Asian Journal of Advances in Research

5(1): 1050-1058, 2022

ASSESSING THE PERFORMANCE OF THE HEALTH CARE SYSTEM IN YEMEN USING THE WHO BUILDING BLOCKS FRAMEWORK

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AUTHOR'S CONTRIBUTION

The sole author designed, analyzed, interpreted and prepared the manuscript.

Received: 19 June 2022
Accepted: 24 August 2022
Published: 30 August 2022

Original Research Article

ABSTRACT

Background: Yemen, a low-income country in the MENA region is facing one of the worst humanitarian crises in the world due to the ongoing conflict that has begun in 2013.This paper seeks to assess the performance of the healthcare system in Yemen before and during the conflict 2010-2020 and examine the impact of the conflict on the healthcare system performance during the period 2015-2020.
Methods: A literature review from 2010 to 2020 of the evidence reported by international and local organizations as well as in published and unpublished articles and reports. The study used the Building Blocks frame work developed by the WHO (2007; 2009) (hereafter WHO-BB).
Results: The results shown before the war, the healthcare system in Yemen suffered from governance weaknesses and corruption, a huge gap in health financial structure, the unequal density of healthcare workers, poor pharmacological regulations, and weak health information. Moreover, the impact of war on the healthcare system was devastating
Conclusion: Healthcare system in Yemen is weak and fragmented. To overcome this issue the government requires restructuring of the internal healthcare sector with the support of international health agencies.

Keywords: Health care system; WHO; Yemen; WAR; international health agencies.

1. INTRODUCTION

Yemen a low-income country in the MENA region is facing one of the worst humanitarian crises in the world due to the ongoing conflict that has begun in 2013. According to the United Nation Development Program (UNDP), the conflict has resulted directly and indirectly in 377,000 deaths by the end of 2021 [1]. About 60 % of the reported deaths are indirect and caused by problems associated with conflict such as the lack of access to safe water, food, energy supply as well as health care services [1]. The situation in Yemen has worsened under the prolonged air, land, and sea blockade that has resulted in a drop in the country's GDP per capita 1674$ in 2014to 824$ in 2018 [2]. As far as the healthcare sector is concerned, the armed conflict has weakened health services. The World Health Organization indicated that after 18 months of armed conflict in Yemen 1900 health facilities out of 3507 facilities were forced to completely or partially stop their services, which resulted in the deprivation of thousands of citizens' access to basic health services [3]. Moreover, many public hospitals have reduced or closed some departments such as intensive care units and operating rooms. The International Committee of the Red Cross

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[4] reported that the majority of public hospitals suffer from a shortage of medicines for chronic diseases, particularly diabetes and hypertension. Furthermore, frequent power outages in hospitals have damaged many medicines that need to be kept refrigerated and stopped dialysis sessions for many patients [4].

This paper seeks to assess the performance of the healthcare system in Yemen pre- and during-conflict 2010-2020and to examine the impact of the conflict on the healthcare system performance during the period 2015-2020. Given the limited availability of detailed data, the analysis presented in this study relies on data reported in different sources such as World Development Indicators (WDI), data from the WHO as well as a review of evidence reported by international and local organizations. While the literature on the impact of war on population health is extensive, detailed assessments of the impact on the healthcare systems are still lacking. This paper seeks to fill this gap in the literature by assessing the impact of the ongoing conflict on both the healthcare system and the population health in Yemen.

This research is organized as follows. The first section provides an overview of the healthcare system in Yemen and its epidemiology profile. The second section provides the data and method used. The third section provides results and the fourth discusses the main findings.

2. THE HEALTHCARE SYSTEM IN YEMEN

Yemen Healthcare System was formed during British colonialism in the 1960s. The main public hospitals including Althawrah, Alsabieen, and Aljomhori were built by the British in 1960 [1]. The healthcare services in a public hospital are not free and focus on the prevention of health projects and programs against infectious and non-infectious diseases [1]. The private sector has thrived particularly after unification in 1990 when Yemen was formerly divided country as northern and southern republics. The number of private healthcare centers was 746 in 2012 [5]. However, the majority of the owners of the private sector are an employee in the Ministry of Public Health as an investment in health provision. Moreover, the not-for-profit sector such as the non-governmental organizations international or local, social and religious supplying healthcare activity in many areas in Yemen like Yemen's Charity society [1]. The health care system in Yemen relies heavily on external funding and the health services provision is primarily delivered through non-governmental organizations such as Doctors without Borders, Eastern Mediterranean Regional Office, and Save the Children [6].

