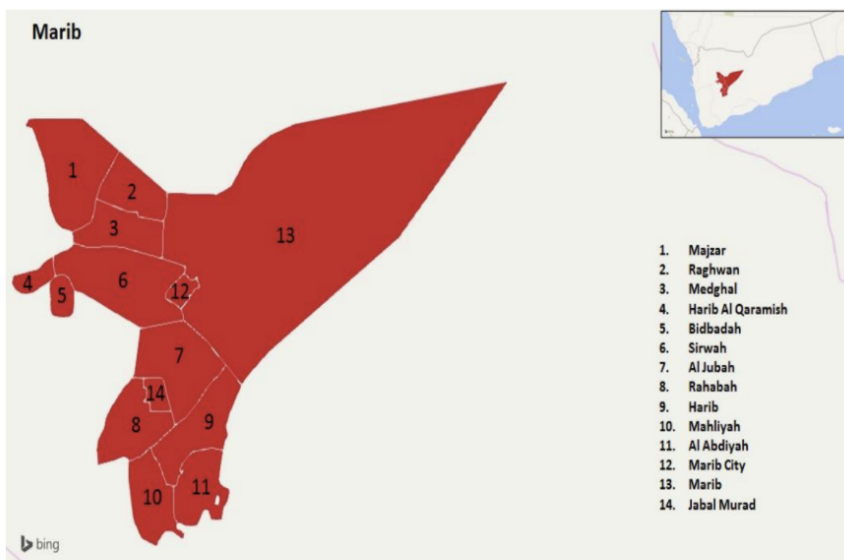


Figure 10. Map of Marib Governorate showing administrative boundaries and locations of districts. Created by Berghof Foundation.

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Marib/ Ma-rib: There has been intensified conflict as the Houthi rebels attempt to enter Marib city and it has resulted in the mass displacement of Yemenis and civilian casualties.¹⁷⁶ Marib has experienced a total of 2354 air raids with 663 targeted at military sites, 496 being targeted at nonmilitary sites, and 1195 having unknown targets.¹⁷⁷ Local tribes in the Marib governorate remain resistant towards the Houthi rebels and this could result in prolonged conflict in the area. The high levels of conflict has increased humanitarian needs, restricted humanitarian access, and has increased tensions between neighboring communities and internally displaced Yemenis. In Marib, informal community female-run health networks have become essential as transportation has become quite difficult as warring parties set up road blockades. Informal community female-run health networks are heavily relied upon as increasing numbers of internally displaced

¹⁷⁵ “Mapping of Local Governance in Yemeni Governorates.” Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

¹⁷⁶ “YEMEN RISK OVERVIEW : Outlook for December 2020 - May 2021.” ACAPS. ACAPS, May 2021. https://reliefweb.int/sites/reliefweb.int/files/resources/20201231_yemen_risk_overview_december_20_may_21.pdf.

¹⁷⁷ “Yemen Data Project” Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

Yemenis arrive in Marib. The interview with Elham also provides insight into how tribal networks are involved and how networks expand within and beyond tribal affiliation, with women helping everyone that they can, regardless of origin.

I interviewed two women from Marib; Nada and Elham. Nada lives 30 minutes outside of the main city of Marib and has seen high levels of violence constantly since 2015. Marib has been occupied by the Saudi-led coalition with constant offensive attacks from the Houthi rebels for 6 years. One of the biggest problems of the conflict for Nada is the impact it has had on travel within the country. Her family has been unable to visit relatives in Sana'a for the past 5 years due to the blockades along major roads connecting Marib to Sana'a and Al-Jawf. Nada is very worried about the health of her brother as it is very difficult to travel to neighboring districts to get to the few nearby hospitals that are still functioning. Nada has been a part of the informal community female-led health networks that have helped women in her community continue to access health information and informal care. With the heightened conflict levels, more women are at risk and reliant on the informal health sector to fill in for the lack of formal health resources. Another reason why Marib is considered so important to both the Houthis and the Saudi-led coalition is because of the oil reserves within the governorate and the oil pipeline that runs to Ras Isa port.

Elham is from Al Abdiyah in the Marib governorate and she explained how dire the influx of internally displaced people moving into Marib has been on the infrastructure. Elham emphasized that there are not enough resources to support the increasing population of displaced Yemenis that have temporarily settled in the region and fears about the movement of warring partings along the road near her village. Elham adds to the various conflicts occurring by emphasizing the continued role that tribes play in Yemen and adds that she is grateful to be a part

of the Murad tribe and that both warring parties are forced to negotiate with every tribe in the areas that dominate. Elham emphasizes that with increased numbers of internally displaced people, women have come together to help provide resources and health information to vulnerable groups within their community and tribe. Tribal affiliations remain a large part of Yemen's society and many of the informal community health networks are differentiated by tribe affiliation and are connected by tribal partnerships.

Janad Region; Taiz Governorate, Ibb Governorate

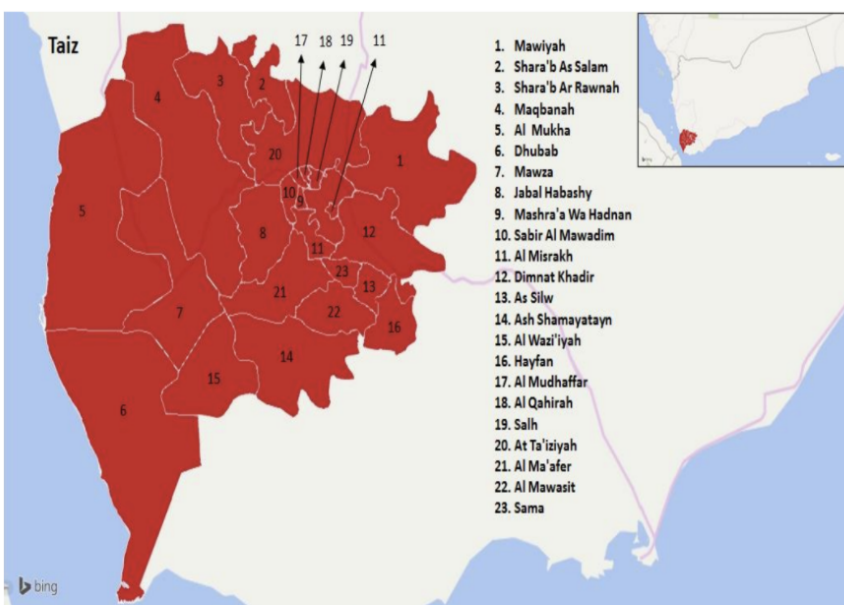


Figure 11. *Map of Taiz Governorate showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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Taiz: Taiz has been a central part of the conflict and has experienced 2661 airstrikes with 1134 targeted at military sites, 752 being targeted at nonmilitary sites, and 775 having unknown

¹⁷⁸ "Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

targets.¹⁷⁹ In Taiz, informal community female-run health networks have expanded as access to the formal medical system has diminished. According to Aailyah, an interviewee, female health networks have existed in Yemen for a long time, but the conflict has forced them to grow in order to protect community health.

Rayya, who works for MSF in Yemen, described the constant attacks on health facilities in Taiz and throughout the country. She has been stationed in different parts of Yemen the past three years and had recently returned to her home country due to increasing fears of COVID-19 and threats to the safety of aid workers on the ground. One example given to me by Rayya was the constant attacks on Al-Thawra hospital which is one of the main care providers in Taiz and supports a large population in the region. This hospital has been attacked by both warring parties multiple times and MSF has aided in repairs, but repeated attacks have made it extremely difficult to maintain adequate functions. Armed intruders have also stormed medical facilities and killed patients receiving medical care. Rayya found the constant threat to her personal safety to be overwhelming and hopes to return to the country soon, but is taking a needed break from the constant drive for survival.

Aiesha is a young woman from the governorate of Al Mukha, Taiz. She has a 10 month old baby girl and worries that her daughter will not grow up in a safe environment. Aiesha attended Taiz university but after completing her degree in 2016, she was unable to get a job as all teacher salaries had been paused. Luckily, Aisha's husband has been able to continue to work at a port but has had to miss weeks of work due to conflict in the area. Aiesha explained that the

¹⁷⁹ "Yemen Data Project" Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

district has been mainly controlled by the Saudi-led coalition but disputes over the territory have continued and risk of violent attacks remain a daily fear for Aisha and her family.

Aaliyah is a retired school teacher in the district of Maqbanah and has witnessed high levels of violence in the region. Aaliyah is most anxious about the constant pillaging of aid relief that has been sent to the country and said that she believed very little of it was actually reaching the Yemenis most in need. Within Maqbanah, Aaliyah describes heightened levels of conflict between Houthi rebels and the Saudi-led coalition, and most of this fighting is due to each group's attempts to gain more control over the ports along the west of the country. Aaliyah explains that female networks have always existed in Yemen, but have been forced to take on a greater role in society over time in order to meet the health needs of each community. Aaliyah believes that these informal community female-run health networks have had to expand and that more women are participating as the conflict continues because, “they have to help other women, it is part of being Yemeni... you could never let your neighbor suffer and all women in Yemen have come together to help keep Yemen’s children safe as men act foolishly”.

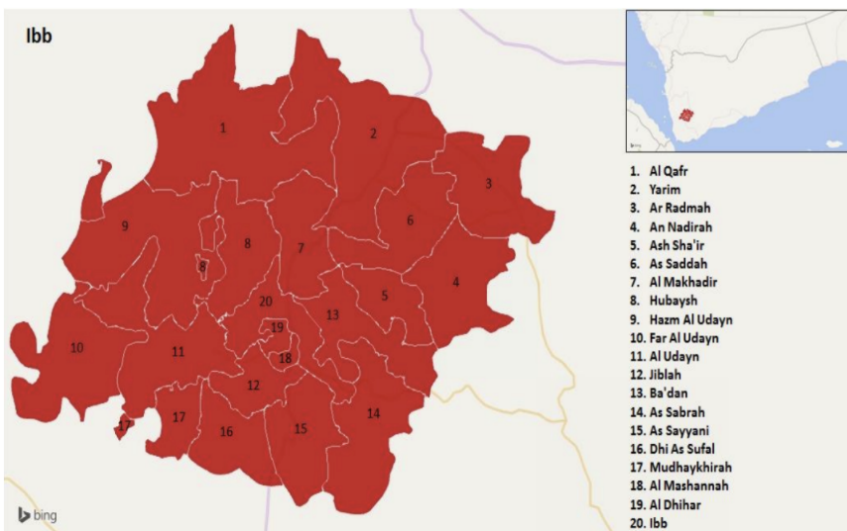


Figure 12. Map of Ibb Governorate showing administrative boundaries and locations of districts. Created by Berghof Foundation.

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Ibb: Ibb has been controlled by the Houthi rebels for the majority of the conflict, starting in 2014 when they came in and worked with tribal leaders to consolidate control and also by appointing a new Houthi governor of Ibb. Ibb has experienced a total of 266 air raids with 96 targeted at military sites, 124 being targeted at nonmilitary sites, and 46 having unknown targets.¹⁸¹ Air strikes have been the primary form of violence in Ibb, but clashes between armed groups and improvised explosive device attacks have also occurred that have targeted both civilians and combatants.¹⁸² In Ibb, food security has become a major problem and many women have banded together to help provide food to families that can not afford the produce being sold at local markets. This is an example of informal community female-led networks functioning more broadly in order to help their communities.

¹⁸⁰ “Mapping of Local Governance in Yemeni Governorates.” Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

¹⁸¹ “Yemen Data Project” Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

¹⁸² Carboni, Andrea. “Inside Ibb: A Hotbed of Infighting in Houthi-Controlled Yemen.” ACLED. ACLED, December 2, 2020. <https://acleddata.com/blog/2019/10/03/inside-ibb-a-hotbed-of-infighting-in-houthi-controlled-yemen/>.

I talked to two women from Ibb; Rasha who lives in the capital city of Ibb and Oma who lives in a village in Ba'dan. Rasha experienced an influx of Houthi rebels coming into the region in 2015 when the Houthis took control over the entire governorate. There has been growing dissent against the Houthi rule in the region and there has been a lot of infighting within the Houthi- Saleh coalition with a massive increase in airstrikes in 2018 and 2019. Rasha describes sustained levels of violence since the conflict began and is increasingly worried about the safety of her brothers who work in khat farming and her husband who works at the Ibb Souk as a merchant.

In Ba'dan, the difficulties facing Oma are very different than in the city. Oma has not had to worry about the safety of her family, but has been hugely affected by the strain on resources and the impacted trade routes. Agriculture is the largest employer in the governorate and Oma and her whole family work on a farm that produces potatoes and onions, but the dismantling of trade routes and checkpoints have limited the family's ability to supply this food to populations further away. Ibb is one of Yemen's biggest agricultural producers and the inability to distribute this product has impacted food insecurity in the country and has led to higher costs of food. Oma's family wants to help provide food to as many people as they can, but they also have to prioritize making a profit so that they can support themselves and continue to farm. Oma hopes that by working with other women in her community to help provide food, she can help some families make it through the conflict.

Tihama Region; Hajjah Governorate, Al Hodeidah Governorate, Al Mahweet Governorate, and Raymah Governorate

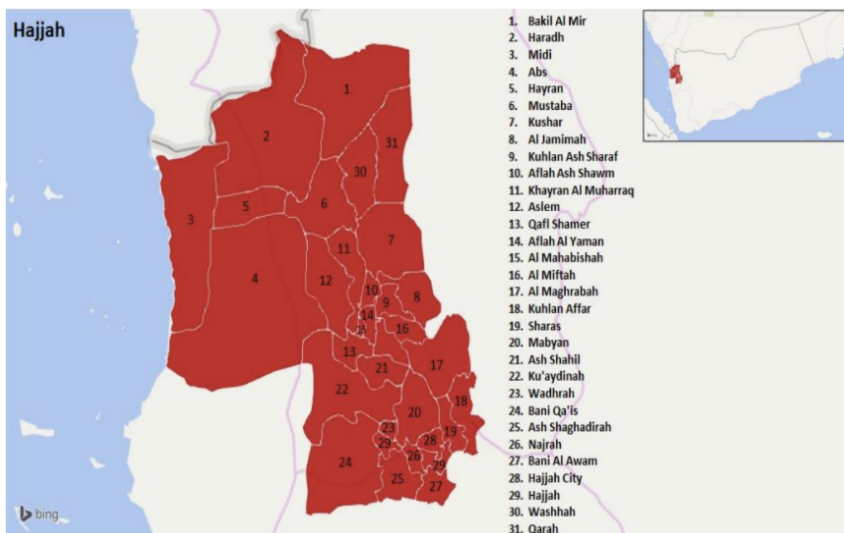


Figure 13. Map of Hajjah Governorate showing administrative boundaries and locations of districts. Created by Berghof Foundation.

