

# Adaptation of care for non-communicable diseases during the COVID-19 pandemic: a global case study

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## ABSTRACT

People living with non-communicable diseases (PLWNCDs) are at greater risk of severe COVID-19 illness. This case study highlights the adaptations that were made to humanitarian health programmes in five countries to reduce exposure risk for PLWNCDs during the COVID-19 pandemic. Common adaptations included facility-level administrative and engineering controls, improved triaging, change in prescribing practices, decrease in frequency of stable patient visits, shift to remote consultations and expanded scope of responsibility for existing community health workers. Despite fears of the impact on health service utilisation, PLWNCDs continued to seek services and changes in utilisation rates between the pre-COVID-19 and COVID-19 periods were attributed more to factors like population changes, COVID-19 travel restrictions, closure of other health services, and enhanced health education and community engagement. This study highlights the resilience and creativity of frontline health staff and managers, and their ability to make quick shifts in service delivery modalities in response to changes in risk for client groups in accordance with the evolving contextual reality. Other contextual changes such as infectious disease outbreaks, conflicts and natural disasters happen regularly within humanitarian settings, and specific groups are often more at risk. With more specific information about risks for different client groups, targeted approaches can be done to ensure that those most at risk of a specific threat are able to ensure access to sustained services.

## INTRODUCTION

In March 2020, COVID-19 was declared a global pandemic. Early in the pandemic, there was evidence that people living with pre-existing non-communicable diseases (NCDs), such as cardiovascular diseases (CVDs), obesity and overweight, and diabetes, were especially vulnerable to severe illness from COVID-19.<sup>1</sup> This led to fear that health services would be quickly overwhelmed if vulnerable patients

## SUMMARY BOX

- ⇒ Despite fears of impact on health service utilisation, non-communicable disease (NCD) services in five humanitarian sites were not impacted by facilities being overwhelmed by patients with COVID-19.
- ⇒ Changes in utilisation were primarily attributed to external contextual factors.
- ⇒ Health programmes adapted care models to ensure the safety of care for people living with NCDs during the pandemic.
- ⇒ Common adaptations included facility-level administrative and engineering controls, improved triaging, change in prescribing practices, decrease in stable patient visits, shift to remote consultations and expanded scope of responsibility for existing community health workers.
- ⇒ This study highlights how programmes can make quick shifts in service delivery modalities in response to changes in risk for client groups in accordance with the evolving contextual reality.
- ⇒ With more specific information about risks for different client groups, targeted approaches can be done to ensure that those most at risk of a specific threat are able to ensure access to sustained services.

with chronic conditions were exposed to COVID-19. It was anticipated that this would overstretch available resources, interrupt the provision of basic services and impact patient access to healthcare. This fear was reinforced by the WHO global assessment in May 2020 that found more than half (53%) of countries evaluated had partially or completely disrupted NCD services.<sup>2</sup>

To complement the guidance developed by the WHO and the United Nations Refugee Agency (UNHCR), the International Rescue Committee (IRC) released a guidance note for care of chronic conditions during the COVID-19 pandemic in April



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2020. It summarised the steps that programmes should take to ensure continued access to care for people living with NCDs (PLWNCDs) while limiting their exposure to COVID-19. Guidance was provided on key considerations for service planning and remote case management methodologies to reduce exposure and limit contact with health facilities. The guidance note was introduced through remote webinars and guidelines notes (in Arabic, French and Spanish). Health Technical Advisors monitored programme adaptations and provided ongoing additional assistance.

## GLOBAL CASE STUDY

This case study aimed to identify adaptations implemented for PLWNCDs care during the COVID-19 pandemic across five IRC programme sites. The case study also aimed to examine if adaptations were effective at ensuring continuity of care and prevention of complications, and if they could be transferred to other areas of primary healthcare (PHC) during outbreaks in humanitarian contexts.

All 14 IRC country programmes managing NCDs were invited to participate in the study. Five countries—Jordan, Kenya, Somalia, Thailand and Uganda—were included based on the following criteria: (1) PHC services that include care for NCDs, (2) availability of data on NCD service provision during 2019 and 2020, (3) willingness to participate in the data collection activities. Myanmar originally met the eligibility criteria but did not participate due to political instability at the time of the study. Four of the five countries are refugee hosting sites (Jordan, Kenya, Thailand and Uganda) and Somalia is categorised as a complex humanitarian crisis<sup>3</sup> with both internally displaced people and host community members affected by conflict.

