

THE EFFECTS OF COVID-19 ON NON-COMMUNICABLE DISEASE: A CASE STUDY OF SIX COUNTRIES

COVID-19 SITUATIONAL ANALYSIS PROJECT



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About this project

In July 2020, iMMAP launched the Global COVID-19 Situation Analysis Project, funded by the Bureau of Humanitarian Assistance (BHA) of USAID. Implemented in Cox's Bazar, Bangladesh,1 Burkina Faso, Colombia, Democratic Republic of Congo, Nigeria, and Syria, this project has produced monthly situation analysis reports that provide humanitarian stakeholders with comprehensive information on the spread of COVID-19 and related humanitarian consequences. Data is identified from humanitarian sources and coded using the projects analytical framework, which is closely aligned with the JIAF framework. Data is stored in DEEP where it can be visualized, disaggregated and aggregated to respond to queries about humanitarian situations.

Based on Lessons Learned for the project, iMMAP commissioned a series of sector-specific lessons learned reports to assess data availability and quality, adaptations, challenges, opportunities that emerged in five humanitarian sectors: education, food security, livelihoods, protection, and water, sanitation and hygiene (WASH). Alongside this, seven thematic reports that focus on gaps in data were also commissioned.

The iMMAP Primary Data Collection exercises were contracted to RIWI and Premise under the supervision of iMMAP. Data collection was conducted remotely using digital data collection technologies that require a smart device and internet connection. All efforts were made to increase coverage of data collection, and weighting was applied, however the sample population may not be representative of the lowest socio-economic and marginalized groups

"This report is the result of a combination of primary and secondary data review exercises that cross-analyze a number of information sources. The views expressed herein do not necessarily reflect the views of USAID, the United States Government, the humanitarian clusters or any one of their individual sources."

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Acronyms

AFR	WHO African Region
AMR	WHO Region of the Americas
BMJ	British Medical Journal
HNAP	Humanitarian Needs Assessment Programme
CDC	Centre for Disease Control
COPD	Chronic Obstructive Pulmonary Disease
DM	Diabetes Mellitus
DMT2	Diabetes Mellitus type 2
DRC	Democratic Republic of the Congo
EMRO	WHO Eastern Mediterranean Region
ESKD	End Stage Kidney Disease
EUR	WHO European Region
FM	Fulminating Myocarditis
GHS	Government held Syria
HCPs	healthcare professionals
HT	Hypertension
HeRAMS	Health Resources and Services Availability Monitoring System
IDPs	Internally Displace Persons
IDSR	Integrated Disease Surveillance and Response
IP	Inpatient Services
IPC	Infection Prevention & Control strategies
LI	LOW INCOME
LMI	LOWER-MIDDLE INCOME
LRTI	Lower Respiratory Tract Infection
MoH	Ministry of Health
NCD	Non-Communicable disease
NCD CCS	Non-Communicable disease country capacity survey
NES	North East Syria
NWS	North West Syria
OP	Outpatient Services
PAHO	The Pan American Health Organization
PHC	Primary Health Care
PLWNCDs	Persons living with Non-Communicable diseases
PPE	Personal Protective Equipment
REVA 4	Refugee influx Emergency Vulnerability Assessment
RMNCAH-N	maternal, newborn, child, and adolescent health and nutrition
RMNCAEH +N	Reproductive, Maternal, Newborn, Child, Adolescent and Elderly Health Plus Nutrition
SRH	Sexual Reproductive Health
SSA	Sub-Saharan Africa

SDG	<i>Sustainable Development Goals</i>
SEAR	<i>WHO South-East Asia Region</i>
UMI	<i>UPPER MIDDLE INCOME</i>
WHO	<i>World Health Organization</i>
WPR	<i>WHO Western Pacific Region</i>

Glossary

Comorbidity	The presence of one or more conditions often co-occurring (concomitant or concurrent) with a primary disease. In addition, comorbidity describes the effect of all other conditions an individual patient might have other than the primary condition of interest and can be physiological or psychological.
Diabetic complications	The presence of the following: cardiovascular disease, nerve damage (neuropathy), kidney damage (nephropathy), eye damage (retinopathy), foot damage, skin conditions, hearing impairment, Alzheimer's disease, etc.
Fulminating Myocarditis (FM)	A condition characterized by a rapidly progressive decline in cardiac function and a high mortality rate. Since the first report of FM patients in the 1980s, several clinical trials and research studies have been published, increasing our knowledge regarding FM. Wikipedia
NON-COVID health services	All health services that do not relate to COVID-19, even when provided to an individual with COVID-19 infection.
Risk Factor	An element that increases a person's chances of developing a disease. For example, cigarette smoking is a risk factor for lung cancer, and obesity is a risk factor for heart disease.
Syndemic/Synergic	The aggregation of two or more concurrent or sequential epidemics or disease clusters in a population with biological interactions, which exacerbates the prognosis and burden of disease (Wikipedia).

Executive Summary

Non-Communicable Diseases (NCDs) are health conditions that cannot be transmitted from one patient to another, and usually manifest a prolonged, persistent, and slow pathology. NCDs are responsible for over 70% of all deaths, with nearly 80% of these deaths occurring in low-and middle-income countries. In addition, NCDs constitute approximately 80% of all years lived with disability globally. With the global population aging, rises in multi-morbidity, longer life expectancies, and increasing survival rates, more and more people are expected to live with the health burden of NCDs (WHO, 2020).

COVID-19 is an ongoing pandemic that emerged at the end of 2019 in China and spread quickly to the rest of the world, affecting, both directly and indirectly, the health and life of the global population. This research attempts to understand the effects of the COVID-19 pandemic on NCDs in Burkina Faso, Bangladesh, Colombia, DRC, Nigeria, and Syria. All six countries are included in the iMMAP COVID-19 Situational Analysis Program, as they are affected by humanitarian crises and conflicts. The report covers the effects of COVID-19 on access to health services, resources allocations, and the medical status of the patients with NCDs.

The research relies on the data collected from trusted academic and institutional sources stored in the DEEP Platform, or directly from World Health Organization (WHO), Centre for Disease Control (CDC), British Medical Journal (BMJ), and ELSEVIER. This secondary data review was complemented with primary data, collected through a key informants' survey conducted using Kobo Toolbox. For the complete questionnaire, please see **Annex1**.

Key findings:

1. Access: the research revealed that the COVID-19 pandemic directly affected access to health services. Mitigation measures across the targeted countries, including movement restrictions and closures, taken to manage the pandemic, had financial implications that prevented patients from seeking health services or accessing medication. This was mainly due to the inability of patients (as well as health workers, medicine, and equipment) to reach the health facilities. All these factors played a role in hindering access to health services, without considering pre-existing problems such as lack of security, conflicts, flooding, among others.
2. Comorbidity and the effects of COVID-19 on the medical status of NCD patients represent the direct effects of the outbreak on the patients' medical status. This study established pre-existing NCDs as a risk factor for becoming infected by a severe form of COVID-19, leading to death in most cases. It also revealed the effects of COVID-19 on NCD outcomes and complications.
3. COVID-19 undermined the provision of NCD health services. While governments and healthcare providers tried to keep the health facilities operational, available information indicate that if the COVID-19 pandemic impacted all health services, NCD health services were most directly affected. The analysis of the number of health services from pre-pandemic 2019 until 2021 shows that the number of services declined during the peak of the COVID-19 pandemic (in mid-2020), before showing a limited recovery.

4. COVID-19 affected the human and financial resources allocated to providing NCD health services in different ways. Generally, some health workers assigned to NCD health services were later reallocated to support the COVID-19 response partially, and the impression is that the same applies to NCDs funds (which is already limited).

The research revealed the need to collect data about the NCDs in all situations and integrate these services in all health levels and in all situations, especially during disasters and emergencies. The main recommendation includes raising awareness on NCDs, collecting data on NCDs, starting to use some kind of Telemedicine with the needed capacity building for the doctors regarding telemedicine, and arranging home delivery of NCD medications. It is also recommended to develop a well trusted and accredited website to offer health information under home health care, to contextualize NCDs within a vision for planetary health, and maximize the role of patients on self-care management and behavior changes for NCDs.

Introduction

Background and Context

At the end of 2019 (31st December), WHO's Country Office in China picked up a media statement by the Wuhan Municipal Health Commission from their website on 'viral pneumonia' cases in Wuhan, People's Republic of China. This was one of the first milestones relating to COVID-19 (WHO, 2020). This research will explore in-depth and draw a comparison of the periods before and after December 31st of 2019, a date widely understood as the beginning of a global pandemic.

This study attempts to understand the effects of the COVID-19 pandemic on Non-Communicable Diseases (NCDs) in six selected countries, i.e., Burkina Faso, Bangladesh, Colombia, DRC, Nigeria, and Syria. All six countries are affected by humanitarian crises and conflicts. In addition, they all form part of the iMMAP [COVID-19 Situational Analysis Programme](#), which provides primary and secondary data review and publishes [Situational analysis](#) reports to inform humanitarian decision-making.

Limitations

This piece of research is based mainly on publicly available secondary data due to the lack of primary data. There is also a limited number of secondary data sources, a phenomenon that affects all NCD research, especially in developing countries. The report draws mainly from trusted resources such as the World Health Organization (WHO), Centre for Disease Control (CDC), British Medical Journal (BMJ), Non-Governmental Organizations (NGOs) and Ministries of Health (MOHs) and international agencies, as well as additional information aggregated into The DEEP (<https://www.thedeep.io/>).

However, some of the selected countries lack baseline statistics that allow the analysis and comparison of pre-post COVID-19. Where available, the information on NCDs before COVID-19 may not necessarily be reliable. Data on NCDs during the pandemic phase (2020-2021) is also lacking. Due to the global rush to combat the pandemic, many resources have been reallocated from many sectors to combat COVID-19. This reallocation of attention and resources to an acute emergency comes at the expense of other health (and non-health) concerns, notably NCDs, a chronic but slow-burning health emergency.

This research mainly used the English language as search basis due to its familiarity and the predominance of English-language sources available. However, sources in French and Spanish were also accessed, consulted, and referenced with the help of online translating services.

Finally, the information available for the six countries varied in quantity and quality.

Literature review

Key Concepts, Theories and Studies

NCDs refer to diseases that cannot be transmitted from one patient to another and that usually manifest a prolonged, persistent, and slow pathology. In most cases, NCDs refer to 'the main four NCDs' which have the most significant effects on mortality and morbidity rates: cardiovascular diseases are cancers, diabetes, and chronic respiratory conditions. Together, these are the four leading causes of death and disability globally, affecting more people each year than all other causes combined. NCDs are responsible for over 70% of all deaths, with nearly 80% of these deaths occurring in low-and middle-income countries. In addition, NCDs constitute approximately 80% of all Disability Adjusted Life Years (DALYs) globally. With the global population aging, rises in multi-morbidity, longer life expectancies, and increasing survival rates, more and more people are expected to live with the health burden of NCDs (WHO, 2020).

The main findings are derived from the rapid assessments and statistics developed by WHO since the start of the outbreak and studies and research published in well-respected websites. At the end of 2020, WHO published the results of its first rapid assessment titled '*Impact of the COVID-19 pandemic on NCD resources and services*', which presented the first set of information about the effects of COVID-19 on NCD (WHO, 2020).

One of the presumed effects can be extrapolated based on the evidence that pandemics often affect basic services, especially health services. Three-quarters of the participating countries reported a considerable degree of disruption to NCD services, which was particularly problematic for those living with NCDs and needing regular or long-term care (WHO, 2020). Governments in all the countries have taken measures to fight against the pandemic that have indirectly and negatively affected the continuity of care of patients with NCDs. This includes disruption to public transport services, the closure of outpatient clinics, 'as well as redirection/deployment of medical staff to the COVID-19 response' (Pan American Health Organization, 2020). Lockdowns also impacted routine life and health status of patients living with chronic diseases like diabetes, mental health, and hypertension (Muhammad Nadeem Saqib, 2020).

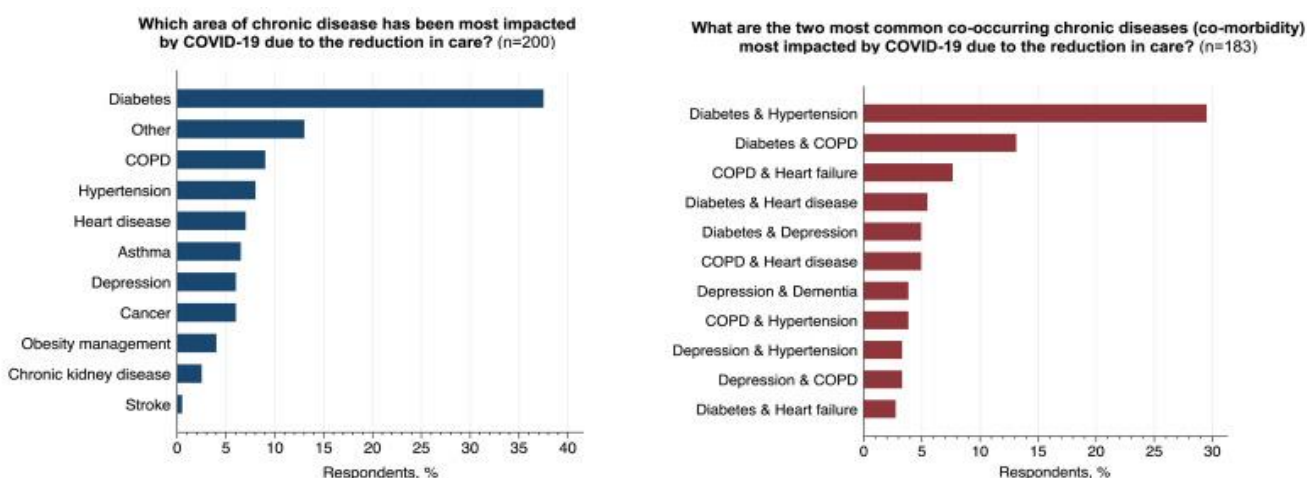
In Africa, the disrupted continuity of essential health services has been reported in many countries, resulting from an imbalance between the demand and supply. This includes disruption of facility-based services for non-communicable diseases (WHO, 2021); NCD treatment and management at 69%, 61% of treatment for mental health and disorders, and 55% of cancer diagnosis and treatment (WHO, 2020).

