

Assessment of the non-communicable diseases kit for humanitarian emergencies in Yemen and Libya

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ABSTRACT

Emergency health kits are a vital way of providing essential medicines and supplies to health clinics during humanitarian crises. The WHO non-communicable diseases (NCDs) kit was developed 5 years ago, recognising the increasing challenge of providing continuity of care and secondary prevention of NCDs and exacerbations, in such settings. Monitoring and evaluation of emergency health kits is an important process to ensure the contents are fit for purpose and to assess usability and utility. However, there are also challenges and limitations in collecting the relevant data to do so.

This Practice paper provides a summary of the key methodologies, findings and limitations of NCD kit assessments conducted in Libya and Yemen. Methodologies included a combination of semistructured interviews, surveys with healthcare workers, NCD knowledge tests and quantifying the remaining contents. The kit was able to support the vital delivery of NCD patient care in some complex humanitarian settings and was appreciated by health facilities. However, there were also some challenges affecting kit use. Some kit contents were found to be in greater or lesser quantities than required, and medicine brands and country of origin affected acceptability. Supply chains were affected by the humanitarian situations, with some kits being held up for months prior to arrival. Furthermore, healthcare staff had received limited NCD training and were unable to dispense certain medicines, such as psychotropics, at the primary care level. Further granularity of kit modules, predeployment facility assessments, increased NCD training opportunities and a monitoring system could improve the utility of the kits.

INTRODUCTION

WHO developed standardised health kit to provide medications and supplies during humanitarian emergencies. Kits are based on WHO's Essential Medicines list and treatment guidelines and the contents are reviewed and adapted regularly.¹ As part of its commitment to improving access to non-communicable disease (NCD) services in humanitarian settings, WHO developed the NCD Kit

SUMMARY BOX

- ⇒ Each WHO non-communicable disease (NCD) kit is designed for a primary healthcare facility and contains medicines and supplies needed for the estimated NCD burden in a population of 10 000 people in the Eastern Mediterranean Region.
- ⇒ An assessment of the kit was undertaken at three facilities in Yemen and three facilities in Libya.
- ⇒ A combination of qualitative and quantitative data was collected through interviews with stakeholders and clinic managers, surveys and knowledge tests with clinic staff, and quantification of medicines remaining in clinics after kit use.
- ⇒ The kit was appreciated in the settings assessed and most medicines and supplies were used.
- ⇒ There were some challenges to kit use including supply chain and delivery issues, quantities of kit contents, poor monitoring and evaluation systems, and a lack of training on NCDs.

(NCDK) through its Regional Office for the Eastern Mediterranean (EMRO) in 2016.² The kit was initially deployed in emergency countries and territories in WHO EMRO (Yemen, Syria, Libya, Afghanistan, Iraq and the occupied Palestinian territories), WHO Africa Regional Office (Ethiopia, DRC, South Sudan), WHO Southeast Asia Regional Office (Bangladesh) and was also prepositioned in WHO regional hubs (Dubai, UAE). The kit consists of five submodules organised by NCD type and is aligned to the WHO Package of Essential Noncommunicable Disease Services,³ which aims to increase access to NCD care at primary healthcare (PHC) level and prevent NCD complications. Each kit contains medications and equipment to support NCD diagnosis and treatment for a population of approximately 10 000 people, over a 3-month period when there is disruption to routine services.

In 2018, WHO EMRO undertook assessments in Syria and Iraq to review the utility,

usability and acceptability of the NCDK. The International Rescue Committee (IRC) and WHO EMRO partnered in 2019 to conduct a detailed assessment of the kit in Yemen and Libya. The purpose of the assessment was to review the NCDK usage and limitations, to inform future adaptations and revisions of the kit contents and rollout process. The assessment also aimed to understand how the NCDK was being used, to explore its acceptability by clinic staff and to review NCD knowledge among health-care workers.