2.1 The Health Indicators and Epidemiological Profile

The population in Yemen is around 29,825,968 with an average growth rate of 2.28% a year [2]. The country has a relatively low urban population 35.19% and the highest population density in Sana the capital city 1,937,451people [7]. The available health indicator figures are based on projection and estimation due to the difficulty of collecting data on the ground. In Figure 1, the selected health indicators present a snapshot of the health status in Yemen from 2010 until 2020 from World Development Indicators (WDI). The average life expectancy at birth (total) is 66 years. The fertility rate in 2010 was 4.67 births per woman and declined to 3.614 in 2020. In addition, the infant mortality rate in 2010 was 45.5 and was noted to have an increase up to 46.5 per 1,000 live births. The incidence of tuberculosis in 2010 was 52 per 100,000 people and 49 per 100,000 people in 2020 [2]. Moreover, Malaria is a common infectious disease in Yemen with a recorded incidence case of 35.7 (per 1,000 population) in 2013 and increased to 45.8 cases (per 1,000 population) in 2018. Malnutrition is another health issue in Yemen. In 2012, around 10,507,526 people are malnourished and approximately 44% of the consumption household's food is poor and limited [8].

2.2 Data

Given the limited availability of relevant data, particularly after the start of the armed conflict in 2015, this study makes use of data reported in several sources such as the World Development Indicators (WDI) of the World Bank and the WHO dashboard data. In addition, a review of the evidence reported by international and local organizations as well as in published and unpublished articles and reports has been conducted to fill the gap in the data. The search has been conducted using the common databases search engines such as Google Scholars, PubMed, and Science Direct, in addition to the Web pages of the main international organizations. The following keywords have been used: Health (care) System, Yemen, Healthcare, System Performance, Assessment, Evaluation, and Conflict. The search includes articles in Arabic and English between January 2010 and December 2022.