The case study was conducted using a mixed-methods observational approach combining both quantitative and qualitative data. Data were collected between February and March 2021. Three main data collection methods were used: (1) online survey, (2) focus group discussions (FGDs) and (3) collection of quantitative service utilisation data.

The online survey was designed using Google Forms and completed by IRC health team members from the five countries. Eleven participants completed the survey after an informed consent. The data collected from the online survey were analysed using Excel and descriptive statistics were used to summarise quantitative drivers and added to content analysis for open-ended questions.

Five FGDs were conducted. Thirty-eight people participated across the five FGDs, including staff from the IRC Headquarters' Global Health Unit and 29 staff participated in the country calls (Somalia (n=2), Uganda (n=4), Kenya (n=4), Jordan (n=9), Thailand (n=10)). The FGDs were conducted in English, online via Microsoft Teams, using a standard question guide with probing. An online interactive board (Google Jamboard) was

also used for participants to write anonymous responses. Data collected through the Jamboard were cleaned and put into an Excel spreadsheet. Two independent coders manually coded the data to reduce intercoder variability. The transcripts were marked with codes to catalogue key concepts and preserve their context. The codes were inductively clustered into themes and categories that represent key issues with NCD services and compared to yield an overview of the trends. Data saturation was also checked to ensure that all the topics in the interview guide were covered by the conceptual model. The data were then analysed in Excel using a thematic framework.

Service utilisation data were analysed and presented using frequencies and percentages. Trend analysis was conducted over the 24-month period. The data were disaggregated by gender and condition. Additional analysis was conducted to determine if there were differences in utilisation based on gender within and across countries and was further tested using the independent sample t-test, assuming unequal variance. The level of significance was reported at  $p < 0.05$ .

## LEARNING FROM THE CASE STUDY

This global case study provided in-depth learning about adaptations made by each country programme during the pandemic in ensuring a safe continuity of care for PLWNCDs.

### Guidance used during the COVID-19 pandemic

During the FGDs, participants across all countries mentioned using guidance to support COVID-19 programme adaptations. All countries reported using some combination of guidance from the following sources: local Ministry of Health (MoH), WHO, Médecins Sans Frontiers, UNHCR, Centers for Disease Control and Prevention, and IRC. Guidance was used to develop context-appropriate adaptations, including country-specific standard operating procedures. Participants reported the guidance from the IRC being useful at the management level, but others reported that it was too simplistic and needing more comprehensive guidance on clinical care for PLWNCDs.

### Main programme adaptations during COVID-19

Participants across all countries reported making programme adaptations to ensure the safety of care for PLWNCDs during the pandemic. The most common reported adaptations were: (1) facility-level administrative and engineering controls, (2) triaging to improve safety of care for patients, (3) change in prescribing practices, frequency of consultations and shift to remote consultations, and (4) expanded scope of responsibility for existing community health workers (CHWs). A table of the main adaptations can be found in [table 1](#).

### Facility-level administrative and engineering controls

Changes in administrative and engineering controls were made across all countries. These included changes in the

**Table 1** List of adaptations and their examples\*

Adaptation	Description	Examples
Facility-level administrative and engineering controls	Changes were made in all five settings to the way staff were working: isolating persons from the hazard through organisational, physical and/or mechanical means.	<ul style="list-style-type: none"> <li>▶ Adapting waiting bays to ensure social distancing</li> <li>▶ Allocating more staff for NCD care</li> <li>▶ Expanding stable patient review periods—from 1 month to 2 months</li> <li>▶ Strengthening infection, prevention, control measures</li> <li>▶ Setting up contingency/preparedness plans</li> <li>▶ Provision of PPE to all staff</li> <li>▶ Avoid long waiting times for patients visiting clinics (spread clinic hours)</li> <li>▶ Designated areas/days for PLWNCDs</li> <li>▶ Activation of appointment systems</li> </ul>
Triaging to identify priorities	Patients were screened upon their first contact with the healthcare system in all five settings. The triaging process has helped to identify priorities, individuals who have suspected or confirmed COVID-19, and control the transmission.	<ul style="list-style-type: none"> <li>▶ Screening to identify PLWNCDs (patients with NCDs were identified as high-risk group)</li> <li>▶ NCD yellow cards (to protect clients with NCDs)</li> <li>▶ Placing a sustainable system with high index of suspicion</li> </ul>
Changes in delivery of clinical care	Changes to prescribing practices have played a pivotal role in all settings during the pandemic. It was shown that programmes have extended the validity of prescriptions issued from 1 month to 2 or 3 months for medication supply of patients with NCD (for stable patients). The frequency of NCD consultations was reduced for stable patients in order to prevent the local transmissions of COVID-19.	<ul style="list-style-type: none"> <li>▶ Allocating more staff for NCD care</li> <li>▶ Designated nurse</li> <li>▶ Working with referral hospitals to adjust follow-ups</li> <li>▶ Implementing telemedicine</li> <li>▶ Halting all non-medical emergency referrals to tertiary facilities</li> <li>▶ Extended prescriptions</li> </ul>
Expanded scope of responsibility for existing community health workers (CHWs) network	There is evidence from all five countries that CHWs are well positioned to play a key role in the community-level fight against the pandemic. The CHWs were required to perform pandemic-related activities and provide critical care services to bridge the gap between health facilities and patients with NCD.	<ul style="list-style-type: none"> <li>▶ Screening at community and health facility level</li> <li>▶ Public health information strategies were developed and adopted for PLWNCDs and their families</li> <li>▶ House visits (when permissions are granted)</li> <li>▶ Delivery of medications and other supplies</li> <li>▶ Mentoring individual patient compliance</li> <li>▶ Integrated outreaches</li> </ul>