The problem of health care disruption began at the initial stage of the pandemic when all countries adopted Infection Prevention & Control strategies (IPC) to combat COVID-19 at the expense of other health issues. Consequently, a lower priority was given to patients with chronic NCDs, such as heart disease, diabetes, cancer, and outpatient facilities for NCDs (mainly hypertension and diabetes) were suspended in several countries (Pietro A. Modesti, 2020). The spreading of COVID-19, however, increased this effect. The percentage of countries with disrupted health service in the first phase (Sporadic cases) rose to 22% for cardiovascular emergencies and 39% for cancer and hypertension management (HT). The second (Cluster transmission) rose to 29% for CV emergencies and 57% for HT management. The third phase (Community transmission) mounted to 46% and 66% respectively (WHO, 2021). Indeed, the presence of this clear relationship between the

transmission level of COVID-19 and the restrictions on access to essential NCD services was unsurprising (WHO, 2020). COVID-19 disrupted the prevention and treatment services for NCDs to the extent that many people had no access to treatment for hypertension, heart attacks, strokes, cancer, or diabetes in 75% of the countries, reported by the United Nations Inter-Agency Task Force report on the Prevention and Control of Non-communicable Diseases. (WHO, 2020). Moreover, according to the WHO and UNDP, more than half (53%) of the countries surveyed had partially or entirely disrupted services for hypertension treatment, 49% for treatment for diabetes and diabetes-related complications, 42% for cancer treatment, and 31% for CVD emergencies. The degree of disruption was linked to the level of COVID-19 transmission (UNDP; WHO, UN agency task force on NCDs, 2020). The findings were similar in the Chudasama study (2020), where *Diabetes Mellitus* (DM) was the condition most impacted by the reduction in healthcare resources due to COVID-19 (38%), followed by chronic obstructive pulmonary disease (COPD) (9%), hypertension (8%), heart disease (7%), asthma (7%), cancer (6%) and depression (6%). More information can be seen in Figure 1 (where you can also find the most co-occurring chronic diseases most impacted by the COVID-19 (Chudasama YV, 2020).

Accessing NCDs services has always been somewhat limited. "Before the pandemic, most communities in the world and particularly many settings with humanitarian crises or conflict already had limited access to good-quality, affordable NCD diagnosis, and care", but this significantly worsened with the outbreak (WHO, 2020). Moreover, this applies to the six study countries, and access "has now been reduced further, as the COVID-19 pandemic has disrupted services" (Brunier & Harris, 2020).

The restrictive measures adopted to combat the outbreak in most countries have disrupted the continuity of care and assistance to patients with NCDs and postponed routine medical appointments and tests, thus significantly affecting healthcare service access and availability for NCDs patients. In addition, the imposed mobility restrictions have limited the access to preventive and control services (Ghiwa Nassereldine1, 2021).



COPD=chronic obstructive pulmonary disorder. Combinations with more than five responses were presented for the two most common co-occurring chronic diseases.

Figure 1, Chronic disease and comorbidities most impacted by COVID-19 due to the reduction in care, based on responses by healthcare professionals who completed the online survey between March 31 and April 23, 2020 (Chudasama YV, 2020).

Research Questions

This research focuses on the effects that COVID-19 has had on the NCDs affected. More specifically, the study aims to answer the following questions:

- What are the impacts of COVID-19 in terms of access to health services?
- What are the effects of COVID-19 on the medical status of NCD-affected people?
- What are the effects of COVID-19 in terms of NCD Services the availability (screenings, surveillance, and treatment)?
- How has COVID-19 affected the allocation of human and financial resources to NCDs care services)?

Relevance and Importance of the Research

The research has synthesized data and information about the effects of COVID-19 on NCDs, which will help document and understand the current situation. This approach aims to aggregate existing data sources to fill some of the existing information gaps and highlight areas where information is not available. It is hoped that this piece of research serves to inform about strategic decision making, including resource prioritization. The other important aspect of this research is scientific and concerns the relationship between the COVID-19 and NCDs complications and the prominent role of pre-existing NCDs as morbidity for COVID-19.

Research design and methodology

Research design

This research is descriptive and focuses on the effects of COVID-19 on NCDs, with an effort to understand how COVID-19 affects pre-existing and new NCD cases.

This research uses mixed methods, qualitative (primary) and secondary data to explore the effects of COVID-19 on NCD cases. The primary qualitative data was collected via an online survey with open-ended questions. The questionnaire was shared with the key informants from the study countries and international NCD experts. In addition, the researcher used the available statistical data from DEEP.

Secondary data was collected via a literature review and includes sources such as the monthly situation analysis reports from iMMAP and the review of documents published by organizations including WHO, CDC, BMJ, and the ELSEVIER.

Methodology

Data collection was undertaken between the 7th of July and 29th of September 2021. The report relies mainly on secondary data, published papers, literature reviews, case studies, published reports, and other available literature. The main sources were WHO, CDC, PubMed, Lancet, BMJ,

and ELSEVIER websites, through the use of search engines such as Google, Google Scholar, and Microsoft Bing.

The key search words: Effect, Impact, COVID-19, SARS-CoV-2, NCD, Non-communicable diseases, Chronic diseases, Health services access, and the names of the targeted countries.

In some cases, the researcher depended on literature in French or Spanish (like Santé, Chronique, Maladie, Maladie non-transmissible, MNT, ENT, Las Enfermedades No Transmisibles), with the use of electronic translation (Google Translate).

Sources of data and data analysis

1. Secondary data sources: DEEP, WHO, CDC, BMJ and Lancet.
2. Primary Data: Targeted survey respondents (Key Informants). The questionnaire was built in KoBo Toolbox, and contained 26 questions, mostly multiple choice with some options for extra commentary. The questions covered eight effects on NCDs listed below.
 - i. The access to NCDs services
 - ii. The effects of COVID-19 on NCD services
 - iii. The effects of COVID19 on NCD screening and surveillance
 - iv. COVID19 related NCDs outcomes and complications
 - v. The effects of COVID-19 on the NCD resources (HR and infrastructure)
 - vi. The effects of COVID-19 on NCD funding
 - vii. The effects of COVID-19 on NCD policies and plans

For the complete questionnaire, please see **Annex1**.

The survey focused on potential key informants, including:

- i. NCDs director at the level of MOH in the six targeted countries
- ii. NCDs Focal Point in WHO country office
- iii. NCDs Focal Points in NGOs (if any)
- iv. Some selected international NCDs experts

The researcher shared a link that was shared with respondents to complete between September 13th and September 24th, with the last questionnaire being submitted on September 23rd, 2021

The research utilized publicly available data and reports that describe the current situation based on the most recently available data for standardized indicators. These were compared with the pre-COVID19 indicators to explore the short, medium, and long-term consequences.

The number of accessed resources is more than two hundred, and 103 were used, and are listed in Table.1 below.

Country	No. relevant references /documents
Bangladesh	8 (English)
Burkina Faso	6 (3 English, 3 French)
Colombia	6 (2 English, 4 Spanish)

DRC	6 (1 English, 5 French)
Nigeria	9 (English)
Syria	25 (English)
General	43 (English)
Total	103 (91 English, 8 French, 4 Spanish)

Table 1 Numbers of used as references for each country

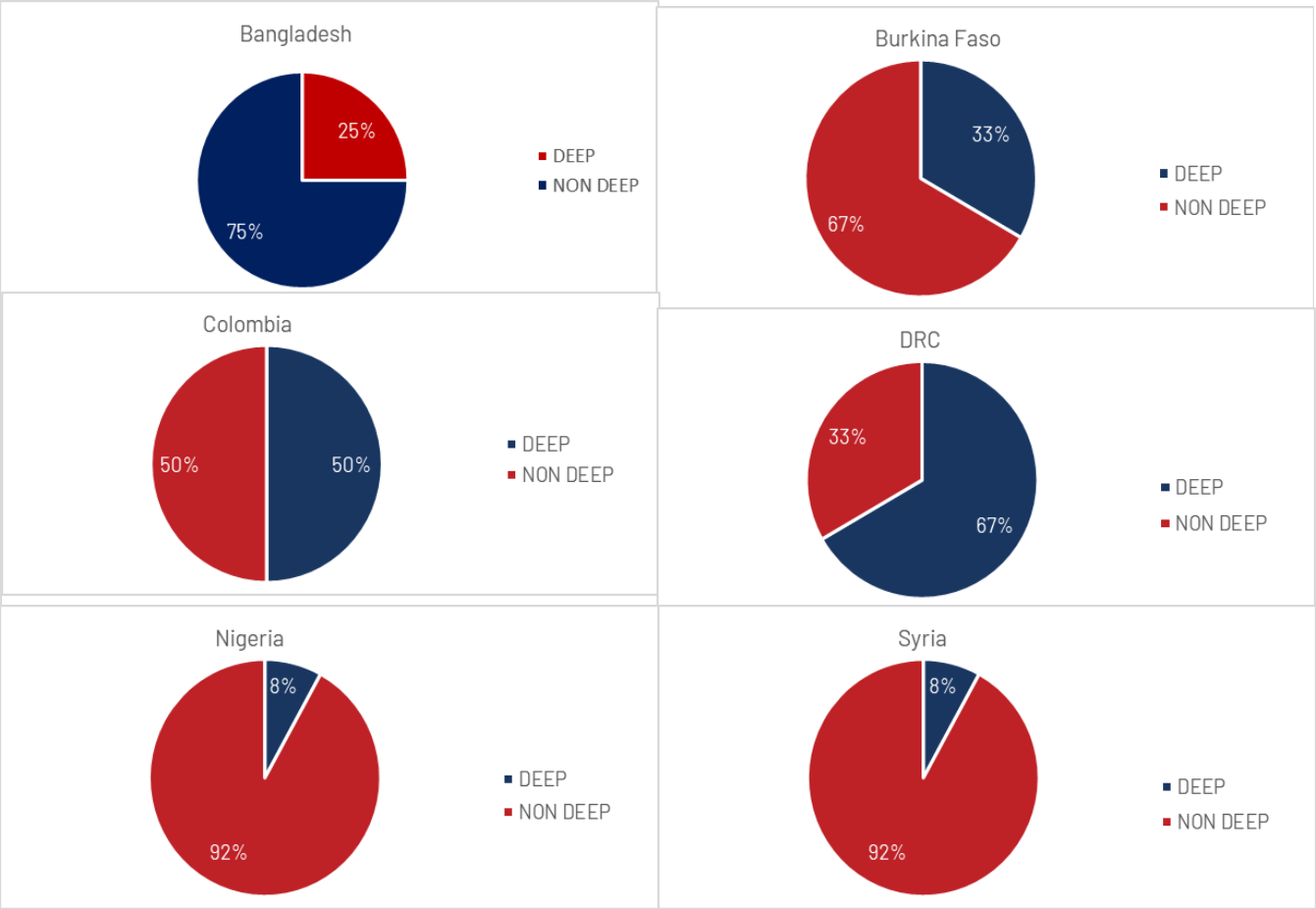


Figure 3 Distribution of used sources according to the country, and to the sources (DEEP) or (NONDEEP). The references came from different sources, and DEEP resources share differs from country to other (half of references in Colombia, and less only 8% in Nigeria and Syria from DEEP

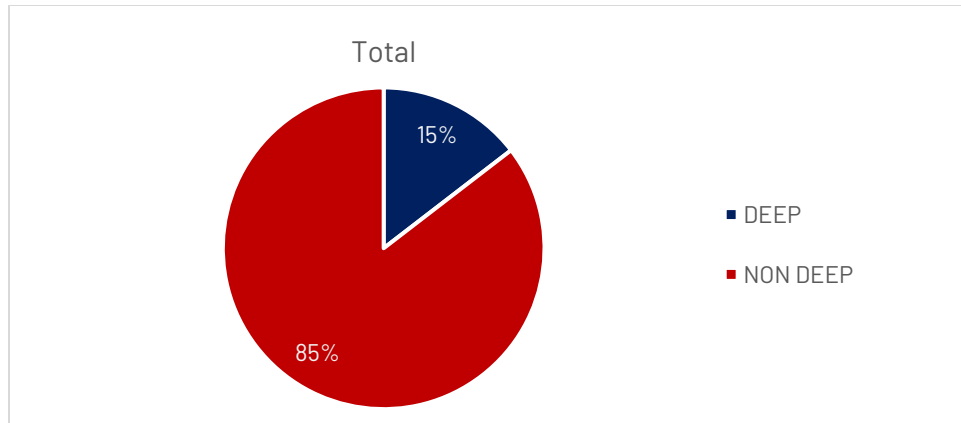


Figure 4 Distribution of sources by country (DEEP or NONDEEP)

