Addressing noncommunicable diseases among urban refugees in the Middle East and North Africa - a scoping review

Zahirah Z. McNatt

Abstract

Background: More than 5.5 million Syrian refugees have fled violence and settled in mostly urban environments in neighboring countries. The Middle East and North Africa (MENA) region accounts for 6% of the global population but 25% of the population are 'of concern' to the UN Refugee Agency. In addition to large amounts of forced migration, the region is also undergoing an epidemiologic transition towards a heavier burden of noncommunicable diseases (NCDs), which in 2018 accounted for 74% of all deaths in the region. To address NCD needs globally, a myriad of policies and interventions have been implemented in low-income stable country settings. However, little is known about which policies and interventions are currently being implemented or are best suited for refugee hosting countries across the Middle East and North Africa.

Methods: A scoping review of peer-reviewed literature was conducted to identify policies and interventions implemented in the Middle East and North Africa to address the needs of urban refugees with noncommunicable diseases.

Results: This scoping review identified 11 studies from Jordan, Lebanon, Iran, West Bank, Gaza and Syria. These studies addressed three foci of extant work, (1) innovative financing for expensive treatments, (2) improvements to access and quality of treatment and, (3) efforts to prevent new diagnoses and secondary complications. All interventions targeted refugee populations including Palestinians, Sudanese, Syrians, Afghans and Iraqis.

Discussion: The scoping review highlighted five key findings. First, very few studies focused on the prevention of noncommunicable diseases among displaced populations. Second, several interventions made use of health information technologies, including electronic medical records and mHealth applications for patients. Third, the vast majority of publications were solely focused on tackling NCDs through primary care efforts. Fourth, the literature was very sparse in regard to national policy development, and instead favored interventions by NGOs and UN agencies. Last, the perspectives of refugees were notably absent.

Conclusion: Opportunities exist to prioritize prevention efforts, scale up eHealth interventions, expand access to secondary and tertiary services, address the scarcity of research on national policy, and incorporate the perspectives of affected persons in the broader discourse.

Keywords: Non-communicable disease, Chronic disease, Health systems, Refugees, Humanitarian response, Syria, Middle East and North Africa, Urban, Semi-urban
Background
More than 5.5 million Syrian refugees have fled violence and conflict, and settled in mostly urban environments in neighboring countries. The Middle East and North Africa (MENA) accounts for 6% of the global population but comprises 25% of the ‘population of concern’ to the UN Refugee Agency (including refugees, internally displaced persons, asylum-seekers and stateless persons). The vast majority of refugees in the MENA region live outside of camp settings in urban and semi-urban environments in Jordan, Lebanon and Turkey [1–3]. In addition to large numbers of displaced persons in urban settings, the region is also undergoing an epidemiologic transition towards more noncommunicable diseases (NCDs). In 2018, NCDs accounted for 74% of deaths in the Middle East and North Africa. In Lebanon, NCDs accounted for 84% of deaths, 76% in Jordan and 78% in Saudi Arabia. Prior to the civil war in Syria, NCDs accounted for 77% of all deaths and as of 2019, a significant portion of the displaced Syrian population resides in Jordan, Lebanon and Turkey [4, 5]. The dual dynamic of a large number of refugees in urban settings and a high burden of NCDs has placed significant pressure on surrounding low-and middle-income host countries, their health systems and humanitarian actors. These pressures limit the ability of health and humanitarian actors to provide care that is accessible, equitable and high in quality.

As a result, Syrians, as well as other refugee groups, face significant challenges as they receive new NCD diagnoses, manage their illnesses, attempt to access host country health systems and cope with conflict and displacement [6, 7]. The most commonly explored NCDs among the Syrian refugee community in Lebanon and Jordan include hypertension, chronic respiratory diseases, diabetes, arthritis and cardiovascular disease. Hypertension prevalence among Syrian refugees in Jordan and Lebanon was estimated at 9.7 and 7.4%, respectively; diabetes prevalence was 5.3 and 3.3%, respectively; and chronic respiratory disease prevalence was 3.1 and 3.8%, respectively [8, 9]. However, these figures are likely underestimates due to self-report bias and difficulties identifying representative samples. Other refugee populations, including Iraqis, Afghans and Palestinians, also have high NCD burdens. Screening activities across the region estimated that 18% of Palestinian refugees had hypertension, while self-reported hypertension among Iraqi refugees ranged between 3 and 30% [6].

To address NCD needs, a myriad of policies and interventions have been implemented in low-income, stable country settings [10]. In 2010 the World Health Organization (WHO) released The Package of Essential Noncommunicable (PEN) Disease Interventions for Primary Health Care in Low-Resource Settings [11, 12]. The PEN included interventions for heart attack and stroke care as well as asthma and chronic obstructive pulmonary disease (COPD). It provided health education and counseling tools and recommendations for how to develop early diagnosis systems. The PEN prioritized the integration of NCD care into primary health care centers and highlighted key medicines and technologies that should be made available in low-resource settings [11, 12]. In 2017 WHO also released an updated version of “Tackling NCDs: Best buys and other recommended interventions for the prevention and control of NCDs [13]. However, both the PEN and the Best Buys did not address the NCD needs or care priorities in complex humanitarian emergencies, including those that result in the forced migration of large populations into urban settings.

In humanitarian settings, it is important to have better information related not only to the scale and nature of NCD needs but also to useful policies and interventions that support effective, equitable practice. In an attempt to identify NCD interventions implemented in humanitarian settings, Ruby et al. [10] conducted a systematic review of the effectiveness of NCD interventions in humanitarian crises. The authors identified eight studies, the majority of which did not explore interventions in refugee crises. Of the studies that did address refugee needs, all were focused on one intervention for Palestinian refugees. However, the Palestinian population is served by the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) and thus has a different healthcare access experience than Syrians or any other refugee group in the MENA region. None of the articles included in the review focused on Syrian, Afghan, Iraqi or any other refugee group present in the region.

As a result, little is known about what policies and interventions are currently being implemented for the diverse group of refugees residing in urban settings in low-and middle-income host countries across the Middle East and North Africa [10, 14]. Accordingly, the purpose of this study was to utilize a scoping review methodology to identify policies and interventions aimed at addressing the needs of urban refugees diagnosed with noncommunicable diseases in MENA region.