\*Data included in this table were generated from FGDs and the online survey.

FGDs, focus group discussions; NCD, non-communicable disease; PLWNCDs, people living with NCDs; PPE, personal protective equipment.

organisation, flow and isolation of patients that aimed to reduce exposure to COVID-19 among vulnerable patients. For example, in Kenya, they adapted the waiting bay to ensure patients could maintain the recommended 6-foot distance and spread clinic hours across both mornings and afternoons to reduce congestion at the clinic.

#### Triaging to identify priorities

All teams did temperature and symptom screening of patients through triage. Reported mechanisms to reduce exposure for PLWNCDs included: (1) designated areas for PLWNCDs when arriving at the health facility (Somalia), (2) NCD yellow cards for PLWNCDs so that they could be more readily identified from the general

population (Kenya), (3) patients with NCD to check their vitals before appointment (Jordan).

#### Changes in delivery of clinical care

All countries made changes in the delivery of clinical care to PLWNCDs, especially clinically stable patients. Adjustments to care included changes in prescribing practices, decreases in the frequency of consultations, changes in health workforce to better accommodate the needs of PLWNCDs and a shift to remote consultations. A main recommendation in the IRC guidance was to increase the allocation of medicines for patients in stable conditions to reduce the frequency of health facility visits. This recommendation was adopted in all countries, at some point during the pandemic. There was variety

in the supply of medicines provided, from a 1-month, 2-month or 3-month supply. However, such adjustments were obstructed due to supply chain issues and available budget which in turn created challenges for medication-adherence monitoring in most countries. In Jordan and Thailand, the CHWs did regular home visits, including checking on medication adherence for stable patients and home delivery for medications. It is unclear what percentage of stable patients in each country received a change in the medication allocation and for how long this change was in effect.

The frequency of NCD consultations was reduced for stable patients with NCD in all countries to prevent exposure. Changes were made to the health workforce to better accommodate the needs of PLWNCDS. For example, in Kenya, they allocated more staff for NCD care, and in Somalia they designated an 'NCD nurse focal point' for PLWNCDS. In Thailand, they assigned a separate NCD team with specific NCD clinic day and made arrangements for an IRC staff person to get NCD medicines for patients from the district hospital. In Jordan, they established an adapted appointment system for PLWNCDS.

Kenya, Somalia, Uganda and Jordan reported introducing some remote clinical support. Different approaches were used including simple follow-up calls, toll-free numbers providing referrals and guidance, structured calls for remote patient monitoring, real-time telemedicine and the use of mobile apps such as WhatsApp. The Kenya team had a special WhatsApp group for CHWs to support PLWNCDS, while in Somalia, they developed an adapted NCD register that allowed them to include patients' phone for contact and asynchronous telemedicine. In Jordan, they implemented remote consultations, which was successful based on good network coverage, a strong health information system and strong digital literacy. To accompany the remote consultations, the Jordan team also introduced 'e-prescriptions'. The Thailand programme was not able to do remote clinical support due to limited internet access in the camps.

#### Expanded scope of responsibility for existing community health workers network

All countries reported using the pre-existing CHWs network to improve care for PLWNCDS, often increasing their pre-COVID-19 responsibilities. CHWs supported follow-ups after appointments, medication adherence, provision of health education and referrals. In Jordan, Somalia and Thailand, CHWs provided medications to stable patients at their home, followed up on medication adherence and identified patients needing referrals.

