Strengthening the primary care workforce to deliver high-quality care for non-communicable diseases in refugee settings: lessons learnt from a UNHCR partnership

Philippa Harris, Ros Kirkland, Saimon Masanja, Peter Le Feuvre, Sarah Montgomery, Éimhin Ansbro, Michael Woodman, Matthew Harris

ABSTRACT
Non-communicable disease (NCD) prevention and care in humanitarian contexts has been a long-neglected issue. Healthcare systems in humanitarian settings have focused heavily on communicable diseases and immediate life-saving health needs. NCDs are a significant cause of morbidity and mortality in refugee settings, however, in many situations NCD care is not well integrated into primary healthcare services. Increased risk of poorer outcomes from COVID-19 for people living with NCDs has heightened the urgency of responding to NCDs and shown a spotlight on their relative neglect in these settings. Partnering with the United Nations Refugee Agency (UNHCR) since 2014, Primary Care International has provided clinical guidance and Training of Trainer (ToT) courses on NCDs to 649 health professionals working in primary care in refugee settings in 13 countries. Approximately 2300 healthcare workers (HCW) have been reached through cascade trainings over the last 6 years. Our experience has shown that, despite fragile health services, high staff turnover and competing clinical priorities, it is possible to improve NCD knowledge, skills and practice. ToT programmes are a feasible and practical format to deliver NCD training to mixed groups of HCW (doctors, nurses, technical officers, pharmacy technicians and community health workers). Clinical guidance must be adapted to local settings while co-creating an enabling environment for health workers is essential to deliver accessible, high-quality continuity of care for NCDs. Ongoing support for non-clinical systems change is equally critical for sustained impact. A shared responsibility for cascade training—and commitment from local health partners—is necessary to raise NCD awareness, influence local and national policy and to meet the UNHCR’s objective of facilitating access to integrated prevention and control of NCDs.

INTRODUCTION
Until recently, non-communicable diseases (NCDs) such as hypertension and cardiovascular disease, diabetes and chronic respiratory diseases, have largely been neglected in humanitarian settings where the main focus of healthcare delivery has been on communicable diseases and immediate life-saving healthcare. There is increasing evidence that NCDs are a major cause of morbidity and mortality in protracted refugee settings, however, there is little evidence to support healthcare interventions to tackle them.
The majority of refugees (86%) are hosted in low-income countries8 which also carry the greatest burden of mortality and morbidity from NCDs.9 As such national health systems and humanitarian organisations in low-income and middle-income countries are now incorporating NCDs into their essential health programmes.3 fo11 The current COVID-19 pandemic has also highlighted the urgent need to improve care for NCDs.12 13 19

Adequate human resources represents a key element of the health system and training clinical staff on NCD prevention and case management is needed.11 14 15 There is, however, little in the literature surrounding training of the primary healthcare workforce to manage NCDs in refugee settings, where availability and experience of medical staff vary widely.5 There is also a need for standardised clinical guidance to help support continuity of care and establish systems to deliver standardised NCD care relevant to the context.5 16

Context of the project

In 2014, the United Nations Refugee Agency’s (UNHCR) Global Strategy for Public Health 2014–201817 included an objective to: ‘Facilitate access to integrated prevention and control of NCDs at the primary care level, to reduce morbidity and mortality from NCDs.9 As such national health systems and humanitarian organisations in low-income and middle-income countries are now incorporating NCDs into their essential health programmes.3 fo11 The current COVID-19 pandemic has also highlighted the urgent need to improve care for NCDs.12 13 19

Adequate human resources represents a key element of the health system and training clinical staff on NCD prevention and case management is needed.11 14 15 There is, however, little in the literature surrounding training of the primary healthcare workforce to manage NCDs in refugee settings, where availability and experience of medical staff vary widely.5 There is also a need for standardised clinical guidance to help support continuity of care and establish systems to deliver standardised NCD care relevant to the context.5 16