Methods
This review was guided by Arksey and O’Malley’s [15] methodological framework for conducting a scoping review. The scoping review methodology was selected to broadly map policies and interventions. This methodology was preferred over that of a systematic review because the literature on this subject is in its infancy and a systematic review would limit the focus to specific study designs and require an assessment of the quality of each study. Scoping reviews allow for the inclusion of all
study designs, including basic descriptions of policies and interventions. These descriptions frequently lack an evaluation, but may nonetheless provide valuable information and be significant to understanding the landscape. Arksey and O’Malley’s framework outlined five steps, (1) identifying the research question, (2) identifying relevant studies, (3) selecting studies, (4) charting the data and (5) collating, summarizing and reporting the results [15].

Research question
The focus of this review was to identify and explore the policies and interventions, implemented by humanitarian actors and host countries, that aim to address NCDs among urban-based refugees in the Middle East and North Africa. The World Health Organization definition for the term “policy” was utilized, stated as the “decisions, plans, and actions that are undertaken to achieve specific health care goals within a society.” [16] The term “urban” in the refugee context refers to cities and towns and excludes refugee camps [17]. Studies were included if urban settings were the focus per a statement in the methods section.

Identifying relevant studies
To identify relevant studies, four databases—PubMed, EMBASE, Medline and PsychInfo—were searched in November, 2018 for articles published in English between 2000 and 2018. The search strategy combined Medical Subject Headings (MeSH terms; see Table 1) and the following keywords or phrases, (1) non-communicable diseases OR chronic diseases OR diabetes OR hypertension OR cardiovascular disease OR chronic respiratory disease OR cancer AND, (2) refugees, AND the (3) Middle East OR North Africa OR Lebanon OR Turkey OR Jordan OR Iran (see Additional file 1). The search terms were purposefully broad in order to capture all relevant policies and interventions. The most prevalent NCDs and the nations hosting the largest numbers of refugees were added to the search order to capture articles that did not directly use the terms “NCD” or “Middle East and North Africa.” The bibliographies of all studies identified in this previous step were reviewed for related articles. The author also hand-searched reference lists of related articles.

Study selection
The search identified a total of 252 articles, including 49 duplicates, which were removed. The remaining articles (203) were eligible for inclusion if they described a policy or intervention that was aimed at addressing NCDs among urban-based refugees in the MENA region. The author reviewed all titles and abstracts and excluded articles based on several criteria (see Table 2). First, when numerous articles relied on the same dataset, only the article(s) which most thoroughly described the approach was included. Second, articles were excluded if they discussed NCDs in high-income countries or focused on prevalence and risk factors, rather than actions taken to improve access and service delivery. Third, opinion pieces, commentaries, news articles and dissertations were excluded. One study was unavailable in the public domain and was replaced by a publication on an earlier version of the same intervention, resulting in 18 relevant articles eligible for full text review. After the full text review, 7 articles were excluded because they focused on refugees residing in refugee camps, rather than urban settings, were repetitive publications or addressed national needs but did not incorporate refugees. Eleven studies were ultimately included (see Fig. 1).

Charting data and collation
Data were extracted from the selected publications and placed in an excel spreadsheet noting the following key variables: author, date of publication, country, aim of the intervention/policy, target population, intervention/policy

Table 1 Search terms

| Referees         | Noncommunicable disease | Middle East |
|------------------|-------------------------|-------------|
| Chronic disease  |                         | North Africa|
| Diabetes         |                         | Lebanon     |
| Hypertension     |                         | Jordan      |
| Chronic respiratory disease |         | Turkey      |
| Cardiovascular disease |             | Iran        |
| Cancer           |                         |             |

Table 2 Inclusion and exclusion criteria

| Study characteristics | Inclusion criteria                                                                 | Exclusion criteria                                                                 |
|-----------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Population            | Refugees in urban settings.                                                        | Populations other than urban refugees.                                             |
| Intervention or policy| Any NCD focused intervention implemented for refugees by a humanitarian actor or a host country health system. Any NCD relevant policy that applied to refugee populations. | Publications/reports that did not describe an intervention or policy. Repetitive publications that presented the same intervention/policy. |
| Setting               | Urban/non-camp environments in the Middle East and North Africa.                   | High income countries; outside the Middle East and North Africa. Refugee camp settings. |
| Study design          | All study designs.                                                                  | Opinion pieces, commentaries, dissertations, news articles.                         |
| Publications (peer-reviewed) | English language only.                                                    | Languages other than English.                                                      |
characteristics, NCDs addressed, how the intervention/policy was measured, outcomes and the implementing organization.

Analyzing, collating, summarizing and reporting findings
The selected studies were read and reread by the author, who used inductive analysis to identify common themes or categories. The author’s search for themes was also guided by two WHO conceptual frameworks. The first framework identified four core components of NCD care -- prevention, treatment, rehabilitation and palliative care [18]. The second, the Health Systems Framework [19] presented six building blocks of a health system and noted financing as key to the functioning of a health system. The resulting three themes of prevention, treatment and innovative financing (see below) were identified in the scoping review and were well aligned with two significant WHO frameworks that aid in understanding NCDs and health systems.

Geographic scope
For the purposes of this review, the term MENA was used in alignment with UNHCR’s regional definition, which includes: Algeria, Bahrain, Egypt, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, State of Palestine, Syria, Tunisia, United Arab Emirates, Western Sahara Territory and Yemen. Turkey and Iran were also included in this analysis as a result of their significant involvement in the refugee response.