Yemen and Libya were selected as assessment sites as the NCDK had been rolled out in several facilities in both countries, both were affected by complex humanitarian situations,⁴⁵ and have a significant burden of NCDs.⁶⁷

SETTING

In Yemen, all three facilities were Hospitals/Tertiary care centres located in Shabowa governorate and staffed by various cadres of health worker including generalist and specialist doctors, nurses, health assistants, pharmacists, etc. The estimated combined catchment population was 222 000. Two facilities reported being supported by WHO and other organisations. Due to the poor M&E infrastructure, it was difficult to get a catchment population for each health facility to quantify the number of potential patients with NCD. The analysis of priority NCD services offered showed that facilities generally offer services related to hypertension and asthma/COPD, while services for diabetes and epilepsy treatment are only offered rarely. Several facilities noted limited services; for example, one facility offered Diabetes treatment for emergencies only, while another facility only treats Asthma and Chronic obstructive pulmonary disease (COPD) when they have Salbutamol available. Mental health services are generally not offered at these facilities, apart from one facility, which provides treatment for anxiety, depression, and psychosis when medications are available and when an external specialist has already diagnosed the patient.

In Libya, two facilities were primary health clinics/posts and one was marked as 'other' without providing specifications. They are staffed by generalist doctors, nurses, health assistants, pharmacists, etc. Two facilities were in Tripoli governorate and one in Zanjur district. The total catchment population for these facilities was estimated to be 90 000 adults and adolescents. Due to the same observations in Yemen, it was difficult to verify the catchment population for each health facility and quantify the number of patients with NCD. During the assessment period the IRC supported one of the clinics through an Essential Package of Health Services project, but the other facilities were not directly supported by the IRC or other NGOs. The capacity at the facilities was good for diagnosing and treating the priority NCDs (hypertension and diabetes). Two facilities did not have the capacity to diagnose asthma/COPD, and all three facilities did not diagnose mental health conditions including epilepsy. Only one facility provides epilepsy treatment.

Kit assessment methodology

This retrospective assessment was conducted through a mixed-methods approach (quantitative and qualitative). Table 1 lists the data collection tools, their description and the data collection process. Data collectors were trained remotely via Microsoft Teams, and continuously mentored by study leads. Tools were adjusted after an initial pilot in one health facility in each country.

In Yemen, the assessment took place in three facilities in Shabowa governorate at least 3 months after receiving the NCDK. In Libya the assessment was conducted in three facilities in the Tripoli area approximately 6 months after receiving the kit.

FINDINGS FROM THE KIT ASSESSMENT

Predeployment needs assessment

The readiness to use the NCDK prior to their deployment was low, with limited pre-existing NCD integration at the primary care level in both countries. None of the facilities assessed offered both diagnostic and treatment services for all priority NCDs (hypertension and cardiac conditions, diabetes and endocrine conditions, chronic respiratory diseases, and mental health and neurological conditions). In Yemen, the lack of electricity at the facility level limited capacity to store insulin and thus manage type 1 diabetes.

Key informants described challenges prior to NCDK deployment in both countries, related to meeting the growing burden of NCDs given medication, equipment and staff shortages. In Libya, political fragmentation and fall of government systems contributed to these issues. In Yemen, the importation of medicines, medical supplies and equipment is a very arduous and bureaucratic process that required several steps to gain approvals and delayed all operations. In both contexts, there was a lack of information around NCD medications and equipment availability due to weak or non-existent data systems. There was no systematic needs assessment done in either context.

Quantification of kit content utilisation

Analysis of the data on the kit contents available in the facilities when the assessment took place indicated a significant lack of essential NCD medicines and supplies in all facilities in Yemen, showing a scarcity of the most basic NCDs medicines even after obtaining the NCDK. In Libya, availability of medicines and supplies varied widely by facility, with a dearth of essential medicines and supplies to a lesser extent than Yemen.

Logistical capacity, repackaging and delays with kit distribution

In both countries, limited planning and coordination prior to NCDK distribution resulted in logistical challenges and low facility readiness. In Yemen, the NCDK was not delivered to the central warehouse in Abyan before distribution, which was thought to result in poor coordination, insufficient monitoring and lack of decision making by the central Ministries of Health. There were also challenges with importation and complaints