Context of the project

In 2014, the United Nations Refugee Agency’s (UNHCR) Global Strategy for Public Health 2014–201817 included an objective to: ‘Facilitate access to integrated prevention and control of NCDs at the primary care level, to reduce morbidity and mortality from NCDs.9 As such national health systems and humanitarian organisations in low-income and middle-income countries are now incorporating NCDs into their essential health programmes.3 fo11 The current COVID-19 pandemic has also highlighted the urgent need to improve care for NCDs.12 13 19

Adequate human resources represents a key element of the health system and training clinical staff on NCD prevention and case management is needed.11 14 15 There is, however, little in the literature surrounding training of the primary healthcare workforce to manage NCDs in refugee settings, where availability and experience of medical staff vary widely.5 There is also a need for standardised clinical guidance to help support continuity of care and establish systems to deliver standardised NCD care relevant to the context.5 16

WHAT WAS DONE

Approach and timeline

The UNHCR is responsible for ensuring access to healthcare services for persons of concern under their mandate. In countries where refugees are hosted in camps, the UNHCR partners with international/local non-government organisations (NGOs) and/or Ministries of Health (MoH) to deliver health services, overseen by in-country UNHCR Public Health Officers (PHOs). This project was implemented in two phases, contracted by UNHCR Headquarters between 2014 and 2021 to work across 13 refugee hosting countries (table 1). It was facilitated in-country by UNHCR PHOs working with two or three PCI clinical associate trainers alongside NGO and MoH representatives.

Five core elements were applied:

1. Meeting in-country stakeholders, pre-training learning needs and facility-based assessments.
2. Adaptation of clinical guidance and training materials to the local setting.
3. Delivery of a ToT programme.
4. Implementation of a pilot monitoring and evaluation (M&E) framework.
5. Distance mentoring in phase 2 with follow-up visits to some countries (allocated by UNHCR where budget allowed).

Meeting with stakeholders, pre-training learning needs and facility-based assessment

Meetings were held with stakeholders at national and local level, including clinicians and managers working in camps where possible. Locally published literature, available NCD guidelines, WHO NCD country profiles19 and STEpwise approach to NCD surveillance surveys40 were reviewed. MoH NCD health information systems, monthly reports and clinic/patient-based clinical records were observed.

A pre-training learning needs and facility-based assessment were performed to better understand challenges faced by HCWs. This involved a rapid appraisal of existing health structures and resources using a baseline checklist for NCDs (online supplemental appendix 1), drawing on adapted elements of the WHO Service Availability and Readiness Assessment survey22 and reviewing current NCD health service provision including HCW roles, supervision and training activities.

Adaptation of clinical guidance and training materials

Training programme delivery was centred around evidence-based, peer-reviewed PCI ‘clinical guides’ based on the WHO Package of Essential NCD (PEN) interventions,22 WHO and UNHCR’s essential medicines list (EML)23 and international primary care guidance adapted from sources such as the National Institute for Health and Care Excellence, UK 24 25 and the European Societies of Cardiology and Hypertension.26 Training materials were adapted to the local context in collaboration with in-country teams to reflect existing national health system structures, protocols, equipment and medication availability aligned with national EMLs. Where appropriate, clinical guides were translated into French, Spanish or Arabic.

Delivery of ToT programme

The ToT lasted 4–5 days, run by practising PCI primary care physicians using a pragmatic peer-to-peer approach. Core clinical material covered priority NCDs as defined by UNHCR. A combination of pedagogical methods was used (table 2).

Participants, chosen by local UNHCR PHOs, included doctors, medical technicians, nurses and pharmacists. Community health workers (CHW) were trained in some UNHCR priority settings where budget allowed. A subset of participants was identified by peers to become NCD ‘Champions’ and encouraged to make action plans for their health facilities, including cascade training to
Implementation of a pilot monitoring and evaluation framework

The pilot M&E framework tracked local, national, and global PCI/UNHCR project activity (table 3). Information was collected at baseline, mid-point (approximately 6 months), and endpoint (approximately 12 months) after the ToT. Improved clinical practice was assessed by random convenience sampling of 40 patient records with diabetes and hypertension. Notes were reviewed as to whether patients had been diagnosed in line with the WHO/PCI agreed clinical criteria, or to assess the detection and management of complications against the WHO/PCI clinical guidance; for example, has the urine been tested for the presence of protein and/or serum creatinine been measured in the preceding 12 months. Information was then entered into the supervision tool.