Results
The results are based on 11 peer-reviewed articles from Jordan (N = 5), Lebanon (N = 3), Iran (N = 1) and the broader region (N = 2). These 11 papers explored the implementation and/or the evaluation of policies and interventions aimed at tackling NCDs among refugees residing in urban/non-camp settings in MENA region (see Table 3). One publication was a mixed-methods study, one was a longitudinal cohort study, five were descriptive studies and one was a non-control, descriptive intervention study. Three were detailed descriptions of interventions with little or no analysis or measurement of effectiveness. The NCDs examined in these publications included Type II diabetes, hypertension, cardiovascular disease, cancer and end-stage renal disease (ESRD). In addition to the policies and interventions

![Fig. 1 PRISMA diagram: the search and selection process](image-url)
### Table 3 Summary of selected studies

| Author and year | Country | Aim of intervention/policy | Target population | Intervention/policy characteristics | NCD(s) addressed | How intervention/policy was measured | Outcomes of intervention / policy* (excerpts from abstracts) | Implementing organization |
|-----------------|---------|-----------------------------|-------------------|--------------------------------------|-----------------|---------------------------------------|--------------------------------------------------------|--------------------------|
| Ballout et al. (2018) [22] | Jordan, Lebanon, West Bank, Gaza | Improve quality of all service with attention to increase in NCD burden | Palestinian refugees | PHC reform, e-health (EMR) system, appointment system and Family Health Teams. | NCDs | Daily consultations, physician satisfaction, waiting time for patient registration, antibiotic prescription rate | Physician’s daily consultations were reduced from 104 to 85. 89% of doctors expressed satisfaction concerning timesaving and efficiency of e-Health. Average wait time in registration queue decreased from 25 minutes to 12 minutes. Average registration time reduced from 6 minutes to 1.5 minutes. Average antibiotic prescription rate decreased from 27% to 24.5% and average number of medical consultations per day decreased 104 to 85. | United Nations Relief and Works Agency |
| Collins et al. (2017) [28] | Jordan | Identify cardiovascular disease risk among patient population | Syrian refugees and Jordanians | Cardiovascular disease risk assessment and management tool for physicians in outpatient NCD clinics. | Cardiovascular disease | Mixed methods: demographics, laboratory testing, risk factor measurements, prescribing behavior | 23.3% of patients had a documented WHO/ISH risk score of which 65% were correct. 60.4% of patients were eligible for lipid-lowering treatment and 48.3% of these patients were prescribed it. Analysis of interviews with sixteen MSF staff identified nine explanatory themes. | Medecins Sans Frontieres |
| Doocy et al. (2017) [25] | Lebanon | Improve quality and continuity of care, health literacy, mobility of medical records and health outcomes. | Syrian refugees, Lebanese | Treatment guidelines: Introduction of standards guidelines, training for clinicians, counseling of patients and mHealth: Patient-controlled health record, EMR & decision tool for clinicians. | Hypertension, Type II diabetes | Clinical measurements, patient-provider interaction, medication prescription and use | Recording of BP readings and blood sugar measurements significantly decreased following the implementation of treatment guidelines. Recording of BP readings also decreased after the mHealth phase as compared with baseline. Recording of BMI reporting increased at the end of the mHealth phase from baseline and | International Organization for Migration; International Medical Corps in 10 health centers |
| Author and year | Country | Aim of intervention/policy | Target population | Intervention/policy characteristics | NCD(s) addressed | How intervention/policy was measured | Outcomes of intervention / policy* (excerpts from abstracts) | Implementing organization |
|-----------------|---------|---------------------------|-------------------|-------------------------------------|-----------------|-------------------------------------|---------------------------------------------------------------|--------------------------|
| Ghods et al. (2005)* [27] | Iran | Make dialysis and kidney transplantation available to refugees | Afghan refugees, Iranians | Integration of refugees into national dialysis and renal transplant program. | End-stage renal disease | Descriptive analysis: # on dialysis, # undergone transplantation, nationality of donors and recipients | Outcomes were not measured | Transplantation Unit, Hashemi Nejad Kidney Hospital |
| Khader et al. (2012) [23] | Jordan | Inform and improve the quality of health services | Palestinian refugees | Cohort monitoring of hypertension patients using e-health | Hypertension | Descriptive analysis of routine program data: number of patients, patient demographics, clinical measurements | Outcome analysis indicated deficiencies in several components of clinical performance related to blood pressure measurements and fasting blood glucose tests. Between 8% and 15% of patients with HT had serious complications such as cardiovascular disease and stroke. | United Nations Relief and Works Agency |
| Khader et al. (2012) [24] | Jordan | Inform and improve the quality of health services | Palestinian refugees | Cohort monitoring of diabetes patients using e-health | Diabetes | Descriptive analysis of routine program data: number of patients, patient demographics, clinical measurements | Outcome analysis indicated deficiencies in several components of care: measurement of blood pressure, assessments for foot care, blood tests for glucose, cholesterol and renal function. 10-20% of patients with DM in the different cohorts had serious late complications | United Nations Relief and Works Agency |
implemented in Jordan, Lebanon and Iran, the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) implemented regional activities across four or five country settings (West Bank, Gaza, Jordan, Lebanon and Syria). Only one of the 11 papers described a national policy, while the remaining...
presented interventions that were implemented by NGOs or UN agencies.

**Intervention/policy characteristics**

These interventions and policies addressed three main categories, (1) innovative financing for expensive treatments (two papers), (2) improvements to access and quality of treatment (six papers), and (3) efforts to prevent new cases as well as secondary complications (three papers). All interventions targeted refugee populations, such as Palestinians, Sudanese, Syrians, Afghans and Iraqis. Five interventions also focused on host-communities including Jordanians, Iranians and Lebanese. A diversity of actors led these NCD interventions, including NGOs (Médecins Sans Frontières, Institute for Family Health, International Medical Corps, Medical Teams International), UN agencies (UNRWA, the UN Refugee Agency, International Organization for Migration) and health facilities (i.e., American University of Beirut Medical Center, Hashemi Nejad Kidney Hospital).

**Theme 1: financing cancer treatment for adults and children**

In two studies, the purpose of the interventions was to provide funding for displaced persons with cancer in Jordan, Syria and Lebanon. Spiegel et al. (2014) described one funding mechanism solely managed by UNHCR, the Exceptional Care Committee (ECC), which required individuals to apply for funds to cover cancer treatments in Jordan and Syria [20]. Saab et al. [21] described a novel funding collaborative between two medical centers in Beirut, Lebanon, and Memphis, Tennessee, respectively [21]. Both publications stated that resource-poor settings and expensive treatments were barriers to cancer care. The authors also noted that financial burdens were exacerbated by a lack of insurance coverage for refugees and other displaced persons. Specifically, Saab et al. [21] stated that while care for Lebanese patients was expensive, most Lebanese patients had partial insurance coverage, thus reducing the financial burden on the medical center partners. Both interventions were able to finance care for cancer treatment; however, the funds available were often insufficient [20, 21]. Between 2011 and 2017, 311 non-Lebanese children received treatment as a result of the medical center collaboration. However, only 107 of them received full treatment. The remaining only had partial treatment covered by the medical center collaboration in Lebanon. In Jordan, UNHCR’s Exceptional Care Committee (ECC) received 511 applications for funding for cancer treatment (between 2010 and 2012) but could only fund 246, which is less than 50% of the requests [20, 21]. These funding mechanisms supported the secondary and tertiary needs of a small segment of patients.

