Mixed methods evaluation of MSF primary care based NCD service in Irbid, Jordan: February 2017- February 2018

Author: Éimhín Ansbro, MSF / LSHTM Research Fellow in NCDs in Humanitarian Settings

Contributors:

- MSF: Tobias Homan, Kiran Jobanputra, Manuela Rehr, Sarah Ellithy, Jamil Quasim, Hashem Tanni, Peter Garrett, Mohammed Shoaib, Karla Bil
- LSHTM: Bayard Roberts, Pablo Perel, Sylvia Garry, David Prieto, Zia Sadique
- MoH Jordan: Mohammad Altarawneh, Majed Assad, Taissir Fardous, Myassar Zindah

The report is available in three versions of different lengths. To access each, click on the links below:

1. Executive Summary (3 pages) page 3
2. Evaluation Report: Short Version (18 pages) page 6
3. Evaluation Report: Full Version (70 pages) page 27
## List of acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMR</td>
<td>Arab Medical Relief</td>
</tr>
<tr>
<td>BMI</td>
<td>Body Mass Index</td>
</tr>
<tr>
<td>BP</td>
<td>Blood Pressure</td>
</tr>
<tr>
<td>COPD</td>
<td>Chronic Obstructive Pulmonary Disease</td>
</tr>
<tr>
<td>CVD</td>
<td>Cardiovascular Disease</td>
</tr>
<tr>
<td>DM</td>
<td>Diabetes Mellitus</td>
</tr>
<tr>
<td>FBG</td>
<td>Fasting Blood Glucose</td>
</tr>
<tr>
<td>GOJ</td>
<td>Government of Jordan</td>
</tr>
<tr>
<td>Hb</td>
<td>Haemoglobin</td>
</tr>
<tr>
<td>HbA1c</td>
<td>Glycosylated Haemoglobin</td>
</tr>
<tr>
<td>HE</td>
<td>Health Education</td>
</tr>
<tr>
<td>HLO</td>
<td>Humanitarian Liaison Officer</td>
</tr>
<tr>
<td>HTN</td>
<td>Hypertension</td>
</tr>
<tr>
<td>HV</td>
<td>Home Visit</td>
</tr>
<tr>
<td>JHAS</td>
<td>Jordan Health Aid Society</td>
</tr>
<tr>
<td>LFT</td>
<td>Liver Function Tests</td>
</tr>
<tr>
<td>MH</td>
<td>Mental Health</td>
</tr>
<tr>
<td>MHPSS</td>
<td>Mental Health and Psychosocial Support</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MOI</td>
<td>Ministry of Interior</td>
</tr>
<tr>
<td>MSF-OCA</td>
<td>Médecins sans Frontières – Operational Centre Amsterdam</td>
</tr>
<tr>
<td>MSF-OCBA</td>
<td>Médecins sans Frontières – Operational Centre Barcelona</td>
</tr>
<tr>
<td>MSF-UK</td>
<td>Médecins sans Frontières – United Kingdom Office</td>
</tr>
<tr>
<td>NCD</td>
<td>Noncommunicable Disease</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental Organisation</td>
</tr>
<tr>
<td>RE-AIM</td>
<td>Reach, Effectiveness, Adoption, Implementation, Maintenance</td>
</tr>
<tr>
<td>UNHCR</td>
<td>United Nations High Commissioner for Human Rights</td>
</tr>
<tr>
<td>UNWRA</td>
<td>United Nations Relief and Works Agency for Palestinian Refugees</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
Executive Summary

Introduction

Non-communicable diseases (NCD) are the leading causes of mortality and morbidity among Syrian refugees in Jordan. Following the onset of the Syrian crisis in 2011, the Jordanian health system was overwhelmed by the chronic disease burden among this group. In response, in late 2014, Médecins sans Frontières Operational Centre Amsterdam (MSF-OCA) opened an NCD service at two primary care centres targeting non-camp based Syrian refugees and vulnerable Jordanians in Irbid, north Jordan, using a multi-disciplinary primary care model. The programme focused on the NCDs causing most deaths in pre-war Syria: cardiovascular disease (CVD), including hypertension, diabetes (DM), and chronic respiratory disease. The model evolved in response to patient needs, programmatic lessons learned and contextual changes. A programme evaluation was done, aiming to refine the model, generate evidence on its feasibility, acceptability and effectiveness and learn lessons to inform translation of a similar model of NCD care to comparable humanitarian settings.

Methods

MSF, the London School of Hygiene and Tropical Medicine and the Jordanian Ministry of Health collaborated on this evaluation in late 2017. Using mixed methods and an implementation research framework, “RE-AIM”, we explored the programme’s Reach and Access, Effectiveness, Adoption and Acceptability, Implementation and Maintenance.

Methods used included:

- Secondary analysis of a pre-existing MSF cross-sectional household survey done in 2016
- Analysis of routine data for patients enrolled January 2015 - December 2017
- Clinical audit on selected patient files
- Qualitative research, involving focus groups and interviews with patients, staff and key stakeholders undertaken in August 2017
- Medication adherence survey of 300 patients
- Non-participant observation of clinic flow and consultation
- Descriptive costing analysis of costs at clinic, project and coordination levels.

Results

MSF is providing a high quality, free, reliable and holistic primary level NCD service in a caring environment. They are further fulfilling their humanitarian remit with specific mental health and psychosocial support (MHPSS) services and a home visit service targeting disabled patients.

Reach and access: It is estimated that over one fifth of adult Syrians in Irbid governorate have least one diagnosed relevant NCD; and, of these, an estimated 23% was reached by the MSF-OCA NCD Service. Almost one third (27.1%) of the 5045 total enrolled patients were Jordanian, in line with Jordanian Government requirements. The Irbid cohort represented a group of older, potentially disabled, patients who have several NCDs and take multiple daily medications. NCD risk factors levels were high: two thirds were obese (62.6%); one-fifth smoked (22.7%) and over two thirds reported low or zero activity levels (37.2%). The most common diagnoses found here (hypertension and diabetes), reflected existing reports on NCD prevalence among Syrian refugees in Jordan.

Most patients considered the MSF clinics physically accessible, in terms of distance and convenience. They were pragmatic in allocating their limited financial resources and prioritised expenditure on transport costs for medical consultations over those for MHPSS, health education or laboratory visits. The available referral options for NCD complications or other conditions were perceived to be opaque, inaccessible, unaffordable and inadequate by patients, staff and some stakeholders. MSF had successfully brokered agreements with other NGOs to cover some referral needs free-of-cost to patients but this was often for a defined period only and was limited by funding.

Adoption and acceptance: The programme was highly acceptable to patients, staff and stakeholders. Patients valued the reliable, free medications and regular laboratory testing provided in a caring environment. Staff were committed, proud and derived satisfaction from seeing patients improve. Multiple stakeholders believed
the programme addressed a significant health need among both Syrians and Jordanians and relieved the potential burden on the MOH.

The majority of patients were retained in care for over 6 months (85.2%); one third of enrolled patients exited, (including 12.5% cumulative loss to follow up and 2.6% deaths). There was good community awareness of the programme and a waiting list of over 200 patients. Syrian community members reportedly had limited access to alternative, affordable NCD services and coped by selectively forgoing medications, sharing with family or neighbours or purchasing from private pharmacies.

The MSF NCD guideline was acceptable and usable by staff and was seen as a tool to negotiate patient demands. Most patients (89%) had very high self-reported medication adherence scores, although this was contradicted by patient and staff accounts of non-adherence. There was some stigma associated with MHPSS services among patients and initial distrust from the medical team, which was partially addressed through multidisciplinary staff training sessions.

Effectiveness: Just over half of type 2 diabetic patients reached clinical targets (HbA1c < 8%) and 63.4% of hypertensive patients had controlled blood pressure (BP < 140/90 mmHg) at their last visit. Patients made the most progress in the first six months post enrolment and the overall trend since the programme began was towards improved control of clinical parameters within the whole cohort. The clinical audit showed there was room to improve in statin prescribing, especially for secondary prevention of cardiovascular disease (e.g. 25% of eligible patients were prescribed a statin).

Implementation: The key challenge to implementing and maintaining effective NCD care in the Syrian refugee population was the impact of the war and refugee experience. This had profound implications for Syrian patients’ ability to engage with the programme in terms of medication adherence, dietary and lifestyle advice, and affordability of access. The programme has made great strides in addressing this by introducing the HLO role (though underutilised); and by expanding and reorienting the MPHSS service. Since this study was performed, the team introduced depression screening with the PHQ-9 tool, which was paused in late 2017 as the burden of morbidity identified overwhelmed services.

Staff adapted health education messages to patients’ literacy, education levels and financial means and involved family members as informal treatment supporters. Space, patient transport costs and limited patient engagement were barriers to implementation of group sessions. Clinicians described a didactic and knowledge-based rather than patient-centred approach to patient education. Additional challenges encountered by the team included: cultural dietary and exercise norms and acceptance of smoking (especially in men), the obesogenic environment and patients’ perception and expectation that medications would provide solutions.

Patients’ behaviour change and medication adherence was facilitated by family and MSF staff support. Staff perceived that excellent patient-staff rapport; positive experiences of supervision, support and training; and good teamwork with colleagues assisted with implementation. Challenges from their perspective were: Syrian patients’ trauma, lower education levels and perceived greater medical complexity compared to Jordanians. Patients’ (of both nationalities) tendency to attend multiple concurrent providers also complicated care delivery.

Essential components and adaptations of the programme included the introduction and expansion of MHPSS in response to significant mental health needs among Syrian patients; the establishment of essential referral pathways; the refinement of health education and introduction of group sessions; the introduction and expansion of a home visit service and the creation of a humanitarian liaison officer role to address social and protection needs.

Costs increased in parallel with increases in service complexity. The total annual financial cost significantly increased from 2015 (£1,857,535.46) to 2016 (£2,796,123.79) reflecting the greater number of active patients and the gradual addition of staff and services, including the home visit and mental health services. The major cost drivers were HR and drugs, with insulin, atorvastatin and glucometer strips proving the most costly drug items. The total annual drug cost would be halved if MSF imported all drugs at MSF warehouse prices. More cost savings could be made by reducing visit frequency and categorising more patients as stable than by task shifting current workload to nurses.
Maintenance: Proposed task shifting had not occurred because of lack of clarity on clinical activity and patient flow, lack of eligibility criteria and resistance from patients and medical staff. Contextual challenges related to operating within the Jordanian government and legal framework. These included the requirement to locally purchase drugs. There was perceived tension between the team’s desire to improve and add complexity to the programme and the need to consider a potential future handover. Several management staff discussed the need to engage with the MOH as the likely handover partner but pointed to the gulf between the current MSF and MOH models of NCD care.