Table 1 Data collection methods and processes

Method	Tool description	Data collection process
Stakeholder Interviews	Semistructured interviews guides for collecting general information on the relevance of the NCDK. Different guides used for interviews with health facility managers and stakeholders.	Two sets of Key Informant Interviews were conducted. Interviews with health facility managers were conducted in person. Reverse translation for Arabic were done. Two health facility staff were interviewed in Libya and seven in Yemen. Interviews with key stakeholders were conducted remotely, in English, by IRC Headquarters (HQ) head staff. Three stakeholders (two from MoH and one from WHO) were interviewed from Yemen, and one from Libya (WHO). A qualitative analysis was conducted using a theoretical framework to organise quotations from the interviews. The thematic analysis was organised to capture the following themes: NCD burden, diagnosis, drugs/ equipment, staff and training, guidelines, kit logistics, kit impact on quality of care, and future plans for NCD care.
Health Facility Assessment: (adapted from the WHO HEARTS Tool)	Survey to collect information around the health system infrastructure and availability of services.	Data were collected retrospectively, after the kit had been used for at least 3 months, through observations and interviews with health facility staff. Information was recorded on Tablet computers using KoBoCollect.
Medication Supplies-General	Survey to collect supply chain information to assess whether the NCDK were received and stored appropriately.	Data were collected retrospectively, after the kit had been utilised for at least 3 months through observations and interviews with health facility staff using a standardised tool. Information was recorded on Tablet computers using KoboCollect.
Medication Supplies-Stock List: (adapted from the Dharma Tool)	Survey to collect information on the NCDK usefulness in improving the capacity to manage NCDs and to calculate the kit contents.	An IRC staff member in Yemen and a consultant in Libya recorded the inventory at each facility. In Yemen, the inventories included 17 Medications and 13 supplies. For Libya, 17 medications and 15 supplies were assessed.
Provider Survey	Survey tool to collect with three sections: (1) general knowledge of all healthcare staff, (2) knowledge of the NCDK content, (3) perceptions of the NCDK.	Surveys were self-administered on paper to healthcare workers managing NCDs. Arabic translations were available and reverse translation was completed where relevant. Physicians received a questionnaire with questions about pharmaceutical content and perception of the NCDK, and knowledge relating to NCDs and clinical practice. All other staff received a questionnaire with basic knowledge questions, plus questions about staff experience and trainings. Eight clinicians in Yemen and three in Libya completed the clinical test, while the basic NCD knowledge tests were completed by other healthcare staff in Yemen (n=38) and Libya (n=69).

IRC, International Rescue Committee; MoH, Ministries of Health; NCDK, non-communicable disease kit.

about kit contents, specifically not receiving the hypertensive and psychotic drugs that were supposed to be in the kit. Some facility staff were not aware of NCDK deployment until the point of delivery. Distribution challenges led to delays with the arrival of the kit at the health facilities, with some expired medications going unused. Furthermore, some specialised psychotropic drugs were distributed to facilities where staff had not been trained to use them, and some medications were received in quantities beyond the local need, such as salbutamol in Yemen, of which the excess were returned to WHO.

In Libya, there were challenges with the logistics and supply chain process with no formally established surveillance system in place to track kit distribution and monitor use. There is conflicting information about the kit being disassembled and repacked in Libya at the central level. A national-level key informant reported pharmacists being trained to disassemble and repack NCDK, however, health facility staff reported receiving the full NCDK. There were also issues regarding communication and accountability, with facility staff unclear on the process to file a report about the NCDK.

Kit content analysis, acceptability and relevance to local practice

Some health facility staff did not know the NCDK had been deployed to their facility even though the kit was in use. For those who did know, there was an appreciation for and acceptance of the kit in Yemen, with health facility managers reporting a decrease in NCD-related emergency presentations and an increase in patient attendance. However, clinical record data were unavailable to verify this. While grateful to receive free medication and better care, the discrepancies between the kit contents and national Essential Medical Lists and/or local guidelines and practices, contributed to a lack of satisfaction among patients. Some patients reported dissatisfaction with receiving medicines from Indian and Chinese manufacturers, as opposed to the Middle East or European generics, which they perceived as superior and more familiar. Overall, perceptions of the NCDK among health facility managers in Libya were favourable. Though it varied by cadre of staff, some also expressed a preference for brand name drugs or were more inclined not to use drugs manufactured in India. Staff in both countries mentioned that the 'WHO brand' contributes to the acceptability of the kit.