183

Hajjah: Hajjah has experienced a total of 2445 air raids with 627 targeted at military sites, 555 being targeted at nonmilitary sites, and 1263 having unknown targets.¹⁸⁴ The ongoing conflict has caused massive internal displacement and 210,000 internally displaced Yemenis have moved from other districts in Hajjah to the district of Abs.¹⁸⁵ The levels of conflict experienced within Hajjah make it an extremely unsafe place for civilians and malnutrition remains an extreme health problem for many children.¹⁸⁶ In Hajjah, informal community female-led health networks have been strong for decades and have become more heavily relied upon as the conflict has

¹⁸³ “Mapping of Local Governance in Yemeni Governorates.” Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

¹⁸⁴ “Yemen Data Project” Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

¹⁸⁵ “Yemen: Conflict in Hajjah.” ACAPS. ACAPS, April 7, 2021. <https://www.acaps.org/special-report/yemen-conflict-hajjah>.

¹⁸⁶ Bracquemont, Marie. “In Hajjah, Children Fight Every Day to Survive.” UNICEF Yemen. UNICEF, November 1, 2018. <https://www.unicef.org/yemen/stories/hajjah-children-fight-every-day-survive>.

progressed. These networks have not changed, but have become more important to fellow women within the region.

Maha is from the directorate of Abs in Hajjah. She is in her late 50s and is very worried about her village. Abs has experienced extremely high levels of conflict and many Yemenis have been forced to flee their homes and travel to the south and east to escape the violence. Maha described a very stark change in the quality of life in Yemen when the conflict began in 2014. For Maha, life had always been very calm and peaceful living in Abs, a coastal plain region with very warm weather. Maha finished her schooling in Abs and tells me of the mass celebrations she remembers from 1990 when the YAR and PDRY came together to form the Republic of Yemen. She said that the health infrastructure in Yemen was improving, especially between 2000-2010 when a series of new health clinics were established near her in neighboring villages. After the Arab Spring in 2011, Maha said that improvement lulled and in 2015, the conflict erupted and access to basic healthcare became much harder. Maha was more directly impacted as the governorate of Hajjah has experienced very high rates of violence and all of the nearby secondary schools have closed. Maha feels extremely anxious for the safety and future of her children and grandchildren and noted her anger toward the Saudi-led coalition. Maha describes her disdain for the Saudi-led coalition for targeting schools with airstrikes and has started to teach her grandchildren in lieu of a formal education. Maha was very excited when I asked her about the existence of informal community female-led health networks and exclaimed that they were “جزء من المجتمع اليمني” which translated to “part of Yemeni society”. Maha describes female health networks as being present in her life and in her grandmother's life as the basis for health in her region and explains how expansive she believed these networks to be. She recalls her grandmother helping other women give birth and teach women about how to clean and care for

babies- Maha believes that her grandmother took on an active role in female health networks and was a well respected elder within the community. Maha did not necessarily think these networks grew since the conflict began, but said that she did believe that they were more important than ever in holding her community together and helping others gain access to resources and healthcare that they needed. Maha also credited the informal community female-led health networks with being extremely useful as families got displaced by conflict because women could reach out to other members and find refuge with women within the network in other directorates.

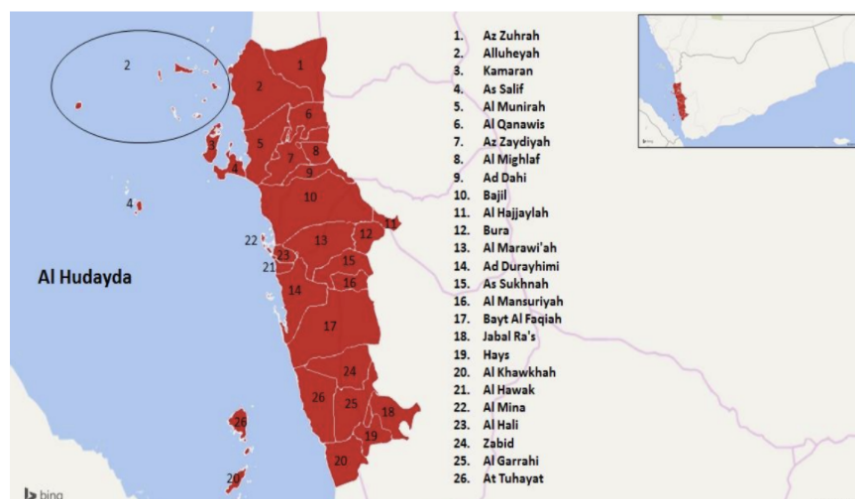


Figure 14. Map of Al-Hodeidah Governorate showing administrative boundaries and locations of districts. Created by Berghof Foundation.

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Al-Hodeidah/ Al-Hudayda: Conflict in Al-Hodeidah has been present since the start of the conflict because it is an extremely important sea port. Tensions escalated in 2018 when the Saudi-led coalition launched an offensive on the city of Hodeidah. Al-Hodeidah has experienced a total of 1817 air raids with 496 targeted at military sites, 787 being targeted at nonmilitary

¹⁸⁷ “Mapping of Local Governance in Yemeni Governorates.” Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

sites, and 534 having unknown targets.¹⁸⁸ Al-Hodeidah has also been impacted by the scaling back of aid into Yemen due to the territory being controlled by the Houthis who have been labelled as a foreign terrorist organization.¹⁸⁹ Experiences by women within this governorate show how moving between informal community female-run health networks allows for women to be supported in new places. The restrictions on travel due to the conflict have made the support given by these health networks even more important.

Civilians within Al-Hodeidah have experienced very high levels of conflict. I was able to talk to three women within the governorate; Rabia from Bajil, Khurmi from Bayt Al Faqiah, and Nura from Zabid. Rabia lives in a district called Bajil which is an hour drive from the city of Al-Hodeidah. Rabia has witnessed extreme levels of conflict and the main transportation route to access the city of Al-Hodeidah has been blocked. Rabia describes how it has become increasingly difficult to travel to hospitals and the limited number of resources that her village has access to. Khurmi is from Bayt Al Faqiah, a village that falls along a very well travelled trade route between Taiz and Al-Hodeidah. In Bani Al-Mahda, Khurmi works as a jewelry maker and has managed to keep making money as the conflict has persisted. As the levels of violence have risen throughout Al-Hodeidah, Khurmi has been forced to travel to Al-Jabeel, a eastern village in Bayt Al Faqiah, that is farther from the trade routes used by the Houthi rebels and Saudi-led coalition. Khurmi described how difficult it was to move from the village that she was born in, but was supported by a new network of women when she arrived.

Nura lives in a town called Zabid within the Zabid directorate of Al-Hodeidah. The town is actually a UNESCO world heritage site and the conflict has come fearfully close to the ancient

¹⁸⁸ “Yemen Data Project” Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

¹⁸⁹ Robinson, Kali Robinson. “How Severe Is Yemen's Humanitarian Crisis?” Council on Foreign Relations. Council on Foreign Relations, February 5, 2021. <https://www.cfr.org/in-brief/how-severe-yemens-humanitarian-crisis>.

town, threatening to destroy the historical mosques and the historical buildings. Nura is extremely proud of her town and is distraught by the purposeful destruction of historic buildings and is fearful that the Saudi-led coalition will target an airstrike at the area. The Islamic State (ISY) has also been present in the region and has purposely damaged historic buildings in the surrounding area. Nura explained that she is fearful for the livelihoods of her two daughters who are 10 and 2 years old. They both have never been able to attend school and she has been trying to teach them the best she can from home. Nura has noticed a significant change in access to care since the conflict began and notes that she feels she can not travel in order to go to the doctors because it would be unsafe.

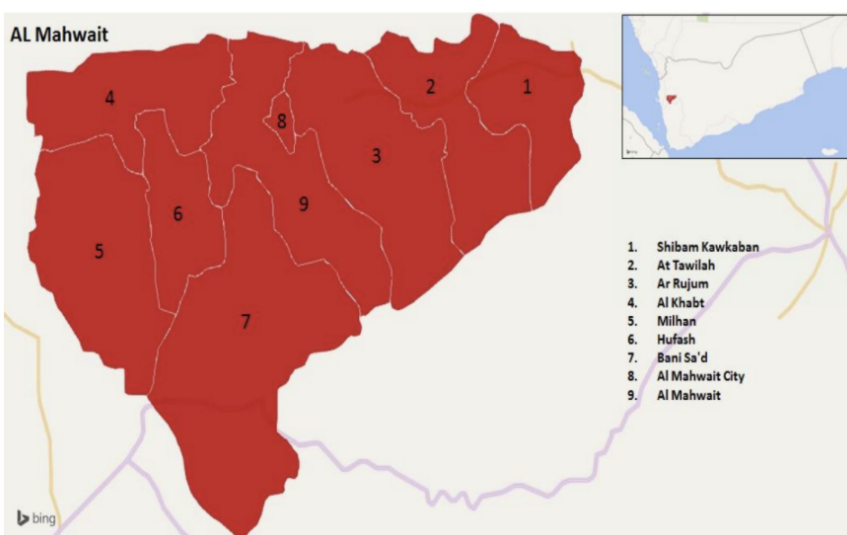


Figure 15. *Map of Al Mahweet Governorate showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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Al-Mahweet/ Al-Mahwit: The population of Al-Mahweet is 695,000 and it's economy is mainly agricultural. Al-Mahweet has experienced a total of 72 air raids with 8 targeted at military sites,

¹⁹⁰ "Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

56 being targeted at nonmilitary sites, and 8 having unknown targets.¹⁹¹ In Al-Mahweet, women are able to obtain medicine and health information through informal community female-led health networks.

In Al-Mahweet, I was able to interview two sisters from the district of Hufash. Walad and Zeinab are 3 years apart and are two of four children in their family. Their family works in farming and their main crops include corn and fruit, but the region has experienced various droughts over the past 20 years which has made farming difficult and earnings inconsistent. There are still hospitals functioning in the districts north of them, but the mountainous terrain makes travelling difficult and they only go to the hospitals if a family member is very ill. Zeinab was hospitalized when she was three for Malaria and was kept in the hospital for a week for intravenous antimalarial therapy and then given anti malarial medicine. Neither Zeinab nor Walad have been to the hospital since and both rely on the informal community female-led health networks in Hufash where they are able to obtain medicine through women who have family members at other district hospitals. Walad experienced a miscarriage when she was first pregnant in 2016, but fortunately, she was in good health and got pregnant again a few months later. Walad described being told to drink herbal tea, to eat well, and to rest often as suggestions from women within the network to prevent miscarrying again. Both sisters gave birth at home multiple times with the help of their grandmother and other female elders and both have taken on more active roles in the female-led health networks.

¹⁹¹ “Yemen Data Project” Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

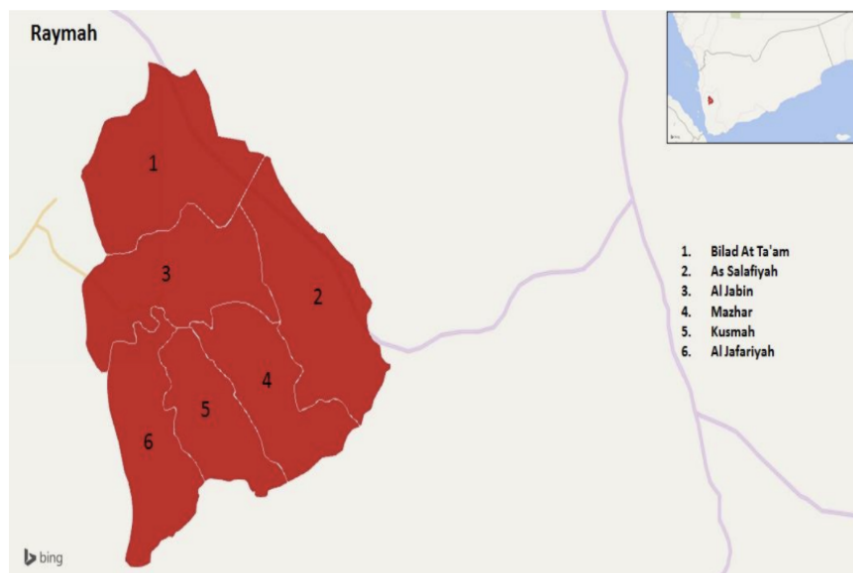


Figure 16. *Map of Raymah Governorate showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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Raymah: Raymah has faced high rates of conflict and has experienced 12 airstrikes with 4 targeted at military sites, 5 being targeted at nonmilitary sites, and 3 having unknown targets.¹⁹³ The governorate has been ravaged by conflict and much of the population has been deprived of essential resources.¹⁹⁴

I was able to talk to Samia who lives in the district of Al Jabin in Raymah. Samia describes how increasing levels of conflict in Al-Hodeidah has made it unsafe for people to travel there to visit the hospitals. Residents of Raymah are unable to travel easily to neighboring hospitals and have only been able to visit Al-Thulaya Hospital in Raymah which has less medical services and doctors. Samia explains that informal community female-led health

¹⁹² “Mapping of Local Governance in Yemeni Governorates.” Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

¹⁹³ “Yemen Data Project” Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

¹⁹⁴ Bandsom, Kerstin. “The Humanitarian Crisis in Yemen Is Getting Worse.” Welthungerhilfe. Welt Hunger Hilfe, November 13, 2018. <https://www.welthungerhilfe.org/news/latest-articles/support-for-families-in-war-torn-yemen/>.

networks have been a part of society for as long as she can remember, but that they are very important due to the conflict and that more women are joining because they can not access the formal medical system. Women have become more reliant upon each other and have joined together to support those in need. Samia, who is 25 weeks pregnant, intends to give birth at home with help from her mother and some women who have been part of the village's female-health network, one of which used to be a nurse.