**Theme 2: improving access to high quality NCD care**

Six of the 11 selected articles focused on improving access to NCD care and/or enhancing the quality of NCD care in primary health centers. These interventions targeted both patients and physicians and were led by non-governmental actors. Two themes were noted within these publications. First, eHealth tools were commonly used as convenient methods for engaging with patients and clinicians to advance education, behavior change and adherence to guidelines. Second, the policy of integrating refugees into host-country health systems was uncommon and where implemented, described in sparse detail. This is evidenced by the limited number of policies identified that incorporated refugees into national health systems. In the scoping review results, integration existed on a spectrum from full inclusion in host-country health systems to calls for NGO actors to utilize their resources to strengthen local health systems by incorporating refugee health workers into service provision. Both themes are discussed further below.

**Utilizing e-health tools to improve healthcare quality**

In 2009, UNRWA embarked on a series of improvements to their health services, with specific attention to diabetes and hypertension. This reform was documented in more than six peer-reviewed publications. Three of these studies were included in the scoping review because they emphasized separate segments of the reform [22–24]. The most recent publication [22] described the implementation journey from 2009 to 2017, when the vast majority of UNRWA health centers completed the rollout. The first two segments of the intervention were the electronic medical record (EMR) and the development of family health teams. The EMR was web-based, utilized the International Classification of Disease codes (ICD 10), and had a built-in appointment system as well as several other clinical functions. The second component of this reform -- family health teams, included a restructuring of services to provide comprehensive primary healthcare and connect families to long term support from a team of providers. The reform also included an mHealth component that addressed specific issues for mothers and children [22]. The authors presented three indicators as evidence of the interventions progress -- a reduction in physician consultations, a reduction in antibiotic prescription rates and high physician satisfaction with the EMR.

This reform was further expanded upon in 2 publications by Khader et al. (2012), which highlighted the cohort monitoring of Palestinian refugees with diabetes and hypertension in one clinic in Jordan, the Nuzha Primary Health Care Clinic [23, 24]. The authors argued that cohort monitoring-- the frequent review of reports
on treatment and outcomes for a particular group of patients—could inform quality improvement efforts over time. Several cohorts were monitored using the EMR system, in order to understand the basic demographics of the patient population. Monitoring also identified program performance on indicators such as the percentage of diabetic patients who had had their blood glucose measured and the percentage of diabetic patients who had received a foot exam. The authors discovered that the clinic performed poorly on several indicators, with just 42% of diabetic patients having had their blood glucose measured as well as little effort to conduct foot exams and no evidence of eye exams. The data showed that cohort monitoring had the potential to aid clinicians in identifying problems and root causes of poor quality care. However, no actions were taken to change the poor performance, though the authors suggested how the data could be utilized in the future.

An intervention in Lebanon also used electronic health tools to improve the quality of care provided in ten primary health centers, managed by the International Organization for Migration and the International Medical Corps. A longitudinal cohort study was conducted to improve care for Syrian refugees and Lebanese patients through the implementation of clinical guidelines and the adoption of an mHealth application [25]. The guidelines were adapted for the local context, and clinicians were trained on all components of the protocol. The mHealth application was implemented as both an EMR for clinicians and a personally-controlled health record (PCHR) for patients. Physicians utilized the EMR for documentation of patient care, and patients used the PCHR component to increase the mobility of their record and to access educational materials on medication and lifestyle behaviors. The full program was implemented in two phases over 20 months.

The authors measured several outcomes: clinical measurements (i.e., blood pressure), patient-provider interactions (measured by exit interviews) and medication prescription and use (measured by phone interviews and health records). Findings were mixed and highlighted that guidelines alone did not improve outcomes, whereas guidelines plus an mHealth application improved several outcomes. Changes in clinical measures were not significant, though the authors argued that the implementation period was short and that many clinicians rejected use of the application. All components of patient-provider interactions improved significantly (i.e., the provider took a medical history, the provider asked about medication complications) and there were notable increases in the reporting of medication prescription and use in the EMR [25].

Integrating refugees into host country health systems
In addition to the use of eHealth applications to improve NCD services, other actors attempted to integrate refugee health workers or refugee health services into host-country health systems. For example, Medical Teams International (MTI) was an early responder to the health needs of Syrian refugees in Lebanon. MTI provided mobile clinics and then shifted service delivery to a focus on expanding the role of community health workers [26]. Several factors motivated MTI’s change in approach. First, the Lebanese government required that NGOs invest in health systems strengthening rather than develop parallel health structures. Second, MTI conducted several studies that identified key gaps in service provision in their own programs. The organization responded by investing in refugee outreach volunteers (ROVs) who served as community health workers. ROVs monitored disease control for community members with diabetes and hypertension, led discussions on changes to diet and smoking habits, conducted cardiovascular disease risk assessments and referred high-risk refugees to primary health centers (PHCs). The authors reported descriptive statistics, including the number of blood pressure monitoring visits completed by ROVs and the number of refugees referred to PHCs for more advanced care. The intervention was not measured for effectiveness and did not present outcome indicators.

One study aimed to improve access to care for refugees with end-stage renal disease in Iran. The Iranian national health policy provided Afghan refugees access to dialysis and kidney transplantation at government facilities [27]. Specifically, Afghan refugees, with end-stage renal disease (ESRD) could receive kidney donations from others of the same nationality. In 2004, the authors conducted a simple descriptive analysis of the transplantation program in Tehran, through a review of Ministry of Health (MOH) records. They found that 241 refugees had ESRD, 179 were on dialysis and 62 had received a transplant. It should be noted that Afghan refugees could not be kidney donors to Iranian nationals for fear of exploitation or coercion. The integration of Afghan refugees into the Iranian health system was a novel approach to managing the health and wellness of displaced persons. While this integration was not measured for effectiveness, it was monitored over time to document availability of the service and any risk of ethical concerns.