Informants in both locations made recommendations for improvement. In Yemen, there were suggestions for a greater variety of medications, such as more than two types of hypertension drugs. Informants reported low use of neuropsychiatric medicines as staff had not been trained to dispense these at PHC level. Receipt of too many asthma inhalers was also reported, and some of the excess stock was returned to WHO for redistribution. Furthermore, some staff described being unable to prescribe drugs, such as levothyroxine, which arrived nearly expired. It was also reported that for carbamazepine and enalapril, the dose of the drug was found to be lower than the dose per tablet usually prescribed in Yemen, which resulted in confusion.

In Libya, respondents suggested adapting kit contents to local needs, having a greater variety of contents, providing further training and improved clinical guidelines, and developing a more structured process for NCDK deployment. Staff also mentioned insufficient insulin quantities, with two facilities that usually provide diabetes treatment reporting stock-outs of both insulin and test strips. Furthermore, carbamazepine was not well accepted in any of the three Libyan facilities assessed, and two facilities were not offering epilepsy services even after receiving the kit.

Human resources readiness for NCD management

More than half of the staff surveyed (38 in Yemen and 69 in Libya) had over 5 years of clinical experience. Over 80% of all staff surveyed reported having never received training on NCDs. Most staff in Libya (86%) and Yemen (83%) correctly answered the basic questions, but there were lower scores for NCDK kit contents and clinical questions. See [table 2](#) for more details.

Physicians in both Yemen and Libya frequently answered questions incorrectly related to beclomethasone inhalers, beta-blocker drugs such as bisoprolol, and the proper starting dosage of risperidone for a patient with psychosis. In Libya, questions most often answered

correctly by all staff were related to diabetes, while the physicians had relatively low scores for the NCDK contents and clinical questions.

Staff perceptions of the kit

There were favourable perceptions of the NCDK among health facility staff who were aware of it. Some of the challenges most frequently mentioned in both Yemen and Libya was included shortages of medicines and equipment. Additionally, in Yemen, staff who participated in the survey were not aware of any clinical guidelines available for NCDs. However, in Libya, respondents noted recent national standards and guidelines developed.

CONCLUSION

It was evident in all facilities that the NCDK played an important role in providing medicines and supplies for a short-term period when other supply chain solutions were disrupted. However, in Yemen, it was used for a longer period than it was designed for. Several challenges were identified for NCDK use in both contexts: surplus quantities of some medicines (eg, asthma inhalers) and insufficient quantities of others (eg, diabetes medicines); lack of monitoring systems for kit deployment and use; patient acceptability of medicines; and a lack of training and capacity particularly for treatment of mental health conditions and epilepsy. Supply chain delays were experienced in both countries, resulting in several months to arrive at the health facilities, by which time some drugs were expired or close to expiration.

No uniform approach was taken in either country to NCDK delivery, which resulted in inconsistency in the management of certain NCDs. Some cases were referred rather than managed at primary level, indicating limited provider knowledge despite having the required medications. In Yemen, care for diabetes and epilepsy at the PHC level was not routinely offered, while in both countries treatment of mental health conditions required referral. Case Manager challenges were also due to provider knowledge gaps, along with inadequate amounts of medicines and supplies, shortage of health workers to manage the high NCD caseload and limited laboratory capacity.

There are several key limitations to this study. A baseline assessment did not take place; therefore the findings are retrospective and could have recall bias. The retrospective quantification of medicines and equipment could be confounded by supplies from other sources. The complex humanitarian settings made remote trainings, selecting health facilities and verifying data challenging. The translation of tools into Arabic could have resulted in misinterpretation or errors. The security challenges in both locations made it hard to maintain consistent sample sizes and adhere to strict study methodologies; consequently, the findings have limited generalisability. In both contexts, it was difficult to quantify the number of potential NCD patients, due to difficulty to get a facility catchment population.

Table 2 Key findings of the provider survey

	Yemen (n=38, %)	Libya (n=69, %)
More than 5 years of clinical experience	58	74
No previous NCD training (all staff)	84	84
No previous NCD training (physicians)*	87	Limited data†
Average scores for basic knowledge questions (all staff)	83	86
Average scores for NCDK contents questions (physicians)*	61	53
Average scores for clinical questions (physicians)*	63	20

*Physicians in Yemen (n=8) and Libya (n=3).
†One participant reported no training and the other left no response.
NCDK, non-communicable disease kit.