Aden Region; Abyan Governorate, Aden Governorate, Dhalea Governorate, and Lahj Governorate

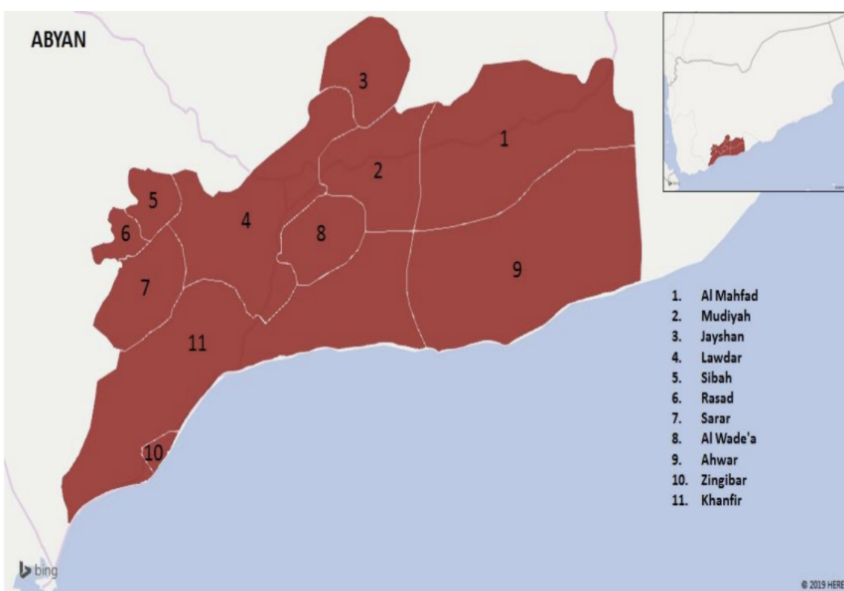


Figure 17. *Map of Abyan Governorate showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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Abyan: The health services available in this governorate via hospitals are reliant on support from international organizations and more than 69 schools in this governorate have been damaged

¹⁹⁵ "Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

since the beginning of the war. According to the Yemen Data Project, there have been 87 air raids with 63 of them targeting military targets, 18 non-military targets, and 4 air raids with unknown targets. This district is currently under the control of the Saudi led coalition. In Abyan informal community female-led health networks are pervasive and help supply medicines by working with pharmacies and also have many women engage within these groups to help educate others about reproductive health and common diseases.

Basma is a woman from the Sarar district within Abyan. She described daily life in the region and how difficult access to basic resources was for her and her family. She works as a caretaker for her grandmother who suffers from cardiovascular disease and asthma. Her grandmother takes a medication called Warfarin and also needs a new inhaler every year or so, but Basma has found it increasingly difficult to access the medication her mother needs and often has to travel to Zin Joubar Hospital in Abyan. The Sarar district where Basma lives is sparsely populated with few medical clinics near her, Basma detailed the reliance women there have on each other for knowledge and connections in lieu of a formal network that would normally play this role. What Basma is describing is the informal female health networks that exist all over the world, but in Yemen, these networks are essential for survival and population health. In Basma's small village, where there is no running water, there is also no local hospital, and most children stop attending school after year 8, prior to high school. The education that women have about reproductive health and common diseases is gained from older female women within their communities. These older women are respected and often, one acts as the community's informal midwife; helping women give birth and instructing women what to eat, how to care for their baby, what common disease symptoms look like, and other basic health knowledge that has been acquired throughout their lives. For a woman named Rana, from the Khanfar district of Abyan,

her aunt played the role of health educator for her extended family and worked with a local clinic to ensure all of the elder community members were having their needed medications delivered. Rana's aunt was meticulous in keeping a journal with symptoms of common disease and was able to diagnose Rana's baby brother with Malaria when he was two due to symptoms of fever, chills, and fast breathing. Rana's family immediately took her brother to a hospital in a neighboring district and he was diagnosed by a doctor and treated with what Rana described as ACT which I assume to be Artemisinin-based combination therapy which holds the same acronym. Rana and Basma both experienced the pervasiveness of informal community female-led health networks and both served a different function, but filled a gap where medical clinics and hospitals were absent.

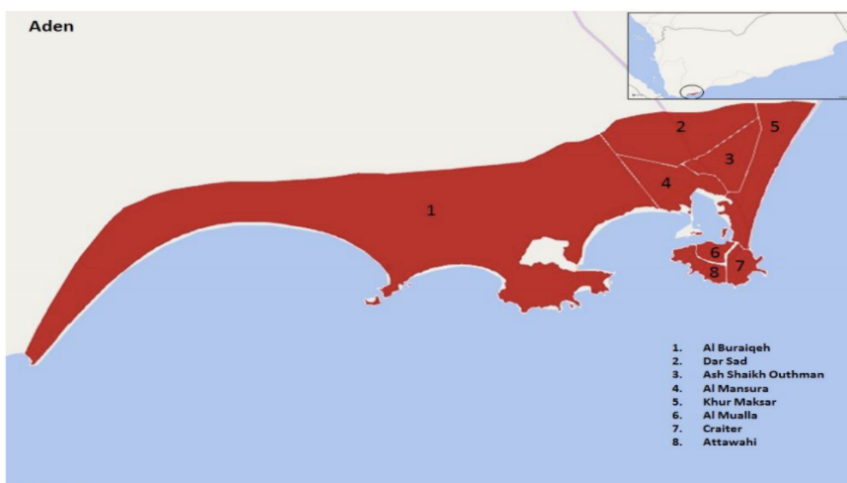


Figure 18. *Map of Aden Governorate showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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Aden: The governorate is a highly sought-after region of the country and has been occupied by the Saudi-led-coalition since 2015 and is also the main region for the Southern Transitional

¹⁹⁶ "Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

Council (STC), or the secessionist organization that calls for a separate Southern Yemen. There have been a total of 293 air raids with 178 of those being directed at military targets, 97 directed at non-military targets, and the remaining 18 air raids having an unknown target. In Aden, the role of informal community female-led health networks has been primarily education as hospitals are still accessible in the region.

I interviewed three women from Aden (Afra, Nakiah, and Safa) and they all had varied experiences with the health system and the role that fellow women played in health networks. Afra, a woman in her early twenties, describes some of the WHO's public health campaigns with a significant focus on nutrition. Afra told me that she thought it was funny that she was educated about malnutrition years before anyone told her about her own reproductive health. Afra described some of the in depth lessons she received while attending a secondary school and remembered that she had to go explain to all of her friends how menstrual cycles work because they had stopped attending school before her and did not fully understand why they were bleeding each month. Afra also describes the community perceptions towards birth control and explained to me that it was widely accepted as long as the woman was married. She said that you would be asked at the pharmacy if you were married and in most towns, the owner/pharmacist would already know if you were or not. Nakiah had a similar experience of gaining a comprehensive understanding of reproductive health at her secondary school in Al Mualla. For Nakiah, she did not describe a direct involvement with informal community female health networks, but also explained that she moved to the city of Aden where access to medical facilities was possible and knowledge about health was attainable through resources in the city. This is a theme that I found throughout the governorates where women who live in urban settings have less interactions with female health networks than women in rural settings.

Safa grew up between Aden and Sana'a and has a unique experience in comparing multiple experiences and interactions with vastly different health systems. During Safa's time in Aden, she found her schooling was subpar compared to the environment she encountered while attending a private secondary school in the capital Sana'a. Safa describes her relationship with older women while in Aden and how much she saw her mother depend on knowledge from women in the community when it came to the prevention of cholera. Safa's mother would have her female friends and community members over for evening tea, all sitting along the walls of the room on Majlis (Yemeni sofas), informing each other of health precautions they heard of. Some would give useful advice and warn against drinking the water from the wells without boiling it first. Others would write down recipes in which they would add herbs to the water to "kill" the cholera. Most of the attention was given to a middle aged woman whose sister worked at a pharmacy, and it was her that Safa's mother paid attention to. Safa remembers her mother teaching her and her 4 brothers and 2 sisters that they all had to wash their hands with soap and water at least 5 times a day before each salat (prayer). Safa was instructed to never drink the ground water unless it has been boiled, even when she felt very thirsty. The knowledge that Safa's mother got from her friend prevented her and all of her children from getting cholera and is a great example of how effective the exchange of knowledge is and the usefulness of preventative measures.

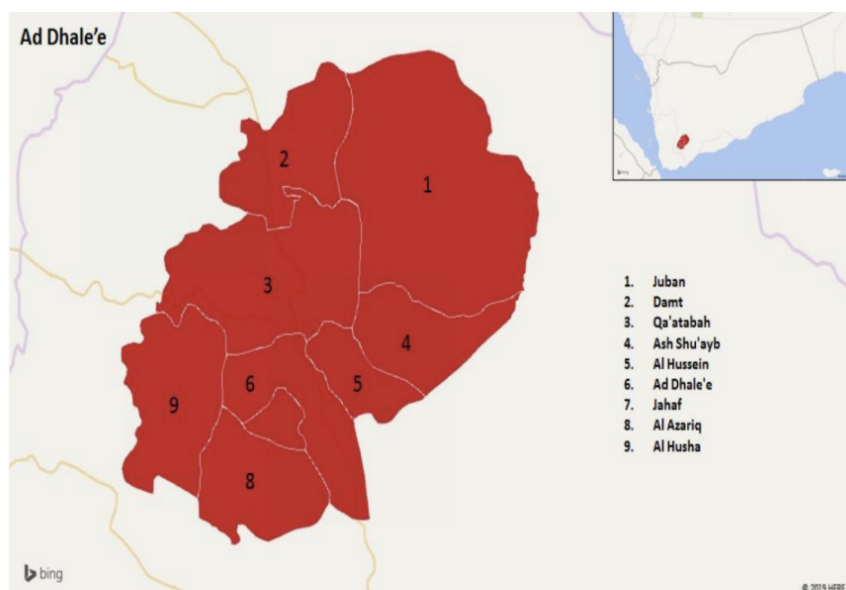


Figure 19. *Map of Al Dhalea Governorate showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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Al-Dhalea/ Al-Dahle/ Ad-Dahle'e: Al-Dhalea has experienced a total of 200 air raids with 139 targeted at military sites, 36 being targeted at nonmilitary sites, and 25 with unknown targets.¹⁹⁸ In Al-Dhalea, informal community female-led networks are present and a unique role they have taken on is safety. Not only do these informal community female-led networks supply information to women, but they also form a strong community of women who look out for each other and provide updated information about the conflict and other safety threats.

Nadira lives in Jahaf, the smallest district within the Al- Dhalea governorate. Nadira describes the governorate as experiencing high levels of conflict since 2015 and is quite scared due to the level of civilian casualties. The health infrastructure within Al-Dhalea has been largely dismantled and many of the aid groups that provided crucial services have had to pull out of the

¹⁹⁷ "Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

¹⁹⁸ "Yemen Data Project" Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

region due to dangerous levels of conflict. Nadira described how she and her friends feel unsafe traveling and have abstained from visiting hospitals due to the risks associated with road travel without protection. Nadira exclaimed that one of the worst health issues in her region is food insecurity and was extremely saddened by the rates of malnutrition in children. Fortunately Nadira and her family have been safe so far and have enough money to feed their family, but Nadira fears that if one of her 5 children were to fall ill, she would not be able to get them the help they would need. Nadira did not describe female health networks in our interview, but her account did emphasize the existence of informal community female-led networks more generally and the reliance she had on other women in her community for safety and information. She also worked with women from her village to provide food and meals for families who did not have the ability to afford food.

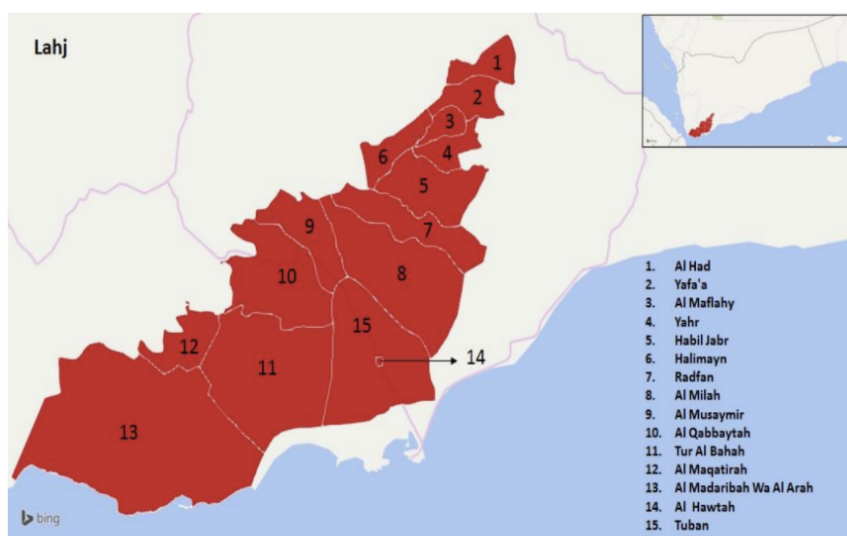


Figure 20. *Map of Lahj Governorate showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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¹⁹⁹ “Mapping of Local Governance in Yemeni Governorates.” Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

Lahj/Lahij: The Islamic State has had some presence in Lahj and has a command structure that is enforced in the south. The group is largely headed by foreigners brought in from Syria and Iraq and maintains power in Lahj and Aden. The Houthi rebels briefly had control over Lahj in spring 2015, but the territory was recaptured in the summer by the Saudi-led coalition along with Aden, Al-Dhalea, and Abyan. Lahj has experienced a total of 397 air raids with 192 targeted at military sites, 82 being targeted at nonmilitary sites, and 123 having unknown targets.²⁰⁰ The main hospitals are Ibn Khaldoun Hospital and Ber Ali Center. In Lahj, much of the health system remains functional, but informal community female-led health networks have become essential due to the high cost of care. Many women can not afford medical care from the formal sector and use informal community female-led health networks to fill in the gaps for care that is less serious.