Table 1 Countries and camp/settlement/region names, their total refugee population* and health partners involved in the project (in addition to host country Ministries of Health)

<table>
<thead>
<tr>
<th>Country</th>
<th>Camp/settlement/region</th>
<th>Refugee population*</th>
<th>Health partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1 (2014–2016)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Algeria†</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Cox’s Bazar</td>
<td>276 000</td>
<td>Bangladesh Red Crescent Society International Organisation for Migration Refugee Health Unit (RHU) Research, Training and Management International</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>Ouagadougou, Dori</td>
<td>32 000</td>
<td>Centre du Support en Santé Internationale (CSSI)</td>
</tr>
<tr>
<td>Jordan</td>
<td>Zaatari</td>
<td>79 900</td>
<td>Jordan Health Aid Society Médecins sans Frontières (MSF)</td>
</tr>
<tr>
<td>Kenya</td>
<td>Dadaab, Kakuma</td>
<td>450 000</td>
<td>Kenya Red Cross Society International Rescue Committee Islamic Relief Kenya Médecins sans Frontières (MSF)</td>
</tr>
<tr>
<td>Phase 2 (2017–2021)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burundi</td>
<td>Kinama, Musasa, Kikuma, Nyankanda, Bwagiriza</td>
<td>76 000</td>
<td>Gruppo Volontariato Civile (GVC)</td>
</tr>
<tr>
<td>Cameroon</td>
<td>East, Adamaou and North regions</td>
<td>436 406</td>
<td>MINSANTE—Ministry of Health, Cameroon FAIRMED African Humanitarian Action (AHA)</td>
</tr>
<tr>
<td>Chad</td>
<td>Refugee operations in the east, south and west</td>
<td>478 664</td>
<td>Agence de Développement Economique et Social (ADES) Centre du Support en Santé Internationale (CSSI) International Rescue Committee (IRC)</td>
</tr>
<tr>
<td>Democratic Republic of Congo (DRC)</td>
<td>Gbadolite, Bili, Zongo, Bas Uélé and Libenge and Kinshasa</td>
<td>490 243</td>
<td>Association pour le Développement Economique et Social (ADES) L’Association pour le Développement Social et la Sauvegarde de l’Environnement (ADSEE)</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Gambella, Assosa, Shire, Jijiga and Melkadida</td>
<td>800 000</td>
<td>Administration for Refugee and Returnee Affairs (ARRA) Médecins sans Frontières (MSF)</td>
</tr>
<tr>
<td>Rwanda</td>
<td>Kigali urban clinic and Kigema, Mugombwa, Kiziba, Mahama 1 and 2, Ghembe and Nyabihu</td>
<td>139 000</td>
<td>American Refugee Council (ARC) African Humanitarian Action (AHA) Save the Children International (SCI)</td>
</tr>
<tr>
<td>Tanzania</td>
<td>Nyarugusu, Nduta, Mtendeli</td>
<td>235 000</td>
<td>Médecins sans Frontières (MSF) Tanzania Red Cross (TRC)</td>
</tr>
</tbody>
</table>

*Approximate camp/settlement/region total refugee population in 2016 for phase 1 countries, and in 2020 for phase 2 countries.
†Detailed information not available at time of publication.

colleagues using training materials provided, and health system improvements guided by the pilot M&E framework (table 3).

A standardised, 15-question, multiple-choice test was used to evaluate participants’ knowledge and understanding, and in some settings clinical skill confidence was rated (using a Likert scale) before and after training. A post-course evaluation questionnaire form was completed.

Each trainee was given access to PCI’s NCD website to engage in a dedicated discussion forum, download cascade training materials and clinical guidance. Where internet access was limited, materials were provided on USB sticks. An attendance register was taken each day and a course certificate was presented to those who attended for 80% or more of the course.
An online webinar was used to explain the framework. Forms were available in English and French.