Table 3 Recommendations

Kit content and design	NCDK contents should be tailored to each health facility level with a predeployment checklist detailing services offered to determine which contents should be included. Furthermore, kit modules could be divided into diseases classifications (submodules) with orders and distribution done accordingly.
Planning, procurement, distribution	Implementation of a comprehensive pre-deployment assessment, including medication and supplies baseline, anticipated patient needs, supply chain readiness and clinical management capacity, to ensure kit is relevant and necessary.
	Better tracking of distribution and anticipated routes for the kit to reach the country. Local distribution of kit contents based on predeployment assessment.
	Use of barcodes on the medicines for effective monitoring of distribution and utilisation.
Human resource and service readiness	Development of an essential medicine list for NCDs for the PHC level, that is, linked with existing national guidance and training, based at the PHC level to improve the transition to regular supply chain.
	Patient education on the use of generic medications to improve acceptability and emphasise the WHO brand.
	Training for health facility staff before delivery of the NCDK, and refresher trainings should be planned and budgeted for. Trainings should include a component on NCD knowledge and management skills, information about the NCD kit contents and monitoring of NCD care and service delivery.
	Protocols that come with the NCD kit should be tailored to existing national guidelines
Monitoring and evaluation	Development of standard health information system, including clinical management as well as supply chain management, aligned to concurrent efforts to strengthen the national health information system.
NCDK, non-communicable disease kit; PHC, primary healthcare.	

Despite the limitations of this study, there are important learnings for the continued use of the kit. Given to the dearth of medications and supplies within humanitarian settings, the NCDK is important for maintaining continuity of care for individuals living with most common NCD conditions encountered at the PHC level. However, the effectiveness of the NCDK is dependent on health system supply chain and the clinical capacity at facilities to manage the conditions the kit is intended to support. The kit was not intended to address supply chain disruption or to fix overall collapsed or already weak health systems, and so effective service provision of the kit requires actions along all health system building blocks with a focus on human resources, adapted service delivery models (including health information

systems), and not merely the provision of medications and supplies.

The main recommendations for next steps in terms of use of the NCDK are outlined in [table 3](#) and are in-line with other NCDK documentation.⁸⁹ The kit provides an opportunity to bridge the humanitarian-development nexus allowing countries affected by humanitarian crises to prioritise a set of NCD essential health interventions to be progressively integrated at the PHC level. The learnings from this assessment highlight the need for continuous medical training on NCDs in low-resources settings, fragile states and in protracted phases of a humanitarian setting, and it would be useful to review NCDK contents vis-à-vis task shifting, tailoring training and guidance accordingly. Global health and humanitarian actors should consider the development of training packages and have trainers readily available to deliver such trainings.

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REFERENCES

- WHO. Emergency health kit. Available: <https://www.who.int/emergencies/emergency-health-kit>
- WHO. Emergency health kit. ncd kit. Available: <https://www.who.int/emergencies/emergency-health-kit/non-communicable-diseases-kit-2016>
- WHO. Package of essential noncommunicable disease interventions. Available: https://www.who.int/ncds/management/pen_tools/en/
- USAID. *YEMEN - Complex emergency*. USAID, 2019.
- Council on Foreign Relations. Global conflict Tracker: Libya, 2020. Available: <https://www.cfr.org/global-conflict-tracker/conflict/civil-war-libya>
- IHME. Yemen. IHME, 2020. Available: <http://www.healthdata.org/yemen>
- World Health Organization. *Non-Communicable disease country profile*. Libya: World Health Organization, 2016. https://www.who.int/nmh/countries/lby_en.pdf?ua=1
- Summary report on the expert consultation on the development of a noncommunicable diseases emergency kit, 2016. Available: https://applications.emro.who.int/docs/IC_Meet_Rep_2016_EN_191108.pdf [Accessed 20 July 2016].
- Slama S, Lee J, Aragno M, *et al*. The development of the noncommunicable diseases emergency health kit. *East Mediterr Health J* 2018;24:92–8.