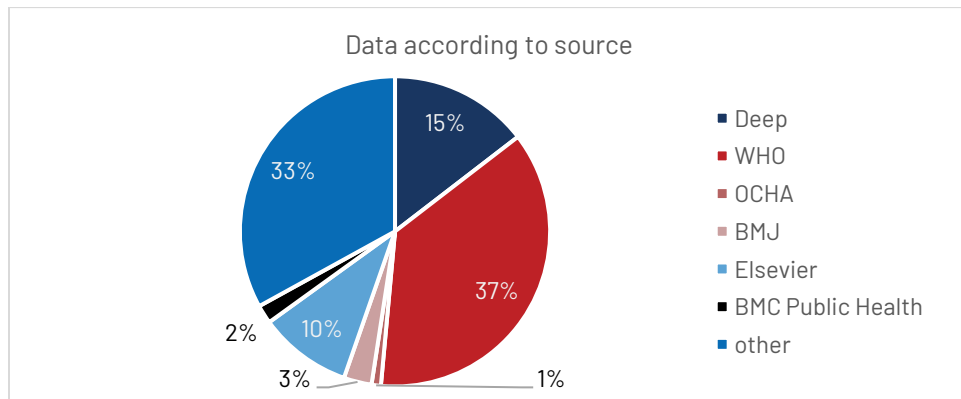


Figure 5 Breakdown of data source, shows that WHO comes in first as a source of data (37%), followed by DEEP (15%), Elsevier (10%), BMJ (3%), BMC Public Health (2%), OCHA (1%) and 33% of the data derived other different sources

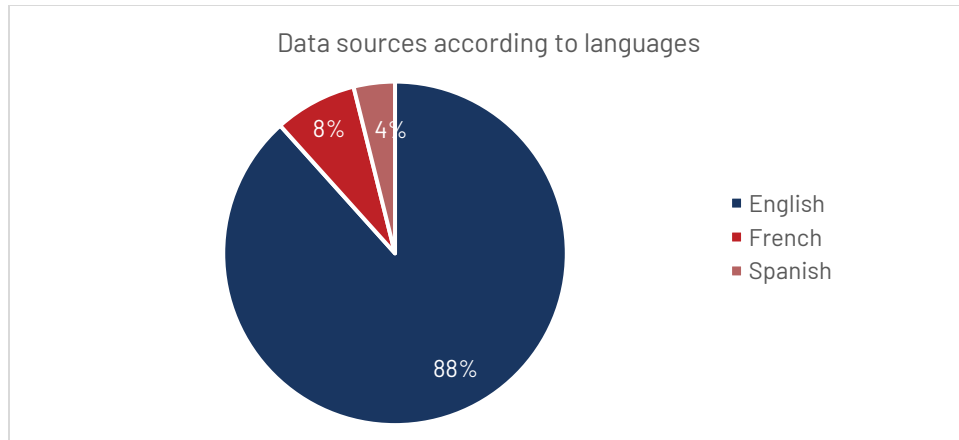


Figure 6 Breakdown of data Language. According to language, and as you see, most of the references are in English.

Gaps in Existing Knowledge

Information about NCDs was scarce before the pandemic, mainly due to the low interest perceived in leading organizations at the global health and the MOH at the country levels.

Despite an extensive literature review, the research did not yield much information on NCDs, even from the ministries of health in the six countries. Instead, most data were obtained from WHO websites, though not covering all the countries of interest.

Findings

The researcher searched the DEEP platform, a repository of thousands of data sources used for the COVID-19 Situational Analysis Project in their monthly analysis reports. The platform is rich in humanitarian data for the targeted countries and covers many aspects of their humanitarian crisis, including the impact of COVID-19 on livelihoods, vaccines, education, health, and healthcare/availability of services). However, NCDs are not the focus of the project, and indeed no specific disaggregation for NCDs exists within the analytical framework used by the project. As such, DEEP had little information available.

1. The effects of COVID-19 on access to health services

According to health expert Katie Palmer, “although there are no data available yet on this issue, it is likely that many NCD patients have decreased access to outpatient visits and one-on-one clinical advice, and, in some cases, there may be a shortage of medicines” (Katie Palmer, 2020). This is likely to disproportionately affect LMICs, where people were unable to access essential medicines or care for chronic conditions, particularly in areas with protracted lockdowns (Lai, 2020). With the rising cases, lockdowns and deaths recorded worldwide, many people living with NCDs may find accessing health care more difficult (Oluwatomi Owopetu1, 2021).

According to a WHO preliminary analysis of 14 African countries, hypertension, DM, CVD, and asthma are the comorbidities most associated with COVID-19 patients, but as governments shifted the focus to the pandemic, health services for NCDs have been severely disrupted (Lefafa, 2020). This is because the healthcare systems postponed and reduced some routine aspects of NCD

management, outpatient visits, and non-urgent surgery to avoid unnecessary hospital visits, reduce the burden on hospital capacity, and decrease infection risk (Katie Palmer, 2020). Twenty-two percent of countries in sub-Saharan Africa reported that they only had emergency inpatient care for chronic conditions. Meanwhile, 37% of countries reported that outpatient care is limited. Hypertension management was disrupted in 59% of the surveyed countries (Lefafa, 2020).

In the Pulse survey on continuity of essential health services during the COVID-19 pandemic, NCDs services essential for a wide range of chronic conditions such as cardiovascular diseases, chronic respiratory conditions, diabetes, and cancer, were affected more than half of the reporting countries (WHO, 2020). NCD diagnosis and treatment was disrupted 69% of nations, with 5% reporting severe/complete disruptions. Cancer diagnosis and treatment were adversely affected in 55% of countries. Access to inpatient NCD services was generally less affected: 62% of countries reported that inpatient NCD services were open, while 35% reported that inpatient NCD services were available for emergencies only. In the same survey, about half of the countries reported severe/complete or partial disruptions to hypertension management services (53%) or diabetes and diabetic complication management services (49%). Asthma services (48%) and palliative care services (48%) were also widely disrupted (WHO, 2020). Disruption to services differed by country; where half of low-income countries reported disruptions to services for cardiovascular emergencies, only 17% of high-income countries did. Likewise, 58% of low-income countries reported disruptions to cancer treatment services compared to 26% of high-income countries (WHO, 2020). Approximately half of countries reported one or more disruptions to essential NCD services (WHO, 2021).

In the second report of the Pulse Survey in 2021 (WHO, 2021), there was a decrease in the number of countries reporting disruptions to NCD services compared to 2020. However, the progress is not as substantial compared to the reductions reported across some other tracer service areas.

1.1 Bangladesh

A cross-sectional study in **Bangladesh** carried out by using self-reported information on nine non-communicable chronic conditions (osteoarthritis, hypertension, heart disease, stroke, hypercholesterolemia, diabetes, chronic respiratory diseases, chronic kidney disease, cancer) showed that *“about a quarter of the participants reported difficulties accessing medicine (23%) and receiving routine medical care (27%) during the pandemic, and this was significantly higher among those suffering from multimorbidity”*. (Sabuj Kanti Mistry, 2021)

When COVID-19 started, the Bangladeshi Government took steps to prevent the transmission of the virus that affected the public health sector. However, these measures had the unintentional consequence of decreasing access to all the health services, including NCDs. According to a key informant, *“the COVID-19 situation limited the access to NCDs services primarily due to mobility restrictions, loss of income so people could not afford appointments, travel or drugs, Opportunity cost has changed with more temporary or insecure livelihoods”*. Additional detrimental causes, such as the shortening of outpatient visiting hours of the public facilities, re-assignment, and task shifting of frontline health workers towards COVID-19 response, contributed to reducing access to health services (Health Services Division Ministry of Health & Family Welfare, 2020). The reduced access occurred despite Government efforts to balance the procedures taken to tackle the pandemic and keep essential health services ongoing for the people in need (Health Services Division Ministry of Health & Family Welfare, 2020).

Bangladesh health management information systems do not disaggregate by non-NCD statistics. However, health service provision (both inpatient and outpatient) decreased significantly between 2019 and 2020 (see Figure 6 below). While this number increased in 2021, it is still lower than the 2019 figure.

The figures below show the number of services provided by the public health facilities in Bangladesh

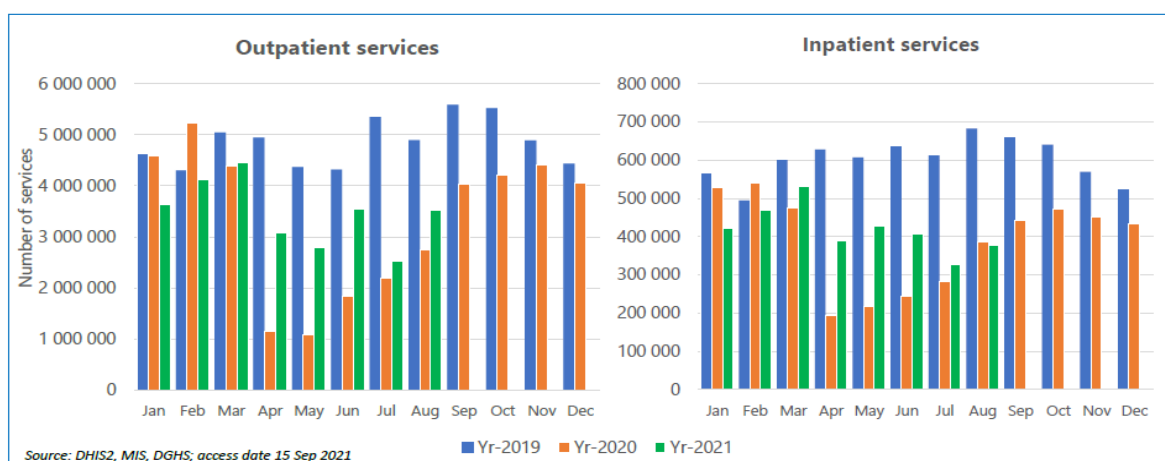


Figure 7 Number of inpatient and outpatient, in Bangladesh, 2019 – 2021 (WHO Bangladesh, 2021)

Focusing on services provided in a single month, public health facilities in Bangladesh provided more than 375 000 Inpatient Services (IP) in August 2021. This was a 15% increase in IP services in public health facilities compared to July 2021, but still 3% less than services provided in August 2020. The recovery of inpatient services is slow and requires immediate attention. It is worth noting that utilization of non-COVID inpatient services was heavily impacted due to the COVID-19 pandemic and remains at 45% of August 2019 levels (WHO Bangladesh, 2021).

The disruption and reduction of health services are seen as a result of the lockdowns. However, the Refugee influx Emergency Vulnerability Assessment (REVA 4) study also revealed additional causes. More than half of the households, in both refugees and host communities, reported difficulties when they seek the services due to: Overcrowded health care facilities (17%), unavailability of medicine or treatment (16%), high cost of medication (36%) and health services, distant health facility (11%) (REVA 4, April 2021), see Figure 7 for details. In addition, both refugee and host communities reported a decrease in debt to pay for health care compared to 2019 (iMMAP, 2021).

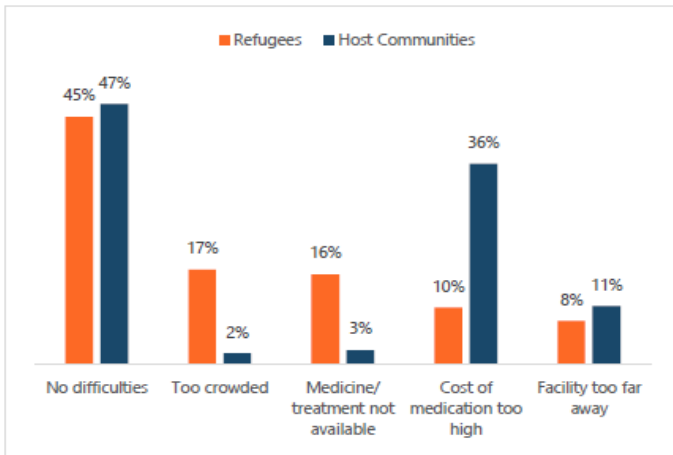


Figure 8 Barriers to health services (REVA 4, April 2021)

1.2 Burkina Faso

Violence, limited resources, and poor access to health clinics have made it difficult for people to reach healthcare services in Burkina Faso. The prevailing security situation has forced several health facilities across the country to close or operate at a minimal capacity (Guest, 2020). Indeed, many researchers attribute a decrease in access to health services to the security situation and attacks of health facilities. Others reported additional contributing factors such as health workers' kidnappings, lack of medicines, distance, and lack of financial means. This situation was further fueled by the COVID-19 and affected health services in general (iMMAP, 2021).