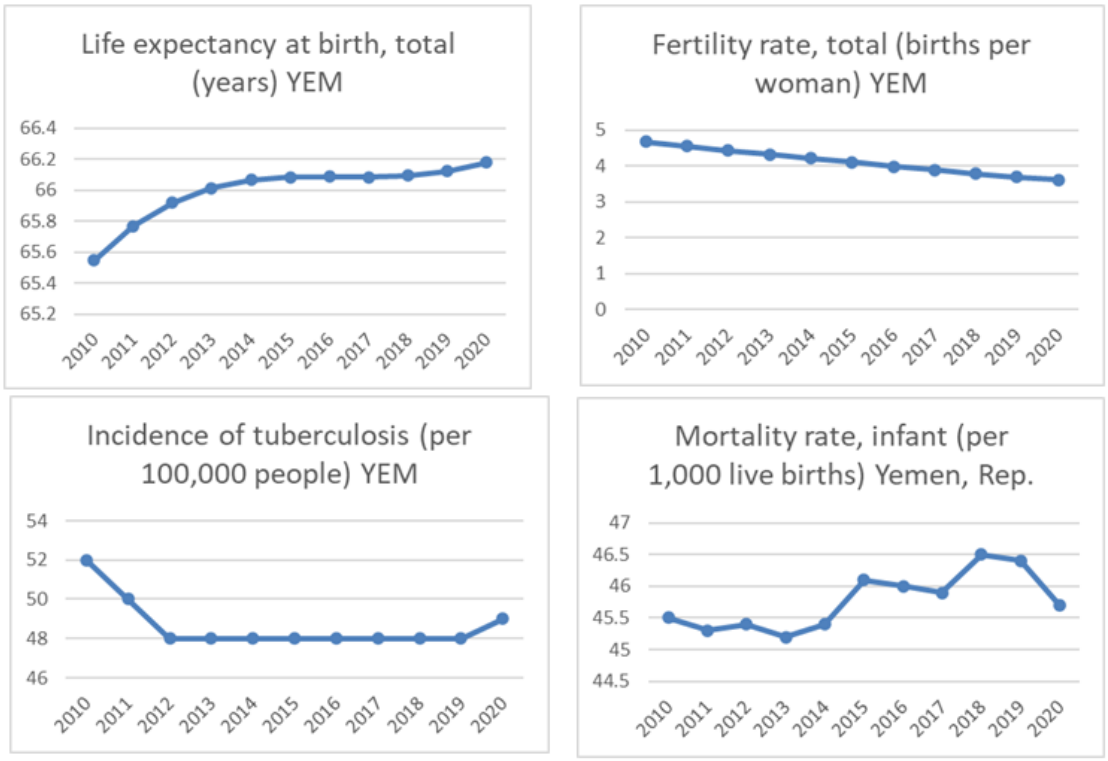

Figure 1. Yemen Health Indicators

3. METHODS

This study uses the Building Blocks framework developed by the WHO (2007; 2009) (hereafter WHO-BB) to assess the performance of the healthcare system in Yemen. The WHO-BB framework– illustrated in Figure 2 – evaluates the performance of the healthcare system using a set of inputs/functions, which include leadership/governance, financing, essential medicines and technologies, health information, health workforce, and service delivery. These inputs/functions are deemed necessary for any healthcare system to perform four outcomes: improved health and equity, responsiveness, financial and risk protection, and efficiency.

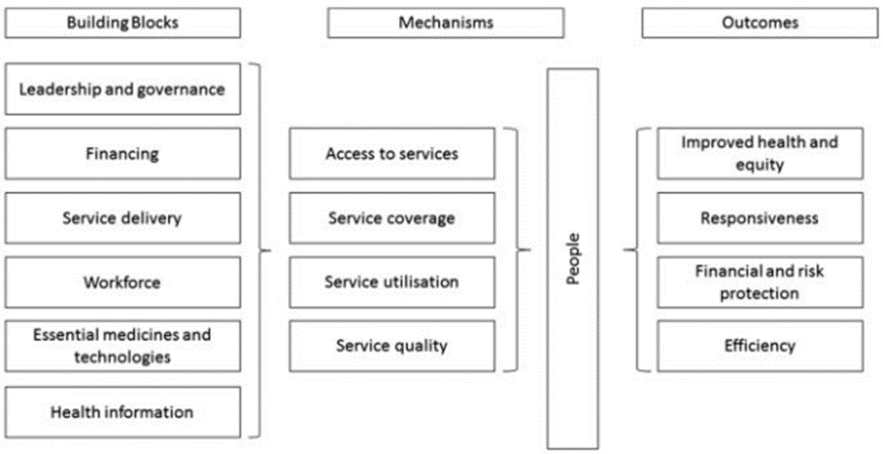

Figure 2. The WHO's health system building blocks framework
Source: adapted from de Savigny (2009)

4. RESULTS

This section presents the results from the analysis of the available data and evidence reported in the literature review according to the WHO-BB framework illustrated in Figure 1. Started with a baseline analysis of pre-war in Yemen from 2010 until February 2015 and was followed by a summary of available data on the impact of armed conflict on the healthcare system in Yemen from March 2015 until 2020.

5. HEALTHCARE SYSTEM IN YEMEN DURING THE PERIOD 2010-2015

5.1 Leadership/Governance

According to the Yemeni constitution, healthcare is guaranteed as a right to all citizens. The Ministry of Public Health and Population (MoPHP) is responsible for the delivery of healthcare across Yemen's 22 governorates and overall healthcare system governance (MoPHP, 2022). Healthcare in Yemen is governed at three levels: at the central level by the MoPHP, at the governorate level by the Governorate Health Offices (GHOs), and local level by district health offices. Furthermore, the governance of MoPHP is extended across four sectors: population health, primary healthcare, curative care, planning, and development (MoPHP, 2022). According to the Governance and Anti-Corruption Diagnostic Survey of the World Bank (2010), the healthcare system in Yemen suffers from governance weaknesses and corruption at the facilities level, particularly for procurement of consumables and costs. In a clear world, the governance in the health sector suffers from weak policy commitment and transparency.