I interviewed two women from Lahj; Zaida and Waheeda. Zaida lives in Tuban, a directorate that borders Aden. Zaida described limited impacts on the conflict on daily life except for the Houthi takeover that occurred in 2015 and the subsequent response from Hadi and the Saudi-led coalition. There was an increasing rate of violence in 2016/2017 due to the presence of AQAP and ISY, but both groups were driven out of the region by 2018. Tensions have continued in the region, even without the Houthis present because of the rising power of the Security Belt forces which are part of the STC. There has been very little violence that has involved civilians in the area and thus Zaida has felt a more minimal impact than in other regions where many civilians were targeted. Waheeda lives in Al Had in the northeastern part of Lahj. Wheeda described how the conflict had worsened and is unhappy by how the STC has worsened the levels of conflict within the district. Waheeda is 23 and is currently pregnant with her first child.

²⁰⁰ “Yemen Data Project” Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

She detailed how she was very happy that the local hospital had remained open and remains slightly nervous that it could close if violence increases. Waheeda explained to me the payment system for medical care and maintained that no one visited the doctor unless it was necessary because all costs had to be paid by the patient out of pocket. Waheed and her husband have been saving money so that she can give birth in the hospital but a friend of hers that used to be a nurse is checking on her as her prenatal care provider. Waheeda described an informal community female health network that she used and was a part of for anything health related except emergencies and had a lot of faith in the women she knew and those who cared for her. In her opinion, these health networks are essential due to the high cost of care, even in areas with continued access to hospitals.

Hadramout Region; Hadramout Governorate, Mahrah Governorate, Shabwah Governorate, Socotra Governorate

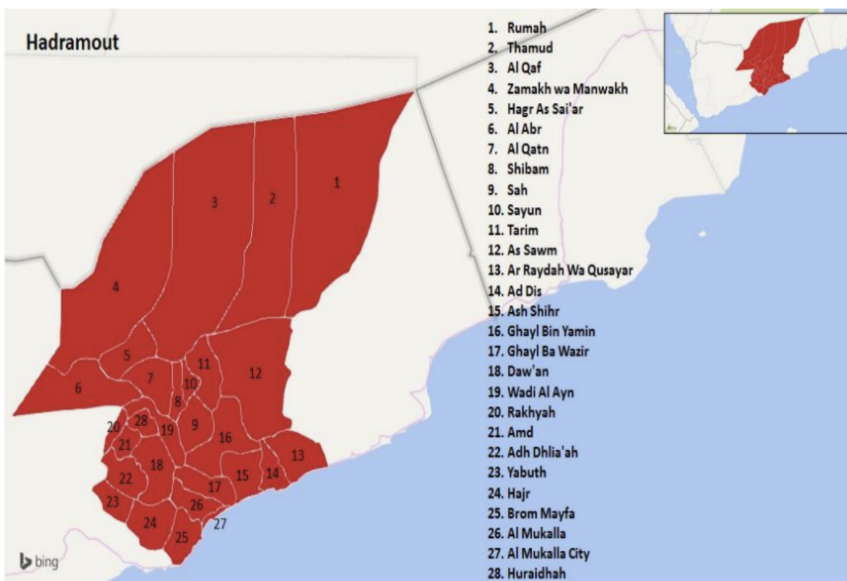


Figure 21. Map of Hadramout Governorate showing administrative boundaries and locations of districts. Created by Berghof Foundation.

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Hadramout/ Hadramout: Hadramout was occupied by Al-Qaeda (AQAP) in 2015 and for a year, the terror group controlled the governorate and partnered with local tribes to maintain power over the local population.²⁰² AQAP seized port taxes and central bank funds which expanded the terror group's wealth.²⁰³ Hadramout has experienced a total of 8 air raids with 5 targeted at military sites, and 3 being targeted at nonmilitary sites.²⁰⁴ In Hadramout, informal

²⁰¹ "Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

²⁰² "Yemen's Al-Qaeda: Expanding the Base." Crisis Group. International Crisis Group, February 23, 2017. <https://www.crisisgroup.org/middle-east-north-africa/gulf-and-arabian-peninsula/yemen/174-yemen-s-al-qaeda-expanding-base>.

²⁰³ Mapping Militant Organizations. "Al Qaeda in the Arabian Peninsula." Stanford University. Last modified February 2020. <https://cisac.fsi.stanford.edu/mappingmilitants/profiles/al-qaeda-arabian-peninsula>

²⁰⁴ "Yemen Data Project" Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

community female health networks have been very important as transportation and movement for women has been limited due to the presence of Al-Qaeda. The lack of female doctors is another reason why the reliance on informal community female health networks has sustained, and many women prefer to receive healthcare from women they know. These networks link the formal healthcare sector to the informal community and are able to provide accurate information to women with limited access.

I was able to interview four women from Hadramout, two of them are from Mukalla; Iman and Khadija, Fatima from Ar Raydah Wa Qusayer, and Aleema from Yabuth. Iman is a medical student at the Hadramout University in Mukalla. Iman described the 13 functioning hospitals that have managed to stay fully functional and notes how lucky she is to be able to continue her education, even as conflict negatively affects large areas of the country. Iman's education has been consistent except for a year where all institutions closed in 2015 when Al-Qaeda (AQAP) occupied the governorate. AQAP's presence had a massive impact on daily life for Iman, she was unable to attend university, she could not leave her house without being accompanied by a male family member, and she could not visit most of her friends. The presence of Al-Qaeda also limited access to hospitals and many women who were the main income earner for their family had a very difficult time making ends meet. Iman and many of her friends remained in contact via WhatsApp, but were unable to gather until after 2016 when the UAE armed forces came into the region and pushed Al-Qaeda back into the northern sparsely-populated region of Yemen along the border with Saudi Arabia. Iman blames the Saudi led-coalition for the Al-Qaeda takeover of Mukalla because the biggest opponent to AQAP is the Houthis and they were busy fighting the Saudi-led coalition, leaving Hadramout vulnerable. Khadija is also a medical student attending Hadramout University. Khadija's family was very

worried during the AQAP takeover of Hadramout as her father had been a vocal critic of the group. Fortunately, her family stayed safe and they rarely left their house for the entire year. I asked Khadija why she had chosen to pursue medicine and she told me that she felt that there were not enough women in the field. When she was younger, she lived in a small village in Brom Mayfa and there was one main hospital near her family, but there were no female doctors and thus, women did not visit the hospital. Khadija's mother was entirely reliant on informal community female health networks in order to access information and medical suggestions. Khadija hopes that by becoming a doctor, she will help make healthcare more accessible to the women around her and she hopes to encourage more women to become doctors.

Fatima is from Ar Raydah Wa Qusayer which is in the southeastern part of the governorate. There is one main hospital in her district and Fatima describes the care as being very high quality. The biggest issue described by Fatima is the lack of jobs and the halting of salaries for government workers around 2015-2016 and lasting until when we interviewed. Fatima's community has a very good hospital but only very few members of the community can afford to go there and most families will not seek care unless it is necessary. Fatima and her family rely heavily on informal community health networks that are run by women, especially for vaccines. The informal community health network in fatima's village is run by a woman who is married to a doctor at the district hospital. This woman provides medical consults with the help of her husband and also works with the district hospital to provide essential services to the community. The linkage of the formal healthcare sector to the informal community health network allows for many people to stay healthy and access vaccines and receive accurate medical information.

Aleema is an artist from Yabuth and was unable to finish her secondary education due to the AQAP occupation in 2015. Aleema is 20 years old and spends most of her time caring for her grandmother who suffers from “forgetfulness”. I have assumed that her grandmother could possibly have Alzheimer's or dementia, and when I asked Aleema if her grandmother had been to the hospital and gotten a diagnosis, she informed me that they were unable to travel, so they could not reach the hospital. There is no hospital in Yabuth and the nearest hospital is more than 100km away in Hajr. Aleema and her grandmother are supported by her two older brothers and she relies very heavily on women in her community to help access basic resources like clean water and food. Aleema describes this informal community as a female-led network that functions as a market for exchanging goods and services as well as a network of knowledge and news. Aleema hopes to move to Mukalla to pursue her passion for art, but is unwilling to leave her grandmother behind.

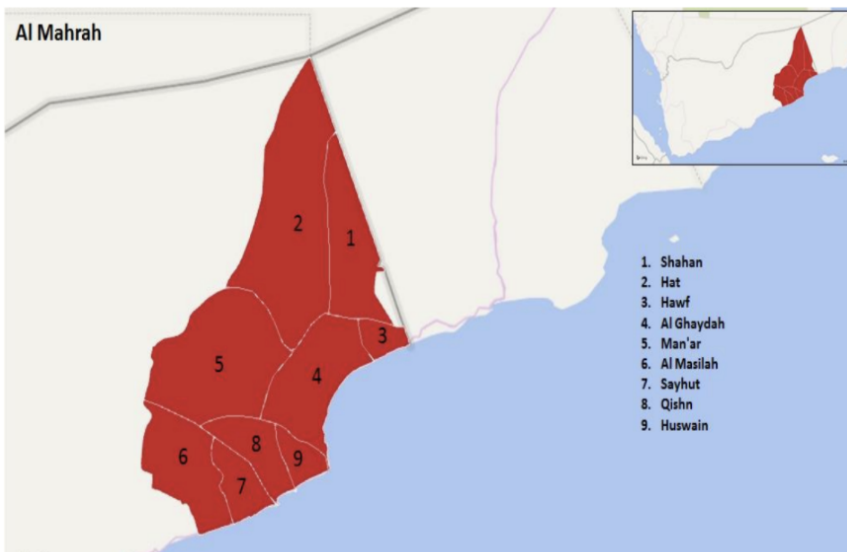


Figure 22. Map of Al Mahrah Governorate showing administrative boundaries and locations of districts. Created by Berghof Foundation.

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Al-Mahrah: The region is so sparsely populated, Al-Qaeda has taken refuge in Al-Mahrah and in October, 2020, the leader of Al-Qaeda in the Arabian Peninsula (AQAP), Khalid Batarfi, was arrested in Ghayda City.²⁰⁶ AQAP is considered the most dangerous branch of Al-Qaeda and emerged out of the merging of the Yemeni and Saudi-Arabian branches of Al Qaeda. AQAP is different from other branches of Al-Qaeda because it is seen as “more capable” and has proved to be competent in distributing messages and taking advantage of media.²⁰⁷

No women were interviewed from this Governorate.

²⁰⁵ “Mapping of Local Governance in Yemeni Governorates.” Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

²⁰⁶ Al Jazeera, UN report. “Leader of Al-Qaeda’s Yemen Affiliate under Arrest.” Yemen News | Al Jazeera. Al Jazeera, February 5, 2021.

<https://www.aljazeera.com/news/2021/2/5/al-qaedas-leader-in-yemen-under-arrest-un-report>.

²⁰⁷ Mapping Militant Organizations. “Al Qaeda in the Arabian Peninsula.” Stanford University. Last modified February 2020. <https://cisac.fsi.stanford.edu/mappingmilitants/profiles/al-qaeda-arabian-peninsula>

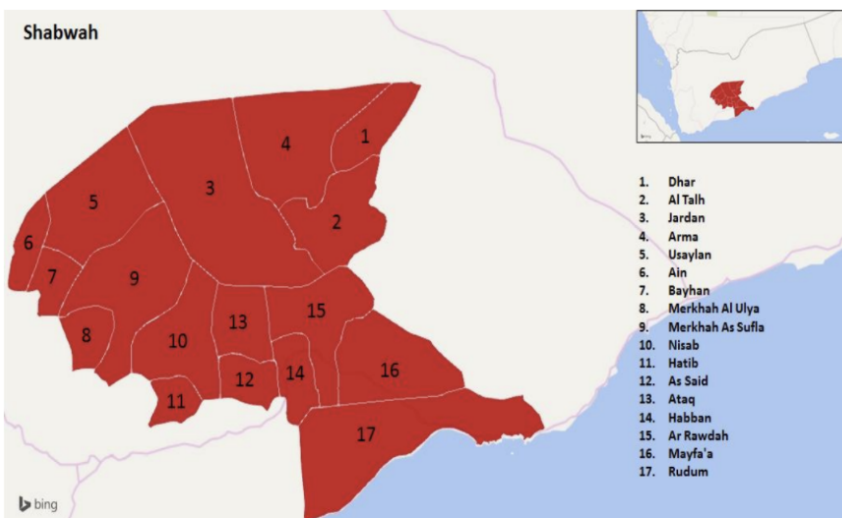


Figure 23. *Map of Shabwah Governorate showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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Shabwah/ Shabwa: Conflict in Shabwah intensified between 2015 and 2017 where it was the main location of conflict between the Houthis and the Saudi-led coalition. The rate of fatalities in the governorate did not fall until; February of 2018. Shabwah has experienced 320 airstrikes with 181 targeted at military sites, 50 being targeted at nonmilitary sites, and 89 having unknown targets.²⁰⁹ In Shabwa, Al-Qaeda’s presence has impacted women and has limited their ability to work and travel freely. Informal community female-led health networks have continued to function throughout the terror groups occupation and are extremely important to the local communities who rely on them for resources and information.

Amina lives in Mayfa’a, a southeastern district in Shabwah. She is a doctor at a district public hospital and has been practicing pediatric and general medicine for 10 years. Amina was

²⁰⁸ “Mapping of Local Governance in Yemeni Governorates.” Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

²⁰⁹ “Yemen Data Project” Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.

only able to interview with me briefly, but she explained that the hospital she has worked at has never had enough resources and that all the hospitals have to barter with each other and with aid groups to obtain the essential medical equipment needed to function properly. Amina was unable to work at the hospital for all of 2015-2016 due to the Al-Qaeda occupation but continued to support informal female health networks. Amina described the female health networks as playing the same role of local clinics, she believes they are incredibly important for identifying illnesses and linking others with healthcare information and access. Especially since the conflict started, many women are more restricted in how they can travel, especially alone, so these informal community female-led health networks allow women to gain access to medications, support, and information that would otherwise be inaccessible.