Conclusions
MSF OCA is implementing a programme of primary level NCD care for Syrian refugees and the Jordanian host population that is highly acceptable to patients, staff and stakeholders. It is affordable for patients, and fulfils MSF’s humanitarian remit while achieving good clinical outcomes. Long-term sustainability and transferability of this complex programme model is, undoubtedly, a challenge but simplification of the care model, reduction of costs, and engagement with the Jordanian government and other actors could maximize its potential long-term success.

Implications and recommendations for Irbid programme and Jordan mission
This collaborative evaluation has helped to formulate challenges faced by the team and to crystallise solutions. Recommendations are based on the evaluation; several have come from the field team and, as this programme is rapidly evolving, many have been addressed or are underway.
- The team will continue the work described in this report on lobbying with UNHCR and other actors, including international donors, on improving access to free or low-cost primary NCD care and relevant referral pathways. They will monitor the effects of the new Jordanian policy, introduced in January 2018, to significantly increase MOH fees for Syrian refugees.
- In order to build on the humanitarian remit of the programme and further restore dignity and reduce suffering amongst the Syrian population, work on further integration of mental health care with care for physical chronic conditions is recommended.
- A review of CVD secondary prevention prescribing practices is recommended and of a one-page prescribing algorithm that excludes cholesterol testing.
- Health education would be more effective if a patient-centred, solution-focused approach was taken, and group work was maximised with individual sessions targeted at specific patient groups.
- Community engagement could be strengthened via introduction of: community outreach workers; community adherence or support groups, led by community workers or peers; an awareness and prevention-raising event e.g. community run or community-based sessions provided by MSF staff.
- The mission could explore several cost savings routes, including innovative procurement approaches, lobbying with the government to import more expensive items, negotiation with local suppliers and adjusting the care models with less frequent clinical review.
- Introducing a referral focal point, targeting specific vulnerable patients with a multi-disciplinary team approach and specifying HLO referral criteria may strengthen these programme aspects.
- Providing transport costs may encourage patients to attend MHPSS/HE group sessions.

Lessons learned and recommendations for MSF and broader humanitarian context
- It is vital to ensure that specific mental health and psychosocial support are included as an integral part of primary level NCD services in humanitarian settings.
- Provide a tiered and integrated approach to mental health and psychosocial support so that patients are triaged to receive the appropriate level of care.
- In the next revision of the MSF NCD guideline, focus on the issues of the vertical approach to each disease, polypharmacy, multi-morbidity, frailty and palliation.
- Where appropriate, a context-adapted, algorithm-driven approach may facilitate task shifting to nurses and further reduce pill burden and workload in specific settings.
- Since a predictable proportion of patients will require referral for screening, diagnosis or treatment of NCD related complications, attempt to secure essential referral pathways (e.g. ophthalmology, cardiology, nephrology) that are acceptable, accessible and affordable for patients.
- Integrate with host health systems where possible and engage in health system strengthening appropriate to the local context in order to facilitate sustainability.
- Implement more broadly the structures, reporting mechanisms and indicators developed within the Jordan programme to reflect the needs of a chronic disease programme.
Evaluation Report: Short Version

Background: Since the start of the Syrian crisis in 2011, over 600,000 registered Syrian refugees fled to Jordan, with 80% living outside of formal camps. Non-communicable diseases (NCDs), particularly diabetes and cardiovascular disease, are among the leading causes of mortality and morbidity among Syrian refugees in Jordan. The health system in northern Jordan has been overwhelmed by the burden of chronic disease amongst Syrian refugees, such that it has been obliged to scale up primary level care for NCDs. Historically, this care was provided at secondary or tertiary level in Jordan. In December 2014, Médecins sans Frontières (MSF) commenced an NCD service at two primary care centres in Irbid using a multi-disciplinary primary care model with task shifting, context-adapted clinical guidelines, adapted patient counselling and support materials and medications from the World Health Organization (WHO) Essential Medicines list. The programme serves non-camp based Syrian refugees and vulnerable Jordanians (the latter constituting 30% of the cohort as stipulated by the Jordanian Government) and focuses on the NCDs and NCD risk factors responsible for the greatest mortality in pre-war Syria. These comprise: hypertension, established cardiovascular disease [CVD – angina, myocardial infarction (MI), ischaemic stroke, transient ischaemic attack, peripheral vascular disease, congestive heart failure] diabetes types I and II, asthma and chronic obstructive pulmonary disease (COPD). This programme represents an opportunity to evaluate and refine a model of NCD care delivered in a humanitarian setting in order to assess its application in comparable settings.

Overall aim: To evaluate a primary care-based model of NCD care in Irbid, Jordan in order to refine the model and to generate evidence on its feasibility, acceptability and effectiveness with a view to translating a similar model to comparable humanitarian settings.

The specific objectives were to examine the:

- **Reach (coverage) and access** to the NCD service and its components to the intended target population.
- **Adoption and Acceptance** of the NCD service and its components (including medication adherence) by the organisation, setting, staff and patients, and consequent changes to behaviour and practice.
- **Effectiveness** of the NCD service, which was examined by identifying trends in clinical outcomes and quality of care indicators and behavioural outcomes
- **Implementation** of the NCD service and its components including fidelity in terms of consistency of applying the defined guidelines and processes; guideline usability, adaptation of structures, processes and tools; and costs.
- **Maintenance** of the NCD service and its components in patients, programme and organisation over time.

Methods:

**Design:** A mixed-methods design was used, based upon the RE-AIM framework (see [http://www.re-aim.hnfe.vt.edu/](http://www.re-aim.hnfe.vt.edu/)). This included: secondary analysis of a pre-existing cross-sectional household survey, analysis of routine cohort data, clinical audit, qualitative research, medication adherence survey and descriptive costing analysis.
Study participants

- Pre-existing cross-sectional health service access survey: participants included Syrian refugee households living outside of camp settings in Irbid governorate, selected using a two-stage cluster design.
- Routine cohort data analysis: all patients six years and older with confirmed NCDs attending the two MSF clinics in Irbid more than once, were included in the analysis, using patient records from January 2015 to December 2017.
- Qualitative research: This involved two same-sex focus group discussions with eight Syrian adult patients each; individual interviews with sixteen purposively-selected adult Syrian and Jordanian patients and eighteen MSF clinical and management staff (past and present); and six key stakeholder interviews including staff from MSF-Operational Centre Barcelona (OCBA), Jordanian MOH staff, United Nations High Commissioner for Refugees (UNHCR) and a Syrian community representative.
- For the medication adherence survey, a convenience sample of consenting patients attending the MSF clinic in August 2017 was selected until 300 surveys were completed.

Data collection

- Household survey data were previously collected in mid-2016 by trained interviewers using an electronic tablet-based survey tool and uploaded to a password-protected server.
- Cohort data from routine patient records were entered daily by trained data clerks into a pre-designed database as part of routine programme activity.
- Clinical audit data were collected in August 2017 on a paper-based checklist from randomly selected routine patient records and entered into a purpose-designed Excel spreadsheet.
- Qualitative data were collected in August 2017 by three trained interviewers using topic guides either in Arabic or English, as appropriate.
- Cost data were obtained from accounting records and supply orders for the period 2015 to 2017 and via staff observation.
- The adherence survey, undertaken in August 2017, utilised an adapted pre-existing self-report medication adherence and beliefs measures, the Medication Adherence Report Scale – 5 item (MARS-5) and the Beliefs About Medicines Questionnaire (BMQ), with data entered into a purpose-designed Excel spreadsheet.

Data analysis

- Secondary analysis of the pre-existing household survey data used descriptive methods.
- For the cohort study, descriptive analysis was undertaken, and modelling explored the clinical outcome trends, complication rates, quality of care and guideline adherence that occurred during implementation of this model.
- Data from the clinical audit and from the adherence survey were analysed using descriptive methods.
- The qualitative research used template analysis, a subset of thematic analysis.
- Descriptive costing analysis explored the annual total, per patient and per consultation costs for 2015, 2016 and 2017, including capital (e.g. building and equipment investment) and recurrent costs (rent, maintenance, human resources, medication, equipment and supplies). The incremental costs of the mental health and psychosocial (MHPSS) and Home Visit (HV)
services were determined. Sensitivity analyses explored key cost drivers, including drugs and human resources.

- Qualitative and quantitative data from the various data sources were synthetized using the RE-AIM framework.

Ethical considerations: This study protocol was approved by the MSF Ethics Review Board and LSHTM Ethics Committee for ethics clearance. Written authorisation to implement the study was provided by the Jordanian Ministry of Health.

Results:

A. REACH AND ACCESS

Reach

Based on self-reported NCD prevalence rates among Syrian refugees interviewed in mid-2016 for the MSF Household Access Survey, the Irbid NCD programme covered approximately 23% of adult Syrian refugees in Irbid governorate who had at least one previously diagnosed NCD targeted by MSF.

Of 5045 patients ever enrolled in the program, 72.6% were Syrian, 27.1% were Jordanian and 0.3% were refugees from Iraq or Palestine. Enrolment patterns changed over time in response to programmatic and contextual changes. More Jordanians than Syrians were enrolled in late 2015 and early 2016 in response to government policy, which required 30% of international non-governmental organisation (NGO) beneficiaries to be Jordanian. The number of Syrians self-identifying at enrolment as unregistered with UNHCR (5.5%, n=202) reflected UNHCR estimates of the proportion of unregistered Syrian refugees in the community. The programme had intended to reach “vulnerable” Jordanians who were not entitled to free MOH access through public health insurance. Initially, the team targeted enrolment at Jordanians who were in receipt of services from the Ministry of Social Development, including financial support from the National Aid Fund. While only 27.6% (n=377) of Jordanians reported being insured on enrolment, all patients interviewed for this study were covered by insurance. Staff believed that most Jordanian patients had access to alternative services and, thus, had piloted a vulnerability-screening tool in 2017 for use in guiding future enrolment.

Demographics

Mean age was 54.7 years (SD 15.7); 59.8% of patients were female; 9.9% of the cohort reported impaired mobility, while 14.4% reported having had no formal education.

High levels of CVD risk factors were present in the program cohort. At enrolment, 22.7% (n=1144) reported current smoking, including 40.8% (n=825) of men; 62.6% (n=2555) were obese, which increased to 73.5% (n=1756) among women; and 37.2% (n=1879) reported low or no regular physical activity. The most common diagnoses managed were: hypertension (60.4%), diabetes type 2 (53.1%), CVD (pre-existing ischaemic heart disease, stroke/transient ischaemic attack, peripheral vascular disease) (25.9%), hypothyroidism (7.6%), asthma (7.0%), musculoskeletal disorder (5.9%) and diabetes type 1 (3.1%). 71% (n=3582) of enrolled patients had two or more target NCD conditions and 57.3% (n=2891) were prescribed 5 or more NCD drugs at their last consultation.