Nonetheless, the health system continued to function, allowing 56.4% of people in need of healthcare to access services. This finding is consistent across regions and socio-economic quintiles across Burkina Faso. For those that were not able to access health services, 'financial affordability' was the most commonly mentioned barrier (76.8%), followed by 'no medical staff available' (12.3%) and 'refused due to lack of space' (10.9%) (World Bank, 2020). Overall, one out of two patients could not access health services.

The main obstacle that prevents accessing health care is financial, which is very important, especially as COVID-19 has devastated economies and livelihoods. Borrowing (loans) was the solution for 30% of surveyed households (iMMAP, 2021). The additional reasons for not accessing health services are the 'low quality of the care provided' due to unqualified human resources and 'lack of medical equipment' that further complicate the work of the health workers who cannot cope with increasing health needs (iMMAP, 2020). The fear of COVID-19 contamination at health facilities also dissuaded patients from seeking treatment (medical staff included) (iMMAP, 2020). One key informant pointed out, "The main NCDs in Burkina Faso are CVD, DM, and Cancer. There is no decrease in the access to the NCDs services due to the COVID-19 or the preventive steps taken".

As it can be deduced from the previous findings, the COVID-19 pandemic has effectively decreased access to health services, though primarily due to safety and security reasons. Most of the population that does not have health care access due to financial constraints and service provider inadequacies. COVID-19 has, directly and indirectly, increased poverty and affected service provision through many different pathways.

1.3 Colombia

The Pan American Health Organization (PAHO) reported that across Latin America, two countries had closed outpatient services. NCD outpatient services continue to be maintained, but with limited access in 18 countries (64%) and are completely open in 7 countries (25%). The disruption in NCD services, either partially or entirely, affected all types of care for people with NCDs, but disproportionately for diabetes, dental care, and rehabilitation services (WHO, PAHO, 2020)

In a study that covered Latin America (**Colombia** included), where countries already had poor control of NCDs, concerns about coronavirus infection led to a reduced number of visits and hospitalizations in patients with NCDs, such as cardiovascular disease, diabetes, and cancer (Ricardo Lopez Santi, 2020). Factors such as access to health services and treatments are essential to understanding the actual situation for patients with cardio-metabolic diseases during the COVID-19 pandemic. Suboptimal adherence to medications taken chronically for secondary prevention of CV and metabolic diseases continues to burden the healthcare system, despite the well-established prevention benefits of compliance. The number of pills per day, the access to healthcare systems, and the availability of drugs and medical prescriptions are potential barriers to appropriate adherence (Ricardo Lopez Santi, 2020).

According to a PAHO report, across Latin America, COVID-19 has affected the continuity of essential services provided at the first level of care, especially in peri-urban, rural areas, and among indigenous populations. This is mainly due to the existing deficit of health teams, social distancing measures, infected staff, and the closure of various primary care facilities. Nevertheless, outpatient services for non-communicable diseases continue to be maintained with limited access. The main reasons for disruption of NCDs services include cancelation of elective care services (58%), clinical staff being re-allocated to the COVID response (50%), and patients not presenting (50%)(WHO.PAHO, 2020).

The situation in Colombia is similar to the other countries in that many factors contribute to a poor NCDs' situation beyond COVID-19. The first factor is the inherent health system lacking essential elements and infrastructure (especially ICUs). Other issues include a large number of Venezuelan refugees, conflict, flooding, COVID-19, and the general lack of information. It is clear that throughout the duration of the COVID-19 pandemic, access to health services decreased for many reasons: the fear of getting infected, the restrictive measures that could compromise the transport of medicines and patients to and from urban centers (iMMAP, AMAZONIA, 2021). According to an evaluation carried out by Save the Children on the impact of the epidemic on the health sector, in Colombia, 98% of respondents perceived a negative impact on the health system (iMMAP, AMAZONIA, 2021). This problem is more visible in rural areas, where the precarious health infrastructure, lack of medical personnel, and armed groups actions, severely impact the access to health services and facilities even more. A situation further aggravated by attacks on medical missions, confinement, and displacement (iMMAP, 2021). These factors push patients to resort to traditional medicine.

In the Amazonas Region of Colombia, many causes have played a role in decreasing access to health services, such as the mobility restricting measures that compromised the transfer of patients to urban centers and fear of infection that prevent residents in the Amazonas Region from accessing hospitals. Other factors include lack of health personnel due to being infected with COVID-19 and increased hospital waiting (iMMAP, 2021). The other additional cause is the lack of

ICUs. It has been observed that four of the six departments in the region lacked intensive care, and three of them had intermediate care, the most worrying data being that the beds available in the region could cover only 0.8% of the severe cases expected at the peaks of the epidemic (iMMAP, 2021)

Among the main factors affecting access to health services, especially in rural areas were the precarious health infrastructure, the lack of medicines and health personnel due to being infected with COVID-19, and increased hospital waiting time (iMMAP, AMAZONIA, 2021). One of the most critical factors globally, for which Colombia is not an exception, is income, which declined significantly due to the Governmental measures to stop the COVID-19 outbreak and disproportionately affected informal employees representing around 50% of those employed (iMMAP, 2020).

In the annual situation analysis report (Jun 2020 – May 2021), iMMAP reports that the population who did not access health care increased from 40% in June–November 2020 to 50% at the end of May 2021. At the same time, between 50% and 70% of Venezuelan migrants reported not accessing health services, a percentage that decreased by May 2021 to 40% (iMMAP, 2021). Refugees remain the most affected group in terms of size of the population and the severity of its needs (iMMAP, 2020); for Venezuelan migrants, the barriers are predominantly the lack of documentation, the costs of care, the remote location of health centers and the discrimination.

1.4 DRC (the Democratic Republic of the Congo)

The Democratic Republic of Congo has a fragile health system with both human-resources for health and health commodity-related problems. In addition, people struggle to access health services due to financial reasons, distrust of the health system, and fear of becoming infected with COVID-19. Other factors limiting healthcare access are movement restrictions, insecurity, conflict, declining income due to the economic impact of health preventive measures, and the fear of getting infected (OCHA, 2020). Altogether, the above factors have caused a drop in the number of consultations for certain health services (iMMAP, DRC, 2020). Before the pandemic, health services covered 30% of the population. However, the access worsened when the pandemic accelerated, notably due to a shortage in medical equipment and the demotivation of healthcare workers (iMMAP, DRC, 2020).

Reduced access led to a decrease in consultations in some services, worsening the health of those who were not followed up with and adopting negative coping mechanisms (iMMAP, DRC, 2020). The COVID-19 pandemic burdens the health system, especially some services, with reduced access to non-COVID-19 related services (iMMAP, DRC, 2020).

A study conducted in Kinshasa on the impact of the COVID-19 pandemic and the response on the health services utilization during the first wave revealed that the pandemic resulted in important reductions in health service utilization in Kinshasa, particularly Gombe Health Zone. The study evaluated the pandemic's impact on the use of essential health services (NCDs diagnosis included), by comparing the number of services from 2018 to the end of 2020 (Celestin Hategeka, 2021). The reductions were highly concentrated in locked-down areas, notably Gombe (81% decline in total visits) relative to health zones without lockdown. When the lockdown was lifted, total visits, visits for infectious diseases, and diagnoses for non-communicable diseases increased approximately

two-fold (Celestin Hategeka, 2021). The lifting of lockdown led to a rebound in health services utilization but remained lower than pre-pandemic levels (Celestin Hategeka, 2021).

1.5 Nigeria

In **Nigeria**, massive population displacements, the influx of returnees, refugees, and attacks on hospitals and primary health care centers by Non-state Armed Groups (NSAGs) continue to disrupt the delivery and implementation of health service programs (iMMAP, 2021). Most reports on Nigeria do not mention NCD or chronic diseases but cite the reasons for the disruption of health services and the decreased demand and access. This appears to be driven by income reduction, movement restrictions, and concerns about COVID-19 transmission (PATH, 2021). A rapid panel survey of households conducted by World Bank found that more than 25% of respondents who needed health services in April 2020 could not access them; this proportion decreased to 14.2% in June and 14.0% in July as lockdowns were eased. However, the proportion who could not access for financial reasons increased over this period. By July 2020, 78% of respondents who could not access care cited financial barriers as their main reason (PATH, 2021). The biggest service disruptions are seen in maternal health, newborn care, vaccination, sick childcare, family planning, and NCD treatment services, as seen in health information management system data from the government of Nigeria (PATH, 2021). The report done by REACH shows that *“99% of settlements indicated there were barriers to health care with the most common being ‘never had health facilities nearby’ cited by 85% of settlements, other barriers included “Facilities destroyed by conflict” 5%, and “No health care workers in the area” 3% (REACH, 2021). The year 2020 has been a challenging year in the overall health delivery of the country; the lockdown led to disruptions in health service delivery (WHO, 2021).*

A cross-sectorial survey using electronic questionnaires was conducted on study participants across the 36 states of Nigeria. The results of this study showed that 35.2% of the respondents managing chronic illnesses had difficulties accessing essential medicines during the COVID-19 lockdown. 84.0% experience deteriorating chronic health conditions due to difficulty in accessing their required medications (Nwoke Emmanuel Awucha, 2020), likely leading to an increase in morbidity and mortality rates. In addition, an increase in medicines' cost was observed by 77.7% of participants. It can be explained by supply chain disruptions, decrease in income generation to make out-of-pocket payments for medicines, and a shift from where medicines were sourced (Nwoke Emmanuel Awucha, 2020). While the cost of medicines rose, 73.9% of respondents living with chronic illness reported that the pandemic negatively affected their income. The main challenges cited by the respondents were poor availability of means of transportation, reduced income, high cost of medicines, and the fear of contracting the virus (Nwoke Emmanuel Awucha, 2020). The combination of increasing medical costs and decreasing income is a deadly mixture which will result in worse outcomes for patients living with NCDs.

“COVID-19 led to decrease in the access of NCDs services, and that the main causes are the restrictions that impede reaching health centers, loss of income so people can't afford appointments, travel or drugs, opportunity cost has changed with more temporary or insecure livelihoods and because healthcare workers were reassigned to COVID-19 response” Key Informant

1.6 Syria

In **Syria**, the situation is very complicated for a variety of reasons. Firstly, it is not easy to distinguish the effects of COVID-19 from other factors, such as conflict or the dire economic situation. Secondly, information (and situation) varies, according to the dominant power (WES, ES, GHS), in addition to the Internally Displaced Persons (IDPs), and refugees. Information is, therefore, more generalized than precise, and most data are based on WHO, NGOs and international organizations.

Due to the weakness of the health information systems that do not capture NCD service utilization and outcomes, general information was gathered about the health services or specific diseases utilization. In general, more than 40% of countries in WHO Eastern Mediterranean Region (EMRO) reported partial or full disruption to hypertension and diabetes management, cancer treatment, asthma services, rehabilitation services, and palliative care. This is despite official reporting that continuity of NCD services is categorized as essential services in national COVID-19 strategic preparedness and response plans (Zlatko Nikoloski, 2021).

The increased demand for care caused by COVID-19, in addition to the restriction of movement, reduced staff and lowered capacity of health care facilities, would disturb the delivery of health care for non-COVID-19 cases. In addition to the shortage of health workers in general, the pandemic has led to some disruption of essential health services in Syria, particularly during the lockdown in March-May 2020 (MOH, 2021).

The NCDs services are included in the primary health care (PHC) services. In the 'Summary of key performance indicators' for the whole of Syria' reports of May 2019-2021, a decrease can be detected in the number of PHC consultation from 295,846 in May 2019 to 99,743 in May 2021 (-66%), the same for Mental health consultations: from 21,410 (2019), to 19,993 (2021), (-9%), and the total *"treatment courses provided at sub-district level"* from 833,708 to 677,625 (-19%) (WHO, EMRO, 2021). The same situation was observed in Jordan, where the Urban refugee population still cannot access comprehensive PHC services, including sexual and reproductive health (SRH) and NCD medications, due to the curfew enforced in May 2020 (World vision, 2020). In Northwest Syria, people suffering from NCDs have been significantly more vulnerable to severe illness or death from COVID-19 due to added reasons, such as the general disruption of services for the prevention and treatment of NCDs (WHO, 2020). In the *Government-held Syria* (GHS), the total number of patients who received NCDs' services in 2019 was 1,608,783, while the total number of patients who received NCDs' services in 2020 is 1,546,672, a reduction of over sixty thousand people (WHO, EMRO, 2020). Availability and utilization of NCDs health care services were assessed at a health center level for; asthma and chronic obstructive pulmonary disease (COPD), cardiovascular services, Hypertension management, and Diabetes management (WHO EMRO, 2018).

The previous findings are substantiated with the primary data obtained through a key informant, with a focus on the effects of restriction procedures applied during the first months of the pandemic, but with the addition of more continuing and increasing factors, i.e., local shortage of many essential medicines. *"Lack of access of NCD patients to the public health centers due to several factors: The first curfew implemented by the Syrian government in May 2020, fear of being infected, global and local shortage of some lifesaving medicines especially for diabetes, cancer, kidney failure and other immunosuppressed diseases"* Key Informant.

In April 2021 only half of the hospitals across Syria were still functioning, with 75% of the communities assessed health services in NES, and less than 50% in NWS had access to healthcare. These numbers have remained stable since December 2020 (iMMAP, 2021).