#### Utilisation of clinical services

At an aggregate level, across the five countries, there was a statistically significant (27%) increase ( $p=0.001$ ) in reported OPD (outpatient department) consultations comparing the 12 months preceding the start of the COVID-19 pandemic (pre-COVID-19), to the first

12 months of the pandemic (COVID-19 period) (see [table 2](#)). This increase was not observed with NCD consultations, as there was a small non-significant decrease of 4% ( $p=0.240$ ) in reported NCD consultations between both periods. Of the OPD consultations, the proportion of NCD consultations changed, with 9% during pre-COVID-19 and 7% during the COVID-19 period.

This global aggregation hides differences between countries. Of the five countries, two had a decrease in both OPD consultations (Jordan: -63% ( $p<0.001$ ); Thailand: -33% ( $p<0.001$ )) and NCD consultations (Jordan: -47% ( $p<0.001$ ); Thailand: -10% ( $p=0.059$ )), and three countries had increases in both OPD consultations (Kenya: 23% ( $p=0.011$ ); Somalia: 64% ( $p=0.007$ ); Uganda: 58% ( $p<0.001$ )) and NCD consultations (Kenya: 33% ( $p=0.012$ ); Somalia: 96% ( $p=0.005$ ); Uganda: 43% ( $p=0.002$ )). There was no change in the distribution of reported OPD and NCD consultations across both genders during the pre-COVID-19 and COVID-19 periods.

The decrease in Jordan was attributed to the pre-COVID-19 strategic decision to refer clients to the MoH facilities, as well as the full lockdown in Jordan which contributed towards decreased ability to travel for consultations. In Thailand, the decrease was attributed to an 8% drop in the refugee population from 2019 to 2020, and the COVID-19 movement restrictions that restricted refugees working outside the camps to not to be able to return to their usual care, and non-refugees (Thai national and migrants from Myanmar) not being able to travel to the camps to access health services.

The increase in consultations in Kenya was attributed to increased incidence of common communicable diseases, UNHCR's enforcement of the encampment policy that resulted in urban refugees moving back to the refugee camps, improved data collection, and a general increase in health seeking behaviour due to children being out of school and enhanced community engagement. The increase in Somalia was attributed to restrictions of public and private hospitals to stay open, which resulted in patients coming to IRC clinics that remained open and accessible, and enhanced community engagement and outreach. The increase in Uganda was attributed to increased screening for NCDs and improved tracking systems that better captured the consultations that were conducted for new and continuing clients.

#### Cardiovascular diseases, hypertension and diabetes mellitus consultations

While there was an overall insignificant decrease of 4% ( $p=0.240$ ) reported NCD consultations across all five countries, the total number of reported CVDs, hypertension (HTN) and diabetes mellitus (DM) consultations increased by 25% ( $p<0.001$ ), 3% ( $p=0.398$ ) and 5% ( $p=0.290$ ) each from pre-COVID-19 and the COVID-19 period ([table 3](#)). Consultations for CVDs decreased in all countries, except for Uganda. For HTN and DM consultations, the trend was consistent with the NCD and OPD

**Table 2** Outpatient department (OPD) and non-communicable disease (NCD) consultations across countries and reported variances during pre-COVID-19 and COVID-19 periods as n (%)