1 Only patients with an available Body Mass Index ≥ 30 kg/ m² result at first visit were included.
Access to NCD care

The majority of patients considered the clinic physically accessible, in terms of distance and convenience. Most Syrian (and some Jordanian) patients emphasised their limited financial resources and were pragmatic in how they allocated them. Staff noted that patients were willing to pay for transport for medical consultations, but prioritised spending on these over Mental Health and Psychosocial Support (MHPSS) services, health education sessions or laboratory visits.

The majority of interviewed patients perceived the clinic to be inaccessible outside of their set appointment times, and most had not tried to access MSF when in need. While clinical staff encouraged certain patient groups (e.g. insulin users) to phone the clinic for advice or gave them their personal numbers, it appears that most patients were strongly encouraged to access the clinic strictly via the appointment system. Some interviewed patients reported running out of medications while waiting for a new appointment after a missed one. However, most staff recounted their efforts to ensure patients had an adequate medication supply in these cases. Staff also reported that some patients had difficulties maintaining access to the clinic e.g. women who depended on the availability of an accompanying family member; a minority of patients who feared being apprehended by Jordanian authorities if they attended the clinic; and disabled patients who lived outside the home visit team catchment area.

Both patients and staff perceived that there was a large unmet need for affordable NCD care among the Syrian community and recounted people begging to be admitted to the programme. Syrian patients expressed frustration about the ‘siloed’ nature of the MSF service with its narrow focus on target conditions, the lack of engagement by doctors when they voiced a need not covered by MSF and the lack of affordable onward referral options. MSF management staff emphasised that the organisation had chosen to provide NCD care at primary level to serve a greater number of patients without incurring the potentially enormous costs of secondary referral. The mission’s policy was to continue to lobby with other NGO actors to provide this care, although options were limited and dwindling.

To manage medical conditions not addressed by MSF or during periods when MSF services were unavailable, most Syrian patients attended MOH services or other NGOs, procured the relevant available medications and supplemented their needs by buying from pharmacies or sharing with family and neighbours. Most Syrians described as unaffordable the limited co-payments introduced by the government in late 2014 to access MOH primary care consultation, medications and testing\(^2\). They also described stock outs of their required medications in MOH centres although one patient had a contrasting experience, describing the MOH as efficient with good medicine availability.

Several Syrian patients currently attending the Irbid MSF-OCA services had previously attended MSF- OCBA clinic in Ramtha, the Emirati hospital in Mafraq or other local NGOs but had switched because attending Irbid involved fewer co-payments or transport costs. To access MOH secondary or tertiary care services, the MOH required MSF’s Syrian patients to attend a JHAS primary care clinic for re-assessment (UNHCR’s local implementing partner) and a decision re onward referral. Both patients and MSF staff viewed this as problematic (discussed in more detail below). One Syrian chose to pay

\(^2\) The Jordanian government offered free, UNHCR-funded, MOH services to Syrian refugees from the start of the crisis to December 2014 when co-payments, equivalent to those paid by Jordanians without public health insurance, were introduced. The policy changed again in January 2018, since these interviews and this data collection took place, to now require Syrian refugees to pay 80% of the full “foreigner” rate for MOH primary care services, medications and tests.
privately for surgical care, which was inaccessible through the UNHCR/MOH system, resulting in catastrophic spending.

Staff perceived that Jordanian patients generally had fewer financial constraints to NCD care access. All Jordanian interviewees were covered by at least one national insurance scheme and thus were entitled to free access to MOH services and/or military health facilities. Jordanian patients did not perceive that stock outs were a major issue within MOH services but rather reported that their preferred drug or equipment was not provided by the service.

B. ADOPTION AND ACCEPTANCE

Clinic Activity and Retention in care

Mean time spent in the cohort per patient was 579.5 days (SD=367) and patients had a clinical review on average once per month [mean monthly visits= 1.02 (IQR=0.68)]. Most enrolled patients (85.2%; n=4297) were retained in care for six months or more. Almost one third of enrolled patients exited the cohort during the study period. Among these, the cumulative defaulter rate was 12.5% (n=632); 6.9% (n=348) voluntarily exited; 4.5% (n=227) were screened out (e.g. those with isolated hypothyroidism initially enrolled were later referred on to another NGO) and 2.6% (n=139) died.

Participation

Few other NGOs provided primary level NCD care in north Jordan. These included MSF-Operational Centre Barcelona, International Rescue Committee (providing NCD care as part of primary care services) International Medical Corps (IMC), Al-Aoun, a local NGO. MSF patients also reported attending the Emirati hospital in Mafraq for NCD care. Stakeholders and MSF management staff perceived that this was due to the high costs and chronic nature of NCD care provision.

Patients and clinic staff commented that there was good community awareness around the MSF service and the main barrier to patient participation was the cap on cohort size. Staff were keen to work for MSF and there was generally low staff turnover. By contrast, they perceived the reportedly high turnover of junior doctors employed in the programme as problematic for both colleagues and patients.

Patients had good awareness of the health education (HE) service and over two thirds of patients attended a session after their last clinical consultation [66.9% (n=2683)]. Few interviewed patients were aware of the MHPSS services. Few discussed psychological issues with their clinician and, by close of 2017, only 24 had been categorised by the doctors as having a mental health disorder. By

---

3 Death was defined as confirmed death reported by family or community member. A defaulter was initially defined as a patient who had not attended any NCD clinic appointments within the previous 90 days, was not known to have died or moved out of the area, and had not been successfully contacted by phone on two occasions by the clinic registrar. The definition was changed in October 2016 to reflect the newly extended appointment interval for stable patients to: two consecutive missed appointments; not known to have died, moved out of the area, or become immobile and ineligible for home care; and not been successfully contacted by phone on two occasions by the clinic registrar. Voluntary exits were those patients who informed staff that they were withdrawing from the programme e.g. they moved out of the area.

4 There was no clear definition of the term ‘mental health disorder’, which was differently understood by different doctors using non-standardized screening tools during the study period January 2015 to December 2017. Some doctors classified patients as having a ‘mental health disorder’ when there was a psychiatric disorder, while others did not specify.
contrast, by 2017 an average of 66 group MHPSS sessions took place per month across both clinics. Space restrictions, particularly in Ibn Sena, and cost of transport limited participation in both HE and MHPSS groups sessions.

Very few interviewed patients were aware of the HLO service, staff perceived that humanitarian issues were under-recognised (and were most likely to be identified during MHPSS sessions) and, as a result, few referrals were made to the HLO. Generally, staff, including the HLO, felt that this role was under-utilised within the programme, especially given the needs identified among Syrian patients when the vulnerability-screening tool was piloted.

Acceptance

Overall, the programme was highly acceptable to patients, staff and stakeholders. Patients valued the MSF service because it provided reliable, free medication supplies and regular laboratory testing in a caring environment. There was some stigma among patients and staff associated with MHPSS in keeping with the cultural context.

Staff were enthusiastic, committed and motivated to help patients. They were proud of the service, felt a sense of ownership and derived satisfaction from seeing patients improve. They viewed MSF as a good employer, providing opportunities to learn and gain valuable experience.

Overall the stakeholders interviewed from UNHCR, MOH and the Syrian community valued the MSF programme as addressing a significant health need amongst Syrian refugees and relieving the burden on the MOH. Each of them called for MSF to do more, either by expanding the reach of the current programme or by extending the scope e.g. providing secondary or tertiary referral services.

Guideline acceptability/usability

The MSF NCD clinical guidelines were seen as largely acceptable and usable by staff, although not readily accessible in the paper-based version provided to them. Some clinicians suggested producing a mobile application version to improve accessibility. They also identified certain weaknesses: the complex, multi-morbid patient with renal impairment or the elderly, frail patient who would benefit from de-prescribing were not covered and the vertical disease approach promoted polypharmacy and over-medicalization of care. Supervisors reported that national doctors believed that the guidelines reduced their autonomy. In addition, supervisors believed some doctors perceived MSF care as “second-class”, compared to their previous practice in Jordan, particularly as their prescribing options were limited by the guideline.

Medication Adherence

A medication adherence survey included 300 patients from both clinics. 45.3% (n=136) were female, the majority (75.7%, n=227) were aged 50 or above and 70% (n=212) of the sample were Syrian, reflecting the make-up of the total patient cohort. The most common diagnoses were hypertension and diabetes. Of note, approximately a third (32.7%, n=98) had more than 3 NCD diagnoses; 76% (n=228) were taking 4 or more MSF medications (with a quarter taking 7+ medications). Over half of respondents (59.7%, n=179) obtained medications concurrently from other sources, including 167 (55.7%) who purchased medications from a pharmacy.

Most patients (89%, n=267) self-reported total MARS-5 score was over 20, suggesting high adherence. Most patients (range: 80.7-84.3%; n=201-253) answered “never” to the individual
MARS-5 components concerning *intentional adherence*, meaning they never engaged in the presented non-adherent behaviours. For MARS question 1, “I forget to take them”, the only question about *unintentional* non-adherence, more patients 32% (n=96) reported this “rarely” or “sometimes” occurred. Syrians reported marginally higher adherence than Jordanians (92.1 versus 88.3%. p= 0.021).

**C. EFFECTIVENESS**

Effectiveness was determined by examining quality of care and clinical outcome indicators as well as patient- and programme-level trends in clinical outcomes.

**Quality of care indicators**

Among type 2 diabetic patients within the year before their last (i.e. most recent) visit, 2202 (43%) had urinary protein testing performed and 1944 (70%) had a foot check documented. 3491 (91.2%) of enrolled diabetic patients prescribed an ACEi had creatinine testing *ever* performed. All 130 audited type 2 diabetic patients had cholesterol testing performed, but only 73.8% (n=82) had a CVD risk score calculated, of whom 65.8% had a statin prescribed correctly according to the recorded score.

Among 1431 enrolled CVD patients who qualified for automatic statin prescription (unless contraindicated), only 25.8% were prescribed a statin, 70.4% were taking at least one antihypertensive and around half (50.1%) were prescribed aspirin at their last visit.

A clinical audit of 128 hypertensive patients revealed that 64% had ever had a CVD risk score recorded.