The cost of health services and medicine is still one of the most important barriers to seeking healthcare. Between 44% of the NES population and 87% of NWS continued to cite cost as a barrier and lack of trained staff (iMMAP, 2021). Lack of medication or medical equipment at healthcare facilities was reported as a barrier to accessing healthcare in 36% (NES) and 53% (NWS) in February 2021, stable percentages since January. This is supported by a survey by IRC that cited lack of medication as the most pressing concern for 70% of health staff (iMMAP, 2021).

Health care services in Syria remained significantly affected by the overcrowding in the health facilities in February 2021. Nearly a third of the assessed communities in the NES and half of those in the NWS, see congestion as a barrier to healthcare access, visibly noted in the overcrowded areas, compared to January in the northeast (iMMAP, 2021). Moreover, the low quality of healthcare services is due to a perceived lack of privacy for women and girls in the health facilities during March and April 2021 (iMMAP, 2021).

The situation of the refugees in Syria is very similar to the situation in Jordan, as noted in one study that noted *"NCDs have been identified as the most common health need among Syrian refugees in Jordan. However, the large influx of refugees and the COVID-19 pandemic have increased pressures on the health system, exceeding its ability to provide adequate care. This is cause for major concern and further amplifies the already growing prevalence of NCDs in Jordan"* (Amani Al-Oraibia, 2021).

The COVID-19 outbreak has caused serious disruptions in this support, as the movement of humanitarian workers has been notably restricted, and NGOs suspended in-person assistance to adapt to a more home-based working style (Dima Al Munajed, 2021). The findings are consistent with the opinions of the key informants about the effect of restriction and financial situation, which reinforces the arguments provided by the secondary data.

"The main factors that played an important role in decreasing the access to the NCDs services are: restrictions on travel to health centers, loss of income (people not being able to afford appointments), changes in travel or drugs opportunity costs, with a visible shift to more temporary or insecure livelihoods."

Key Informant

2. The effects of COVID-19 on NCDs patients (and Comorbidities)

There is synergy between COVID-19 and NCDs, given that people affected by NCDs are more susceptible to COVID-19 infection, which could dramatically worsen their pre-existing NCD condition. As stated by the WHO *"the effect of COVID-19 on the pre-existing cases of NCDs is prominent. Older people and people with pre-existing conditions (such as heart diseases, diabetes, and respiratory conditions) appear to be more susceptible to becoming severely ill with the COVID-19 virus"* (WHO, 2020). Reasons behind the increased morbidity and mortality of NCDs patients are many. Still, one of special importance is that the decrease in access to health services and medicines leads to an increase in both direct mortality from the outbreak and indirect mortality from preventable and treatable conditions (Brunier & Harris, 2020). In addition, decreased physical

activity due to lockdowns decreases the mobility of people, and this is *“of particular importance to NCD patients, where physical activity is essential for controlling symptoms and risk factors such as obesity, hypertension, and elevated glucose levels”* (Katie Palmer, 2020).

There is a general lack of literature on NCDs in LMICS, and all countries represented in this study are LMICS. According to the WHO, *“There was a greater likelihood of collecting or collating NCD-related comorbidities with increasing country wealth”* (WHO, 2020). The prevalence of comorbidities in the study countries is expected to mirror other LMICs where NCDs prevalence is high; however, this topic is not adequately represented in the existing literature.

It is well known that people with pre-existing NCDs are particularly vulnerable to health risks brought about by emergencies and disasters. *“CVD (chronic lung diseases) and DM are more vulnerable to disruption and stress induced by disasters. A significant proportion of mortality in post-disaster phases results from the failure of health care services to cater to the needs of patients with chronic diseases”* (Emily Ying Yang Chan 1, 2020). On the other hand, patients with NCDs are more likely to suffer severe cases of a COVID-19. *“Africans living with NCDs such as hypertension and diabetes are more likely to suffer severe cases of COVID-19 and eventually die,”* according to the Africa office of the WHO (Tih, 2020). In addition, constraints and the already resource-limited health system can lead to increased morbidity and mortality for patients with NCDs in Sub-Saharan Africa (Oluwatomi Owopetu1, 2021). This increase in fatality rates is attributed to many factors: first, NCDs patients (DM or HT) are at high risk of getting severe illness and death, and second, because of disruptions in NCD treatment (Tih, 2020).

COVID-19 is considered a syndemic (a set of linked health problems involving two or more afflictions, interacting synergistically, and contributing to the excess burden on the pre-existing diseases) for the people living with NCDs (PLWNCDs). A case interacts with various pre-existing medical conditions and social, ecological, and political factors which exacerbates existing NCDs. This is worse for PLWNCDs from disadvantaged groups who are less likely to receive healthcare compared to PLWNCDs from socially advantaged groups like people from LMICs (Lai, 2020).

NCDs are now spiking the number of untimely COVID-19-related deaths. Almost one-fourth (22%) of the global population is estimated to have an underlying condition that increases their vulnerability to COVID-19, and most of these conditions are NCDs (Banatvala & Small, 2020). Some patients, such as people with DM, are at increased risk for hospitalization and adverse events after COVID-19 infection, especially if the diabetes is uncontrolled, making them more vulnerable to poor outcomes after infection. The same applies to cardiovascular diseases and hypertension that appear as risk factors for worse outcomes after COVID-19 infection (Alessandro Demaio, Courten, & Tellier, 2013). In addition, COVID-19 can also cause fulminant myocarditis associated with acute heart failure and cardiogenic shock, as well as asymptomatic myocardial inflammation paired with cardiac arrhythmias (Andrew Y. Chang MD, 2020). At the same time, patients with pre-existing cardiovascular disease (CVD) are amongst those with the highest risk of adverse outcomes from COVID-19 (Andrew Y. Chang MD, 2020). The exact effects of the virus are not well determined. Still, according to previous experiences with a viral infection, the suggested effects that COVID-19 can trigger are acute coronary syndromes, arrhythmia, and heart failure via direct and indirect mechanisms (Chaitanya Rojulpote, 2020).

For some NCDs like hypertension, disruption of hypertension management occurred in 59% of African Region countries, and management of DM complications was disrupted in 56% of the

countries (Tih, 2020). Global Burden of Disease studies show that the morbidity and age-standardized death rates from NCDs are higher in at least four African countries (**DRC, Nigeria, Ethiopia, and South Africa**) than in high-income countries (Oluwatomi Owopetu1, 2021). This is likely to result from resources being redirected to the acute problem of COVID-19 pandemic control (Oluwatomi Owopetu1, 2021).

COVID-19 lockdowns have the potential of increasing CVD and associated mortality by indirectly increasing CVD risk factors, such as physical inactivity, improper eating habit, tobacco usage, and alcohol misuse. These factors can later escalate CVD-related premature deaths that can reduce the success of 2013, global action for the prevention and control of NCD premature deaths by 25% by 2025. However, not much effort was put into studying the effects of the COVID-19 lockdown on CVD risk factors, as shown in studies more focused on the effect of CVDs on COVID-19 complication and mortality (Abubakar, 2021). The above findings are consistent with the results of some global studies, such as one conducted in Italy, where the results indicated that nearly all (96.2%) of those who died in hospitals had comorbidities. Most of them had NCDs, such as hypertension, DM, CVDs and chronic lung disease, especially COPD (Lai, 2020). Furthermore, COVID-19 decreases the utilization of many health care services due to its impact on the prevention, identification, and management of chronic disease and even emergency care (Karen A. Hacker & Janet Wright, 2021).

The impact of SARS-CoV-2, the virus that causes COVID-19, on people with or at risk for chronic disease cannot be overstressed enough. COVID-19 has impeded chronic disease prevention and disrupted disease management. Therefore, helping those committed to chronic disease prevention and intervention to identify ways forward is a crucial matter (Karen A. Hacker & Janet Wright, 2021).

The lockdown has increased risk factors of CVDs, and as such, there might be an increase in the number of NCD-related mortality rates, and this effect will not end with COVID-19 pandemics; the effects of COVID-19 on NCDs are long-acting.

2.1 Bangladesh

In Bangladesh, the growing burden of NCDs amongst older adults is a major emerging public health problem. During the COVID-19 pandemic, health services in low- and middle-income countries, including Bangladesh, have been disrupted (Sabuj Kanti Mistry, 2021). About one in four participants experienced difficulties accessing medicine (23%) and receiving routine medical care (for the medicines and one disease) and an increase to 78.7% for the health services and multi-morbidity (Sabuj Kanti Mistry, 2021). People with underlying NCDs have a higher risk for developing severe and even fatal COVID-19. As such, COVID-19 and NCDs have a combined impact on the most vulnerable population in Cox's Bazar by further exposing patients with pre-existing conditions. WHO has employed all efforts to maintain the delivery of essential health services throughout the COVID-19 outbreak, emphasizing NCDs prevention and management (WHO Bangladesh, 2021).

Figure 8 (below) presents the role of comorbidities in the rate of death, more than half of deaths were between comorbid people (52%), and the role of the disease ranged from 64.5% in Diabetes, 63.8% in high blood pressure to 2.6% for liver diseases

NCDs in Bangladesh, are responsible for 67% of all deaths (30% from cardiovascular diseases, 12% from cancers, 10% from chronic respiratory diseases, 3% from diabetes and 12% from other NCDs).

Additionally, 70.9% of the adult population have at least one risk factor. Inadequate intake of fruits and vegetables, tobacco use, low physical activity, extra salt intake, high cholesterol and obesity are some of the common factors associated with the prevalence of NCDs in the country. In Cox's Bazar, 6.2% of those confirmed with COVID-19 have been found to have NCDs as comorbidities. (WHO Bangladesh, 2021)

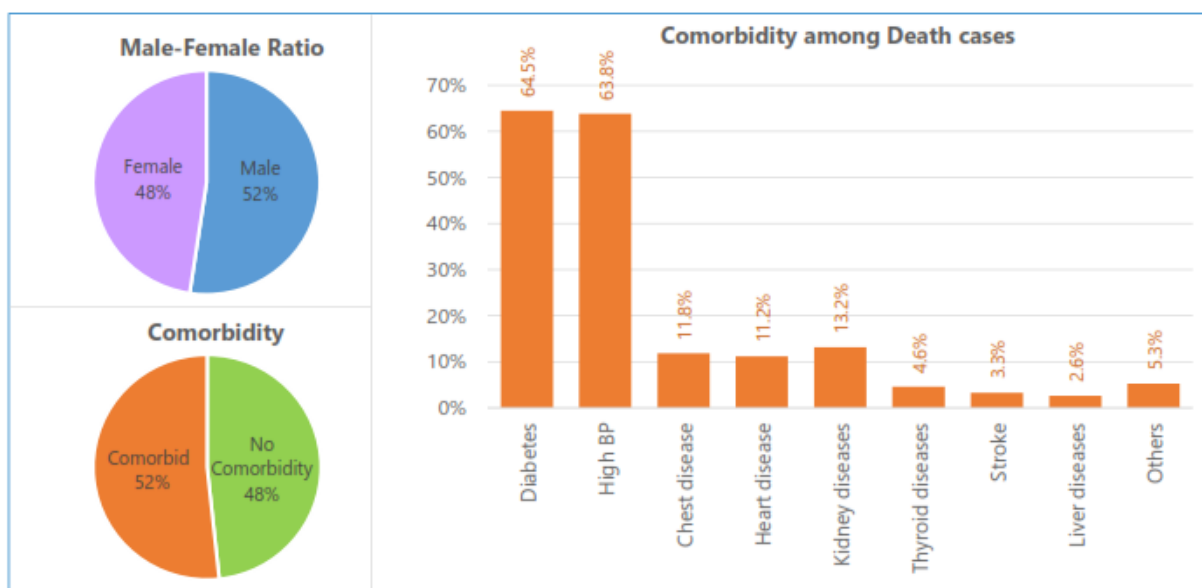


Figure 9. Distribution of death in the week between (13 and 19 Sep 2021), and Comorbidity among death cases (WHO Bangladesh, 2021)

2.2 Burkina Faso

Pre-existing chronic diseases pose an additional risk to the COVID-19 exposure. This vulnerability is exacerbated by movements restrictions and the limitation of home-based activities, further accentuating the degree of isolation and marginalization (iMAP, 2020). This synergism worsens the outcome of COVID-19, as seen from health reports; "This mortality is mainly due to chronic non-communicable diseases, deficiencies nutrition, and epidemic diseases" (SANTE, 2020). The information about NCDs in Burkina Faso is limited. Deteriorations in mental health have also been noticed because of the outbreak, especially in low-income individuals, appearing as a feeling of sadness, lack of appetite, lack of sleep, fatigue, loss of self-confidence, etc. (iMAP, 2021).

2.3 Colombia

In Colombia, adults with chronic diseases face difficulties and barriers in accessing the needed services due to low capacity and hospital coverage, especially in rural areas (iMAP, 2021). In addition, a lack of services (or attention) for patients with chronic diseases can increase the risk for these patients. The lack of timely-provided care of these diseases posed the risk of a health crisis, placing 14% of the Colombian population in a high vulnerability to COVID-19 due to comorbidities or other risk factors such as being older. Additionally, a lack of timely care for patients with chronic diseases poses a risk of a health crisis (iMAP, 2021). The strict containment measures devised to manage the pandemic have forced the population to adopt coping

mechanisms such as traditional medicine and increased barriers to primary care and medicines (iMMAP, 2020).