Theme 3: preventing NCDs and NCD complications
Prevention efforts were highlighted in three of the identified studies. Collins et al. [28] illustrated a cardiovascular disease (CVD) risk assessment and prevention program that took place in two Médecins Sans Frontières (MSF) clinics in Jordan. The clinics introduced CVD risk assessments in tandem with cholesterol
testing. This risk assessment tool was applied to Syrian refugees and Jordanian patients with hypertension, diabetes, chronic obstructive pulmonary disease, asthma and CVD and was intended to aid clinicians in identifying risk and prescribing relevant medications. The team conducted a mixed-methods study to understand the extent to which the tool was used and challenges faced during implementation. Quantitative findings revealed that very few patients had a CVD risk score assigned to them and that half of the high-risk patients were not prescribed the needed medication. Qualitative findings uncovered reasons for this failure to adhere to the CVD risk assessment guidelines, including confusion about how to use risk assessment charts and the desire to prioritize lifestyle changes over medications. Further, the risk assessment was only being conducted by physicians but several nurses seemed to have a better understanding of the tool. This intervention focused on improving clinician behavior and preventing CVD among patients who had other NCD diagnoses.

The remaining two prevention efforts aimed to change patient behavior. Rowther et al. [29] presented a diabetes risk assessment and motivational interviewing intervention in a Jordanian clinic managed by the Institute for Family Health (IFH). This program, the Computer-Assisted Diabetes Risk Assessment and Education program (CADRAE), targeted marginalized communities across a broad spectrum including refugees (Syrian, Palestinian and Iraqi) and Jordanians. The initiative had two components: a self-administered computerized survey that helped patients identify their diabetes risk, followed by a short, computerized, motivational interview that supported patients in considering lifestyle changes. The survey portion asked patients about family history, use of anti-hypertensives, physical activity, fruit and vegetable intake, body mass index and other items. The motivational interview was a mini-counseling session aimed at aiding patients in setting achievable goals around their behaviors. Both activities took place in the IFH clinic waiting room. Patients also received phone calls 1-month after the encounter. Program effectiveness was not evaluated.

Abu Kishk et al. [30] evaluated the final prevention-related intervention, a community-based campaign for Palestinian refugees who had diabetes and attended an UNRWA clinic. The six-month campaign, “Life is Sweeter with less Sugar” included education sessions focused on, among other things, diabetic symptoms, medications and dental care. The campaign also incorporated monthly cooking classes and bimonthly exercise sessions in various communal locations. Similar to most UNRWA interventions, this campaign took place in four out of five of UNRWA’s locations -- Jordan, the West Bank, Lebanon and Gaza. Syria was excluded as a result of the Syrian Civil War. The authors evaluated the effectiveness of the intervention by analyzing pre-and-post performance on several data elements, including demographics, body measurements, blood tests and blood pressure. Significant changes were observed in all areas.

**Discussion**

This scoping review identified 11 publications that presented interventions and policies aimed at addressing NCDs among urban refugee populations in MENA region. Ten of the 11 publications focused on interventions, and only one described a national policy. The majority of the studies were conducted in Jordan, addressed the NCD needs of adults, and tackled five diseases - diabetes, hypertension, cancer, cardiovascular disease and end-stage renal disease. Palestinian and Syrian refugees were the most common population targeted for support. However, the majority of papers that focused on Palestinians pertained to a single regional reform effort undertaken by a UN agency, UNRWA. Other funding and implementing organizations involved in the selected studies were Médecins Sans Frontières, International Organization for Migration, International Medical Corps, the Transplantation Unit at Hashemi Nejad Kidney Hospital, Institute for Family Health, Noor Al Hussein Foundation, University of California-Irvine, American University of Beirut, Children’s Cancer Center of Lebanon Foundation, St. Jude Children’s Research Hospital, the American Lebanese Syrian Associated Charities and Medical Teams International.

It is important to note the paucity of published work that thoroughly described NCD interventions and policies related to urban refugees in crisis-affected contexts or evaluated the efficiency and effectiveness of such approaches. In light of the growing burden of noncommunicable diseases in middle-income settings, coupled with the increasing frequency of humanitarian crises in middle-income countries, the field requires greater investment in research on effective ways of addressing NCDs. Much of the peer-reviewed literature articulated the challenges faced -- high prevalence, high percentage of deaths due to NCDs, general barriers to care and other upstream concerns -- but presented very few tested solutions.

This review produced five key findings that have implications for research and practical efforts to address NCDs among urban refugees in the Middle East and North Africa. First, very few studies focused on the prevention of noncommunicable diseases among displaced populations. This is unfortunate since displacement is increasingly a long-standing situation, and prevention is a pillar of efforts to improve long-term health. Primary prevention efforts are less expensive than treatment and can shift the focus from expensive hospital services to less expensive health centers and community-based...
programs [31]. The studies identified through this review focused solely on patients who had already been diagnosed with a disease and were being treated at a primary healthcare clinic. Only one study implemented a program outside of a clinic setting and incorporated community-based concepts. However, that study team focused only on patients who had been diagnosed in their primary healthcare clinics, and were thus attempting to prevent secondary complications.

Opportunities exist to engage in the primary prevention of noncommunicable diseases among adults, adolescents and children who have yet to be affected by any diagnosis. Greater attention and funding should be directed towards primary prevention in order to reduce morbidity, mortality and healthcare costs [7]. Moreover, many NCDs are preventable through changes in individual behavior, reductions in social and economic inequalities and regulation of commercial determinants of disease. Two of the three prevention studies focused on the former, changing patient behavior, while the third prioritized modifying physician behavior. No studies explored more complex root causes of NCDs, or implemented multi-sectoral approaches to address these issues. Prevention efforts could include education, smoking cessation, cooking courses, the modification of public spaces to improve accessibility and legislation that limits the marketing of unhealthy foods. In addition, several interventions highlighted in this review may be adapted to address prevention concerns, including the deployment of refugee outreach volunteers and the utilization of mobile technologies for education and coaching.