Dina lives in Arma, a northeastern district in Shabwah and has experienced economic difficulties since the conflict began. Dina worked as an elementary teacher in Aden for 5 years after she finished secondary school and took her exams. She moved back to her home village in 2013 due to her parents arranging her marriage, but she disliked the suitor and declined to marry him. As a single woman with no job, she has been very reliant on her family for support and feels extremely cutoff due to the violence that has made it difficult for her to travel alone outside of her district. Dina hopes to return to Aden in the future, but would need to have a job secured before moving and fears that without a change in the levels of violence, she will be stuck at home for several more years.

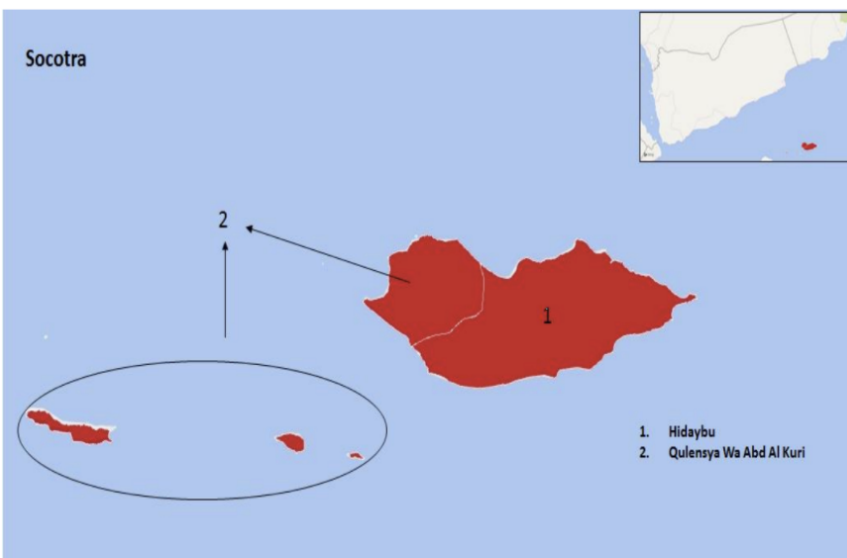


Figure 24. *Map of Socotra Governorate showing administrative boundaries and locations of districts.* Created by Berghof Foundation.

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Socotra: Socotra has remained distant from the server conflict occurring on the mainland, but has technically been under the control of the Saudi-led coalition, except for a brief period in 2018 when the UAE attempted to gain control over the land. In Summer 2020, the STC seized control over the main island of Socotra and deposed the governor. These actions were perceived as a coup and the STC declared self-rule in the south of the country in April 2020.²¹¹ The unique location of the island, located in the shipping lane that links Asia to Europe via the Suez Canal means that control over the island is important.

No women were interviewed from this Governorate.

²¹⁰ “Mapping of Local Governance in Yemeni Governorates.” Berghof Foundation. Berghof Foundation, January 2020. <https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

²¹¹ Reuters in Aden. “Yemeni Separatists Seize Island of Socotra from Saudi-Backed Government.” The Guardian. Guardian News and Media, June 21, 2020. <https://www.theguardian.com/world/2020/jun/21/yemen-separatists-seize-island-of-socotra-from-saudi-backed-government>.

Discussion

In Yemen, informal community female-led health networks have strengthened to support communities that lack adequate health systems and have evolved instinctively as a necessary response to provide mutual aid. Women from all sects of life participate in these networks, some in active roles as educators and resource providers and others act more as aids for the women who have more health knowledge. Many of the women behave as intermediaries between formal healthcare workers (doctors, pharmacists, midwives, nurses) and the community, and others work between different informal groups transferring information. These women have taken on roles that are unsubsidized in order aid in the maintenance of community health and have created an informal social safety net that includes distribution of resources, knowledge, access to needed services, affordable medications, and improved bargaining power for disadvantaged groups. In a gendered society with economic inequities, women have organized effectively and have created a profusion of support networks across the country at various levels to improve the quality of life for other women and Yemeni society at large.

The interviews provided insight into the impacts of the conflict on informal community health networks and based on the interviews with women in Amran, Dhamar, Sa'dah, Sana'a, Al-Jawf, Marib, Hajjah, Al-Hodeidah, Al Mahweet, Raymah, Abyan, Aden, and Al-Dhalea, we can confirm that these health networks have been strengthened and are hugely important to community health. Interviews from Al-Bayda, Lahj, Hadramout, and Shabwa show that the presence of terror groups have a negative impact on access to healthcare and has limited the activities of informal community female-led health networks due to restrictions on female gatherings. Women from Taiz and Ibb describe a growth in participation and scope of informal community female-led health networks.

The collapse of health infrastructure and the lack of health workers in Yemen means that as we move towards a safer and less unstable Yemen, it will be necessary to focus a large portion of resources and funding on the rebuilding of the country's health system. Using methods constructed by the multicountry ReBUILD consortium, a possible framework for strengthening health systems post-conflict can be laid out, with adjustments for the unique situation in Yemen.²¹² Rebuilding the health system and improving health outcomes in Yemen requires thinking about the steps that must be taken in order to improve gender equity. The biggest improvements that must be made include increasing female educational attainment, improving the quality of basic education, especially in rural regions, and the continuous promotion of women's rights which Yemen has committed to in the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) which it signed in 1984.²¹³²¹⁴

Health systems are made up of six major building blocks that have been devised by the WHO, these include; service delivery, health workforce, health information systems, access to essential medicines, financing, and leadership/governance.²¹⁵ We can group these building blocks into three sections; leadership/governance and health information systems are part of health policy more generally, financing and health workforce are key input components, and medical products, technologies, and quality service delivery are the immediate outputs of the health system. By breaking down the different components of the health system, we can improve the

²¹² Martineau, Tim, Barbara McPake, Sally Theobald, Joanna Raven, Tim Ensor, Suzanne Fustukian, Freddie Ssengooba, et al. "Leaving No One behind: Lessons on Rebuilding Health Systems in Conflict- and Crisis-Affected States." *BMJ global health*. BMJ Publishing Group, July 28, 2017.

²¹³ Rogers, Haley. "Women's Empowerment in Yemen." *The Borgen Project*. Borgen Project, October 13, 2019. <https://borgenproject.org/tag/womens-empowerment-in-yemen/>.

²¹⁴ "Women Empowerment." *Yemen Embassy in Washington DC*. Yemen Embassy of the Republic of Yemen, April 4, 2016. <https://www.yemenembassy.org/about-yemen/women-empowerment/>.

²¹⁵ "MONITORING THE BUILDING BLOCKS OF HEALTH SYSTEMS: A HANDBOOK OF INDICATORS AND THEIR MEASUREMENT STRATEGIES." WHO. WHO, 2010. https://www.who.int/healthinfo/systems/WHO_MBHSS_2010_full_web.pdf.

inputs (health workforce and infrastructure) that provide outputs (interventions and available service with accessible and actionable data) that will enhance the outcomes (coverage) and lead to a more general impact (morbidity and mortality).²¹⁶ Policy interventions should be evidenced-based and should clearly use feedback loops where data are clearly used to inform decision making. This should influence how the system is delivering care with the goal of improved population health. It is also essential to encourage patient engagement so that patient and provider education and policies, as well as enhance service delivery and governance can be improved.²¹⁷

Some priorities for rebuilding the health system in Yemen include establishing effective primary health care and preventative care systems to reverse the increases in child and maternal mortality that has occurred throughout the conflict.²¹⁸ Improving the utilization of skills possessed by educated young people in Yemen in order to support them with technical expertise that could aid in the development of effective long-term solutions.²¹⁹ The financial flows for health should be monitored at the national and district level by the Yemen Ministry for Public Health and Population and financial resources should be heavily allocated to health facilities and targeted at health worker training. Funding will need to come from the Yemen Ministry for Public Health and Population and the country will also require substantial donor commitment. It

²¹⁶ “MONITORING THE BUILDING BLOCKS OF HEALTH SYSTEMS: A HANDBOOK OF INDICATORS AND THEIR MEASUREMENT STRATEGIES.” WHO. WHO, 2010.
https://www.who.int/healthinfo/systems/WHO_MBHSS_2010_full_web.pdf.

²¹⁷ Bombard, Yvonne, G Ross Baker, Elaina Orlando, Carol Fancott, Pooja Bhatia, Selina Casalino, Kanecy Onate, Jean-Louis Denis, and Marie-Pascale Pomey. “Engaging Patients to Improve Quality of Care: a Systematic Review.” *Implementation science* : IS. BioMed Central, July 26, 2018.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6060529/>.

²¹⁸ “Rebuilding Yemen's Health System after Conflict.” *Health Systems Global*. Health Systems Global, August 15, 2016.
<https://healthsystemsglobal.org/news/rebuilding-yemens-health-system-after-conflict-early-findings-from-a-diaspora-engagement/>.

²¹⁹ “Rebuilding Health in Yemen after Conflict.” *Musāhamatna* briefing: Rebuilding Health in Yemen after Conflict . Yemen Health Network (Musāhamatna), August 25, 2016.
<https://www.saferworld.org.uk/downloads/pubdocs/report-health-scenarios-for-yemenliverpoolfinal.pdf>.

is essential that community health centers and hospitals are given more financial autonomy in order to address specific health challenges present within their population. Yemen as a whole must decide how best to finance their health system and this can be done by instituting a more formal health insurance infrastructure in the long term. Universities must be strengthened with professors receiving salaries to improve the training of doctors and to increase the number of doctors and health system staff in the country. Yemen's government needs to invest in the reconstruction of physical infrastructure, equipment, schools, transportation, libraries, sanitation systems, water supply systems, irrigation infrastructure, roads, and cellular systems.²²⁰

Realistically, Yemen will need substantial external funding in order to rebuild the health system, these external funders include WHO, UNICEF, NGOs, other governments, and individual donors. One essential aspect of allocating funds in order to help Yemen rebuild in the minimization of corruption by instituting ethical standards, adequate pay, and incentive structures.²²¹ Improving community participation is essential to the development and implementation of health services and by organizing around Imams and community leaders, health surveillance on primary causes of mortality could be very effective.²²²²²³ By improving community participation, it would be much easier to coordinate health on a national scale and allow for data collation and dissemination systems to discern when health needs are most demanding. Health data should be readily accessible to the public, along with reports, and used

²²⁰ "Rebuilding Health in Yemen after Conflict." Musāhamatna briefing: Rebuilding Health in Yemen after Conflict . Yemen Health Network (Musāhamatna), August 25, 2016. <https://www.saferworld.org.uk/downloads/pubdocs/report-health-scenarios-for-yemenliverpoolfinal.pdf>.

²²¹ "Rebuilding Health in Yemen after Conflict." Musāhamatna briefing: Rebuilding Health in Yemen after Conflict . Yemen Health Network (Musāhamatna), August 25, 2016. <https://www.saferworld.org.uk/downloads/pubdocs/report-health-scenarios-for-yemenliverpoolfinal.pdf>.

²²² "Rebuilding Health in Yemen after Conflict." Musāhamatna briefing: Rebuilding Health in Yemen after Conflict . Yemen Health Network (Musāhamatna), August 25, 2016. <https://www.saferworld.org.uk/downloads/pubdocs/report-health-scenarios-for-yemenliverpoolfinal.pdf>.

²²³ Haldane, Victoria, Fiona L H Chuah, Aastha Srivastava, Shweta R Singh, Gerald C H Koh, Chia Kee Seng, and Helena Legido-Quigley. "Community Participation in Health Services Development, Implementation, and Evaluation: A Systematic Review of Empowerment, Health, Community, and Process Outcomes." PloS one. Public Library of Science, May 10, 2019. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6510456/>.

for health education and public health programs.²²⁴ Instituting the integration of a formal knowledge management plan so that the process of rebuilding the system is well documented and systematically disseminated at local/regional/national levels. A formal knowledge management plan can help improve performance, competitive advantage, innovation, and continuous improvement.²²⁵ It is essential that alongside infrastructure development, in a post-conflict Yemen, the formal sector is linked with these informal health networks in order to integrate them into a new health system and move these women into monetized roles that allow for them to continue doing this invaluable work while also supporting their families.

²²⁴ “Rebuilding Health in Yemen after Conflict.” Musāhamatna briefing: Rebuilding Health in Yemen after Conflict . Yemen Health Network (Musāhamatna), August 25, 2016.

<https://www.saferworld.org.uk/downloads/pubdocs/report-health-scenarios-for-yemenliverpoolfinal.pdf>.

²²⁵ Haughom, John. “Knowledge Management in Healthcare: It's More Important Than You Realize.” Health Catalyst, October 23, 2019. <https://www.healthcatalyst.com/enable-knowledge-management-in-healthcare>.

Conclusion

The interviews I conducted provide a unique insight into life in Yemen and give voice to Yemeni women and the incredible work they are doing in order to provide care, resources, education, and safety to their communities. Through these interviews, a better understanding of how communities access care is described and the current barriers to adequate healthcare. Some of the barriers to accessing healthcare include levels of conflict, infrastructure damage, cost of transport, road blocks, safety concerns, people to travel with, availability of female doctors, location of hospital, presence of terror groups, and cost of care. Women in Yemen have created networks of mutual aid that have existed for decades, but these networks have become extremely important and have grown as access to formal healthcare has diminished. Women within these networks have played a role in various health sectors with some acting as midwives, others as educators, and some as middle women between the formal health system and those who have been forcibly separated due to the violence surrounding them and the barriers to access. The extent to which these networks are relied upon and strengthened varies by governorate; largely based upon access to the formal health care sector. In regions that experience heightened levels of conflict and health infrastructure destruction, informal community female-led health networks have grown and are more heavily relied upon by women and the community. In governorates with heightened terror group presence, informal community female-led health networks have been unable to expand and provide care due to the restrictions on free movement for women.