The mortality of the elderly (who are more vulnerable to COVID-19) could have repercussions on the continuity of the transmission of knowledge on traditional medicine that is valued by indigenous populations of the Amazon (iMMAP, AMAZONIA, 2021). The epidemic and confinement have also harmed mental health, leading to increased suicide rates (iMMAP, AMAZONIA, 2021).

2.4 DRC

In the Democratic Republic of Congo, COVID-19 mortality is related to factors such as gender (males were 68% of confirmed cases, an 77% of deaths), age (over 50 years), and the presence of comorbidities, such as high blood pressure and diabetes (70% of deceased patients presented with comorbidities) (iMMAP, DRC, 2020). Indeed, those with specific needs, as disability, chronic disease, and old patients (older than 65 years) are most at risk and most vulnerable (OCHA, 2020). “The state of population health influences the risks of contamination, especially on the risks of developing a severe COVID-19 form. At the same time, the COVID-19 has a greater impact on morbidity and mortality of specific vulnerable groups in the whole country (elderly, patients with chronic disease, or immunodeficiency)” (iMMAP, DRC, 2020).

COVID-19 has a direct impact on the morbidity and mortality of vulnerable groups such as the elderly, chronically ill, and immunosuppressed patients, in addition to the psychological and emotional effects on sick people and their loved ones (OCHA, 2020). Finally, the restrictions and difficulties in accessing health services could force the patients to resort to traditional medicines despite their negative consequences. Migrants and refugees were the most affected by difficulties in accessing health services (iMMAP, 2020).

2.5 Nigeria

Upon admission to hospital for COVID-19, the most prevalent underlying conditions at hospital admissions in Nigeria were obesity (14.3%) among people 0-18 years old, obesity (14.5%) among people 19-45 years old, hypertension (34.1%) among people 46-65 years old, hypertension (47.7%) among people 66-75 years old, and hypertension (55.8%) among people over 75 years old (WHO, Nigeria, 2021). Obesity, hypertension, DM are among the comorbidities for people admitted into the hospitals with COVID-19 (WHO, Nigeria, 2021).

The presence of comorbidities in all COVID-19 severe cases is clearly remarked in the study conducted on the Clinical and Demographic Characteristics of COVID-19 patients in Lagos, Nigeria. The study revealed that comorbidities were present in almost half of the study participants (49.4%), and these comorbidities were associated with developing severe COVID-19 disease, with the most common being hypertension and Diabetes (Ngozi Otuonye, 2020). In the study, all four patients (2.6%) who died were older than 60 years and had comorbidities such as hypertension, diabetes, Lower Respiratory Tract Infection (LRTI), and Pneumonia that further complicated the disease. The study concluded that “old age, obesity, and the presence of comorbidities may be associated with increased mortality” (Ngozi Otuonye, 2020).

Diabetes type2 (DMT2) is a chronic disease and a global epidemic. It is a known fact that comorbidities, including DM pose a higher risk of infection with COVID-19. Additionally, the outcomes following the infection are far worse than in people without such comorbidities. DMT2

has been a global burden for decades, further aggravated with the onset of COVID-19. Consequently, at a global level, healthcare systems and the diabetes population were impacted during this pandemic. Mitigation restrictions that were aimed to curb the spread may have imposed a higher burden on the diabetes population (Justine Sciberras 1, 2020).

The effects of COVID-19 on NCDs have been documented in Nigeria where “84.0% experiencing deteriorating chronic health conditions in the light of the difficulty in accessing their medicines” (Nwoke Emmanuel Awucha, 2020).

2.6 Syria

While the IDP population is comparatively young in **Syria**, some of them have conditions that put them at higher risk of COVID-19 infection or poorer outcomes. It is worth noting that Syrian refugees are at higher risk of non-communicable diseases (NCDs) due to their lifestyle, hence more prone to have preexisting health conditions before displacement (Paul Moawad, 2020). Globally, NCDs are highly prevalent among refugees, which would increase the risk for severe COVID-19 infection and bad prognosis. The circumstances in which refugees find themselves harm the NCDs development and control (Amani Al-Oraibia, 2021). Indeed, many refugees already suffer physical and functional disabilities due to the war or pre-existing chronic diseases that worsened because of it. Psychologically, the experience of conflict, poverty, and displacement leaves many with regular feelings of distress, anger, and fear and, compromised both physically and psychologically (Dima Al Munajed, 2021). The COVID-19 pandemic added one more hardship to the care of NCDs by increasing the burden on overstretched health systems, reducing capacity to address NCDs, and disproportionately affecting those with previous health conditions (Amani Al-Oraibia, 2021).

Internationally, the case fatality ratio is around 5% though this varies with context. In under-resourced settings, delays to healthcare access, inadequate resources, or care costs could lead to the progression of cases from moderate-severe to critical or fatal. In NWS, it is estimated that 118,423 IDPs are high risk, including those with NCDs (Marzouk1, et al., 2020).

Also, fear of going to a health center and lack of medicines and health services may lead NCD patients to reduce the number of doses of the prescribed medicines or to rely on lower-quality care, such as self-medication (or alternative medicines such as homemade treatments). The same situation applies to those who cannot access hospitals or depend on private pharmacies. All such behaviors will worsen people with chronic diseases (iMMAP, 2021).

The opinion of a key informant supported the finding revealed in secondary data, especially about the effect of COVID-19 on people with pre-existing NCDs. *“The NCDs with COVID-19 infection have long hospitalization period and complications and high burden of diseases, and mortality rate.”* Key Informant

3. The effects of COVID-19 on the NCDs Services

While people living with NCDs are more vulnerable to COVID-19, services for the prevention and treatment of NCDs are also negatively affected by the pandemic. Travel constraints and lockdowns limit access to preventive services, hospital treatment, and prescription medicines (WHO, 2020).

In a survey conducted to reveal the effects of COVID-19 using Google forms and sent to patients with chronic diseases using WhatsApp, and the internet, 98% of the participants (181 people) stated

“Following the outbreak of COVID-19 in Bangladesh in March 2020, a significant decrease was observed in the uptake of essential health services for Rohingya refugees, including NCDs from April to October 2020. Effects were profound in outdoor NCD consultations due to fear of people to receive health services at facility level. Another cause is that the financial effect of Covid19 decreased chances to access health services.” Key Informant

that that lockdown had affected their routine life. In comparison, 45% reported effects on their health. No significant difference was noted between the various demographic characteristics. However, 71% of the participants with mental health issues reported effects on their health. 53% missed their routine medical checkup, and 42% missed regular testing. Similarly, 66% could not continue their daily exercise (Muhammad Nadeem Saqib, 2020).

The effects of COVID-19 on the NCDs provided services in the six countries of the current study are expected to be similar to the effects in other LMICs where the prevalence of NCDs is high. However, there is a lack of literature on this topic. While PLWNCDs are more vulnerable to COVID-19, services for the prevention and treatment of NCDs are also negatively affected by the pandemic and measures such as travel constraints and lockdowns, limited access to preventive services, hospital treatment, and prescription medicines (WHO, 2020)

The first rapid assessment led by WHO revealed that: *“Three-quarters (75%) of countries reported the ministry of health was collecting or collating data on NCD-related comorbidities in COVID-19 patients”* (WHO, 2020), but there was a disruption of routine health services, such as screening and diagnosis, supplies of essential medicines, and access to health service providers and support services (Lai, 2020).

3.1 Bangladesh

As presented in **Figure 9**, the numbers of NCDs main diseases services reached the minimum values during May and June 2020, when the movement restrictions (and the COVID-19 pandemic) reached the peak. The data was obtained from Tekhaf region in Cox’s Bazar area during 2020. Overall; more DM services were provided compared with CVD services. The number of services decreased in April and May 2020, with an increase noticed after removing movement restrictions and the relief of the COVID-19 situation. The number, however, did not return to the levels prior to the outbreak (2019).

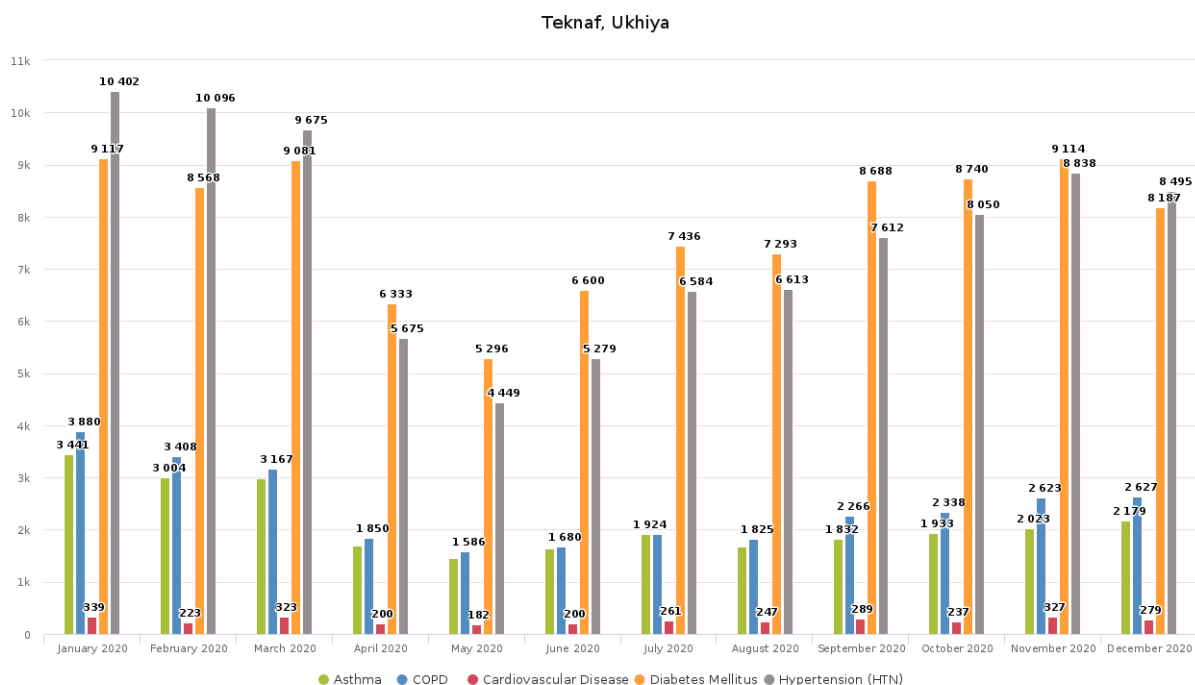


Figure 10 Number of NCD Services provided in Teknaf and Ukhiya during 2020. (DGHS, Bangladesh, 2021)

A key informant supported the discovery found in secondary data, especially between Rohingya refugees, and mentioned a postponement of some NCDs-related activities. *“Six of NCD planned activities for 2020 (or after) have been postponed because of COVID19”* Key Informant

3.2 Burkina Faso

The literature review found no information on health services, especially NCDs, during the COVID-19 pandemic in **Burkina Faso**. Information was found on maternal health, family planning, newborn and children care, but no data pertaining NCDs (PATH, 2021).

Consequently, only primary data was analyzed, revealing an increase in the number of services provided for the main NCDs between 2020/2021 and 2019. The number of people accessed medical screenings for NCDs increased after start of the epidemic compared to before. Respondents also stated that *“the capacities for resuscitation were generally limited, because the NCDs centres were only partially equipped”* Key informant.

3.3 Colombia

The effects of COVID-19 in **Colombia** are similar to the of other countries. Colombia has also recorded an insufficient number of available ICUs that cannot cater to the increasing needs due to the epidemic. The occupancy of ICUs fluctuated in accordance with the COVID-19 cases in the country. In June 2020, occupancy rates by the department did not exceed 1%. Still, they increased drastically between July and October to 60% at the national level and again decreased in November and fluctuated between around 50 and 70% from December 2020 to February 2021. The situation became critical, exceeding 80% of occupation in April and May, coinciding with the third peak of the epidemic, a situation that remained in June 2021 (iMMAP, 2021)

Colombia has a health infrastructure battered by climatic events and armed conflicts, especially in rural areas, coupled with an increasing problem of limited availability of specialized care services for mental health and chronic diseases (iMMAP, 2021). The situation has been made worse by the COVID-19 pandemic, both directly and indirectly. The restrictive measures taken to control the epidemic compromised the transfer of medicines to the urban centers (iMMAP, 2021).

Indeed, there is no rigorous information about the impact of health services beyond the occupation of ICUs. However, some inhabitants of Puerto Nariño and Leticia (Amazonas) believe that there is an impact on these services, including a lack of health personnel due to being infected with COVID-19, increased waiting times in hospitals, disruption of health care and nutrition services (iMMAP, 2021). After about six months from the start of COVID-19, about two-thirds of the departments lacked intensive care, and half of them had intermediate care, the most worrying data being that the beds available in the region could cover only 0.8% of the severe cases expected at the peaks of the epidemic (iMMAP, 2021).