**Indicators of clinical effectiveness and trends over time**

Just over half (53.2%, n=1478) of ever-enrolled type 2 diabetic patients attained clinical target (HbA1c < 8%) at their last recorded visit. Models of diabetic control showed there was an overall trend towards improved HbA1c. The median per patient HBA1c was at target at baseline and a greater proportion of patients’ readings were at or close to target by 6 and 12 months post enrolment. The mean per patient fasting capillary blood glucose (FBG), was above target (70-150 mg/dL) at all time points [165.47 mg/dL at baseline (95%CI: 162.50 to 168.45)] but showed significant improvement at six and twelve months post enrolment [159.22 mg/dL (95%CI: 154.98 to 163.47, p=<0.001) at 6 months and 153.43 mg/dL at 12 months (95%CI: 149.07 to 157.79, p=0.045)].

Of the 3148 enrolled hypertensive patients with a completed BP check at their last visit, 63.4% (n=1996) had controlled blood pressure (BP < 140/90 mmHg). Models of BP control in the cohort showed that mean monthly per visit systolic BP was below target with an overall downward trend since programme inception. On a per patient basis, mean systolic BP decreased from 130.1 mmHg (95% CI: 129.5 to 130.7) to 128.4 mmHg at 6 months (95%CI: 127.7 to 129.1, p=<0.001) with a very slight additional decrease by 12 months.

**Loss to follow up**

As described above, among 5054 patients ever enrolled, the cumulative defaulter rate was 12.5 % (n=632) and 2.6% (n=136) had died by the end of the study period. Deaths were determined by
word of mouth and following a defaulter survey, which showed that deaths among exited patients were significantly higher at 9.3% (139 of 1489 patients). The survey determined that the major reasons for defaulting were: being too busy, unable to attend the appointments for another reason, unable to afford transport costs, moved from the area, returned to Syria, no longer required services or were otherwise lost to follow up.

**Behaviour change**

At each health education session patients were asked to categorise their exercise level as active, inactive, moderately active, and moderately inactive but it was not otherwise quantified. Among patients enrolled for at least 3 months, almost two thirds [2144 (64.1%)] of patients had changed activity levels between first and last consultation and a further one fifth [593 (17.7%)] reported decreased activity levels. We could not determine whether smoking behaviour had changed since it was not quantified, and patients’ self-reported smoking behaviour change was recorded only relative to their previous visit.

**D. IMPLEMENTATION**

**Fidelity of programme implementation**

To determine to what extent the intervention was delivered as intended, we examined input, process and output indicators (including quality of care indicators as described earlier). Inputs, which involved referral for laboratory testing were well performed e.g. 100% of audited Type 2 diabetic patients (n=130) had serum cholesterol tested since enrolment; 73.8% had a CVD risk score performed (n=82), and of these 89% were correct on re-calculation. 65.9% of those with a CVD risk score recorded (n=54) had a statin prescribed at the guideline-advised dose.

**Facilitators and barriers to implementing the programme from a patient, provider and programmatic perspective**

**Patient perspective**

The main challenge identified by both patients and providers was the impact of war and the refugee experience on NCD care and self-management of Syrian patients. Some patients expressed deep despair and hopelessness and most linked the psychological distress of their war experience with the onset or exacerbation of their NCD condition. When interviewed in summer 2017, most were unaware of the programme MPHSS services and felt it was not the appropriate to discuss mental health issues within the medical consultation.

Specific barriers to lifestyle change and medication adherence described by patients included financial, psychological, lack of understanding, lack of willpower and the need to cook and eat separately to their family.

The main facilitators to effecting lifestyle change and medication adherence was family support, mainly from their children, or from extended family. Also key was the caring and supportive atmosphere of the MSF service and the time given to them by health educators and pharmacists.

**Staff perspective**
Staff-perceived facilitating factors to implementing NCD care included: excellent patient-staff relationships, trust and rapport-building developed through repeated patient contact; staff satisfaction and positive experiences of supervision, support and training; and good communication, teamwork and “family”-like atmosphere.

Staff were enthusiastic, committed and motivated to help patients. They were proud of the service, felt a sense of ownership and derived satisfaction from seeing patients improve. They viewed MSF as a good employer, which provided opportunities to learn.

From a management perspective, engaging frontline staff in decision-making, providing adequate and respectful supervision and the availability of highly qualified, committed staff were all seen as important in facilitating the implementation of the project.

Staff confirmed that Syrian patients’ ability to engage in lifestyle change and medication adherence was hampered by stress, disempowerment and poverty. Some clinical staff also described the negative effect this had on their personal stress levels and their feelings of inadequacy in managing traumatised Syrian patients.

Factors intrinsic to the Syrian patients, which were perceived as challenging included: perceived lower education levels and literacy alongside greater medical complexity, severity and frailty compared to Jordanians. Staff reported that Jordanian patients were more engaged in self-management of their condition and had greater agency to change. The commented that Jordanians had higher levels of education and literacy, as well as greater financial means and access to alternative NCD care via national insurance.

Aspects of Syrian and Jordanian patients’ healthcare seeking behaviour, including failure to adhere to appointment times, tendency to access care and medications from several sources concurrently, and pressuring doctors to prescribe (e.g. antibiotics) were also perceived as challenging by MSF staff. Some staff suggested the prevailing culture of private medicine in both Syria and Jordan fostered a preference for and dependence on drugs and investigations. MOH staff also reported these challenges in managing both Syrian and Jordanian patients within the MOH system. Indeed, one MOH respondent described the introduction of MOH co-payments as a strategy to reduce Syrian patients’ “shopping” of MOH services.

Specific challenges around work practices and environment were also noted by staff, including: lack of appropriate clinic space, dissatisfaction with the six-day working week, poor communication between clinic and office teams and the perceived lack of promotion opportunities. Management staff perceived rates of sick leave among clinic staff to be high and felt this and the highly medicalised approach to patient care constituted barriers to delivering high quality chronic care.

Programme perspective

Certain challenges were noted around programme design, sustainability and the broader MSF ethos. Management staff described their ethical dilemma in pitching service provision at the primary care level, when the team was aware of patients’ referral needs and the few accessible options available to them. The programme was perceived to be expensive compared to other MSF programmes, driven primarily by medication costs. The UNHCR and other NGO participants concurred on the high costs of delivering NCD care in Jordan, particularly of medications and secondary or tertiary referral. Several management staff raised the issue of MSF programme sustainability. They felt that the
increasing cost and complexity of the programme was somewhat in conflict with the need to plan for a potential future exit. Some also commented on the tension between what was perceived by some as the ‘development’ nature of the programme and MSF’s humanitarian remit and practice.

Essential components and adaptations to deliver an NCD service in this setting

Mental health service

The service, introduced in April 2016, evolved in response to several factors, including: an initially slow rate of referrals from the medical team, the perceived burden of unidentified mental ill health and the breadth and scale of psychological morbidity encountered. Low levels of patient awareness, stigma, the compartmentalisation of medical and mental health care and lack of trust in the service from medical staff, and the lack of efficient, effective and consistent mental health screening were seen as challenges to service delivery at the time of the interviews. To address these challenges, MPHSS services expanded the focus from medication adherence to broader psychological morbidity. In addition, MPHSS staff provided training to other staff cadres; improved communication with the medical team; performed psycho-education sessions in the waiting room, which increased awareness and encouraged patients to self-refer; revised tools; and introduced Living Well groups for men, women and teenagers with diabetes and their parents. However, the MHPSS team reported that their proposal to introduce blanket mental health screening was initially met with resistance from the medical team as it was perceived as overly time consuming.

Referral pathways

The programme had identified that a certain, predictable portion of the cohort would require referral to specific secondary or tertiary services for consultation, investigation or intervention for complex or severe disease. These included cardiology, ophthalmology, nephrology and podiatry services. The existing referral pathways for Syrian refugees to access secondary and tertiary care via JHAS and the MOH were described as opaque, complex, inconsistent, unreliable and time consuming for patients and staff to navigate. Interviewed stakeholders confirmed the difficulties with the referral pathways to access MOH secondary care. However, UNHCR saw a change to the status quo as unlikely, citing reduced international funding of the Syrian response, and suggested that the only alternative was strengthened advocacy with international funders and NGOs to fill the gap. Jordanian patients could access the MOH services free if they held public insurance and for a subsidised fee if not.

MSF had bypassed this pathway by creating a short-term bilateral agreement with Qatari Red Cross (QRC) to provide cardiology and ophthalmology services. A referral audit performed by staff after cessation of the QRC agreement in mid-2017, determined that that other potential referral pathways were inadequate or of poor quality. They proposed introducing a dedicated referral manager, continuing to build on successful collaborations with other NGOs, and advocating to identify further partnerships.

5 Following these interviews, screening with the PHQ-9, a widely used, validated depression screening tool, was introduced in November 2017 but was suspended in December 2017 as the burden of morbidity identified overwhelmed MHPSS capacity.
Health Education

The original programme design included individual health education sessions for every patient at each medical consultation. The health education team received training in motivational interviewing and they reported making several adaptations to their tools and content following a visit from the headquarters advisor. All staff adapted lifestyle advice to patients’ limited means.

Patients were confident in their knowledge of healthy lifestyle recommendations. While some had made positive change, many felt unable to do so due to psychological distress, lack of will power and lack of understanding. Staff and stakeholders mentioned the obesogenic environment, hyper-caloric diet and cultural acceptance of smoking as barriers to lifestyle change. The health education approach as described by staff themselves, particularly doctors, appeared didactic and overly knowledge-based. This was confirmed by supervisors’ accounts and on observation of consultations.

Humanitarian Liaison Officer

The HLO was underutilised in general, with low awareness among patients and low referral rates form staff. The team planned to introduce specific referral criteria and training to address this.

Home visit service

Staff were proud of the home visit service, which was considered unique in Jordan and especially important in fulfilling the humanitarian remit of the programme by serving patients who otherwise could not access care.

Costs of delivering the MSF NCD service

Costs increased in tandem with the increase in service complexity. The total annual financial cost increased by 51% from 2015 (€1,857,535) to 2016 (€2,796,124), reflecting the increase in the total number of active patients and the gradual addition of staff and services throughout 2015. These included the home visit service, mental health service and additional counselling, pharmacy, medical and nursing staff. The increase in total cost from 2016 to 2017 (€2,991,421) was much less pronounced at 7%. The per consultation cost similarly increased each year from €92.28 in 2015, to €107.91 in 2016 and to €112.49 in 2017.

The principal cost drivers were human resources (HR) and drugs. HR costs ranged from 38.9% of total Euro costs in 2015 to 42.6% in 2017. Drug costs were the next most costly input, increasing annually from €648,207.42 (34.9% of total) in 2015 to €1,206,806 (43.2%) in 2016 and €1,223,188 (41.6%) in 2017. Laboratory costs accounted for an average of 7% of total costs (range: 6.1 to 7.8%) while biomedical equipment accounted for 5.9% of expenditure in 2015 but only 0.1% in subsequent years. Underlying data show that this was largely driven by purchase of HbA1c machine cartridges in 2015. Capital costs were negligible, accounting for less than 2% of total annual costs.