The war has had a devastating impact on Yemen, but the women within the country have formed informal community female-led health networks that have allowed for women to empower themselves and provide essential resources to their families and support their communities. The gendered social spheres within the country have fostered mutual aid, to benefit

female-led health networks and society. Dr. Hooria Mashhour, the previous Minister of Human Rights in Yemen, and a Yemeni human rights and women's rights activist, explained to me that, "Women, first of all, are the key element for peace in Yemen and are vital to community health currently".²²⁶ Women in Yemen have experienced extreme instability and many have been internally displaced, but they are also collectively working together to fill the gaps in the health system that have formed as a result of the conflict. Informal community female-led health networks are essential to the provisioning of care and distribution of care in Yemen. These networks formed out of spontaneous mutual aid and are grouped at the community and tribal level, but interact with the remaining formal health sector and work with other informal community female-led health networks in their governorate and throughout Yemen. By establishing the existence of informal community female-led health networks within Yemen and examining the role and functions of these health networks, this research displays the invaluable non-monetized system of female-led mutual aid that is supporting population health in Yemen.

²²⁶ Mashhour, Dr. Hooria, and Philippa Chadwick. Interview: Women's Rights in Yemen and Female Health Networks. Personal, April 24, 2021.

Bibliography

- “4 Ways the War in Yemen Has Impacted Women and Girls.” Crisis Watch- International Rescue Committee. IRC, December 20, 2019.
<https://www.rescue.org/article/4-ways-war-yemen-has-impacted-women-and-girls>.
- “6 Troubling Facts About the Looming Famine in Yemen.” World Food Program USA. World Food Program, August 8, 2019.
<https://www.wfpusa.org/articles/6-troubling-facts-about-the-looming-famine-in-yemen/>.
- Abdullah, Khaled. “Who Are Yemen's Houthis?” The World from PRX. Reuters, September 2018. <https://www.pri.org/stories/2018-12-14/who-are-yemen-s-houthis>.
- “ACAPS Briefing Note: Yemen - Escalation of Conflict in Al-Jawf and Marib Governorates .” Yemen: Cholera Outbreak - Oct 2016. Assessment Capacities Project, March 24, 2020.
<https://reliefweb.int/report/yemen/acaps-briefing-note-yemen-escalation-conflict-al-jawf-and-marib-governorates-24-march>.
- Al Jazeera, UN report. “Leader of Al-Qaeda's Yemen Affiliate under Arrest.” Yemen News | Al Jazeera. Al Jazeera, February 5, 2021.
<https://www.aljazeera.com/news/2021/2/5/al-qaedas-leader-in-yemen-under-arrest-un-report>.
- Al-Awlaqi , Sameh. “Yemen's Health System Fragmentation during the Conflict: The Impact on the Health and Nutrition Status of a Vulnerable Population,” March 18, 2019.
<https://www.internationalhealthpolicies.org/blogs/yemens-health-system-fragmentation-during-the-conflict-the-impact-on-the-health-and-nutrition-status-of-a-vulnerable-population/>.
- Al-Ansi, Abdulrahman. “The African Refugees and Migrants Trapped inside Yemen's War.” Reuters. Thomson Reuters, June 20, 2020.
<https://www.reuters.com/article/us-refugee-day-yemen-africans/the-african-refugees-and-migrants-trapped-inside-yemens-war-idUSKBN23R09S>.
- Al-Dawsari, Nadwa, Laila Lutf al-Thawr, and Samuel Ramani. “For Yemen's Houthis, the Status Quo Is the Key to Power.” Middle East Institute. Middle East Institute, April 26, 2021.
<https://www.mei.edu/publications/yemens-houthis-status-quo-key-power>.
- Al-deen, Nuria Shuja. “Narrowing the Gender Gap in Yemen A Gender Analysis.” Relief Web. International Rescue Committee, 2019.
<https://reliefweb.int/sites/reliefweb.int/files/resources/finalyemengenderassessmentreport2020.pdf>.
- Al-Hamdani, Sama'a. “Understanding the Houthi Faction in Yemen.” FOREIGN POLICY ESSAY. Lawfare, January 30, 2020.
<https://www.lawfareblog.com/understanding-houthi-faction-yemen>.

- Al-Hunaishi W, Hoe VC, Chinna K. "Factors associated with healthcare workers willingness to participate in disasters: a cross-sectional study in Sana'a, Yemen." *BMJ*, October 17, 2019. <https://bmjopen.bmj.com/content/9/10/e030547>.
- Alley, April. "Yemen's Houthi Takeover." International Crisis Group. International Crisis Group , October 4, 2016. <https://www.crisisgroup.org/middle-east-north-africa/gulf-and-arabian-peninsula/yemen/yemen-s-houthi-takeover>.
- Alterman, Jon B. Report. "Aid and Conflict: Pitfalls in Yemen". Center for Strategic and International Studies (CSIS), August 1, 2018. <http://www.jstor.org/stable/resrep22322>.
- "America's Counterterrorism Wars." New America. New America, 2020. <https://www.newamerica.org/international-security/reports/americas-counterterrorism-wars/the-war-in-yemen/>.
- Bandsom, Kerstin. "The Humanitarian Crisis in Yemen Is Getting Worse." Welthungerhilfe. Welt Hunger Hilfe, November 13, 2018. <https://www.welthungerhilfe.org/news/latest-articles/support-for-families-in-war-torn-yemen/>.
- Baron, Adam. "Mapping the Yemen Conflict." ECFR. European Council on Foreign Relations, October 19, 2015. <https://ecfr.eu/special/yemen/>.
- Baron, Adam. "Mapping the Yemen Conflict." ECFR. European Council on Foreign Relations, October 19, 2015. <https://ecfr.eu/special/yemen/>.
- Bergström, Staffan, Elizabeth Goodburn. "The role of traditional birth attendants in the reduction of maternal mortality." *Safe motherhood strategies: a review of the evidence*. 2001. <http://dspace.itg.be/bitstream/handle/10390/2654/2001shsop0077.pdf>.
- Beuze, Jean-Nicolas. "Women Struggle to Get by as Yemen Conflict Hits Six-Year Mark - Yemen." ReliefWeb. OCHA Services, March 2021. <https://reliefweb.int/report/yemen/women-struggle-get-yemen-conflict-hits-six-year-mark>
- Blackburn, Christine Crudo, Paul E. Lenze, and Rachel Paige Casey. "Conflict and Cholera: Yemen's Man-Made Public Health Crisis and the Global Implications of Weaponizing Health." *Health Security*. Mary Ann Liebert, April 17, 2020. <https://doi.org/10.1089/hs.2019.0113>.
- Bombard, Yvonne, G Ross Baker, Elaina Orlando, Carol Fancott, Pooja Bhatia, Selina Casalino, Kanecy Onate, Jean-Louis Denis, and Marie-Pascale Pomey. "Engaging Patients to Improve Quality of Care: a Systematic Review." *Implementation science : IS*. BioMed Central, July 26, 2018. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6060529/>.
- Bracquemont, Marie. "In Hajjah, Children Fight Every Day to Survive." UNICEF Yemen. UNICEF, November 1, 2018. <https://www.unicef.org/yemen/stories/hajjah-children-fight-every-day-survive>.

- Briody, Carolyn, Leonard Rubenstein, Les Roberts, and Eamon Penney. "Review of Attacks on Health Care Facilities in Six Conflicts of the Past Three Decades." *Conflict and Health*. BioMed Central, 2018. <https://core.ac.uk/download/pdf/161459879.pdf>.
- Camacho A, Bouhenia M, Alyusfi R, Alkohlani A, Naji MAM, de Radiguès X, et al. . Cholera epidemic in Yemen, 2016–18: an analysis of surveillance data. *Lancet Global Health*. (2018) <https://www.sciencedirect.com/science/article/pii/S2214109X18302304>.
- Carboni, Andrea. "Inside Ibb: A Hotbed of Infighting in Houthi-Controlled Yemen." ACLED. ACLED, December 2, 2020. <https://acleddata.com/blog/2019/10/03/inside-ibb-a-hotbed-of-infighting-in-houthi-controlled-yemen/>.
- CGTN Africa. "Inside Yemen: Healthcare System Crippled as Conflict Continues." YouTube. YouTube, October 2, 2018. <https://www.youtube.com/watch?v=BnpTeurRrB4>.
- "Cholera Epidemic in Yemen: 2020 Update." The Global Alliance Against Cholera (G.A.A.C), July 28, 2020. [https://www.choleraalliance.org/en/ressources/news/cholera-epidemic-yemen-2020-update#:~:text=According%20to%20the%20World%20Health,governorates%20of%20Yemen%20\(3\)](https://www.choleraalliance.org/en/ressources/news/cholera-epidemic-yemen-2020-update#:~:text=According%20to%20the%20World%20Health,governorates%20of%20Yemen%20(3).).
- "Cholera Situation in Yemen, January 2020 - Yemen." World Health Organization . WHO, 2020. <https://reliefweb.int/report/yemen/cholera-situation-yemen-january-2020>.
- "Conflict and Gender Relations in Yemen ." Yemen Gender Report . CARE International, OXFAM Great Britain, or the Gender Standby Capacity Project, November 2016. <https://www.care-international.org/files/files/YemenGenderReport171116.pdf>.
- "COVAX." World Health Organization. World Health Organization, 2020. <https://www.who.int/initiatives/act-accelerator/covax>.
- "The DHS Program." The DHS Program - Country Main. DHS. https://www.dhsprogram.com/Countries/Country-Main.cfm?ctry_id=46.
- Doubek, James, and Mary Louise Kelly. "As Yemenis Starve, Humanitarian Relief Group Pleads For International Help." NPR. NPR, March 1, 2021. <https://www.npr.org/2021/03/01/972530322/as-yemenis-starve-to-death-humanitarian-relief-group-pleas-for-international-hel>.
- Doucet, Lyse. "Yemen War: Joe Biden Ends Support for Operations in Foreign Policy Reset." BBC News. BBC, February 5, 2021. <https://www.bbc.com/news/world-middle-east-55941588>.
- Dresch, Paul. "A History of Modern Yemen." Cambridge University. Cambridge University Press, December 7, 2000.

- Druce, Philippa, Ekaterina Bogatyreva, Frederik Francois Siem, Scott Gates, Hanna Kaade, Johanne Sundby, Morten Rostrup, et al. "Approaches to Protect and Maintain Health Care Services in Armed Conflict – Meeting SDGs 3 and 16." *Conflict and Health*. BioMed Central, January 29, 2019. <https://conflictandhealth.biomedcentral.com/articles/10.1186/s13031-019-0186-0>.
- Dugatkin, Lee Alan. "The Prince of Evolution: Peter Kropotkin's Adventures in Science and Politics." *Scientific American*. Scientific American, September 13, 2011. <https://www.scientificamerican.com/article/the-prince-of-evolution-peter-kropotkin/#:~:text=Natural%20selection%2C%20Kropotkin%20argued%2C%20led,selection%20had%20favored%20such%20actions>.
- Dunbar, Charles. "The Unification of Yemen: Process, Politics, and Prospects." *Middle East Journal* 46, 1992. <http://www.jstor.org/stable/4328466>.
- Dureab F, Al-Awlaqi S, Jahn A. COVID-19 in Yemen: preparedness measures in a fragile state. *Lancet Public Health*. (2020) <https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667%2820%2930101-8/fulltext>.
- Dyer, Owen. "Yemen's health system buckles under Saudi led bombardment and blockade." *BMJ*. June 29, 2015. <https://doi.org/10.1136/bmj.h3549>.
- "Eastern Mediterranean Region- Yemen." World Health Organization. World Health Organization. Accessed April 26, 2021. <http://www.emro.who.int/child-adolescent-health/data-statistics/yemen.html>.
- EBCOG Scientific Committee. "The Public Health Importance of Antenatal Care." Facts, views & vision in ObGyn. Universa Press, 2015. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4402443/>.
- Editorial . "The Humanitarian Cost of Yemen's Crumbling Health System." *The Lancet Haematology*. The Lancet , December 2018. [https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026\(18\)30198-4/fulltext](https://www.thelancet.com/journals/lanhae/article/PIIS2352-3026(18)30198-4/fulltext).
- El Bcheraoui, Charbel, Aisha O. Jumaan, and Michael Collison. "Health in Yemen: Losing Ground in War Time." *Globalization and Health*. US National Library of Medicine- National Institutes of Health, April 25, 2018. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5918919/>.
- El-Saharty, Sameh, Gail Richardson, and George Schieber. "Republic of Yemen Health Sector Strategy Note." World Bank Document . World Bank, February 2001. <https://openknowledge.worldbank.org/bitstream/handle/10986/14953/444950replacem1s0file0to0catalogue1.pdf?sequence=1&isAllowed=y..>
- Faraj Bamatraf, Fauzia, Noor Abdul-aziz Binkroom, and Mazin Ahmed Jawass. "Causes of Mortality in Children 1-59 Months in Yemen." *Hadhrumout University. Hadhrumout University Journal of Natural & Applied Sciences*, December 2017.

https://hu.edu.ye/hu-publications/wp-content/uploads/2021/01/%D9%81%D9%88%D8%B2%D9%8A-%D8%A8%D8%A7%D9%85%D8%B7%D8%B1%D9%81-%D9%85%D9%86%D8%B3%D9%82-6P_14_2_2017.pdf.

Fink, Günther, Isabel Günther, and Kenneth Hill. "Slum Residence and Child Health in Developing Countries." *Demography* 51, August, 2014.
<http://www.jstor.org/stable/42920052>.

"Five Women Inform Workers Share Their Challenges in Accessing Health Services." WIEGO. WIEGO, April 2016.
<https://www.wiego.org/blog/five-women-informal-workers-share-their-challenges-accessing-health-services>.

Garbarski, Dana. "The Interplay between Child and Maternal Health: Reciprocal Relationships and Cumulative Disadvantage during Childhood and Adolescence." *Journal of Health and Social Behavior* 55, no. 1 (2014): 91-106.. <http://www.jstor.org/stable/43186882>.