According to the evaluation of Save the Children on the epidemic's impact on the health sector, the health situation is further aggravated by the reduction of non-COVID-19 related health services, including mental health and chronic disease. In Colombia, 98% of respondents perceived an impact on the health system, while 16% stated they could not access any service (iMMAP, 2021). Carelessness and loss of interest of health institutions in NCDs and chronic diseases increased their vulnerability to COVID-19 (iMMAP, 2021) (iMMAP, 2020). The situation applies to the refugees, migrant, and Colombian populations.

3.4 DRC

There is available information on health services during the COVID-19 in general, but no data specifically focuses on NCDs. In DRC, there is a decline in the health services, as mentioned in the report of COVID-19 analysis, *"The country has seen its already fragile health system deteriorate with a demotivated staff and problems with the supply of medical equipment. In addition to these obstacles are the financial barriers to accessing health services and the fear of catching the virus within the infrastructures. This situation has caused a drop in consultations for certain health services and stigmatization of infected people"* (iMMAP, DRC, 2020).

There is a drop in the number of health services during 2020, as a result of government measures and low income that constrained a part of the population to give up on healthcare and to rely on self-medication and the use of plants, *"However, no data could confirm this trend for the month of January"* 2021 (iMMAP, 2021).

3.5 Nigeria

The epidemic and the global rush to respond to COVID-19 by increasing intensive care unit beds, installing ventilators, extending lockdowns, and adopting other containment measures was accompanied by a reduced interest in other health services, which led to disruption of routine health services such as screening and diagnosis, supplies of essential medicines, and access to health service providers and support services (Lai, 2020). Most countries (77%) reported some disruption to the Ministry of Health NCD activities planned for the current year, such as public screening programs for NCDs, which WHO advised countries to suspend during the pandemic, disruption to the implementation of NCD surveys (39%) and suspension of mass communication campaigns (37%) (WHO, 2020). In **Nigeria**, there was a 35% decrease in the number of newly

diagnosed respiratory diseases to 4,477 in July 2021 compared to 6,848 in July 2019 (Federal Ministry of Health , 2021).

The findings revealed that the effect of COVID-19 on NCDs services was evident, according to the Federal Ministry of health, but it needs a rapid assessment according to the key informant.

"The health centers continued to provide the NCDs services to a great extent, but the change in NCDs services is unknown and needs a rapid assessment." Key Informant

The lockdown resulting from the COVID-19 outbreak led to the postponement of some planned NCDs-related activities (WHO, 2021).

3.6 Syria

"Since the beginning of the pandemic, people in northwest Syria (NWS) who suffer from NCDs have been significantly more vulnerable to severe illness or death from COVID-19. This increased risk has been compounded by a general disruption of services for the prevention and treatment of NCDs" (WHO-EM/SYR, 2020).

The COVID-19 pandemic has added further hardship to the care of NCDs by increasing the burden on overstretched health systems, reducing capacity to address NCDs, and disproportionately affecting those with previous health conditions, particularly in low- and middle-income countries, where the majority of refugees reside (Amani Al-Oraibia, 2021). This is the case in Jordan, where NCDs have been identified as the most common health need among **Syrian** refugees, where a large number of people increased the pressure on the health facilities, exceeding the ability of the health care system to provide adequate care (Amani Al-Oraibia, 2021). In addition, many refugees with preexisting chronic diseases worsened because of their condition; psychologically, the experience of conflict, poverty, and displacement have left many individuals with regular feelings of distress, anger, and fear (Dima Al Munajed, 2021).

Before the COVID-19 pandemic, refugees depended on aid provided by the NGOs and humanitarian organizations, but the pandemic has caused serious disruptions in this support, as the movement of humanitarian workers has become restricted, and NGOs suspended assistance to adapt to home-based working (Dima Al Munajed, 2021). The impact of the constraining preventive measures implemented to date means that refugee communities will suffer consequences for months and years to come, with their ability to survive being threatened and an expected long-term health impact for a population already at high risk of NCDs (Paul Moawad, 2020).

The COVID-19 Situation Analysis report issued in April 2021 cited that about 40% of communities where COVID-19 risk indicators were reported mentioned lack of medicines or medical equipment at health facilities, implying that it acted as a barrier to healthcare access in the **northeast**. Similarly, the top priority health needs in the region were the treatment of chronic diseases and medicines. In the **northwest**, in April 2021, this proportion rose to 50% in communities with COVID-19 risk indicators, slightly lower than in March 2021. Treatment for chronic diseases was also a top priority health need (iMMAP, 2021). The situation is repeated in the **GHS**, according to the HeRAMS reports, as access to the NCDs services decreased in public hospitals (see **Table 2**), public health centers (**Table 3**), and private hospitals (**Table 4**). In terms of specific diseases, some improvements were recorded between 2019 and 2020 (WHO/EM/SY, 2021) (WHO/EM/SY, 2021). (WHO/EM/SY, 2021).

Table 2 Comparison between the total NCDs' consultations in Public Hospitals of Syria, MoH, 2019-2020 (WHO/EM/SY, 2021)

	2019	2020	Change %
Cardiovascular	132,270	100,463	-24%
Cancer	231,523	259,842	12%
Diabetes	64,406	45,710	-29%
Diabetic complications	22,901	18,042	-21%
End Stage Kidney Disease (ESKD)	50,895	51,287	1%
Hypertension	97,534	87,794	-10%
Total NCDs	368,006	303,296	-18%

As reflected in **Table 2**, NCDs services treated in public hospitals decreased on average by 18%, ranging between a 29% decrease (for DM), and 12% increase (for Cancer).

Table 3 Comparison of the NCDs' consultations in Public Health centers, Syria, MoH, 2019-2020

	2019	2020	Change %
Asthma & COPD	74,328	65,733	-12%
Cardiovascular	197,865	185,648	-6%
Diabetes	889,825	913,302	3%
Hypertension	446,765	381,989	-14%
Total NCD	1,608,783	1,546,672	-4%

As shown in **Table 3**, the NCDs services provided in public health centers decreased on average by 4% throughout all pathologies, ranging from a 14% decrease for Hypertension to a 3% increase for DM.

Table 4 Comparison of the NCDs' consultations in Private Hospitals, 2019-2020, Syria, Al-Hasakeh Governorate, 2019-2020 (WHO/EM/SY, 2021)

	2019	2020	Change %
Cardiovascular	6,010	5,461	-9%
Diabetes	3,631	3,511	-3%
Diabetic complications	477	305	-36%
ESKD	170	174	2%
Hypertension	4,501	4,570	2%

Total NCD	8,779	8,560	-2%
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Table 4 displays the NCDs services provided in private hospitals, showing an average decrease of 2% between 2019 and 2020, with a 36% decrease for DM complications and a 2% increase for ESKD and Hypertension.

From the primary data, some of the effects of COVID-19 on health services included; the absence of contingency stocks for PHC & NCD, shortages of medicines, and lack of essential medicines and equipment. This means, in particular, the absence of ventilators at public health centers. Only the hospitals that receive severe COVID-19 cases for secondary and tertiary health care interventions have ventilators. Moreover, some isolation centers cannot expand the number of beds and relevant medical equipment (ventilators, ICU beds, and monitors), along with sustainable oxygen sources and oxygen stations. In addition, they face a shortage of certain medicines and lack of strategic stockpiling and contingency stocks.

"There is a decrease in the number of services provided for the main NCDs between 2020 and 2021 compared with 2019 due to: medicines' shortage, lack of access due to fear of infection, curfew and lockdown during the second quarter of 2020. Some outreach services were decreased, as did the number of screened persons for NCDs, due to a lack of accessibility for PHC services including screening ones." Key Informant

4. The effects of COVID-19 on NCDs resources

Data on NCD health expenditure assumed by governments worldwide are scarce. Still, some evidence suggests that resources directed to the COVID-19 response are 174 times higher than what is currently being spent on NCD services (The Defeat-NCD Partnership, 2021). In the Pulse survey, which explored the continuity of essential health services during the COVID-19 pandemic (WHO, 2020), 20% of countries reported that government funds had been reallocated from NCDs to non-NCD services, with seven nations (4%) reporting a loss of more than 50% of the funds. In PAHO region, government budgets for NCDs have largely been preserved. NCD funds have been reallocated in only one country, with more than 50% of these funds redirected to COVID-19. Respondents from 10 countries (36%) reported not knowing whether NCD funds were reallocated to COVID-19 (WHO, PAHO, 2020).

The global landscape is similar, as funds allocated to the COVID-19 response reaching USD 11.3 trillion to date, compared with the USD 371 billion required annual investments to achieve all the targets of SDG 3 in LMICs (WHO, 2010) – not just SDG 3.4 focused on NCDs (Kretchmer, 2020). (The Defeat-NCD Partnership, 2021). In other words, SDG 3 would be fully met by 2030 in LMICs with the amount that has been spent on COVID -19 in just over 6 months.

The majority of LMICs spend significantly less on NCDs every year. Furthermore, in India, similarly to the global trend, we note that the amount spent on NCD care every year barely represents 0.25 percent of the country's spending on tackling COVID-19 (The Defeat-NCD Partnership, 2021). The same applies to humanitarian organizations where NCDs continue to receive little attention from humanitarian organizations in the acute phase of disaster and emergency response (Alessandro Demaio, Courten, & Tellier, 2013).

The shifting focus of health care systems globally to address the COVID-19 pandemic was also reflected in the reassignment of health staff, from NCD facilities to COVID-19 units, in all surveyed countries (low and MIC), as well as the disruption of medical supplies and diagnostics as a result of nationwide lockdowns (Uday Narayan Yadav, 2020). In the Pulse survey, nearly all countries (94%) reported that all or some Ministry of Health staff assigned to NCDs care and risk factors supported the COVID-19 efforts either full time or along with routine NCD activities (WHO, 2020).

4.1 Bangladesh

As previously mentioned, Bangladesh is among the countries most impacted by decreased access to NCD services, exacerbated by the reassignment of health staff (Lai, 2020). The reassignment of dedicated staff will have a further adverse effect on access to healthcare services and treatment adherence by People Living with NCDs (PLWNCDs), especially in many LMICs, such as Bangladesh. Governments in various countries have focused on NCD services while tackling COVID-19, but only 42% of low-income countries have done so compared to 72% of high-income countries (HICs) (Lai, 2020). Moreover, in all cases, there has been a redeployment of healthcare resources – personnel, equipment, and finance – to directly combat and stem the global tide of accelerating numbers of COVID-19 infections (Oluwatomi Owopetu¹, 2021).

The findings of resources reassignment in secondary data are in line with the primary data. “All staff who were allocated to NCDs partially supported COVID-19 efforts, the same situation for the fund to NCDs which been affected by COVID-19 response, but partially.” Key Informant

4.2 Burkina Faso

No information was found in the literature regarding resources reallocation in favor of COVID-19 in **Burkina Faso**. Only primary data has been analyzed.

A key informant survey revealed that the main impact of COVID-19 were new rules and regulations which reallocated resources. Key informants reported that some of the staff working on NCDs had been reallocated to work on COVID-19 response partially. The funds allocated to NCDs had been partially affected by COVID-19 response efforts.

4.3 Colombia

According to PAHO WHO, “The Ministry of Health of Colombia reassigned staff members to work on NCD services have largely been redirected to work on the COVID-19 response, reducing personnel available to manage people with NCDs. Almost all countries (89%, 25/28 countries) reported that some or all NCD staff are supporting COVID-19 efforts either full time or part time” (WHO, PAHO, 2020). “The main reasons cited for disruption of NCD services include cancelation of elective care services (58%, 14/24), clinical staff being re-allocated to COVID response (50%, 12/24), and patients not presenting (50%, 12/24)”. (WHO, PAHO, 2020). Indeed, it was difficult for the countries and health care workers to balance the demand to respond to the COVID-19 pandemic, while maintaining other essential health services (WHO, 2020).

Despite the incomplete information, it is clear that the limited capacities in country raised a need to reallocate resources to fight the COVID-19, and this weakened primary health care services, including NCDs such as DM or HT, especially in the Departments of Chocó and Atlántico, and the

districts of Riohacha and Bogotá. (iMMAP, 2020). Furthermore, ts affected the follow-up of chronic diseases, preventive medical services and NCDs managements (iMMAP, 2020).

4.4 DRC

In DRC, as noted by many organizations operating in the country, the reallocation of staff and equipment to fight the COVID-19 pandemic has affected all other health services. “Much of the staff and equipment available has been mobilized for the COVID-19 response, causing a major risk in the prevention and management of other diseases” (OCHA, 2020). Access to many health services, including management of chronic diseases, was disrupted by the human resources reallocation and focus on COVID-19 pandemic (iMMAP, DRC, 2020).

4.5 Nigeria

There was no information regarding resources reallocation in favor of COVID-19 in **Nigeria**.

The WHO 2020 annual report mentioned a “*Chronic underfunding of the NCD division and other NCD programs*” (WHO, 2021). For Nigeria, only primary data was available to analyze.