Distance mentoring and follow-up visit
In phase 2, distance mentoring consisted of video calls (quarterly where possible) between PCI, UNHCR PHOs, and occasionally key managers of partner organisations and clinicians, to highlight progress and challenges. A second follow-up face-to-face visit was undertaken by PCI between midpoint and endpoint in some settings.

WHAT WAS FOUND
Meeting with stakeholders, pre-training learning needs and facility-based assessment
The diversity of multiple different health partners (table 1) and MoHs influenced the range of commitment to NCD care, resource allocation, and project implementation.

The NCD baseline checklist found most clinics did not collect detailed NCD information or have training or supervision activities for HCW on NCDs. Patients were largely seen in busy general outpatient clinics with no appointment or recall system, or details on retention in care, with sporadic follow-up. In some areas there was a low awareness of the high prevalence of NCDs—especially hypertension—among HCWs themselves.

Access to WHO essential investigations and equipment was limited in most settings. For example, blood pressure monitors were in short supply or not functional. Lack of capillary blood glucose monitors and test strips, laboratory reagents for creatinine monitoring and facilities for measuring HbA1c were widespread. Consumables such as urine dipsticks were often out of date or stored incorrectly. Inconsistent availability of appropriate NCD medications, including insulin, was evident. Medication ordering for NCDs was done annually and delivery of medicines thereafter was often delayed, inconsistent and sporadic.

Adaptation of clinical guidance and training materials
In some settings, health partners were already using NCD clinical guidelines, however, this varied significantly. Some MoH guidelines were out dated or promoted medication not in line with the UNHCR EML. In the absence of appropriate clinical protocols, recommendations focused on the need to distribute PCI’s adapted clinical guides to support consistent management of NCDs. By engaging participants and health partners in the process, and with PHO support, the ToT was able to influence future medication procurement to encourage adherence to new guidance; for example, use of glibenclamide was discouraged in favour of gliclazide, bisoprolol was recommended instead of widely available atenolol, anlodipine once daily instead of nifedipine and salbutamol inhalers instead of salbutamol tablets.

Delivery of ToT programme
Across 13 countries, 649 health workers were trained in the initial ToT and received certificates of course completion (table 4). The degree of cascade training undertaken proved difficult to measure, and the definition was clarified (January 2019) to represent ‘a session/sessions that amounted to eight hours of teaching, as a single long day of training, or in shorter sessions or ‘on-job’ training’.

Knowledge gained
In all 13 countries, a mean improvement in pre-training and post-training knowledge tests was seen in participants including doctors, medical officers, nurses and pharmacists (figure 1) who were trained together.

Healthcare worker engagement
Engagement and enthusiasm from participants was generally high, reflected in self-reported confidence ratings when done in some settings, and post-training course evaluation. Consultation skills sessions were well received and often represented a new approach to learning. Rapid staff turnover was consistently reported to be a barrier to the cascade process, with lack of time, organisation of activities or personnel for supervision, and little succession planning or budget for cascade training. Some
HCWs reported an inability to leave their camp without a permit as a restrictive factor to accessing training. Action planning by NCD champions that was SMART (specific, measurable, attainable, realistic, timely) was a valuable feature of training workshops. For example, in Tanzania an interdisciplinary NCD management monthly team meeting was set up in one facility. Additionally, an exchange visit between camps run by two different

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Pilot monitoring and evaluation framework</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facility level</strong></td>
<td><strong>Data collection tool</strong></td>
</tr>
<tr>
<td>Local</td>
<td>Supervision tool and summary scoring sheet</td>
</tr>
<tr>
<td>National</td>
<td>M&amp;E tracker: using the supervision tool and summary scoring sheets, data were inputted at country level using the PCI website</td>
</tr>
<tr>
<td>Global</td>
<td>Master Comparison Table</td>
</tr>
</tbody>
</table>

M&E, monitoring and evaluation; NCD, non-communicable disease; PCI, Primary Care International; PHO, Public Health Officer; UNHCR, United Nations Refugee Agency.