Insulin Mixtard was the most expensive drug item each year, accounting for 12.5-14.5% of total drug budget (€81,143 in 2015; €169,673 in 2107; and €177,154 in 2017). Glucometer strips were the second most expensive item, accounting for 10-12.5% of annual drug expenditure. Atorvastatin 20 mg was the third most costly item in 2017 at €97,833.13 (8%), whereas in previous years Atorvastatin 10 mg contributed the bulk of statin costs. The twelve most costly drug items for 2017 (all formulations combined), accounting for 86% of total expenditure. Insulin was the most costly item, contributing 17% of total drug costs (€202,277).
Sensitivity analyses showed that total and per patient costs were most sensitive to the removal of coordination and project office level costs, which reduced costs by 30%. The total incremental cost of the MHPSS services increased from €76,835 in 2016 to €109,324 in 2017 in line with its expansion. Overall, the service accounted for 3-4% of total programme costs. The total incremental cost of the home visit service increased by 10% in line with its expansion (from €205,061.98 in 2016 to €226,396.30 in 2017) and contributed an average of 7.45% of total programme costs each year.

E. MAINTENANCE

Challenges and adaptation to maintain the programme

Management staff described the project having reached a stage when national staff may have become frustrated and bored and suggested it was important to keep them interested, challenged and to adequately utilise their extensive skills and experience.

Task shifting, in this context meaning the transfer from doctors to nurses of the majority of clinical review appointments for stable patients, was described by management staff as being repeatedly discussed but not successfully implemented at the time of the interviews. The main barriers identified were: lack of clear documentation or understanding of clinical activity and patient flow, lack of clear eligibility criteria for nurse review, patients’ preference for regular doctor review, a protectionist approach to specialist medical care in Jordan, regulatory barriers on nurse prescribing and, above all, limited pharmacy capacity.

Contextual challenges included those related to operating within the Jordanian government and legal framework. These costly and/or time-consuming issues included the requirement to purchase drugs locally, the lack of specific legislation or government focal point for NGOs, the perceived multiple layers of bureaucracy, and the requirement to work with Jordan Health Aid Society (JHAS) as a gatekeeper to MOH services. The obesogenic environment, cultural acceptance of smoking and the generally sedentary lifestyle were also cited as contextual challenges to delivering NCD care in this setting.

The sustainability of the current vertical programme model was questioned by several of the management staff. They also discussed a perceived lack of clear exit strategy at the time of the interviews and the tension between the team’s desire to continue to improve and add complexity to the programme and the need to consider a potential future handover. Some questioned whether the vertical programme model was an appropriate choice, since the current set up might be difficult to hand over. Several discussed the need to engage with the MOH as the likely handover partner but pointed to the gulf between the current MSF and MOH models of NCD care. They also considered the potential dilemma that may arise if the programme were required to simplify yet maintain quality of care standards acceptable to MSF during a potential handover process.

Some respondents felt that MSF may perceive the increasing cost of HR and medications as unsustainable in the long term. Adapting the programme model could bring cost efficiencies. Given the prevailing salary costs and an assumed need for nurses to refer a portion of patients back to doctors for review, more would be gained from categorising a greater number of patients as stable and reducing frequency of patient review rather than by transferring the current cohort of stable patients to nurses.
Challenges in providing NCD care within the MOH system

MOH participants described facilitating factors and challenges to delivering high quality NCD care at primary level within the MOH system. While senior officials were confident that adequate political commitment, policies, drug supply chain, guidelines, training and supervision were in place, clinic-level staff cited multiple barriers to delivering NCD care. These included: the difference in perceived patient demands and usual MOH provision, patients’ tendency to attend multiple providers, unregulated patient access (which impeded accurate forecasting of drug requirements), understaffing of doctors, underutilisation of nurses, lack of comprehensive records systems and lack of technical supervision.

Key findings and lessons learned

Reach and Access

- The MSF-OCA NCD Programme reached approximately 20% of the adult Syrian population with previously diagnosed NCDs in Irbid governorate in 2017. There was still a significant group of Syrian patients who struggled to meet the costs of accessing NCD care through UNHCR/MOH, private sector or private pharmacies and affordability and accessibility is likely to be further impacted by the change in GOJ policy in early 2018 to significantly increase MOH co-payments.
- The majority of Syrian patients could manage physical access, distance and transport costs to reach MSF clinics for their medical care or pharmacy needs. However, they carefully balanced very limited household finances and chose to attend medical consultations instead of laboratory, health education or MHPSS sessions. Thus, cost was a barrier to accessing these aspects of the MSF programme at the time of interviews. Equally, interviewed patients described the co-payments required to access MOH primary care consultations, medications and investigations as a barrier.
- Patients appreciated many aspects of the appointment system, including SMS reminders. Staff strongly encouraged adherence to the appointment system and had achieved a 90% adherence rate. Despite some staff providing their personal phone numbers to support selected patients, most patients and some staff perceived the appointment system as rigid, and inaccessible outside of prescribed appointment times. In addition, patients and staff described a punitive approach being taken when patients missed appointments, with some patients reporting resultant treatment interruption.
- There is a lack of accessible, affordable and consistent secondary and tertiary referral options covering NCD complications or conditions not covered by MSF. The UNHCR/JHAS system for Syrian refugees to access secondary/tertiary MOH services was described as complex, opaque and inadequate. Other than the successful QRC collaborations (the periodic collaboration for cardiology intervention and the now suspended collaboration for

---

6 This refers to the initial highly subsidized co-payments for Syrian refugees to access MOH primary care services, introduced in 2014, which were equivalent to those paid by Jordanians without public health insurance. As earlier noted, larger co-payments, equivalent to 80% of the “full foreigner rate” were introduced in January 2018 since the interviews and data collection for this evaluation took place.
ophthalmology), there were few other adequate, good quality referral options available free-of-cost to patients.

- In fulfilling the Government of Jordan (GOJ) requirements that 30% of beneficiaries should be Jordanian, staff perceived that many insured Jordanians, who could access alternative services, had been enrolled in the programme rather than vulnerable, uninsured Jordanians as intended. The team has learned that a set of simple, practical vulnerability criteria is required to appropriately target MSF services to the local community in this setting and introduced these from late 2017.

- Lack of patient awareness, stigma, limited medical team sensitisation or trust in the service and the cultural approach to mental health issues had proven barriers to patients accessing MHPSS and HLO services. Training by supervisors, shared medical and MHPSS training sessions, and ad hoc group psycho-education sessions in the waiting room also helped to address this.

**Adoption and acceptance**

- The programme was highly acceptable to patients, staff and stakeholders.

- Patients perceived that they received good quality care in a caring and respectful environment; they valued the free medications, regular laboratory and vital sign testing most highly.

- Patients were frustrated by the vertical or siloed approach to care and felt that they were not listened to when they expressed a medical need that was beyond the scope of MSF’s target conditions. The lack of accessible or affordable referral options was also a source of dissatisfaction for patients. This finding may influence future design of MSF NCD programmes towards a more integrated approach.

- There appeared to be some stigma associated with the MHPSS both from patients and staff, which is in keeping with the broader cultural context. Efforts were made by staff to address this as described above.

- Stakeholders, including MOH and community representatives, and MSF staff, valued the service and would have liked to see it expanded in reach and/or scope.

**Effectiveness**

- Over half of Type 2 diabetic patients and hypertensive patients achieved control at their last visits (when all patients ever enrolled were included). Models show that levels of BP, HBA1c and FBG improved 6 and 12 months after enrolment in the programme. Trends in clinical target attainment also improved as the programme evolved over time.

- There appeared to be room to improve in certain aspects of quality, for example in: statin prescribing for CVD patients, CVD risk scoring and statin prescribing in general, and performance of annual urinary protein testing in diabetic patients.

---

7 The blanket mental health screening introduced in November 2017 also helped to address this and was suspended in December 2017 as the available MHPSS services were overwhelmed by the amount of morbidity.
Self-reported medication adherence was extremely high, possibly due to social desirability bias. It may need to be further elucidated, particularly as some patients and staff described both intentional and unintentional non-adherent behaviours. While the majority of interviewed (especially Syrian) patients declared themselves to be “very committed” to taking their medications, several described stopping medications, taking them intermittently and sharing medications with those in need. Staff and patients both emphasised the negative impact of mental distress on medication adherence.

**Implementation**

- The key challenge to implementing and maintaining effective NCD care in the Syrian refugee population was the impact of the war and refugee experience. This had profound implications for Syrian patients’ ability to engage with the programme in terms of medication adherence, dietary and lifestyle advice, and affordability of access. The programme has made great strides in addressing this by introducing the HLO role and specific HLO referral criteria; expanding and reorienting the MPHSS services; and planned introduction of depression screening with the PHQ-9 tool.
- However, the number of patients identified by PHQ-9 screening (introduced in November 2017, since this study took place) overwhelmed the available MHPSS. Thus, adequate downstream services need to be in place if screening is introduced\(^8\).
- Staff have learned to adapt their health education messages to patients’ literacy, education levels and financial means and have involved family members as informal treatment supporters. Space, transport costs and limited patient engagement have proven to be challenges in delivering group-based sessions. However, the overall individual-based approach seems didactic and knowledge-based rather than patient-centred. Additional challenges encountered by the team included: cultural dietary norms and acceptance of smoking (especially in men), the obesogenic environment and the perception and expectation that medicine will provide solutions.
- Patients’ healthcare seeking behaviour and tendency to access multiple providers and sources of medications is likely to influence medication adherence. Doctors, pharmacists and adherence supporters may need to be aware of this and address it in adherence counselling. As has been successfully done in other settings, adopting the model of concordance, individualising a multi-faceted treatment support approach and formally involving treatment supporters may prove valuable here.
- In 2017, the guideline covered most clinical scenarios that doctors encountered, but it had limitations, including inadequate programmatic guidance, lack of immediate accessibility in its paper-based form, perceived promotion of polypharmacy and limited guidance on complex, multi-morbid patients with renal impairment or frailty\(^9\).

---

\(^8\) In early 2018, the team planned to introduce abbreviated 2-item depression and anxiety screening (PHQ-2 and GAD-2) and it may be worth evaluating which tool best balances sensitivity with efficiency in this setting.