Second, a promising area of intervention was the use of health information technologies (HIT), including electronic medical records (EMRs), NCD databases for clinicians, and mHealth applications for patients. EMRs were used to manage daily clinical encounters as well as monitor patients over time to identify trends in care and areas for improvement in service delivery. An NCD database was utilized to review physician practice behaviors and identify the need for additional intervention with physicians and nurses. An mHealth application, administered on a portable touch-screen computer, helped patients understand their risk of developing diabetes and encouraged them to modify their lifestyle to avoid diagnosis. One intervention combined an EMR for clinicians with a personally controlled health record (PCHR) for patients, providing both parties access to the medical record, the ability to move the record easily to another facility, and to view educational materials. The use of HITs in resource-poor settings has increased dramatically in recent years and has been used to manage a variety of health concerns and health systems challenges [7, 32]. HIT may be well suited for prevention, treatment and rehabilitation efforts among populations on the move. Health and humanitarian actors should continue to research and expand on these experiences with HIT’s in order to identify effective interventions and scale them up in relevant contexts.

Third, the vast majority of publications were solely focused on tackling NCDs through primary care efforts and did not address specialized needs or services. While primary care is a key component of NCD services, access to specialists and more advanced care is important for the prevention of mortality and morbidity. For example, people with diabetes are at risk of diabetic retinopathy and neuropathy, and specialists help to treat and avoid these secondary complications. Primary care interventions were the most common because the implementers identified in this review were NGOs and UN actors. As a result of funding limitations and a lack of experience with supporting NCDs in crisis settings, NGO and UN actors often only provide primary care. However, a prioritization of primary care without the support of specialists (i.e., endocrinologists, nephrologists, oncologists, pulmonologists) and secondary care settings reduces access to comprehensive and coordinated NCD services and negatively impacts health outcomes. Access to advanced secondary and tertiary NCD services are an urgent concern among refugee populations in urban/non-camp settings and likely can only be improved through efforts to integrate refugee populations into national health systems [33].

Fourth, only one publication addressed a national health policy and did so with very little detail. Policy frameworks serve as guiding documents for how to address large scale health needs, include all populations, identify financial and other resources, cultivate partnerships and monitor and evaluate policy implementation. The dearth of documentation about policy frameworks that address NCD needs among refugees in urban settings is problematic. Policy development and implementation are complex and require the involvement of many stakeholders. Frequently key populations are left out of policies, or the steps taken to implement a policy lack fidelity to what the policy had intended to accomplish. Poorly crafted policies can discriminate against marginalized communities or have other unintended consequences. As a result, continuous, unbiased monitoring and evaluation of national policies is key to ensuring inclusiveness and effectiveness. Greater efforts are needed to document and evaluate current policy frameworks and their success in addressing NCDs in displaced populations.

Moreover, the one policy identified in this scoping review responded to the needs of Afghan refugees by making them eligible for Iran’s national program for dialysis and kidney transplantation. This policy focused on the integration of refugees into host country health systems. UNHCR and other actors tout integration as the
approaches to NCDs. However, it is recognized that the
have resulted in missed opportunities to identify novel
across the region. Also, the review is limited to select
view a wide range of interventions and policies from
the goal of scoping reviews and made it possible to re-
ity of the selected studies. However, this is aligned with
methodologies and did not attempt to critique the qual-
tifications. This scoping review included all possible study
resources [14, 34, 36]. Parallel structures also risk doing
harm by creating short term programs that are frequently
interrupted, providing services that are not aligned with
cultural expectations, and focusing heavily on treatment
over prevention of illness [37]. Documentation and
evaluation of policy frameworks could aid stakeholders in
exploring integration opportunities and determining
feasibility and effectiveness of such approaches.

Last, refugee perspectives on their own health and
their access to NCD services were notably absent from
the literature. While interventions and policies were pre-
sented in varying depth and quality, researchers failed to
document how refugees interacted with health services
in urban settings and whether these services met their
needs. Capturing and analyzing the experiences of
affected persons is key to increasing health access, en-
hancing the quality of services and improving health
outcomes. Dozens of authors have argued that health
professionals and health systems benefit from listening
to patients and communities [38, 39]. This ‘listening’ al-
 lows the system to respond to needs and engage patients
in the co-creation and design of health services and
other approaches to wellness [38, 40]. Incorporating
patient and community perspectives into the design and
evaluation of programs results in a variety of benefits includ-
ing empowerment of vulnerable communities, strengthening
of health systems and greater patient self-care and self-
management [39]. This gap in the literature suggests that
clinicians and health systems may have a limited under-
standing of patient and community assets and needs, and
may be making incorrect assumptions about what is most
useful for the populations they serve.

Limitations
These findings should be viewed in light of several limi-
tations. This scoping review included all possible study
methodologies and did not attempt to critique the qual-
ity of the selected studies. However, this is aligned with
the goal of scoping reviews and made it possible to re-
view a wide range of interventions and policies from
across the region. Also, the review is limited to select
years (2000–2018) and the English language, which may
have resulted in missed opportunities to identify novel
approaches to NCDs. However, it is recognized that the
discourse on tackling NCDs among urban refugees in-
creased in response to the fleeing of Iraqi refugees in 2003
and Afghan refugees in 2001. Thus, the majority of the
reviewed work on this topic occurred in this time period.

There is a risk that the works captured by this review
do not include all relevant interventions and policies,
particularly because practitioners may not have pub-
lished these items as peer-reviewed literature and grey
literature was not reviewed. Further, in this scoping re-
view, each intervention and policy was described at
derminating levels of depth due to differences in depth of
description and analysis in the original publication. A
future review may benefit from a more thorough con-
sultative process, wherein reviewers contact and inter-
view implementers to gain more in-depth understanding
of intervention characteristics and additional findings
that may have arisen post-publication. Even with these
limitations, the findings of this study have significant
implications for practitioners, policymakers and donors
and can be utilized to explore additional research
questions, identify possible interventions worth piloting
and collaborate with actors that have valuable experience
in the subject area.