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Total number of healthcare workers directly trained in each country</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country</strong></td>
<td><strong>Primary healthcare medical practitioners</strong></td>
</tr>
<tr>
<td>Algeria</td>
<td>28</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>23</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>27</td>
</tr>
<tr>
<td>Burundi</td>
<td>11</td>
</tr>
<tr>
<td>Cameroon</td>
<td>13</td>
</tr>
<tr>
<td>Chad</td>
<td>12</td>
</tr>
<tr>
<td>DRC</td>
<td>7</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>8</td>
</tr>
<tr>
<td>Jordan</td>
<td>40</td>
</tr>
<tr>
<td>Kenya</td>
<td>39</td>
</tr>
<tr>
<td>Rwanda</td>
<td>3</td>
</tr>
<tr>
<td>Tanzania</td>
<td>22</td>
</tr>
<tr>
<td>Uganda</td>
<td>44</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>277</td>
</tr>
</tbody>
</table>

*Includes doctors, medical/clinical officers. †Includes lab technician, pharmacist, Public Health Officer, health partner coordinator. DRC, Democratic Republic of Congo.
health partners with differing resources and capacity was arranged by participants and facilitated by UNHCR, its aim to provide peer-to-peer learning and promote engagement through case-based discussion and meetings using WhatsApp. This provided a welcome opportunity for learning beyond the cascade model.

Implementation of pilot monitoring and evaluation framework
Despite repeated efforts by PCI and UNHCR, quality of engagement, timely submission and accuracy of data submitted was variable. However, in six out of eight phase 2 countries an improvement in clinical practice was reported using correct diagnostic criteria, an up-to-date patient register for NCDs was subsequently maintained, a call and recall system was implemented and an improvement of the overall average supervision score was seen. All eight countries reported a fall in stockouts of three essential medicines.

Distance mentoring and follow-up visits
Eleven WhatsApp groups were established across the eight phase 2 countries, with 200 users, of whom 141 (70%) were active soon after training. These stimulated participants to share cases and supported cascade training initially, particularly where a strong group identity had been established during training.

The PCI NCD Training website was used by 287 participants, of whom 45% (128) downloaded training materials. Unreliable internet connectivity limited the website’s value in some settings.

Follow-up visits of 1–2 weeks’ duration occurred in only 6 out of 13 countries due to limited funding or security concerns. Depending on need, refresher training, mentoring of HCWs in facilities and programmatic support for health systems strengthening at camp and partner level was provided.

WHAT WAS LEARNT

Strengths of the project
Through its wide geographical reach and contact with multiple different government departments and NGOs, this project has increased awareness and contributed to initial steps to improve delivery of NCD care in refugee settings.

Our experience echoed previous findings that clinical guidance for NCDs in humanitarian settings is often absent or insufficient.2 3 7 We were able to promote use of evidence based clinical guidance in managing NCDs which is likely to improve effectiveness of NCD care in humanitarian settings.3 15

However, training HCWs cannot be delivered as a ‘one size fits all’ approach. With the number of refugees increasing in every region of the world, humanitarian settings vary significantly.28 The epidemiology of NCDs, duration of displacement, security constraints, competing priorities and health system characteristics in the host country, including availability and experience of medical staff affects delivery of NCD care.3 5 15

For example, remote rural camps in Tanzania present unique health access challenges in contrast to Zaatar camp in Jordan—home to many thousands of Syrian refugees, with high background rates of NCDs in the host country.29 30 Ongoing security, financial and logistical constraints in Democratic Republic of Congo shortened training to 4 days, while poor internet connectivity restricted training activities and use of M&E tools in some settings. This reinforced the need for effective multi-stakeholder collaboration and in-depth learning and facility-needs assessment prior to training. A flexible, realistic, and context specific approach to co-adapting clinical guidance and training materials was used to encourage genuine engagement and meaningful adoption of new guidelines into practice.
Insufficient health workers has been identified as a barrier to NCD intervention delivery.\textsuperscript{31} ToT programmes are a well-known, cost effective and realistic way to increase capacity of health workers by improving knowledge and facilitating task sharing\textsuperscript{32–34} and could help decentralise NCD care to the primary care level.\textsuperscript{18} We were able to train different cadres of HCW together to promote task sharing, although formal job descriptions may have to be adapted locally by MoH to facilitate this. Future training should ensure CHW are prioritised in a cascade model that is adapted appropriately, and community recipients of care should be consulted.