\(^9\) An updated version of the MSF NCD guidelines has since been released and is available in electronic format.
In keeping with increasing complexity and patient throughput, programme cost per patient per year (PPPY) has increased annually from €629 in 2015 to €845 in 2017. While the major cost drivers are similar (drugs and human resources), the PPPY cost appears greater than those of NCD care delivered by MSF in Swaziland or Democratic Republic of Congo. However, comparisons must be made with caution since the programme content and the prevailing HR costs and drug procurement regulations are very different in each setting.

The MHPSS and HV services accounted for 4% and 7% incremental cost including their associated HR components.

**Maintenance**

The GOJ regulatory environment is a challenge to maintenance of the programme, including:

- the requirement that medications are locally purchased in Jordan rather than imported;
- the lack of single focal point or set of regulations governing NGOs; and
- the significant bureaucratic delays that MSF has encountered. Since the interviews took place, the Jordanian government has introduced an online system for humanitarian agencies to access governmental departments.

Planning for the maintenance of the programme will need to take account of increasing costs of medicines and human resources.

In exploring the potential cost efficiencies that may be realised from reorganisation of medical consultation workflow, the most important factors were the frequency of review and the proportion of patients categorised as stable, and therefore suitable for nurse review or longer doctor review intervals.

**Implications and recommendations for the Irbid programme and Jordan mission**

This iterative and collaborative evaluation, including a field visit and interviews that took place in August 2017, has helped to formulate and document some of the challenges faced by the team and to crystallise solutions. The following recommendations are based on the evaluation and several have come from the team in the field. The programme is dynamic and constantly evolving and thus many of these recommendations are currently being addressed by the team.

1. This evaluation and the Household Access survey have identified that Syrian patients face barriers to accessing NCD care in Jordan, mainly due to cost. The team should continue to monitor the impact of increased MOH co-payments on Syrian refugees, potentially performing a costing study from the patient perspective. It is also vital to continue the lobbying, which the mission is already engaged in, with UNHCR and other actors, including international donors, on maintaining/increasing funding for the Syrian crisis and on improving access to free or low-cost primary care for Syrian refugees in Jordan.

2. Increase patient access to the clinic outside of their scheduled appointment times by including e.g. one emergency slot per doctor per day. It may also be worth exploring staff’s suggestion to dedicate a clinical staff member to answer cohort patients’ phone queries for a pre-defined period e.g. one-two hours per day.
3. Continue to apply vulnerability screening, based on medical need and financial means, to better target patients for inclusion in the broader cohort and in the home visit service.

4. In order to build on the humanitarian remit of the programme and further restore dignity and reduce suffering amongst the Syrian population, work on further integration of mental health care with care for physical chronic conditions is recommended and implementation of the following is planned:
   a. Increase awareness of and access to MHPSS services via continued engagement with the broader clinical team and communication with patients e.g. through psycho-education sessions, posters and videos in the waiting room, text messages.
   b. Monitor the effect on workload and MHPSS capacity of introducing a new tool (PHQ-2/GAD-2) and screening interval. It may be appropriate to screen patients on enrolment and on a six-monthly basis with the possibility of referral being triggered by clinical review in the interim.
   c. Triage of patients, strengthening of existing systems of tiered layers of complementary psychosocial supports with referrals between the different layers, which may include: psychiatric support; individualised counselling; emotional and practical support through individual, family or group interventions (by MSF or ideally through partner organisations); and integrated existing community support mechanisms. Thus strengthening of links with other actors providing this type of care may be warranted.
   d. Expand group psychoeducation, peer support and living well groups. Consider providing transport costs with monitoring and evaluation of its effectiveness or alternatively, bringing group sessions to the community by holding them on a rotating basis in areas of Irbid governorate where patients are concentrated.
   e. To continue to address the perceived lack of adequate, good quality referral options for psychiatric care, build on the training of one family practitioner in primary-level mental health care that took place in early 2018. Invest in on-going training and close supervision for these staff and monitor referral rate, uptake and outcomes of this enhanced service. Expand the MSF drug list to include basic psychoactive drugs included in mhGAP (WHO Mental Health Gap Action Programme). Work with the broader team around mental health stigma.

5. There is overwhelming evidence that statin and antiplatelet prescribing significantly reduces mortality and morbidity. There is room to improve on this in the programme. Further emphasis could be placed on statin prescribing especially to known CVD and DM patients with microvascular complications; antiplatelet prescribing in CVD patients may need to be improved although it may be underestimated as Clopidogrel prescribing was not examined. A simple re-audit of statin, antihypertensive and antiplatelet prescribing in CVD patients could be performed in 6 months.

6. Health education may be more effective if a patient-centred, solution-focused approach is taken and is targeted at patients with specific needs. This may require additional exploration with HE, medical and nursing staff and reinforcement of techniques they have been trained in such as motivational interviewing. Much of the basic health education and lifestyle advice is applicable to all patients and could be delivered in a group setting. However, specific
targeted advice, e.g. insulin initiation, inhaler technique and focus on patients with adherence challenges could be reserved for one-to-one HE sessions.

7. Based on the costing analysis performed as part of this evaluation, the mission could explore cost savings through several avenues:
   a. Continue to work with the Jordan mission / Access Campaign team to advocate for improved access to affordable primary NCD care and relevant referrals. Map the out-of-pocket direct medical and nonmedical costs that would be incurred by the multi-morbid, elderly Syrian NCD patient typical of the MSF programme if attending MOH services, especially in light of GOJ’s decision in January 2018 to significantly increase MOH fees for Syrian refugees.
   b. While the Access Campaign work has shown that drugs are procured relatively cheaply within the MOH system, MSF purchases drugs from the private sector. This study has confirmed that significant savings could be made by importing some or all of the top line drugs from the Amsterdam procurement unit, particularly insulin, statins, inhalers, and Access Campaign work has shown that there may be scope to negotiate with private suppliers or directly with manufacturers (particularly on an intersectional level).
   c. Explore innovative options around procurement such as joining GOJ, Gulf region or UNRWA procurement processes for some or all items.

8. Most patients have blood pressure either at target or close to target. Review and potentially revise criteria to categorise patients as stable and therefore eligible for nurse review and less frequent visits. Monitor criteria revised in 2017 for patients to be seen on a 3 or 6-monthly basis by nurses with doctor review on a less frequent basis.

9. Continue to engage with UNHCR and other actors regarding provision of free-of-cost, reliable secondary and tertiary referral options for patients, especially for ophthalmology, cardiology and nephrology. Focus on task shifting with on-going evaluation of patient flow, establishment and monitoring of criteria for nurse follow up and doctor review and management of pharmacy capacity. Monitoring the proportion of patients that require referral by nurses back for doctor review would help with service planning.

10. It would be ideal to implement full task shifting, involving nurse initiation and adjustment of drugs. However, this would require significant negotiation and advocacy with the MOH, licensing and regulatory authorities, and with clinical staff and patients themselves. However, it would likely bring cost-savings and may result in a model that other actors, including the MOH, could emulate.

11. Formalise the teamwork already evident in the programme, by introducing a multidisciplinary team approach e.g. hold regular case conference meetings with all members of the clinical team to discuss specific patients with increased needs.

12. Introduce a formal treatment supporter model, building on MSF experience in HIV care, especially targeting certain patients e.g. frail, elderly or insulin users. Treatment supporters could facilitate and encourage medication adherence and lifestyle change.

13. Provide transport costs for certain, targeted activities e.g. group health education and MHPSS and monitor effectiveness of this initiative, as mentioned above, e.g. how many people did not attend at all once referred and how many sessions were missed by those attending before and after implementation.
14. Review content and process of health education and ensure regular supervision to make more patient centred, solution-focused, and inclusive of motivational interviewing techniques. Individual health education may be most suited to adherence and treatment support and change in lifestyle e.g. diet, smoking and exercise may be better suited to group sessions. Obese women and men who smoke seem to be key groups to focus on. Practical classes, such as exercise classes, walking groups, cooking groups may help to address both behaviour change and provide social support and strengthen community ties for the programme. As above, patients may be encouraged to attend MHPSS/HE group sessions if transport costs are provided by MSF.

15. Strengthen community engagement activities and build on community links. Consider introducing community outreach workers and community adherence or support groups as has been shown to be successful in the HIV setting. These could be patient-led or could involve MSF staff travelling to deliver sessions in the community. Consider an awareness-raising event e.g. run or walk involving the community.

16. Consider increasing access and acceptability of HLO service by defining specific referral criteria, increasing patient awareness and by allowing patients direct access to the HLO.

17. Introduce a referral focal point that can keep abreast of changes in the referral environment, keep medical teams updated, support patients through the referral process and document referral needs and outcomes. A detailed survey of patients’ referral needs would facilitate advocacy within MSF and with other partners. Acknowledging the significant work done by the team in the area, it is recommended to continue to advocate to reduce barriers to secondary and tertiary care referral. Options may include further negotiation with the MOH for direct access for MSF to MOH services, advocacy with other international NGOs leading to further bilateral agreements, identification of a referral pathway utilising the private sector.

18. Introduce more interaction between staff of both clinics and between the office and clinics to foster a sense of teamwork and cooperation.

**Lessons learned and recommendations more broadly for MSF and NCD programmes in other humanitarian contexts.**

1. MSF experience is consistent with global observations that mental illness is extremely prevalent in people with chronic diseases in humanitarian settings (including a number of specific psychiatric disorders, which are themselves chronic diseases), but integration of MH and NCD services may be suboptimal. It is vital to ensure that mental health and psychosocial support are included as an integral part of primary level NCD services in humanitarian settings.

2. Provide a tiered approach to mental health and psychosocial support so that patients are triaged to receive the appropriate level of care e.g. define those in need of clinical mental health services delivered by trained clinicians or counsellors versus those for whom focused psychosocial support services, which may be delivered by trained non-specialists, is more appropriate.

---

10 This was done in late 2017.
3. In the next revision of the MSF NCD guideline, focus on the issue of the vertical approach to each disease, polypharmacy, multi-morbidity, frailty and palliation. One option would be to include vignettes of several complex patients or clinical scenarios. An evaluation of guideline usability in other settings may be warranted.

4. Design and evaluate streamlined, algorithm driven protocols, which are appropriate to the local setting. In Jordan, this could involve using flow charts to guide statin prescribing. In other settings it may include the use of fixed-dose combination drugs. It may be effective to focus on big wins or best buys such as appropriate statin prescribing in those that automatically qualify and achieving a clinically significant drop in blood pressure in CVD and diabetic patients.

5. Design and evaluate an algorithm-driven, context-specific approach to further explore task shifting to nurses, and reduction of pill burden and staff workload. Extensive stakeholder engagement from the outset would be required, especially as, depending on the medical culture and context, a simplified regime may not be acceptable to patients, staff and broader community. Integrate lessons from HIV programmes around the use of treatment supporters and family and community engagement.