5.2 Healthcare Financingand Expenditure

Total health expenditure (THE) accounts for about4.8% of GDP and about 81$per capital 2014 which is the lowest in the world (World Bank, 2020). The healthcare system relied greatly on direct out-of-pocket spending and payments in the form of flat-rate user charges for outpatient and inpatient services, which constitute more than 75% of the in the year 2013 [9]. Moreover, patients from rural and remote areas bear additional heavy costs of transportation, which formed a significant barrier to accessing healthcare services [9]. Government Health Expenditure has decreased from 22% to 10% between 2010 and 2015 [6]. In addition, external funding by international organizations and donors has doubled from 2013 to2015 after Arab Spring in Yemen [6]. There is no national health insurance system for citizens in Yemen. However, many citizens formed self-help groups and solidarity schemes in some areas called "Community-based health insurance" due to the lack of any substantial social protection schemes versus financial health risks in Yemen [9]. It is based on an Islamic tradition in the form of a religious tax called "Zakat" that derived from Quran teachings obliges Muslims to do annual charitable donations from their properties for the benefit the poor people in-group of health services such as surgeries, screenings, and medicines [9]. However, private insurance contributions are very high compared with the purchasing power in the country as health-insurance coverage is focused strongly on hospital care [9].

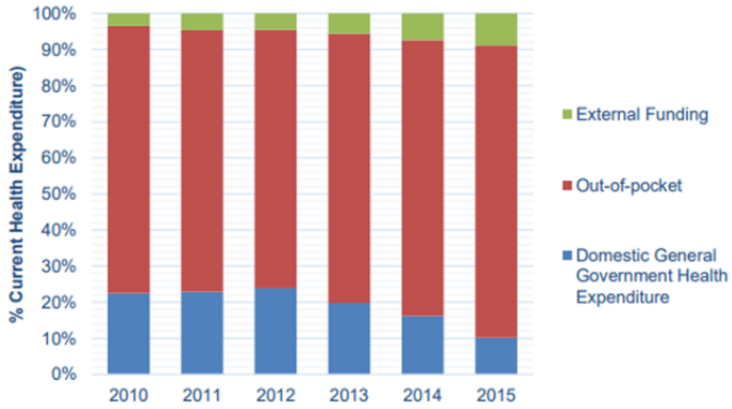

Figure 3. Health Expenditure by Source Government, Oop, External 2010 – 2015
Source: Graph produced using WHO health expenditure data, 2010- 2015

5.3 Healthcare Delivery

A recent study reported that only 51% of health care facilities in Yemen are functional while about 19.7 million citizens lack access to the needed health care (Nathan et al. 2020).Health services in Yemen were ordered at primary, secondary, and tertiary health care levels (WHO, 2014). The health care system across 333districts in Yemen was complemented by vertical programs that focused on the prevention and control of diseases nationwide, with financial and technical support from donors and international organizations including the Global Alliance for Vaccines and Immunizations (GAVI), WHO, and the Food and Agriculture Organization (FAO) [10]. There is significant inequality in availability and access between rural and urban areas. In 2013, around 30% of the population in rural areas did not have access to any health services [6]. There were significant differences in rural areas, only 22.6% of deliveries occurred in health facilities compared with urban areas to 49.1% in health facilities [6]. In rural areas, free healthcare is only available for a daily limited time because the healthcare providers work in public health facilities in the daytime and then work in their private clinics in the afternoon and evening [10].

5.4 Human Resources: Availability and Creation

The distribution of healthcare workers is found to be inequitable, especially in rural areas (REF). The density of physicians in 2013 was two per 10000 population and three hospitals per 100000 populations (WHO, 2015). However, some hospitals in rural areas had no anesthetist or operating surgeon and some hospitals stay closed for a couple of months due to insufficient staffing (WHO, 2015). According to AlSerouri et al. [11],the shortage of female healthcare workers was a major barrier to access healthcare for women and likely considering the reason behind the low Caesarian section rate of 0.5%and a large disparity in the proportion of births between urban 34% and the rural 12%.On the other side, the private healthcare sector is mostly staffed by employees from the public sector because the salaries in the private sector are roughly five times higher than those in the public sector [5]. Such public-private dual practices created significant problems in both sectors including divided loyalties, slackness, and self-referrals of the patients from public to private health care centers [11]. Although many researchers called for human resources policy and reforms because human resources management is a critical component in ensuring responsiveness to the health care needs of the population, no reforms were done in the last 10 years.