The ToT programme created a platform for dialogue whereby local HCWs were empowered to influence health system improvements beyond the ToT. Engaging the multidisciplinary team in operational aspects of NCD care enabled new perspectives to be shared and promote effective teamwork. Uniformity of clinical guidance enhanced the cascade process, helped facilitate knowledge sharing and interorganisational communication. UNHCR PHOs and clinicians were able to influence pharmacy procurement pathways to reduce stock outs by improving medication and equipment consumption and forecasting, and therefore improve adherence to evidence-based guidelines for NCDs in line with the UNHCR EML. Training discussions focused on clinical priority setting including relevant screening activities and prioritisation of laboratory investigations appropriate to each setting, as well as consolidating referral pathways necessary for emergency NCD care.\textsuperscript{14} The positive contribution created by peer-to-peer learning across camps and communities of practice should be encouraged.

Limitations

Although a transfer of knowledge was demonstrated initially, without on-going commitment and nurture this may not translate into a more capable workforce.\textsuperscript{33} Pre-training and post-training knowledge tests showed improvements; however, the range of results around the mean, and the association with HCW cadre was not reported, restricting more meaningful interpretation. Confidence ratings may be subject to reporting bias while pre- and post-training knowledge tests are unable to measure programmatic, consultation or trainer skills. Future ToT programmes may benefit from incorporating on-job training for improved effectiveness.\textsuperscript{35}

For sustainability of the cascade model to be achieved wider issues that can facilitate or prevent continuation of training need to be considered.\textsuperscript{33} This includes selection of training participants based on ability, experience and soft skills.\textsuperscript{33} Cascade training should occur promptly to ensure momentum, and quality of knowledge gained is maintained. A clear expectation of cascade training, with budget and time allocation to support it, is needed. The short timeframe, limited by funding, restricted opportunities for supervision and complete transfer of training skills. Additionally, stock outs of medication and poor equipment availability persisting after the ToT disincentivised adherence to clinical guidance.

Competing clinical priorities on HCWs, often working far from home in stressful environments, requires significant personal sacrifice and commitment and should be recognised to ensure staff engagement and retention. Regular follow-up, refresher training and supportive supervision and evaluation of staff performance should also be set up.\textsuperscript{15} Continuous professional development on NCD management that is appropriately incentivised should be incorporated into job descriptions of HCWs in humanitarian settings contractually with health partners, whereby project managers recognise increased input from HCWs in the cascade process.

Unfortunately, reliability and validity of data entered into the M&E supervision tool restricted analysis, despite some health system indicators showing improvements in delivery of NCD care. As the integration of NCD care becomes more established and data collection more widespread, it will be easier to gather meaningful M&E. Improvement of data collected systematically on NCD patients into the UNHCRs tablet-based Integrated Refugee Health Information System will be an important step in facilitating how programmes can be evaluated in future.

Future recommendations and further work

Through various challenges experienced in this project valuable lessons have been learnt. Table 5 outlines future recommendations to consider in training of HCWs on NCDs in refugee settings. With limited evidence on health intervention research in humanitarian settings\textsuperscript{6} measuring effectiveness of the ToT programme is needed, but likely to be challenging where data collection is limited. Assessing clinical effectiveness of training within a health system that is lacking many of the resources required to implement new knowledge and practice is challenging. Significant confounding influences, and varying attitudes and behaviours that determine how participants may learn and apply knowledge means monitoring patient outcomes only may not be fully representative. To reflect this complexity, triangulation of multiple sources of data is required (ie, preknowledge/postknowledge and skills test results, clinical record review and health system indicators including availability of essential medications and equipment and the provision of healthcare workers). Further qualitative research on facilitators and barriers experienced by HCWs to improve care for NCDs in different settings is needed.\textsuperscript{36} Additionally, we would recommend following participants more formally using knowledge and skills testing after 6 months and 12 months to guide the need for refresher training, although high turnover of clinical staff and ongoing funding and supervision are challenges that need to be considered to achieve this. Questions on how the training has changed practice over time, and what services and clinical guidelines have been implemented following training may be more informative. Future evaluation of this project will
be an important step to understand this and assess attribution of any gains lost over time.