Conclusion
The aim of this review was to compile research about the
interventions and policies aimed at addressing the needs of
urban based refugees diagnosed with noncommunicable
diseases across the MENA region. The review concluded
that, (1) very few interventions were aimed at preventing
NCDs among the forcibly displaced, (2) that eHealth and
mHealth were readily used across different crisis settings
and (3) that most NCD efforts solely focused on primary
care, while secondary and tertiary NCD care were absent
from the refugee literature. Additionally, the review
identified (4) limited writing on health policies and (5) an
absence of work that inquired about refugee perspectives
and experiences with NCD services in host countries.

Much additional work is needed to provide comprehen-
sive, equitable, quality health supports for urban refugee
populations. In regard to NCDs, opportunities exist to
prioritize prevention efforts, scale up eHealth and mHealth
interventions, expand access to secondary and tertiary ser-
dices, analyze national health policies and elevate the voices
of refugees in health services research. While there are
several interventions and policies that appear promising,
other efforts will require more rigorous study designs to
determine effectiveness in diverse settings. This scoping re-
view is a first step in documenting current interventions
and policies and recognizing strengths and gaps across
these approaches. Practitioners, policymakers and donors
can utilize this content to more strategically plan local, na-
tional and global responses to NCD needs among refugees
residing in urban settings.
Supplementary information

Supplementary information accompanies this paper at https://doi.org/10.1186/s13031-020-0255-4.

Additional file 1. Search syntax.

Abbreviations

CADRAE: Computer-assisted diabetes risk assessment and education; COPD: Chronic obstructive pulmonary disease; CVD: Cardiovascular disease; DM: Diabetes mellitus; ECC: Exceptional care committee; EMR: Electronic medical record; ESRD: End-stage renal disease; HIT: Health information technology; ICD: International Classification of Diseases and Related Health Problems; IFH: Institute for Family Health; IOM: International Organization for Migration; MOH: Ministry of Health; MSF: Médecins Sans Frontières; NCD: Noncommunicable disease; NGO: Non-governmental organization; PCHR: Patient-controlled health record; PEN: Package of Essential noncommunicable disease interventions; PHC: Primary health center; ROV: Refugee outreach volunteer; UN: United Nations; UNHCR: The UN Refugee Agency; UNRWA: United Nations Relief and Works Agency for Palestine Refugees in the Near East; WHO: World Health Organization

Acknowledgements

The author would like to thank Dr. Mike Wessells, Dr. Neil G. Boothby, Dr. Cassie Landers and Dr. Craig Spencer for their review of the manuscript and the Informationists at the Augustus C. Long Health Sciences Library for their guidance.

Authors’ contributions

The author read and approved the final manuscript.

Authors’ information

Not applicable.

 Funding

Not applicable.

Availability of data and materials

Not applicable.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The author declares that there are no competing interests.

Received: 18 September 2019 Accepted: 29 January 2020

References

1. McNatt ZZ, Freels PE, Chandler H, et al. “What’s happening in Syria even affects the rocks”: a qualitative study of the Syrian refugee experience accessing noncommunicable disease services in Jordan. Conflict Health. 2019;13:26. https://doi.org/10.1186/s13031-019-0209-x [published Online First: 2019/06/19].

2. Guterres A, Spiegel P. The state of the world’s refugees: adapting health responses to urban environments. JAMA. 2012;308(7):673–4. https://doi.org/10.1001/jama.2012.10161. [published Online First: 2012/08/16].

3. Rehr M, Shoabi M, Ellithy S, et al. Prevalence of noncommunicable diseases and access to care among non-camp Syrian refugees in northern Jordan. Conflict Health. 2018;12:33. https://doi.org/10.1186/s13031-018-0168-7 [published Online First: 2018/07/17].

4. Movafi H. Conflict, displacement and health in the Middle East. Global Public Health. 2011;6(5):472–87. https://doi.org/10.1080/17441692.2011.570358. [published Online First: 2011/05/19].

5. Movafi H, Spiegel P. The Iraqi refugee crisis: familiar problems and new challenges. JAMA. 2008;299(14):1713–5. https://doi.org/10.1001/jama.299.14.1713. [published Online First: 2008/04/10].

6. Amara AH, Aljurdi SM. Noncommunicable diseases among urban refugees and asylum-seekers in developing countries: a neglected health care need. Globalization Health. 2014;10:24. https://doi.org/10.1186/1744-8603-10-24. [published Online First: 2014/09/04].

7. Aebischer Perone S, Martinez E, du Montier S, et al. Non-communicable diseases in humanitarian settings: ten essential questions. Conflict Health. 2017;11:17. https://doi.org/10.1186/s13031-017-0119-8. [published Online First: 2017/09/22].

8. Doocy S, Lyles E, Hanquart B, et al. Prevalence, care-seeking, and health service utilization for non-communicable diseases among Syrian refugees and host communities in Lebanon. Conflict Health. 2016;10:21. https://doi.org/10.1186/s13031-016-0088-3. [published Online First: 2016/10/26].

9. Doocy S, Lyles E, Robertson T, et al. Prevalence and care-seeking for chronic diseases among Syrian refugees in Jordan. BMC Public Health. 2015;15:1097. https://doi.org/10.1186/s12889-015-2429-3. [published Online First: 2015/11/02].

10. Ruby A, Knight A, Perel P, et al. The Effectiveness of Interventions for Non-Communicable Diseases in Humanitarian Crises: A Systematic Review. PloS one. 2015;10(9):e0138303. https://doi.org/10.1371/journal.pone.0138303. [published Online First: 2015/09/26].

11. Bollars C, Nasei T, Thomissen R, et al. Adapting the WHO package of essential noncommunicable disease interventions, Samoa. Bull World Health Organ. 2018;96(8):578–83. https://doi.org/10.2471/BALT.17.203695. [published Online First: 2018/08/15].

12. Hyon CS, Nam KY, Sun HC, et al. Package of essential noncommunicable disease (PEN) interventions in primary health-care settings in the Democratic People’s Republic of Korea: A feasibility study. WHO South East Asia J Public Health. 2017;6(2):69–73. [published Online First: 2017/09/01].

13. WHO. Tackling NCDs: Best buys and other recommended interventions for the prevention and control of noncommunicable diseases. Geneva: World Health Organization; 2017.