5.5 Essential Medicines and Technologies

The healthcare professionals raised serious concerns about medicines supply, regulations, and quality control (REF).The Supreme Board for Drugs and Medical Appliances in Yemen (2013) reported that about 60% of all medicines in the market are smuggled and sub-standard [12]. Moreover, physicians are hesitant to prescribe generic medicines due to counterfeit drugs, which resulted in losing confidence in the healthcare system [12]. However, most citizens struggle to buy the necessary medicines for their health due to difficulties in the availability and affordability of medicines [10]. Most of the original medicines available in Yemen are very expensive which pushes the patients to get cheaper counterfeit medicines [12].

5.6 Health Information

Health information gathering before the war was fragmented. Staff faces difficulties to reach far rural areas and a lack of safety [10]. Health data gathering was hampered by the weak capacity for dissemination and data management, especially with information relays from rural areas in Yemen [10]. However, international organizations introduced a new electronic Disease Early Warning System (eDEWS) in Yemen with support from donorsto support communicable disease surveillance and provide improved case report data by using cell phone technology [6].

6. THE IMPACT OF CONFLICT ON THE HEALTHCARE SYSTEM IN YEMEN (2015-2020)

6.1 Leadership/Governance

Since the onset of armed conflict in March 2015, the health system governance's functions in Yemen significantly deteriorated. The war has divided the country into two main districts north and south and therefore with no clear governance mechanisms in place [10]. The country has poor coordination in the health response, but MoPHP still formally led healthcare in partnership with the WHO regional office, including twenty partner organizations such as Medicines Sans Frontie`res (MSF) and the International Committee of the Red Cross (ICRC), and United Nations Children's Fund (UNICEF) as part of a health cluster [2]**.** Although the fragmentation, some governance mechanisms have been working effectively, such as the integrated supervision capacity of the Global Health Observatory (GHO) and District Health Office (DHO) as reform and

investment by WHO with different partners. eDEWS is the only system that supplies regular data on communicable diseases in Yemen. The issue is that eDEWS is covering only 37% of all health facilities and the poor responses from the government and leaders are other challenges to eDEWS' functionality. According to WHO [3], only 21% of all eDEWS alerts were verified within the first 24 h of detection.As a result of that many Non-governmental organizations evacuated most of their employees as the conflict escalated and poor governance [13].

6.2 Healthcare Financing and Expenditure

The annual GDP growth rate declined from 42 billion in 2015 to 21.6 billion in 2018 [2]. Many relief organizations suspended their works and projects in healthcare due to the death of staff in the attacks and lack of security such as Red Cross International, Qatar Red Crescent, and the International Organization for Migration (WHO, 2022). External donors and partners channel funds through local non-governmental organizations and international, as well as World Health Organization to provide healthcare services [2]. Figure 4 illustrates the main countries funding the health sector in Yemen in USD.

During the armed conflict period, the external financing for health steadily increased peaking in 2018 at around 605 million USD and declining to about 370 million USD in 2019 [14]. Figure 5 below illustrates the latest estimation while paralleling the trends with external funding for nutrition and food security.

6.3 Healthcare Delivery

Many hospitals and clinics have been destroyed during the war. In addition, the continuous conflict has brought up several infectious diseases such as cholera with more than one million cases had been reported in 2018, and diphtheria about 5701 reported cases in 2020 due to breakdown in the country's water and sanitation systems (WHO, 2022). There is substantial variability in access to healthcare. A study by El-Bcheraoui et al. [15], mentioned a large reduction in vaccine coverage for all antigens between 2013 and 2016 particularly for the first dose of measles vaccine among children aged 12–23 months around 36·4%.On the other side, many citizens are struggling to access healthcare due to the far location or blockage of the main roads, especially in the rural area and war areas. A study conducted by Garber et al, [16] found that nearly 40% of the population spent more than two hours of travel time to arrive at surgical care or comprehensive emergency obstetrics. In addition, more than 12·1 million USD (42·4%) of Yemeni people lived more than one hour from the nearest partially or fully functional public hospital.