GAVI, UNICEF, and WHO. "Yemen Receives 360,000 COVID-19 Vaccine Doses through the COVAX Facility [EN/AR] - Yemen." ReliefWeb. WHO, March 31, 2021.
<https://reliefweb.int/report/yemen/yemen-receives-360000-covid-19-vaccine-doses-through-covax-facility-enar>.

Gebretsadik, Solomon, and Emmanuel Gabreyohannes. "Determinants of Under-Five Mortality in High Mortality Regions of Ethiopia: An Analysis of the 2011 Ethiopia Demographic and Health Survey Data." *International Journal of Population Research*. Hindawi, December 8, 2016. <https://www.hindawi.com/journals/ijpr/2016/1602761/>.

Geyoushi, Bohaira E., Zoë Matthews, and R. William Stones. "Pathways to Evidence-Based Reproductive Healthcare in Developing Countries." *BJOG: An International Journal of Obstetrics and Gynaecology*. Elsevier, May 6, 2003.
https://www.sciencedirect.com/science/article/pii/S1470032803029811?casa_token=7Iqpjcro4MAAAAAA%3AaMnv2AjXoVJwfu_b1e1VOftpjBGjdBV-WGzuJ5u1tybt4gkyU7jrsE6QsfNjc_UfBjQHV9p4LYw.

Ghobari, Mohammed. "Tens of Thousands of Yemeni Houthis Protest against Fuel Reform, Government." Reuters. Thomson Reuters, August 18, 2014.
<https://www.reuters.com/article/us-yemen-protests/tens-of-thousands-of-yemeni-houthis-protest-against-fuel-reform-government-idUSKBN0GI1O420140818>.

"Global Gender Gap Report 2020." World Economic Forum. World Economic Forum, 2019.
http://www3.weforum.org/docs/WEF_GGGR_2020.pdf.

"Goal 6: Clean Water and Sanitation: UNDP in Yemen." UNDP. UNDP, 2020.
<https://www.ye.undp.org/content/yemen/en/home/sustainable-development-goals/goal-6-clean-water-and-sanitation.html>.

Grimm, Michael. "Does Inequality in Health Impede Economic Growth?" *Oxford Economic*, July 2011. <http://www.jstor.org/stable/23015138>.

- Haldane, Victoria, Fiona L H Chuah, Aastha Srivastava, Shweta R Singh, Gerald C H Koh, Chia Kee Seng, and Helena Legido-Quigley. "Community Participation in Health Services Development, Implementation, and Evaluation: A Systematic Review of Empowerment, Health, Community, and Process Outcomes." *PloS one*. Public Library of Science, May 10, 2019. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6510456/>.
- Haughom, John. "Knowledge Management in Healthcare: It's More Important Than You Realize." *Health Catalyst*, October 23, 2019. <https://www.healthcatalyst.com/enable-knowledge-management-in-healthcare>.
- "Health Cluster Yemen ." *Health Cluster Bulletin*. Health Cluster Yemen, January 2019. <https://www.who.int/health-cluster/countries/yemen/Yemen-Health-Cluster-Bulletin-Jan-2019.pdf>.
- "Health Cluster Yemen ." *Health Cluster Bulletin*. Health Cluster Yemen, June 2020. <https://www.who.int/health-cluster/countries/yemen/Yemen-Health-Cluster-Bulletin-June-2020.pdf?ua=1>.
- "Health System in Yemen Close to Collapse." World Health Organization. World Health Organization, September 30, 2015. <https://www.who.int/bulletin/volumes/93/10/15-021015/en/>.
- "History of Yemen." *Encyclopædia Britannica*. Encyclopædia Britannica, inc. Accessed April 26, 2021. <https://www.britannica.com/place/Yemen/History>.
- IIE-SRF and the Association of Yemeni Academics & Professionals. *Yemen's Higher Education Crisis*. Zoom, 2021.
- "Immunization Country Profile- Yemen." World Health Organization. World Health Organization, October 2020. https://apps.who.int/immunization_monitoring/globalsummary/countries?countrycriteria%5Bcountry%5D%5B%5D=YEM&commit=OK.
- "In Aden's Only COVID-19 Treatment Centre We Are Seeing a Catastrophe Unfold." *Médecins Sans Frontières* . MSF International, May 21, 2020. <https://msf-seasia.org/news/18976>.
- "In Yemen, Women Face Added Challenges Posed by COVID-19 amidst Ongoing Armed Conflict." UN Women. UN, July 29, 2020. <https://www.unwomen.org/en/news/stories/2020/7/feature-yemen-covid-amidst-armed-conflict>.
- Karasik, Theodore, and Giorgio Cafiero. "Yemen's Humanitarian Disaster: Halting the Famine Threat". Middle East Institute, October 2017.. <http://www.jstor.org/stable/resrep17611>.
- Kinna , Ruth, and Thomas Swann. "This Anarchist Thinker Helps Explain Why We Feel so Driven to Help Each Other through the Coronavirus Crisis." *The Conversation*. The Conversation, January 14, 2021.

<https://theconversation.com/this-anarchist-thinker-helps-explain-why-we-feel-so-driven-to-help-each-other-through-the-coronavirus-crisis-134494>.

Knights, Michael. "The Military Role in Yemen's Protests: Civil-Military Relations in the Tribal Republic." *Journal of Strategic Studies*. Taylor & Francis, February 12, 2013. <https://doi.org/10.1080/01402390.2012.740660>.

Lackner, Helen, and Abulrahman Al-Eryani. "Yemen's Environmental Crisis Is the Biggest Risk for Its Future." The Century Foundation. The Century Foundation, December 15, 2020. <https://tcf.org/content/report/yemens-environmental-crisis-biggest-risk-future/>.

Lambert, Louise T, Babar T Shaikh, Juanita Hatcher, David Haran, Michael E Reschen, and Amit Patel. "Health in the Middle East." *BMJ: British Medical Journal* 333, November 4, 2006. <http://www.jstor.org/stable/40700763>.

"The Life and Death Struggle against Cholera in Yemen." World Health Organization. World Health Organization, July 4, 2017. <https://www.who.int/en/news-room/feature-stories/detail/the-life-and-death-struggle-against-cholera-in-yemen>.

Looi, Mun-Keat. "Covid-19: Deaths in Yemen Are Five Times Global Average as Healthcare Collapses." *The BMJ. British Medical Journal Publishing Group*, July 27, 2020. <https://www.bmj.com/content/370/bmj.m2997>.

Maada Korsu Kandeh, Joseph, and Lalit Kumar. "Developing a Relative Ranking of Social Vulnerability of Governorates of Yemen to Humanitarian Crisis." *International Journal of Geo-Information*. United Nations Office for the Coordination of Humanitarian Affairs, March 31, 2015. https://www.researchgate.net/publication/282351212_Developing_a_Relative_Ranking_of_Social_Vulnerability_of_Governorates_of_Yemen_to_Humanitarian_Crisis.

Macias, Amanda. "'This War Has to End' - Biden Halts U.S. Support for Offensive Military Operations in Yemen." *CNBC*. CNBC, February 5, 2021. <https://www.cNBC.com/2021/02/04/biden-will-announce-end-of-us-support-for-offensive-operations-in-yemen.html>.

Magdy, Samy. "Report: Over 130 Attacks on Medical Facilities in Yemen War." *AP NEWS*. Associated Press, November 14, 2019. <https://apnews.com/article/8cae880768a849158756a03deefc1ce2>.

"Malnutrition: Emergencies and Disasters." World Health Organization. World Health Organization, January 2020. <https://www.who.int/news-room/q-a-detail/malnutrition-emergencies-and-disasters#:~:text=In%20emergencies%2C%20people%20are%20at,diseases%20that%20can%20be%20fatal>.

"Mapping of Local Governance in Yemeni Governorates." Berghof Foundation. Berghof Foundation, January 2020.

<https://berghof-foundation.org/library/mapping-of-local-governance-in-yemeni-governorates>.

Mapping Militant Organizations. “Al Qaeda in the Arabian Peninsula.” Stanford University. Last modified February 2020.
<https://cisac.fsi.stanford.edu/mappingmilitants/profiles/al-qaeda-arabian-peninsula>.

Martineau, Tim, Barbara McPake, Sally Theobald, Joanna Raven, Tim Ensor, Suzanne Fustukian, Freddie Ssenooba, et al. “Leaving No One behind: Lessons on Rebuilding Health Systems in Conflict- and Crisis-Affected States.” *BMJ global health*. BMJ Publishing Group, July 28, 2017.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5656126/>.

Mashhour, Dr. Hooria, and Philippa Chadwick. Interview: Women's Rights in Yemen and Female Health Networks. Personal, April 24, 2021.

“Maternal Mortality Ratio Yemen (National Estimate, per 100,000 Live Births).” Data. World Bank, 2018. <https://data.worldbank.org/indicator/SH.STA.STNT.ME.ZS?locations=YE>.

McCluskey, Padraic, and Jana Brandt. “When the Needs Are Overwhelming: Balancing Quality and Coverage in a Hospital in Yemen.” Humanitarian Practice Network. HPN, January 2020.
<https://odihpn.org/magazine/needs-overwhelming-balancing-quality-coverage-hospital-yemen/>.

McKernan, Bethan. “Health Workers Targeted at Least 120 Times in Yemen Conflict – Report.” *The Guardian*. Guardian News and Media, March 18, 2020.
<https://www.theguardian.com/world/2020/mar/18/health-workers-targeted-at-least-120-times-yemen-conflict>.

“MONITORING THE BUILDING BLOCKS OF HEALTH SYSTEMS: A HANDBOOK OF INDICATORS AND THEIR MEASUREMENT STRATEGIES.” WHO. WHO, 2010.
https://www.who.int/healthinfo/systems/WHO_MBHSS_2010_full_web.pdf.

Montgomery, Marcus. “A Timeline of the Yemen Crisis, from the 1990s to the Present.” Arab Center Washington DC. Arab Center, February 2021.
http://arabcenterdc.org/policy_analyses/a-timeline-of-the-yemen-crisis-from-the-1990s-to-the-present/.

Myre, Greg, Merrit Kennedy, and Vanessa Romo. “U.S. Intelligence: Saudi Crown Prince Approved Operation To Kill Jamal Khashoggi.” NPR. NPR, February 26, 2021.
<https://www.npr.org/2021/02/25/971215788/biden-administration-poised-to-release-report-on-killing-of-jamal-khashoggi>.

Nugali, Noor. “Arab Coalition in Yemen Confirms Sanaa Blood Bank Was Bombed by Mistake.” Arab News. Arabnews, October 3, 2019.
<https://www.arabnews.com/node/1563311/middle-east>.

- Ott, Haley. "48,000 Yemeni Women Could Die Giving Birth as UN Starts Shutting Down Maternity Services Due to Funding Gap." CBS News. CBS Interactive, May 15, 2020. <https://www.cbsnews.com/news/coronavirus-news-un-maternity-wards-in-yemen-are-out-of-money/>.
- "Overview." World Bank. World Bank, March 2021. <https://www.worldbank.org/en/country/yemen/overview>.
- Penney, Debra S, and Jeanne Raisler. "Meeting Women's Health Needs in Yemen: a Midwifery Perspective." *Journal of Midwifery & Women's Health*. Elsevier, June 1, 2000. <https://www.sciencedirect.com/science/article/abs/pii/S1526952399000057#!>.
- Photo Story. "Gallery: A Day at the General Rural Hospital in Thi As Sufal District: MSF." Médecins Sans Frontières . MSF International, December 9, 2016. <https://www.msf.org/gallery-day-general-rural-hospital-thi-sufal-district>.
- Physicians for Human Rights. "Yemen: Attacks on Health." PHR newsletter. PHR, January 2019. https://phr.org/wp-content/uploads/2019/01/Jan_2019-Newsletter_FINAL.pdf.
- Physicians for Human Rights. "Yemen: Attacks on Health." PHR newsletter. PHR, August 2019. https://phr.org/wp-content/uploads/2019/08/PHR-August__2019-Yemen-Newsletter.pdf.
- Population Reference Bureau. "Healthy Mothers and Healthy Newborns: The Vital Link." Population Reference Bureau, April 2002. <https://www.prb.org/healthymothersandhealthynewbornsthevitallink/>.
- Press Release. "24 Million Yemenis at Catastrophic Humanitarian Risk Following New U.S. Terrorist Designations of Ansar Allah, Warns IRC." International Rescue Committee (IRC). IRC, January 11, 2021. <https://www.rescue.org/press-release/24-million-yemenis-catastrophic-humanitarian-risk-following-new-us-terrorist>.
- Press Release. "Mothers and Children Left to Die in Yemen without Access to Medical Care: MSF." Médecins Sans Frontières . MSF International, April 24, 2019. <https://www.msf.org/mothers-and-children-left-die-yemen-without-access-medical-care>.
- Press Release. "Yemen: MSF Hospital Destroyed by Airstrikes: MSF." Médecins Sans Frontières . MSF International, January 19, 2016. <https://www.msf.org/yemen-msf-hospital-destroyed-airstrikes>.
- "Priorities for Gender Equality in Yemen's COVID-19 Response." UN Women . UN, May 12, 2020. https://www2.unwomen.org/-/media/field%20office%20arab%20states/attachments/publications/2020/05/yemen%20response%20covid-19_action%20brief.pdf?la=en&vs=2651.
- Project, Borgen. "Women's Empowerment in Yemen." The Borgen Project. Borgen Project https://borgenproject.org/wp-content/uploads/The_Borgen_Project_Logo_small.jpg, October 13, 2019. <https://borgenproject.org/tag/womens-empowerment-in-yemen/>.