14. Jobanputra K, Bouille F, Roberts B, et al. Three Steps to Improve Management of Noncommunicable Diseases in Humanitarian Crises. PloS Med. 2016;13(11):e1002180. https://doi.org/10.1371/journal.pmed.1002180. [published Online First: 2016/11/09].

15. Arsky HOML. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8:19–31.

16. Organization WH. Health policy 2019 Available from: https://www.who.int/topics/health_policy/en/.

17. UNHCR. UNHCR policy on refugee protection and solutions in urban areas; 2009 p. 1–29.

18. WHO. Global Action Plan for the Prevention and Control of Noncommunicable Disease 2013-2020. Geneva: World Health Organization; 2013.

19. WHO. Monitoring the building blocks of health systems: A handbook of indicators and their measurement strategies. Geneva: World Health Organization; 2010.

20. Spiegel P, Khalifa A, Mateen FJ. Cancer in refugees in Jordan and Syria between 2009 and 2012: challenges and the way forward in humanitarian emergencies. Lancet Oncol. 2014;15(11):e290–7. https://doi.org/10.1016/S1470-2045(14)70067-1. [published Online First: 2014/05/30].

21. Saab R, Jeha S, Khalifeh H, et al. Displaced children with cancer in Lebanon: a sustained response to an unprecedented crisis. Cancer. 2018;124(7):1464–72. https://doi.org/10.1002/cncr.31273.

22. Ballout G, Al-Shorbaji N, Abu-Kishk N, et al. UNRWA’s innovative e-health for 5 million Palestinian refugees in the near east. BMJ Innov. 2018;4(3):128–34. https://doi.org/10.1136/bmjinnov-2017-000262.

23. Khader A, Farajallah L, Shabih Y, et al. Cohort monitoring of persons with hypertension: an illustrated example from a primary healthcare clinic for Palestine refugees in Jordan. Trop Med Int Health. 2012;17(9):1163–70. https://doi.org/10.1111/j.1365-3156.2012.03048.x. [published Online First: 2012/08/01].

24. Khader A, Farajallah L, Shabih Y, et al. Cohort monitoring of persons with diabetes mellitus in a primary healthcare clinic for Palestine refugees in Jordan. Trop Med Int Health. 2012;17(12):1569–76. https://doi.org/10.1111/j.1365-3156.2012.03097.x. [published Online First: 2012/10/12].

25. Doocy S, Paik KE, Lyles E, et al. Guidelines and mHealth to Improve Quality of Care for Syrian Refugees in Lebanon. Global Health Sci Pract. 2017;5(3):495–506. https://doi.org/10.9745/ghsp-d-17-00043. [published Online First: 2017/09/21].
27. Ghods AJ, Nasrollahzadeh D, Kazemeini M. Afghan refugees in Iran model renal transplantation program: ethical considerations. Transplant Proc. 2005;37(2):565–7. https://doi.org/10.1016/j.transproceed.2004.11.084 [published Online First: 2005/04/26].

28. Collins DR, Jobanputra K, Frost T, et al. Cardiovascular disease risk and prevention amongst Syrian refugees: mixed methods study of Medecins Sans Frontieres programme in Jordan. Conflict Health. 2017;11:14. https://doi.org/10.1186/s13031-017-0115-z [published Online First: 2017/07/21].

29. Rowther AA, Dykzeul B, Billimek J, et al. Computer-Assisted Diabetes Risk Assessment and Education (CADRAE) for Medically Vulnerable Populations in the Middle East: a Novel and Practical Method for Prevention. J Global Health Perspect. 2015;2015 [published Online First: 2016/02/03].

30. Abu Kishk NM. Evaluation of the diabetes campaign for Palestine refugees with diabetes mellitus attending UNRWA health centers. Int J Food Sci Nutr Diet. 2015;04(7):246–52.

31. Probst-Hensch N, Tanner M, Kessler C, et al. Prevention—a cost-effective way to the non-communicable disease epidemic: an academic perspective of the United Nations High-level NCD Meeting. Swiss Med Wkly. 2011;141:w13266. https://doi.org/10.4414/smw.2011.13266 [published Online First: 2011/06/09].

32. Doocy S, Paik K, Lyles E, et al. Pilot Testing and Implementation of a mHealth tool for Non-communicable Diseases in a Humanitarian Setting. PLoS Curr. 2017;9. https://doi.org/10.1371/currents.dis.9bd48a8ac93797b1999a37de099be74 [published Online First: 2017/07/27].

33. Doocy S, Lyles E, Akhu-Zaheya L, et al. Health service access and utilization among Syrian refugees in Jordan. Int J Equity Health. 2016;15(1):108. https://doi.org/10.1186/s12939-016-0399-4 [published Online First: 2016/07/16].

34. Spiegel PB. The humanitarian system is not just broke, but broken: recommendations for future humanitarian action. Lancet. 2017. https://doi.org/10.1016/S0140-6736(17)31278-3 [published Online First: 2017/06/13].

35. Morand M. The implementation of UNHCR’s policy on refugee protection and solutions in urban areas. UNHCR: Geneva; 2012. https://www.unhcr.org/516d658c9.pdf.

36. Langlois EV, Haines A, Tomson G, et al. Refugees: towards better access to health-care services. Lancet. 2016;387(10016):319–21. https://doi.org/10.1016/S0140-6736(16)00101-X [published Online First: 2016/02/06].

37. Wessells MG. Do No Harm: Toward Contextually Appropriate Psychosocial Support in International Emergencies. Am Psychol. 2009;64(8):842–54. https://doi.org/10.1037/a0018634.

38. Robert G, Cornwell J, Lockett L, et al. Patients and staff as codeesigners of healthcare services. BMJ. 2015;350:g7714. https://doi.org/10.1136/bmj.g7714 [published Online First: 2015/02/12].

39. Ocloo J, Matthews R. From tokenism to empowerment: progressing patient and public involvement in healthcare improvement. BMJ Qual Saf. 2016;25(8):626–32. https://doi.org/10.1136/bmjqs-2015-004859 [published Online First: 2016/03/20].

40. Batalden M, Batalden P, Margolis P, et al. Coproduction of healthcare service. BMJ Qual Saf. 2016;25(7):509–17. https://doi.org/10.1136/bmjqs-2015-004315 [published Online First: 2015/09/18].

**Publisher’s Note**

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.