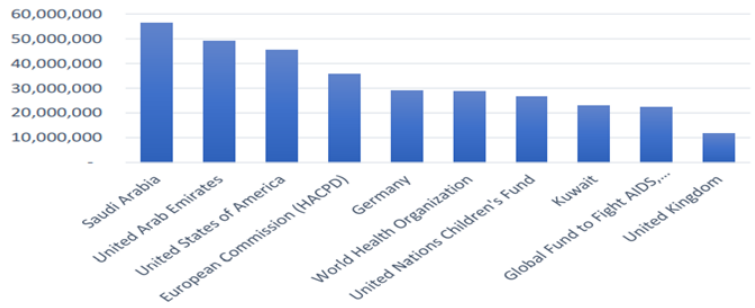

Figure 1. Sources of External Funding for Health, Yemen 2019

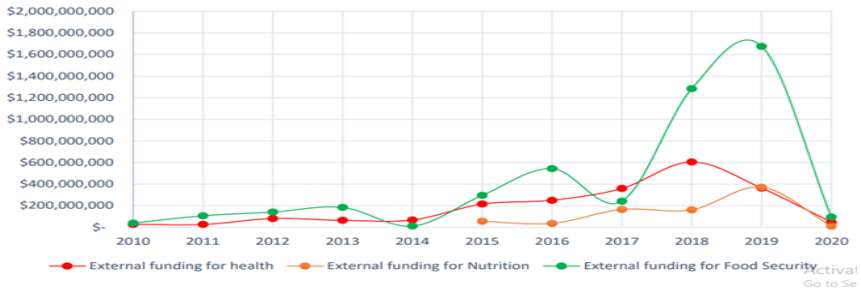

Figure 5. Total external funding for health in Yemen
Source: OCHA. [14]. Yemen Humanitarian Response Plan

6.4 Human Resources: Availability and Creation

The distribution of healthcare workers between rural and urban areas remains inequitable. A study reported about 18% of the 333 districts of the country lack doctors and many of those doctors who remain working did not receive their wages for two years [17]. According MedGlobal [18], said that there are five healthcare professionals for every 10000 people, which is less than half the World Health Organization benchmark. Due to political conflicts between the parties, many healthcare providers left their job because of a lack of security. However, during the covid-19 pandemic around 97 healthcare providers died from covid-19 in the first wave counted by physicians and medical students in Sana [17].

6.5 Essential Medicines and Technologies

The war destroyed many medical equipment and pharmacies. The majority of public hospitals suffer from a shortage of medicine for chronic diseases particularly diabetes and hypertension [4]. Research done by Ibrahim et al. [19] reported only 52.8% of the essential and vital medicines were available in private and public healthcare settings. The storage of medicine was affected by the recurrent stop of electricity particularly medication that required to be saved in the fridge. In addition, a shortage and damage to specific medical machines specialized equipment, and drugs, notably oncology and renal dialysis care [19].

6.6 Health Information

The armed conflict made a huge gap in gathering and reporting health information. The majority of available data based on estimation. Some initiatives by health clusters organizations still working in some areas like eDEWS in fragmented patterns in communicable disease surveillance. However, the data on Health Management Information System (HMIS) reporting rates in Yemen are not available publicly at the present.