- “Propping Up Yemen's Health System Without Pay.” Doctors Without Borders - USA. MSF international , September 28, 2017.
<https://www.doctorswithoutborders.org/propping-yemens-health-system-without-pay>.
- Qirbi, Naseeb, and Sharif A Ismail. “Health System Functionality in a Low-Income Country in the Midst of Conflict: the Case of Yemen.” OUP Academic. Oxford University Press, April 11, 2017. <https://academic.oup.com/heapol/article/32/6/911/3591753>.
- Raslan, Rasha, Skye El Sayegh, and Sana Chams. “Re-Emerging Vaccine-Preventable Diseases in War-Affected Peoples of the Eastern Mediterranean Region—An Update.” Front Public Health. Front Public Health- NIH, October 2017.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5661270/>.
- “Rebuilding Health in Yemen after Conflict.” Musāhamatna briefing: Rebuilding Health in Yemen after Conflict . Yemen Health Network (Musāhamatna), August 25, 2016.
<https://www.saferworld.org.uk/downloads/pubdocs/report-health-scenarios-for-yemenlive-rpoolfinal.pdf>.
- “Rebuilding Yemen's Health System after Conflict.” Health Systems Global. Health Systems Global, August 15, 2016.
<https://healthsystemsglobal.org/news/rebuilding-yemens-health-system-after-conflict-early-findings-from-a-diaspora-engagement/>.
- Report. “Complicated Delivery: The Yemeni Mothers and Children Dying without Medical Care: MSF.” Médecins Sans Frontières . MSF International, April 24, 2019.
<https://www.msf.org/complicated-delivery-yemeni-mothers-and-children-dying-without-medical-care>.
- “Republic of Yemen - Country Engagement Note for the Period FY20-FY21 : Yemen .” World Bank. World Bank, April 2019.
<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/757121557938303017/yemen-country-engagement-note-for-the-period-fy20-fy21>.
- Reuters in Aden. “Yemeni Separatists Seize Island of Socotra from Saudi-Backed Government.” The Guardian. Guardian News and Media, June 21, 2020.
<https://www.theguardian.com/world/2020/jun/21/yemen-separatists-seize-island-of-socotra-from-saudi-backed-government>.
- Reuters Staff. “Yemen Gets First COVID-19 Vaccines but Is ‘at the Back of the Queue.’” Reuters. Thomson Reuters, March 31, 2021.
<https://www.reuters.com/article/us-health-coronavirus-yemen-vaccine/yemen-gets-first-covid-19-vaccines-but-is-at-the-back-of-the-queue-idUSKBN2BN1J4?il=0>.
- Riedel, Bruce. “Who Are the Houthis, and Why Are We at War with Them?” Brookings. Brookings, December 18, 2017.
<https://www.brookings.edu/blog/markaz/2017/12/18/who-are-the-houthis-and-why-are-we-at-war-with-them/>.

- Robinson, Kali Robinson. "How Severe Is Yemen's Humanitarian Crisis?" Council on Foreign Relations. Council on Foreign Relations, February 5, 2021. <https://www.cfr.org/in-brief/how-severe-yemens-humanitarian-crisis>.
- Robinson, Kali. "Yemen's Tragedy: War, Stalemate, and Suffering." Council on Foreign Relations. Council on Foreign Relations, February 2021. <https://www.cfr.org/background/yemen-crisis>.
- Rogers, Haley. 2017. "Breaking down cultural barriers to girl's education in Yemen." The Borgen Project. <https://borgenproject.org/tag/womens-empowerment-in-yemen/>.
- Romanello, Michele. "Measurement and Correlates of Child Mortality in Yemen." Open Access Library Journal. Open Access Library, October 31, 2018. <https://www.oalib.com/articles/5299911#.YItkZ31KidY>.
- "Saada, Yemen." Crisis Group. International Crisis Group, April 22, 2021. <https://www.crisisgroup.org/trigger-list/iran-us-trigger-list/flashpoints/yemen>.
- Saunders, John, and Trevor Smith. "Malnutrition: Causes and Consequences." Clinical medicine (London, England). Royal College of Physicians, December 2010. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4951875/>.
- Schmitz, Charles. "The Huthi Ascent to Power." Middle East Institute. Middle East Institute, April 26, 2021. <https://www.mei.edu/publications/huthi-ascent-power>.
- Sharaf, Mohammed. "For Yemeni Women, the Path to Universities Gets Tougher - Al-Fanar Media." Al-Fanar Media. Al-Fanar Media, August 19, 2019. <https://www.al-fanarmedia.org/2019/08/for-yemeni-women-the-path-to-universities-gets-tougher/>.
- Spears, Dean, Arabinda Ghosh, and Oliver Cumming. "Open Defecation and Childhood Stunting in India: An Ecological Analysis of New Data from 112 Districts." PLOS ONE. Public Library of Science, September 16, 2013. <https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0073784>.
- STATcompiler. DHS, 2020. <https://www.statcompiler.com/en/>.
- Torbosh A, Al Amad MA, Al Serouri A, Khader Y. "The Impact of War in Yemen on Immunization Coverage of Children Under One Year of Age: Descriptive Study." JMIR Public Health Surveillance. JMIR, October 23, 2019. <https://publichealth.jmir.org/2019/4/e14461/>.
- "Transfer of Power to Abd Rabbuh Mansur Hadi." Encyclopædia Britannica. Encyclopædia Britannica, inc. Accessed April 26, 2021. <https://www.britannica.com/place/Yemen/Transfer-of-power-to-Abd-Rabbuh-Mansur-Hadi>.

- Ugalde, A, E Selva-Sutter, C Castillo, C Paz, and S Cañas. “Conflict and Health: The Health Costs of War: Can They Be Measured? Lessons from El Salvador,” July 15, 2000. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1118168/#:~:text=Studies%20assessing%20the%20health%20impact,%2C%20disabilities%2C%20infant%20mortality%2C%20and.>
- United Nations High Commissioner for Refugees. “Shortfall Threatens Critical Aid for Nearly One Million Displaced Yemenis and Refugees.” UNHCR. UNHCR. Accessed April 26, 2021. <https://www.unhcr.org/en-us/news/briefing/2020/4/5ea7ecd84/unhcr-shortfall-threatens-critical-aid-nearly-million-displaced-yemenis.html>.
- “Unravelling the Nutrition Complex.” CHILDREN FIRST: THE STORY OF UNICEF, PAST AND PRESENT. UNICEF, n.d. <https://sites.unicef.org/about/history/files/Child-First-CH-03-p063-090-unravel-nutrition-complex.pdf>.
- “UN Office of the Resident Coordinator and Humanitarian Coordinator for Yemen The Ministry of Health in Aden Confirms the First Case of COVID-19 in Yemen.” 2020. https://reliefweb.int/sites/reliefweb.int/files/resources/HC%20Statement_COVID-19_First_Case.pdf.
- “Urgent Funding Needed to Protect Health and Safety of Women and Girls in Yemen amidst COVID-19.” UNFPA Yemen. UNFPA, May 6, 2020. <https://yemen.unfpa.org/en/news/urgent-funding-needed-protect-health-and-safety-women-and-girls-yemen-amidst-covid-19-0>.
- Varisco, D. “Pumping Yemen Dry: A History of Yemen’s Water Crisis.” *Human Ecology*. Springer, April 30, 2019. <https://doi.org/10.1007/s10745-019-0070-y>.
- Voices from the Field. “Yemen: ‘Our Patients and Staff Need to Feel Safe’: MSF.” Médecins Sans Frontières. MSF International, January 8, 2016. <https://www.msf.org/yemen-our-patients-and-staff-need-feel-safe>.
- Voices from the Field. “Yemen: ‘The Majority of Our Patients Suffered from War Injuries.’” Médecins Sans Frontières. MSF International, August 13, 2015. <https://www.msf.org/yemen-%E2%80%9Cmajority-our-patients-suffered-war-injuries%E2%80%9D>.
- “War of Secession and Political Unrest.” *Encyclopædia Britannica*. Encyclopædia Britannica, inc. Accessed April 26, 2021. <https://www.britannica.com/place/Yemen/War-of-secession-and-political-unrest>.
- Washington Center For Yemeni Studies. “The Impact of Biden's Victory on the Course of the War in Yemen.” Washington Center For Yemeni Studies. WCYS, November 14, 2020. https://wcysus.org/news_details.php?lng=english&sid=277.

- Webair, H.H., Al-assani, S.S., Al-haddad, R.H. et al. "Assessment of patient safety culture in primary care setting, Al-Mukala, Yemen." *BMC Family Practice*, October 13, 2015. <https://doi.org/10.1186/s12875-015-0355-1>.
- "Weekly Epidemiological Record." World Health Organization Geneva . WHO, September 21, 2018. <http://apps.who.int/iris/bitstream/handle/10665/274654/WER9338.pdf?ua=1>.
- Whitehead, Frederika. "Water Scarcity in Yemen: the Country's Forgotten Conflict." *The Guardian*. Guardian News and Media, April 2, 2015. <https://www.theguardian.com/global-development-professionals-network/2015/apr/02/water-scarcity-yemen-conflict>.
- WHO. "Health System in Yemen Close to Collapse." World Health Organization. World Health Organization, September 30, 2015. <https://www.who.int/bulletin/volumes/93/10/15-021015/en/>.
- "Withering Life." Mwatana for Human Rights. Mwatana, July 30, 2019. <https://mwatana.org/en/withering-life2018/>.
- "WOMEN AS PEACEBUILDERS IN YEMEN ." Yemen Report . SOCIAL DEVELOPMENT DIRECT, June 2018. http://www.sddirect.org.uk/media/1571/sdd_yemenreport_full_v5.pdf.
- "Women Empowerment." Yemen Embassy in Washington DC. Yemen Embassy of the Republic of Yemen, April 4, 2016. <https://www.yemenembassy.org/about-yemen/women-empowerment/>.
- "Women in Conflict Resolution and Peacebuilding in Yemen." United Nations. United Nations, 2019. <https://yemen.un.org/en/15853-women-conflict-resolution-and-peacebuilding-yemen>.
- "YEMEN HUMAN RIGHTS IN YEMEN DURING AND AFTER THE 1994 WAR." Human Rights Watch. Human Rights Watch/Middle East, October 1994. <https://www.hrw.org/publications>.
- "Yemen Hospitals on the Brink of Closure as Health System Collapses Leaving 8 Million Children without Access to Healthcare - Yemen." ReliefWeb. Disasters Emergency Committee, December 19, 2016. <https://reliefweb.int/report/yemen/yemen-hospitals-brink-closure-health-system-collapses-leaving-8-million-children>.
- "Yemen Infant Mortality Rate 1950-2021." MacroTrends. MacroTrends, 2021. <https://www.macrotrends.net/countries/YEM/yemen/infant-mortality-rate>.
- "Yemen Maternal Mortality Ratio, 1960-2020." Knoema. World Data Atlas , 2020. <https://knoema.com/atlas/Yemen/Maternal-mortality-ratio>.

- “Yemen National Health and Demographic Survey.” Republic of Yemen Ministry of Public Health & Population & Central Statistical Organization. Republic of Yemen Ministry of Public Health & Population , 2013. <https://dhsprogram.com/pubs/pdf/FR296/FR296.pdf>.
- “Yemen Operation.” Global Focus. UNHCR, 2021. <https://reporting.unhcr.org/node/2647>.
- “Yemen Risk Overview : Outlook for December 2020 - May 2021.” ACAPS. ACAPS, May 2021. https://reliefweb.int/sites/reliefweb.int/files/resources/20201231_yemen_risk_overview_december_20_may_21.pdf.
- “Yemen War: 5 Years since the Houthis’ Sanaa Takeover.” Yemen war. Aljazeera, September 2019. <https://www.aljazeera.com/news/2019/9/21/yemen-war-5-years-since-the-houthis-sanaa-takeover>.
- “Yemen.” Institute for Health Metrics and Evaluation. IHME, September 20, 2017. <http://www.healthdata.org/yemen>.
- “Yemen: Amran Governorate - Cholera Attack Rate with Population and Functionality of Water Source.” WASH cluster. Water Projects Database 2010-2011, June 2017. https://reliefweb.int/sites/reliefweb.int/files/resources/yem_amran_wash_cholera-attack-rate_a3_en_0.pdf.
- “Yemen: Arrival of COVID-19 Vaccines a 'Game Changer' .” UN News. United Nations, March 31, 2021. <https://news.un.org/en/story/2021/03/1088782>.
- “Yemen: Conflict in Hajjah.” ACAPS. ACAPS, April 7, 2021. <https://www.acaps.org/special-report/yemen-conflict-hajjah>.
- “Yemen: WHO Coronavirus Disease (COVID-19) Dashboard With Vaccination Data.” World Health Organization. World Health Organization, 2021. <https://covid19.who.int/region/emro/country/ye>.
- “Yemendataproject.org.” Yemen Data Project. Open Society Foundations. Accessed April 26, 2021. <https://yemendataproject.org/>.
- “Yemen's Al-Qaeda: Expanding the Base.” Crisis Group. International Crisis Group, February 23, 2017. <https://www.crisisgroup.org/middle-east-north-africa/gulf-and-arabian-peninsula/yemen/174-yemen-s-al-qaeda-expanding-base>.
- Zainab. “Yemen: The Strength to Save My Family.” Blogs from Doctors Without Borders. MSF International , July 15, 2020. <https://blogs.msf.org/bloggers/zainab/yemen-strength-save-my-family>.
- Zawiah, Mohammed, Fahmi Y Al-Ashwal, Ramzi Mukred Saeed, Mohammed Kubas, Sara Saeed, Amer Hayat Khan, Syed Azhar Syed Sulaiman, and Rami Abduljabbar.

“Assessment of Healthcare System Capabilities and Preparedness in Yemen to Confront the Novel Coronavirus 2019 (COVID-19) Outbreak: A Perspective of Healthcare Workers.” *Frontiers in public health*. Frontiers Media S.A., July 28, 2020. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7399068/#B4>.

Zawiah, Mohammed, Fahmi Y Al-Ashwal, Ramzi Mukred Saeed, Mohammed Kubas, Sara Saeed, Amer Hayat Khan, Syed Azhar Syed Sulaiman, and Rami Abduljabbar. “Assessment of Healthcare System Capabilities and Preparedness in Yemen to Confront the Novel Coronavirus 2019 (COVID-19) Outbreak: A Perspective of Healthcare Workers.” *Frontiers in public health*. Frontiers Media S.A., July 28, 2020. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7399068/>.