6. Since a predictable proportion of patients will require referral for screening, diagnosis or treatment of NCD related complications, ensure essential referral pathways are in place and are appropriate, acceptable, accessible and affordable for patients. Explore innovative ways to address this need e.g. the use of mobile phone technology for retinal screening.

7. Integrate with host country health systems in humanitarian settings where possible and engage in health system strengthening to facilitate sustainability if this is appropriate to the local context. This may include supporting the introduction, adaptation or innovation of longitudinal delivery systems, and/or implementation of lifelong care and community engagement. Chronic care data collection and monitoring, supply chain strengthening, and training and capacity building of local staff may also be relevant. Work with country partners around regulation and licensing to facilitate nurse prescribing.

8. MSF may need adapt structures and reporting mechanism to reflect chronic care such as: a) reducing frequency of medical reporting to three- or six-monthly intervals; b) developing a quality monitoring framework appropriate to NCD services, which may include adopting indicators developed in Jordan to reflect longitudinal care (e.g. measuring retention in care, treatment interruption, mean visit interval and mean change in clinical parameter from baseline to six months); and c) introducing regular, 3-monthly patient file reviews.

Conclusions

MSF is providing a high quality, free, reliable and holistic primary level NCD service for Syrian refugees and the Jordanian host population in a caring environment. The programme is highly acceptable to patients, staff and stakeholders and is achieving good clinical outcomes. MSF is further fulfilling their humanitarian remit by the provision of specific mental health and psychosocial support (MHPSS) services and a home visit service targeting disabled patients.
However, the costs are high, and it seems plausible to simplify the model of care for patients and staff by further exploring some strategies such as reliable, accessible and direct referral pathways, task shifting, simplification of treatment (e.g. combination therapy for cardiovascular secondary prevention), innovative models for procuring drugs and reducing cost barriers for patients to access all aspects of NCD care. Additionally, it is important to build on efforts to comprehensively identify and address the mental health and psychosocial needs of the population.

Long-term sustainability of this complex and costly programme is, undoubtedly, a challenge but simplification of the model of care, reduction of costs, and engagement with the Jordanian government and other actors could maximize its potential long-term success.
Table of Contents

Executive Summary.........................................................................................................................3
Evaluation Report: Short Version.....................................................................................................6
Evaluation Report: Full Version.......................................................................................................30
1 Background..................................................................................................................................30
2 MSF Model of NCD Care in Irbid..................................................................................................31
  2.1 NCD Service description.........................................................................................................31
  2.2 Patient circuit.........................................................................................................................31
  2.3 MSF NCD Clinical Guidelines ..............................................................................................32
  2.4 Programmatic and Technical Changes over Time.................................................................33
  2.5 Contextual changes..............................................................................................................33
3 Study Aims and Objectives...........................................................................................................36
4 Methods and Study Design .........................................................................................................36
  4.1 Description of the study sites.................................................................................................36
  4.2 Overall study design...............................................................................................................36
  4.3 Secondary analysis of pre-existing cross-sectional survey data ...........................................37
    4.3.1 Data collection, management and analysis...................................................................37
  4.4 Routine cohort data analysis..................................................................................................37
    4.4.1 Data collection, management and analysis.................................................................38
  4.4 Clinical audit...........................................................................................................................38
  4.5 Medication Adherence Survey..............................................................................................38
    4.5.1 Study population.............................................................................................................38
    4.5.2 Survey data collection......................................................................................................38
    4.5.3 Survey data analysis........................................................................................................39
  4.6 Qualitative study....................................................................................................................39
    4.6.1 Qualitative data collection..............................................................................................39
    4.6.2 Qualitative data analysis..............................................................................................41
  4.7 Costing study.........................................................................................................................41
    4.7.1 Costing data collection.................................................................................................41
    4.7.2 Costing data analysis .....................................................................................................42
5 Results..........................................................................................................................................44
  5.1 REACH AND ACCESS ..........................................................................................................44
    5.1.1 Does the programme reach its target population?........................................................44
    5.1.2 Patient demographics.....................................................................................................45
    5.1.3 CVD risk factors at enrollment.......................................................................................47
    5.1.4 Diagnoses.......................................................................................................................48
    5.2.3 Accessibility....................................................................................................................49
  5.2 ADOPTION and ACCEPTANCE ..............................................................................................50
    5.2.1 Clinic activity and retention in care..............................................................................51
    5.2.2 Participation....................................................................................................................52
    5.2.3 Referral needs and available pathways...........................................................................53
    5.2.4 Acceptability..................................................................................................................53
    5.2.5 Guidelines acceptability/usability ................................................................................55

Mixed methods evaluation of MSF primary care based NCD service in Irbid, Jordan: February 2017- February 2018

27
5.2.6 Medications adherence ..............................................................................55
5.3 EFFECTIVENESS ..........................................................................................58
  5.3.1 Quality indicators ..................................................................................58
  5.3.2 Clinical outcomes ................................................................................58
  5.3.3 Trends in clinical outcomes ..................................................................59
  5.3.4 Loss to follow up ..................................................................................62
  5.3.5 Behaviour change ................................................................................63
5.4 IMPLEMENTATION .......................................................................................64
  5.4.1 Fidelity of programme delivery ..............................................................64
  5.4.2 Facilitating factors and barriers to implementing the programme from a patient, provider and programmatic perspective ..................................................................................................................65
  5.4.3 What are the essential components and adaptations necessary to deliver an NCD service in this setting? ............................................................................................................................71
5.5 MAINTENANCE ............................................................................................85
  5.5.1 Challenges and facilitating factors for patients to remain in the programme ..........................................................85
  5.5.2 Programmatic challenges and adaptations made to maintain the programme ..................................................85

6 Discussion .......................................................................................................89
  6.1 Reach and access .....................................................................................89
  6.2 Adoption and acceptance ........................................................................91
  6.3 Effectiveness ............................................................................................91
  6.4 Implementation .........................................................................................93
  6.5 Maintenance .............................................................................................99
7 Limitations ......................................................................................................100
8 Key findings and lessons learned..................................................................100
  8.1 Reach and access .....................................................................................100
  8.2 Adoption and acceptance .......................................................................101
  8.3 Effectiveness ............................................................................................101
  8.4 Implementation .........................................................................................102
  8.5 Maintenance .............................................................................................103

9. Recommendations ........................................................................................103
  9.1 Implications and recommendations for the Irbid programme and Jordan mission ........................................................103
  9.2 Lessons learned and recommendations for NCD programmes in other humanitarian contexts ............................................107

10 Conclusion ..................................................................................................108
11 Proposed Indicators for future NCD programmes ......................................109
12 Dissemination Plan ......................................................................................110
13 References ..................................................................................................111

14 Annexes ......................................................................................................119
  Annex 1: Evaluation indicators using the RE-AIM framework ....................119
  Annex 2. Organogram of Irbid NCD Programme ........................................122
    3a) Self-reported legal status of Syrian patients and ........................................123
    3b) Self-reported insurance status of Jordanian Patients ............................123
  Annex 4: Number of NCDs and NCD drugs* at the last visit, cohort 2015-2017 by age ..................................................124
  Annex 5: MARS-5 Logistic Regression results ................................................125
  Annex 6: Data collection forms ....................................................................127

Mixed methods evaluation of MSF primary care based NCD service in Irbid, Jordan: February 2017- February 2018
Annex 6a: Topic guide – Focus group discussions with NCD patients..........................127
Annex 6b: Annex 6b: Topic guide – Semi-structured interviews with NCD patients ................128
Annex 6c: Topic guide – Semi-structured interviews with NCD health care providers and staff....129
Annex 6d: Topic guide – Semi-structured interviews with key stakeholders .........................130
Annex 6e: Patient self-report medication adherence and beliefs questionnaire .....................131
Annex 7: Individual Interview Participant Details .................................................................134
Evaluation Report: Full Version

1 Background

NCDs have been responsible for the majority of deaths worldwide for more than three decades, causing 68% of the 56 million global deaths in 2012. NCDs accounted for 77% of mortality in pre-conflict Syria, with cardiovascular disease the leading cause of death. Data from the UNHCR and other actors has confirmed the high burden of NCDs amongst Syrian refugees in Jordan. As in other settings, the majority of these refugees live amongst the local community and traditional camp-based care-provision has had to be adapted to support refugees living in informal urban settings. In response to the overwhelming burden of chronic disease amongst urban-dwelling Syrian refugees, the health system in north Jordan has been obliged to scale up primary-level NCD care. Historically, this care was provided at secondary or tertiary level in Jordan. Médecins sans Frontières (MSF), a humanitarian emergency medical organisation, has supported the Jordanian health system in providing NCD care to the Syrian refugee and vulnerable Jordanian population in Irbid, Jordan’s second largest city, since 2014.

In any setting, patients with NCDs tend to be older, have multiple, co-morbid chronic conditions and are prescribed several medications. They require long-term, continuous medical care and psychosocial support rather than the acute, episodic care that usually characterises healthcare in humanitarian settings. In addition, chronic medical conditions and mental illness or distress often co-exist; depression is more common in people with chronic disease compared to the general population and can worsen associated health outcomes. We can assume that NCD and mental health co-morbidities are more frequent still amongst refugees fleeing a protracted civil war.

The attention of the global health community has recently shifted to include chronic NCDs, focusing on four core NCDs (cardio-vascular diseases, diabetes, chronic respiratory diseases and cancer) with shared characteristics: they are increasingly common due to globalisation; they are responsible for an epidemiological shift in low- and middle-income countries (LMICs); they share common, behaviourally-modifiable risk factors; and they are amenable to testing and treatment at primary care level. To improve NCD outcomes in LMICs, WHO and others advocate strengthening person-centred, primary-level NCD care, which involves use of: evidence-based treatment protocols (which involve global cardiovascular risk management, lifestyle modification and supported self-care), a core set of generic medications and basic technologies.

While a wealth of scientific evidence on cost-effective, primary care-based clinical management of NCDs exists in stable high-income countries, little evidence is available to guide the delivery of such interventions in LMICs – particularly for conflict-affected and forcibly displaced populations. The research evidence base and the MSF institutional experience to support NCD programming in humanitarian settings are still more limited. Thus, this programme, described in detail below, was initiated to meet an identified healthcare gap for Syrian refugees, and has evolved in response to the clinical, technical and programmatic needs that have emerged over time. This process has resulted in a multidisciplinary care model, which includes specific humanitarian and mental health and psychosocial support (MHPSS). This evaluation provides an opportunity to refine a model of NCD care delivered in a humanitarian setting in order to improve patient care and to support the application of similar programmes in comparable settings.
2 MSF Model of NCD Care in Irbid

Using a primary care model, described in detail below, the NCD service is based on a multidisciplinary approach with task shifting; context-adapted clinical guidelines and tools; adapted health education and MHPSS and medications included in the World Health Organization (WHO) Essential Medicines list.