OPD	Pre-COVID-19*			COVID-19†			Variance		
	All	Male	Female	All	Male	Female	All	Male	Female
Jordan	140947 (10)	40281 (3)	100666 (7)	52098 (3)	10378 (1)	41720 (2)	-88,849 (-63)	-29,903 (-21)	-58,946 (-42)
Kenya	338983 (23)	168815 (12)	170168 (12)	415397 (22)	201579 (11)	213818 (12)	76414 (23)	32764 (10)	43650 (13)
Somalia	144358 (10)	53586 (4)	90772 (6)	236882 (13)	88877 (5)	148005 (8)	92524 (64)	35291 (24)	57233 (40)
Thailand	188905 (13)	80226 (6)	108679 (7)	125873 (7)	52524 (3)	73349 (4)	-63 032 (-33)	-27 702 (-15)	-35 330 (-19)
Uganda	645214 (44)	253 736 (17)	391 478 (27)	1 020 314 (55)	394 840 (21)	625 474 (34)	375 100 (58)	141 104 (22)	233 996 (36)
<b>Total</b>	<b>1 458 407 (100)</b>	<b>596 644 (41)</b>	<b>861 763 (59)</b>	<b>1 850 564 (100)</b>	<b>748 198 (40)</b>	<b>1 102 366 (60)</b>	<b>392 157 (27)</b>	<b>151 554 (10)</b>	<b>240 603 (16)</b>
<b>NCD</b>									
Jordan	42677 (33)	15495 (12)	27182 (21)	22482 (18)	7812 (6)	14670 (12)	-20 195 (-47)	-7683 (-18)	-12 512 (-29)
Kenya	15697 (12)	6696 (5)	9001 (7)	20952 (17)	8839 (7)	12113 (10)	5255 (33)	2143 (14)	3112 (20)
Somalia	7187 (6)	2477 (2)	4710 (4)	14051 (11)	5413 (4)	8638 (7)	6864 (96)	2936 (41)	3928 (55)
Thailand	45986 (36)	14885 (12)	31101 (24)	41304 (34)	13070 (11)	28234 (23)	-4682 (-10)	-1815 (-4)	-2867 (-6)
Uganda	16712 (13)	5730 (4)	10983 (9)	23829 (19)	7434 (6)	16395 (13)	7117 (43)	1704 (10)	5412 (32)
<b>Total</b>	<b>128259 (100)</b>	<b>45283 (35)</b>	<b>82977 (65)</b>	<b>12,2618 (100)</b>	<b>42568 (35)</b>	<b>80050 (65)</b>	<b>-5641 (-4)</b>	<b>-2715 (-2)</b>	<b>-2927 (-2)</b>

\*March 2019–February 2020.

†March 2020–February 2021.

**Table 3** Cardiovascular disease (CVD), hypertension (HTN) and diabetes mellitus (DM) consultations across countries and reported variances during pre-COVID-19 and COVID-19 periods as n (%)

CVD	Pre-COVID-19*			COVID-19†			Variance		
	All	Male	Female	All	Male	Female	All	Male	Female
Jordan	108 (1.54)	57 (0.81)	51 (0.73)	16 (0.18)	1 (0.01)	15 (0.17)	-92 (-85)	-56 (-52)	-36 (-33)
Kenya	193 (2.74)	84 (1.19)	109 (1.55)	157 (1.78)	58 (0.66)	99 (1.13)	-36 (-19)	-26 (-13)	-10 (-5)
Somalia	42 (0.6)	22 (0.31)	20 (0.28)	25 (0.28)	11 (0.13)	14 (0.16)	-17 (-40)	-11 (-26)	-6 (-14)
Thailand	2845 (40.45)	1121 (15.94)	1724 (24.51)	2397 (27.25)	953 (10.83)	1444 (16.42)	-448 (-16)	-168 (-6)	-280 (-10)
Uganda	3845 (54.67)	980 (13.93)	2865 (40.74)	6201 (70.5)	1525 (17.34)	4676 (53.16)	2356 (61)	545 (14)	1811 (47)
<b>Total</b>	<b>7033 (100)</b>	<b>2264 (32)</b>	<b>4769 (68)</b>	<b>8796 (100)</b>	<b>2548 (29)</b>	<b>6248 (71)</b>	<b>1763 (25)</b>	<b>284 (4)</b>	<b>1479 (21)</b>
<b>HTN</b>									
Jordan	20402 (35.48)	7165 (12.46)	13237 (23.02)	17195 (29.06)	6022 (10.18)	11173 (18.88)	-3207 (-16)	-1143 (-6)	-2064 (-10)
Kenya	8108 (14.1)	3187 (5.54)	4527 (7.87)	10612 (17.93)	4202 (7.1)	6064 (10.25)	2504 (31)	1015 (13)	1537 (19)
Somalia	1912 (3.32)	673 (1.17)	1228 (2.14)	3917 (6.62)	1581 (2.67)	2332 (3.94)	2005 (105)	908 (47)	1104 (58)
Thailand	22768 (39.59)	7588 (13.2)	15180 (26.4)	21034 (35.55)	7074 (11.96)	13960 (23.59)	-1734 (-8)	-514 (-2)	-1220 (-5)
Uganda	4315 (7.5)	1112 (1.93)	3203 (5.57)	6412 (10.84)	1478 (2.5)	4934 (8.34)	2097 (49)	366 (8)	1731 (40)
<b>Total</b>	<b>57505 (100)</b>	<b>19725 (34.3)</b>	<b>37375 (64.99)</b>	<b>59170 (100)</b>	<b>20357 (34.4)</b>	<b>38463 (65)</b>	<b>1665 (3)</b>	<b>632 (1)</b>	<b>1088 (2)</b>
<b>DM</b>									
Jordan	13569 (43)	4774 (15)	8795 (28)	11144 (33)	3934 (12)	7210 (22)	-2425 (-18)	-840 (-6)	-1585 (-12)
Kenya	5094 (16)	2312 (7)	2752 (9)	7108 (21)	3171 (9)	3917 (12)	2014 (40)	859 (17)	1165 (23)
Somalia	3202 (10)	938 (3)	2261 (7)	5362 (16)	1749 (5)	3606 (11)	2160 (67)	811 (25)	1345 (42)
Thailand	8456 (27)	1887 (6)	6569 (21)	7756 (23)	1622 (5)	6134 (18)	-700 (-8)	-265 (-3)	-435 (-5)
Uganda	1572 (5)	594 (2)	978 (3)	2049 (6)	754 (2)	1295 (4)	477 (30)	160 (10)	317 (20)
<b>Total</b>	<b>31893 (100)</b>	<b>10505 (33)</b>	<b>21355 (67)</b>	<b>33419 (100)</b>	<b>11230 (34)</b>	<b>22162 (66)</b>	<b>1526 (5)</b>	<b>725 (2)</b>	<b>807 (3)</b>