7. DISCUSSION

The assessment undertaken in this study provides useful information about the performance of the healthcare system in Yemen. The impacts of the current humanitarian crisis in Yemen are devastating in terms of institutional collapse and economic recessions, which are reflected sharply in the health sector. In terms of health indicators, noted an increase in infant mortality rate 2018-2019 is illustrated in Figure 1. The findings show fragmentation in the health system in Yemen existed before the conflict and became worse as the conflict evolves. The classical role of the central government has been incapacitated and replaced by groups of proto-states. The war-affected negatively the healthcare system and resulted in fragmentation, and lack of coordination among the areas, and adversely affected the country's response to healthcare needs. There is weakness in terms of outbreak response and diseases prevention before the war and becomes worse during the armed conflict period. That is connected to poor longstanding in data collection and surveillance systems. The structure of health financing has significant gaps between domestic general government health expenditure and out-of-pocket before the war and raised in external funding during the war due to the decline in GDP growth rate. The initiative of the WHO regional office in collaboration with MoPHP and in partnership with 20 NGOs to lead healthcare services in the country have a positive impact to save the healthcare system after its collapse. Noted some international NGOs who deliver vital healthcare services have withdrawn their staff due to lack of security and exposure to air attacks. As Namakula and Witter [20], said sustainable healthcare delivery in conflictive regions relies on a degree of protection offered to HCWs during the fighting. The unequal distribution of Healthcare workers related to demographic and security issues that existed in both conditions and deficits in expertise were another issue noted particularly during the war [21,22]. The loyalty to political parties was affected by access to healthcare services during the war notably in rural areas as many healthcare providers moved to private healthcare facilities to get high salaries. In terms of essential medicines and technologies in both phases, presented weak government oversight and poor policies and regulations related to medication [23,24]. However, the deficit in skillful staff and modern medical equipment reduced the quality of healthcare services and patients satisfaction. Finally, health information is still classic and very weak since the prior war and has not covered the whole area in the country [25-27]. That is one of the obstacles for academics, policymakers, and researchers to analyze the health situation and plan clear strategies.

8. CONCLUSION

This paper assessed the performance of the healthcare system in Yemen prior and during the conflict 2010-2020, and examined the impact of the conflict on the healthcare system performance during the period 2015-2020. The study is based on secondary data from a literature review from 2010 to 2020of the evidence reported by international and local organizations as well as in published and unpublished articles and reports. The theoretical framework used

in this paper is the Building Blocks framework developed by the WHO (2007; 2009) (hereafter WHO-BB).The results show prior war, the healthcare system in Yemen suffered from governance weaknesses and corruption, a huge gap in health financial structure, the unequal density of healthcare workers, poor pharmacological regulations, and weak health information. Moreover, the impact of war on the healthcare system was devastating.

9. RECOMMENDATIONS

To overcome this issue the government requires restructuring of the internal healthcare sector with the support of international health agencies. Here are some recommendations for short and long term may help policymakers in reforming the healthcare system in Yemen:

1. Collaboration is required from political parties to respond to healthcare services needs.
2. Work closely with WHO and UN humanitarian aid agencies with transparency
3. Increase the distribution of HCW in rural areas.
4. Remove all barriers that may face healthcare providers in their working areas.
5. Strengthening surveillance systems and health information by the adoption of successful experiences from other countries with a partnership with international NGOs.
6. Continues monitoring for financial distributions of any projects funding related to healthcare services.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. United Nations Development Program. Assessing the Impact of War in Yemen: Pathways for Recovery; 2021.
   Available:https://www.undp.org/publications/assessing-impact-war-yemen-pathways-recovery
2. World Bank. Yemen Republic. GDP Data; 2020.
   Availablehttps://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=YE
3. World Health Organization. Health services are deteriorating as the conflict continues in Yemen; 2016.
   Available:http://www.emro.who.int/ar/2016-arabic/health-services-decline-as-conflict-in-yemen-continues.html
4. International Committee of the Red Cross. Yemen: Conflict has catastrophic consequences for health Care; 2017.
   Available:https://www.icrcnewsroom.org/story/en/1694/yemen-conflict-has-catastrophic-consequences-for-health-care
5. Fuss M. Increasing Health Care Access in Yemen through Community-Based Health Insurance. The Indiana Journal of Global Legal Studies. 2016;23:2.
   Available:https://www.repository.law.indiana.edu/cgi/viewcontent.cgi?article=1630&context=ijgls
6. World Bank. Health Sector in Yemen: Policy Note; 2021.
   Available:https://www.worldbank.org/en/country/yemen/publication/health-sector-in-yemen-policy-note
7. United Nations. World Population Prospects; 2019.
   Available: https://population.un.org/wpp/
8. The Integrated Food Security Phase Classification. IPC Yemen Acute FI Situation; 2012.
   Available:https://www.ipcinfo.org/ipc-country-analysis/details-map/es/c/459507/?iso3=YEM
9. Holst J, Gericke CA. Healthcare financing in Yemen. International Journal of Health Planning and Management. 2012;27:198–225.
10. Qirbi N, Ismail S. Health System Functionality in Low-Income Country in the Midst of Conflict: The Case of Yemen. Health Policy and Planning Journal. 2017:911-922.
    DOI: 10.1093/heapol/czx031
11. Al Serouri A, Al Rukeimi A, Bin Afif M, Al Zoberi A, Al Raeby J, Briggs C, Hanafi H. Findings from a needs assessment of public sector emergency obstetric and neonatal care in four governorates in Yemen: a human resources crisis. Reproductive Health Matters. 2012;20:122–8.
12. AL-Tamimi S, Hassali M, Alrasheedy A. Challenges to generic medicines utilization in Yemeni healthcare system. Generics and Biosimilars Initiative Journal. 2013;2(2):63-4.
    DOI: 10.5639/gabij.2013.0202.017
13. Cunningham A. To stay and deliver? The Yemen humanitarian crisis 2015. Medecins Sans Frontieres Emergency Gap Series. 2016;2.
    Available:https://emergencygap.msf.es/sites/default/files/Emergency%20Gap%20Series_2_Stay%20and%20Deliver_Yemen%20Crisis%202015_April%202016.pdf, accessed 28 December 2016
14. OCHA financial Tracking Services. Yemen Humanitarian Response Plan; 2020.