In the context of COVID-19, the rise in remote digital/e-learning may help health partners fill the gap in providing HCW education via blended learning, both online and offline. This is likely to be more sustainable and scalable than face-to-face training. ToT programmes should also be extended to include other neglected NCD topics, such as chronic kidney disease, and palliative care.

**CONCLUSIONS**

As far as we are aware this paper describes the first multisite ToT programme for primary HCWs on NCDs in refugee settings. We have shown ToT programmes are a feasible way to address the lack of trained HCW in primary care to deliver high quality and continuity of NCD care in diverse resource constrained refugee settings. ToT programmes can engage multidisciplinary teams to promote task sharing and influence health system improvements. Locally adapted provision of clinical guidance is a vital step in their roll out. The cascade training process needs to be supported and supervised with mutual responsibility generated across stakeholders, with necessary funding, to succeed in implementation and sustainability. The challenge is to create genuine engagement, realise and measure improvements to clinical practice, and to change systems and processes in ways that will sustain these improvements, whereby the importance of cocreating an enabling environment for HCWs to deliver accessible, high-quality care is prioritised.
Author affiliations
1Primary Care International, Oxford, UK
2School of Public Health, Catholic University of Health and Allied Sciences (CUHAS), Bugando Medical Centre, Mwanza, Tanzania
3Centre for Global Chronic Conditions, London School of Hygiene & Tropical Medicine, London, UK
4The Office of the United Nations High Commissioner for Refugees, Geneva, Switzerland
5Department of Primary Care and Public Health, Imperial College London, London, UK

Twitter
Emílmí Ansbro @EmihnA and Matthew Harris @dmatljharris

Acknowledgements
We would like to thank all UNHCR staff, including in-country PHOs and Erica Hering, former senior UNHCR PHO in Geneva, for their commitment to the success of the project. We would also like to thank all clinical associate members of PCI; Jack Barton for support with monitoring and evaluation tools; Jane Lennon for communications support; Lucinda Ham for reviewing the project report recommendations and Julia Beart for her leadership in planning and executing the project. Our sincere gratitude is also extended to all the healthcare workers who contributed to the training, and the health partners who supported the project.

Contributors
PH, RK and MH proposed the content of the article. RK interpreted the monitoring and evaluation data from the different country projects. PH wrote the first draft with help from RK and MH. PH is the article guarantor. All other authors reviewed and edited the manuscript and gave final approval to be published.

Funding
The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests
PH, SM, PLF, RK are employed by PCI having worked on the UNHCR project outlined in this paper. MH is a member of the PCI advisory board. MH is supported in part by the NW London NIHR Applied Research Collaboration. Imperial College London is grateful for support from the NW London NIHR Applied Research Collaboration and the Imperial NIHR Biomedical Research Centre. MW is employed by the United Nations High Commissioner for Refugees. EA is employed by London School of Hygiene and Tropical Medicine and is engaged by UNHCR as part of a consultancy to evaluate UNHCRs NCD programming. The authors alone are responsible for the views expressed in this publication which do not reflect those of NIHR, the Department of Health and Social Care, LSHTM or UNHCR.

Patient consent for publication
Not applicable.

Ethics approval
This study does not involve human participants.

Provenance and peer review
Not commissioned; externally peer reviewed.

Data availability statement
Data are available upon request.

Supplemental material
This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access
This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.

ORCID iDs
Philippa Harris http://orcid.org/0000-0002-9222-7864
Emílmí Ansbro http://orcid.org/0000-0002-2291-1652
Matthew Harris http://orcid.org/0000-0002-6005-9710

REFERENCES

Correction


33 Mormina M, Pinder S. A conceptual framework for training of trainers (ToT) interventions in global health. *Global Health* 2018;14:100.


35 Rowe AK, Rowe SY, Peters DH, et al. The effectiveness of training strategies to improve healthcare provider practices in low-income and middle-income countries. *BMJ Glob Health* 2021;6:e003229.