\*March 2019–February 2020.

†March 2020–February 2021.

consultation trends, with declines in Jordan and Thailand, and increases in Kenya, Somalia and Uganda.

Uganda was the only country where consultations increased in all areas: CVD by 61%, HTN by 49% and DM by 30%, along with an increase in overall NCD consultations by 43%. For Jordan, there was a significant decline in CVD consultations by 85% ( $p=0.016$ ), in DM consultations by 30% ( $p=0.002$ ) along with a decline of 15% ( $p=0.005$ ) for HTN consultations compared with a 47%

( $p<0.001$ ) decrease in NCD consultations. The higher decrease in CVD consultations was attributed to CVDs requiring advanced lab investigations and referrals to secondary level care, more than the other conditions.

Thailand experienced a decline in HTN, CVD and DM, but the decline in CVD was the only one that was significant ( $p=0.038$ ). Kenya and Somalia both had decreases in CVD but increase in HTN and DM. The decrease in CVD in Somalia was attributed to patients perceiving that

it was less likely to receive care for CVD at the PHC level during the pandemic, and in Kenya, it was attributed towards limited referrals leading to patients being less likely to seek care at the PHC level.

## CONCLUSION

This study highlights the resilience of humanitarian front-line staff and actors in maintaining services for PLWNCDS during the COVID-19 pandemic. All programmes used existing guidance to adapt care models for their context. These adaptations included facility-level administrative and engineering controls, triaging to improve safety of care, change in prescribing practices, frequency of consultations and shift to remote consultations, and expanded scope of responsibility for existing CHWs.

These adaptations seemed to work, at least in their ability to maintain access to services for PLWNCDS since health service utilisation was not drastically affected in any country, when comparing the two periods. However, the study was not able to determine if the adaptations were effective at reducing the risk of COVID-19 for PLWNCDS, as there were no data on COVID-19 incidence among PLWNCDS vis-à-vis people living without an NCD. We were unable to assess impact on inpatient service utilisation by PLWNCDS due to lack of data. Further evidence is needed to confirm the impact of adjusting the frequency of visits for stable patients with NCD and other suitable follow-up procedures, and their impact on the reduction of COVID-19 exposure. Future analyses should focus on clinical outcomes as well as patient-reported outcomes and the effect of COVID-19 risk on PLWNCDS in order to strengthen the evidence on adaptations and their impact on the prevention of secondary complications of NCDs. Future studies should also assess patient safety and compliance with adapted care models, and the cost-effectiveness of the continuation of some of these adaptations for care of PLWNCDS after COVID-19.

The learning from this case study is relevant to other services delivered through a PHC system. This study emphasises the quick shift in service delivery modalities in response to changes in risk for client groups in accordance with the evolving contextual realities. During this period, the adjustments were due to COVID-19, but other contextual changes such as infectious disease outbreaks, conflicts and natural disasters happen regularly within humanitarian settings. This case study highlights that with more specific information about risks for

different client groups, targeted approaches can be done to ensure that those most at risk of a specific threat are able to ensure access to sustained services.

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