Respondents reported that the staff working on NCDs had been partially reallocated and sometimes to combat Covid-19. Additionally, the healthcare workers and health facilities affected NCDs management and care for other programs being re-purposed for COVID-19 response and more funders interested in COVID-19 activities. Key Informant

4.6 Syria

There was little information regarding resources allocation in favor of COVID-19 in Syria, except for what a WHO report mentions concerning the situation in NWS, “the investment in prevention, early diagnosis, screening, treatment and rehabilitation of NCDs has been particularly redirected to support overstretched health facilities in the region during the pandemic” (WHO, 2020). More information was obtained from key informants. One stated that:

“COVID-19 led to new rules and regulations which reallocate the resources (and increase the fund and interest with NCDs)” key informant

In summary, it can be asserted that the resources mobilized to accelerate the development and distribution of the COVID -19 vaccine are unprecedented. The question here is what could be achieved if similar resources were dedicated to improving access to medicines and other health technologies for NCDs. The speed of the COVID-19 response has been made possible by massive public investments that support innovation. Since February 2020, the global public sector has invested over 93 billion in COVID-19 vaccines and related therapies (kENUP Foundation, 2021). A lot more could have been done in the management of NCDs if a similar step had been taken to ensure equitable and affordable access to NCDs essential medicines and technologies.

“Some of the staff working on NCDs been reallocated to work on COVID-19 response, partially and sometimes. The funds allocated to NCDs been partially reallocated to COVID-19 response efforts”. Key Informant

Discussion

The findings suggest that COVID-19 has affected NCDs patients in different ways and varying degrees, with a pronounced effect on access to essential health services (in most countries, except Burkina Faso, where no decrease in access was noticed, according to key informants). The common causes for reduced access to health services were movement restrictions, financial barriers, and cost of health services and medicines (in addition to the rather unstable security situation across the six countries, which impacts the former factors).

The numbers of health services provided varied from country to country, with services decreasing in Bangladesh and Syria between 2019 compared with 2020 (or 2021) and increasing for Burkina Faso. According to a key informant, the number of NCDs services in Burkina Faso increased, with increased attention to NCDs, despite the limited capacity of health centers to receive patients. In Colombia, data scarcity does not allow one to draw conclusions. However, the impression is that the available health services were limited. In both DRC and Nigeria, no information was available from the literature.

The findings also demonstrated the presence of comorbidity between COVID-19 and NCDs, with a synergistic effect. This means that patients with pre-existing NCDs suffer from higher infection rates of COVID-19. As a result, they are more likely to develop severe forms of the disease and complications, which is reflected in higher hospitalization and mortality rates caused by COVID-19. At the same time, COVID-19 patients have a higher probability of being affected by NCDs. These results were identified at the global level and in some national-level literature, but most likely, they can apply to all countries.

The reallocation of resources (human, material, and financial) towards COVID-19-related activities was witnessed to varying degrees across the six countries of this study. Most of the sources mentioned partial and temporary re-allocation of NCDs staff, while information about funds reallocation was mostly non-specific.

These findings shed light on the impact of COVID-19 on NCDs, though, in different ways and to varying extent, in all six countries but Burkina Faso. This is consistent with a trend noticed at a global level. In Burkina Faso, as the findings indicate a limited effect and an increase of health services, further studies might be necessary to explore the exact situation. The security situation and conflicts have been established in this study as factors that contribute to reducing access to health services, though it is difficult to separate between the negative effects of poor security and conflicts on one side and the COVID-19 on the other side.

Additional studies are needed to support these findings and, more importantly, to explore the exact effects of COVID-19 on NCDs, the mechanism of how these effects happen, and how we can avoid these effects in any similar pandemic in the future.

In summary, both direct and indirect effects of COVID-19 are clear. The direct effect of the pandemic on PWNCDs lay in the patient status, and this effect is synergistic, as the NCDs increase the vulnerability of the patient, making them more susceptible to infection, and if infected,

increase the likelihood of severe forms of the disease with worse outcomes. The indirect effects are through the procedures and regulations to tackle the pandemic and affected the NCDs (access, financial, and affordability of medicines and services).

Conclusion

The study aimed to research and document the effects of the COVID-19 pandemic on NCDs in the target countries: Bangladesh, Burkina Faso, Colombia, DRC, Nigeria, and Syria. The COVID-19 pandemic affected NCDs in the targeted countries both directly and indirectly regarding access, NCDs services, resources re-allocation, and morbidity rates of PWNCDs. The governments' preventive measures and regulations indirectly affected the socio-economic status of the populations and their freedom of movement. The latter also impacted health workers and the delivery of medicines and equipment. The combined effect of these factors hindered access to NCDs services.

COVID-19 has indirectly affected NCDs because the governments, in their attempt to fight the pandemic, redirected most of the healthcare resources (both human and financial) away from non-COVID-19 diseases and activities (NCDs included) and towards the pandemic. The effect was even more serious since NCDs were not regarded as high priorities before the pandemic. As a result, NCDs-related services decreased following the pandemic outbreak. There was an overall decrease in access and availability of health services (including trained staff, medicine, and equipment).

There is a synergistic relationship between COVID-19 and NCDs. On the one hand, NCDs make people more susceptible to being infected with the COVID-19 and to developing severe forms of the disease. On the other hand, COVID-19 is more serious for patients with pre-existing NCDs and worsens morbidity and mortality outcomes. This mutually reinforcing relationship sheds light on the necessity to provide special care to protect this vulnerable group.

Many factors affected the NCDs during the COVID-19 pandemic, including security, conflict, social and financial status. Their multiplicity makes it difficult to identify the extent to which they impacted NCDs and the specific impact of the pandemic on the latter.

The research also highlighted the present information gap surrounding NCDs in most studied countries. Therefore, there is a need for more research on NCDs and integration of NCDs at all levels of the health system, including setting up an effective health information system to combat the emerging pandemic of NCDs.

Recommendations

1. Raise awareness amongst humanitarian organizations about the importance of collecting NCD-related indicators and integrate NCDs care services into all health system levels, especially at the PHC level.
2. Embrace teleconsultation, phone-based consultation, and monitoring as means for the provision of telemedicine, and adopt mobile health applications as alternative strategies to solve the problem of facilities' closure and health care access.
3. Integrate NCD-focused training courses for the doctors about telemedicine in their training curriculum.

4. Help overcome access issues, consider home delivery of medicines (depending on mobile health unites).
5. Consider Home health care (home services), supported by well-trained health workers and GPs.
6. Develop well-trusted and accredited websites to offer health information and to share health messages.
7. Empower and maximize the role of patients by providing self-care and management information for patients (via online course, mobile messages, and social media platforms).
8. Integrate NCDs services in the essential health services at all places and levels.
9. An important step is to provide information on self-management behavior changes for NCDs and COVID-19 through SMS and social media platforms.
10. Conduct public health awareness and social behavior change communication campaigns to raise awareness on social media, radio, and other mass media channels to adopt a healthy lifestyle.

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Annexes

1. THE effects of COVID-19 on non-communicable disease: A Case Study of Six Countries Questionnaire

A. ACCESS TO NCD SERVICES

1. Is there a decrease in the access to the NCDs services (in general) due to the COVID-19 (or the procedures taken)?

Yes

No

2. (If yes), what are the main factors that played an important role in decreasing the access to NCDs services?

Access issues

- Restrictions on travel to health centers because of COVID-19
- Loss of income so people can't afford appointments, travel, or drugs
- Opportunity cost has changed with schools closed and increased childcare demands
- Opportunity cost has changed with more temporary or insecure livelihoods
- Other (Please specify)

.....

.....

B. NCD - RELATED HEALTH SERVICES

3. Is there any change in the MoH (WHO, NGO) policy for access to the main NCDs services (Prevention, Surveillance & Screening, Management & treatment)?

- No
- Yes, on some levels (mention)
- Yes, on all levels
- Don't know

4. What are the main NCDs in your country?

- CVD
- DM
- COPD
- Cancer
- Other (Mention)

5. Is there any change in the number of services provided for the main NCDs between 2020 (2021) compared with 2019?

- No
- Yes, (increase, decrease)
- Don't know

Whatever the answer, ask if there is any evidence like reports or statistics

6. Could you please note what NCD-related services have been affected due to COVID-19? (if any)

.....

7. What are the main causes of affecting NCDs by COVID19?

- Covid 19 decreases the immunity of the body towards NCDs
- Covid 19 leads to new rules and regulations which reallocate the resources (and increase the fund and interest with NCDs)
- The financial effect of Covid19 decrease the access to the health services
- Decrease of health workers interest in NCDs
- Other (specify)

.....

8. How does the MoH (WHO, NGO) deal with the disruption of NCDs services because of COVID19?

.....

.....

C. COVID19 effect on N CD screening and surveillance

9. Has the number of people who have access to medical screenings (Number of screened persons for NCDs) changed after the start of the epidemic compared to before?

No, the same (compared with the same number in similar months) or Yes, increased Yes, decreased

I don't know

Explain

10. Does the MoH (or WHO, NGO ...) have a Surveillance system of NCDs?

Yes No

11. Does the MOH collect data on NCD from COVID-19 patients in the Covid19 treatment centers)?

Yes No

12. Does the MoH (or WHO, NGO ...) collect data about the comorbidity (mortality & complications) between the NCDs patient affected by COVID19? Yes No

D. COVID19 related NCDs outcomes and complications

13. Have the outcomes of non-communicable diseases become worse because of COVID19? Yes or No

If yes, how:

A. increase in the number of complications

B. increase in leg amputation

C. increase in Cardiac infarction

D. increase in sudden death

E. increase in Cancer mortality rate

E. other (specify)

14. Is there a worsening of NCDs in the COVID19 infected patients or in all the NCDs patients?

Only in those affected by COVID19 (explain) in All NCDs patients (explain)

E. INFRASTRUCTURE

15. Have MoH staff working on NCDs responsible Health workers in the (WHO, NGO ...) been reallocated to work on COVID-19 response?

- Yes - All staff supporting COVID-19 efforts completely
- Yes - All staff partially supporting COVID-19 efforts partially
- Yes - Only partially, but for full time
- Yes - Partially and sometimes
- No
- Don't know

16. Have NCD centers the needed equipment (especially ventilators) and drugs (especially anticoagulants and antibiotics) to treat the NCDs patient with Covid19?

Yes No only drugs only equipment to some degree (not completely)(explain)

17. Have the COVID-19 centers the needed equipment (especially ventilators) and drugs (especially anticoagulants and antibiotics) to treat NCDs?

Yes No only drugs only equipment to some degree (not completely)(explain)

F. Funding

18. Have the funds allocated by the MoH (WHO, NGO) to NCDs been affected by COVID-19 response efforts?

- No
- Yes, partially
- Yes, completely
- to great extend
- Don't know

19. Is there any additional funding allocated for NCDs in the budget (MoH, WHO, and NGO) after the COVID-19 epidemic?

- Yes
- No
- Don't know

F. POLICIES AND PLANS

20. Have NCD centers continued in their normal work or have been changed to be a part of the COVID-19 response?

- No
- Yes, partially
- Yes completely
- to great extend
- Don't know

21. Do you have a COVID 19 response plan in your country (MoH, WHO, NGO ...)?

- No
- Yes(If Yes, Could you share it)
- Under developing

22. Does this response plan contains NCDs as a part of the essential health services?

- No
- Yes
- Don't know

If yes, could you offer a copy of this plan?

23. Are the main NCDs services included in the list of essential health services of your COVID-19 response plan?

- Yes, completely
- Yes, partially (mention)
- If there are more than the main NCDs mention ...
- Don't know

24. Were there any NCD activities planned for 2020 (or after) that have been postponed because of COVID-19?

- No
- Yes
- Don't know

If yes, could you count?

.....

.....

25. (If Yes, to the previous question) is there any plan for the ministry to reinitiate any suspended NCD services?

- No
- Yes
- Don't know

26. How do you think you can help re-initiate the suspended NCD services?

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2. Research schedule

Timeframe	Deliverable / Tasks
19th July	Start date
19th – 23 rd July	Inductions and introductions
19th – 30 th July	Methodology development & planning
30 th July	Interim Report (5 pages overview methods & questionnaire)
30th July – 23 rd August	waiting for feedback
23 rd – 25 th August	List of secondary data sources and potential respondents
20th –31st August	Data collection
1 st –3 rd September	Communication with the countries directors (and contact the KIs)
6 th September	The questionnaire is ready in KoBo
8 th – 24 September	Data collection KoBo questionnaire
21 st September	First Draft discussion
21 st –26 th September	Update the draft
30 th September	Receiving comments on the draft
5 th October	Sharing the Final draft
22 nd October	Finalization

The outbreak of disease caused by the virus known as Severe Acute Respiratory Syndrome (SARS-CoV-2) or COVID-19 started in China in December 2019. The virus quickly spread across the world, with the WHO Director-General declaring it as a pandemic on March 11th, 2020.

The virus' impact has been felt most acutely by countries facing humanitarian crises due to conflict and natural disasters. As humanitarian access to vulnerable communities has been restricted to basic movements only, monitoring and assessments have been interrupted.

To overcome these constraints and provide the wider humanitarian community with timely and comprehensive information on the spread of the COVID-19 pandemic, IMMAP initiated the COVID-19 Situational Analysis project with the support of the USAID Bureau of Humanitarian Assistance (USAID BHA), aiming to provide timely solutions to the growing global needs for assessment and analysis among humanitarian stakeholders.



BETTER DATA | BETTER DECISIONS | BETTER OUTCOMES

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