Available: https://fts.unocha.org

15. El-Bcheraoui C, Jumaan A, Collison M, Daoud F, Okdad A. Health in Yemen: losing ground in war time. Globalization and Health Journal; 2018.
Available: https://doi.org/10.1186/s12992-018-0354-9
16. Garber K, Fox C, Abdalla M, Tatem A, Qirbi N, Lloyd-Braff L, Al-Shabi K, Ongwae K, Dyson M, Kebir Hassen K. Estimating access to health care in Yemen, a complex humanitarian emergency setting: a descriptive applied geospatial analysis. The Lancet Journal. 2020:E1435-E1443.
Available: https://doi.org/10.1016/S2214-109X(20)30359-4
17. Looi M. COVID-19: Deaths in Yemen are five times global average as healthcare collapses. *The BMJ;* 2020.
Available:http://dx.doi.org/10.1136/bmj.m2997
18. MedGlobal. A tipping point for Yemen's health system: the impact of COVID-19 in a Fragile State; 2020.
Available: https://medglobal.org/yemen-covid-report-july2020/
19. Ibrahim M, Alshakka M, Al-abd N, Bahattab A, Badulla W. Availability of Essential Medicines in a Country in Conflict: A Quantitative Insight from Yemen. Int. J. Environ. Res. Public Health. 2021;18:175.
DOI: 10.3390/ijerph18010175
20. Namakula J, Witter S. Living through conflict and post-conflict: experiences of health workers in northern Uganda and lessons for people-centered health systems. Health Policy and Planning. 2014;29:ii6–14.
21. Ministry of Health and Population; 2022.
Available: https://moh-ye.org/
22. OCHA. MENA: Crises in Focus - an Overview of Humanitarian needs in the Region; 2016.
Available: https://gallery.mailchimp.com/
Available:https://pubmed.ncbi.nlm.nih.gov/25274642/
23. Al-Awlaqui A, Tambor M, Duplaga M. Evaluation of the National Health Cluster Performance in Yemen: A Qualitative Study; 2019.
Available:https://ruj.uj.edu.pl/xmlui/handle/item/234822
24. AlKarim T, Abbara A, Attal B. Armed Conflict alone Does not Explain the Devastation of Yemen's Health System. BMJ Glob Health. 2021;6(2): e004740.
DOI: 10.1136/bmjgh-2020-004740
25. Transparency International. Corruption Perceptions Index 2015.
vailable:http://www.transparency.org/cpi2015
26. World Bank. Yemen - Governance and Anti-Corruption Diagnostic Survey; 2010.
Available:https://documents.worldbank.org/en/publication/documents-reports/documentredirects?url=/curated/en/2010/03/16620607/yemen-governance-anti-corruption-diagnostic-survey
27. World Health Organization. Health System Profile: Yemen; 2006.
Available:729-doc-11.pdf(sesric.org)