2.1 NCD Service description

The MSF NCD programme’s target population comprises urban-based Syrian refugees, both United Nations High Commissioner for Human Rights (UNHCR) registered and unregistered, and vulnerable Jordanians (those not entitled to or otherwise unable to access subsidised Ministry of Health services). At present, MSF is the only provider of free, primary-level, specialised NCD care to Syrian refugees in Irbid governorate; other non-governmental organisations (NGOs) require co-payments for similar services.

In December 2014, MSF commenced a vertical NCD programme in Irbid within an MOH primary care centre at Ibn-Sena. A second clinic was opened at Ibn-Rushd in April 2015 alongside a private charitable medical organisation, Arab Medical Relief Services.

To date over 5000 patients have been enrolled in the Irbid programme. The service initially consisted of triage by nurses, routine medical review by doctors, health education provided by health promoters at each clinical contact, and provision of free medications dispensed from the on-site pharmacy by trained pharmacists. Specific programme components were added over time in response to emerging patient, programmatic and contextual needs, discussed below.

The MSF NCD programme focuses on the four most common NCDs or NCD risk factors, which were responsible for the highest mortality amongst Syrians before the current conflict: cardiovascular disease (CVD), including: hypertension (HTN), myocardial infarction, angina, pectoris, stroke, transient ischaemic disease, peripheral vascular disease; diabetes mellitus types I and II (DM); asthma and chronic obstructive pulmonary disease (COPD); and co-morbid mental health issues which may impact on NCD care, such as bereavement, anxiety and depression. The programme does not address cancer treatment and palliative care. Patients with these named NCDs or risk factors are admitted to the programme and the programme guidelines, treatment protocols and data collection tools focus on these diseases. Other NCDs are referred on to the MOH or to other NGOs as appropriate.

2.2 Patient circuit

A basic primary-level NCD service was initially introduced at each clinic. Patients are directed at reception to the MSF NCD service if they have both a medical indication (suspected or confirmed target NCD or risk factor) and a social indication (Syrian refugee, refugee of other origin or vulnerable Jordanian). All other cases are directed to the standard MOH (or private) primary care service.

Patients are initially triaged by nurses who record socio-demographic data; measure height, weight, waist circumference, blood pressure, heart rate, capillary blood sugar level, temperature and oxygen saturations; and calculate body mass index.

Doctors undertake all new patient consultations and the majority of follow-up medical consultations. Initially all doctors were unspecialised but from 2016, each clinic employed one specialist doctor and
one unspecialised doctor; an additional doctor was employed in late 2016 to cover absences and contribute to quality improvement activities. Medical consultations are based on setting-specific protocols. These were initially derived from Jordanian and international guidelines and were later adapted in line with MSF Operational Centre Amsterdam (MSF-OCA) NCD guidelines (see section 1.1.3 for more detail).

At first visits, doctors record a complete medical, medication and family medical history and perform a clinical examination for each patient. Lifestyle CVD risk factors (smoking status, alcohol intake, exercise levels) are recorded; global cardiovascular risk score is calculated; acute complications are identified and treated; long-term medications are prescribed for symptom management and secondary prevention of complications; patients are referred for laboratory testing; and a follow-up interval is determined. Patients with specific needs are referred internally (see below) or externally to the Jordanian public health services or to other NGOs, where services are available.

Follow-up visits involve review of patients’ symptoms and disease control, vital signs, laboratory results; determination and recording of new diagnoses; adjustment and / or initiation of medications; and referral for further laboratory tests or to other health providers as required. Doctors also cover health education at each consultation and refer all patients to the programme health promoters.

Health promoters provide individually tailored health education at each clinical contact. Topics covered include: education about diagnosis and disease, treatment and adherence support, patient concerns and expectations, and lifestyle changes. Motivational interviewing techniques are used to support patients to make lifestyle modifications related to diet, exercise levels and smoking. On enrolment, the doctor and health educator see patients for thirty minutes each; patients on return visits spend approximately fifteen minutes each with clinical staff (either a doctor or nurse) and a health educator.

Routine laboratory tests are carried out at a local laboratory, which has been quality assured by MSF. Medications are from the MSF Green List (the list of medications approved for use in MSF projects), with some additions relevant to the local context, and are locally purchased. Pharmacists and pharmacy assistants provide medication counselling and dispensing services from the MSF pharmacy located onsite at each clinic. Prescriptions are renewed at maximum one-monthly intervals. Patient data are maintained in paper-based purpose-designed chronic care files, which are stored securely at each clinic.

2.3 MSF NCD Clinical Guidelines

MSF-OCA has developed a new NCD Guideline to address the lack of standard guidelines on non-communicable disease management in humanitarian settings within MSF and elsewhere (http://hdl.handle.net/10144/618798). This was based on international guidelines, such as NICE, American Diabetes Association, British Thoracic Society and European Hypertension Society. This provides programmatic and evidence-based clinical guidance for NCD management and is currently being field-tested in MSF programmes in diverse settings but, to date, it has not been formally evaluated.
2.4 Programmatic and Technical Changes over Time

Specific additions were made to the programme over time in response to patient and programmatic needs. A home visit service was introduced in August 2015 to care for frail or immobile patients. It operates six mornings a week and initially served frail or immobile patients living within a ten-kilometre radius of the clinics, later expanded to 15 kilometres. It initially comprised a doctor, nurse and driver and was expanded into two teams with the addition of a home visit mental health counsellor and physiotherapist from November 2017. Patients are seen on a monthly basis initially; stable patients may be reviewed by phone or by the nurse and visited less frequently by the home visit team doctor.

A humanitarian liaison officer (HLO) was employed in August 2015 to assist vulnerable patients with social issues and direct them appropriately to services provided by other humanitarian actors. Patients are referred to the HLO by the medical team or the mental health service.

A mental health component was added in April 2016 to serve patients with NCDs and relevant, identified mental health co-morbidities, which may impact on their NCD care e.g. bereavement, anxiety or depression. Two trained counsellors provide mental health and psychosocial support (MHPSS) through group psycho-education and discussion sessions and individual counselling. In November 2017, a third counsellor was added to the team to enable expansion and to allow coverage of the home visit patients. Group sessions take place in clinic meeting rooms and content is responsive to issues raised by patients. Initially doctors referred patients to the service for individual sessions, but uptake was low and referral was expanded to nurses from November 2016. Formal feedback structures between counsellors and medical staff have been introduced and will undergo review and refinement. In October 2017 a depression screening test (PHQ9) was added to the programme; this led to a sharp rise in identification of people with depressive issues.

Admission and vulnerability criteria were changed also. The programme proposal was to serve 4000 patients at two sites in Irbid city. Jordanian policy requires that 30% of all NGOs’ beneficiaries are Jordanian and thus, after prolonged communication with the MOH on this issue, vulnerable Jordanians were enrolled during the last quarter of 2015. Enrolments were then closed from January 2015 until late 2016 when a further 150 patients were enrolled after a data cleaning exercise revealed more capacity in the system. Vulnerability and admission criteria were reviewed and updated in the second quarter of 2017.

Technical changes introduced over time include: (1) attempted task shifting to nurses of follow-up consultations for stable patients (2) introduction of MSF-OCA NCD Guidelines and (3) implementation of spirometry.

2.5 Contextual changes

Contextual changes that occurred since programme inception were related to both overall refugee response budget and to security. Having previously been entitled to free MOH primary and emergency care, the Jordanian government introduced co-payments, similar to those paid by uninsured Jordanians, for Syrian refugees accessing these services in November 2014; (2) the World Food Programme cut cash assistance to Syrian refugees in August 2015; (3) the Jordanian MOH...
budget for Syrian refugees was cut in February 2017; (4) the UNHCR budget was reduced in 2017; and (5) access to MOH primary and emergency care was further limited for Syrian refugees in January 2018 when full non-subsidised fees were introduced. Security changes included: (1) border closure and increased scrutiny of refugees by the Jordanian authorities following a security incident in Rukban, north Jordan, in 2015; (2) a ceasefire agreement between Syrian opposition groups and the Government of Syria in South Syria in February 2016; (3) a cessation of hostilities agreement in South Syria leading to an unsustained increase in returnees to Syria; and 4) an escalation of fighting within Syria in February 2018.
Programme Timeline 2014 to 2017
3 Study Aims and Objectives

**Overall aim:** To evaluate a primary care-based model of NCD care in Irbid, Jordan in order to refine the model and to generate evidence on its feasibility, acceptability and effectiveness with a view to translating a similar model to comparable humanitarian settings.

**The specific objectives** are to examine the:

- **Reach** (coverage) of the NCD service and its components to the intended target population.
- **Effectiveness** of the NCD service. We defined “effectiveness” for this evaluation as quality of care. This will be examined by identifying trends in clinical outcomes and quality of care indicators; exploring perceived benefits, unintended consequences, behavioural outcomes and evaluating economic outcomes.
- **Adoption/acceptance** of the NCD service and its components (including medication adherence) by the organisation, setting, staff and patients, and consequent changes to behaviour and practice.
- **Implementation** of the NCD service and its components including fidelity in terms of consistency of applying the defined guidelines and processes; guideline usability, adaptation of structures, processes and tools; and costs.
- **Maintenance** of the NCD service and its components in patients, programme and organisation over time.

4 Methods and Study Design

4.1 Description of the study sites

The study setting is Irbid city in northern Jordan. Irbid governorate borders southern Syria and hosts 27% of the estimated 1.27 million Syrians living in Jordan. There are 135,280 Syrians living in Irbid governorate who are registered with the UNHCR as persons of concern.

The majority (80%) of registered Syrian refugees in Jordan live outside official refugee camp settings within the local community. MSF and other non-governmental organisations support the Jordanian government and the UNHCR in providing health care for out-of-camp refugees. Currently, MSF is the only actor providing free, specialised NCD care in Irbid governorate.

The previously completed MSF Household Access and Utilisation Survey was conducted in Irbid governorate in northern Jordan in 2016. Most of the area is uninhabited, mountainous terrain. The majority of Syrian refugees live in urban and peri-urban areas of Irbid city or Ramtha town, while the remaining 40% live in rural areas.

This evaluation, including use of routine service data, took place in the two vertical, primary care-based MSF-supported clinics providing NCD care in Irbid city centre. The first clinic was opened in December 2014 within an MOH primary care facility in Ibn-Sena. The second clinic opened in April 2015, alongside a private organization, Arab Medical Relief (AMR), in their facility at Ibn-Rushd.

4.2 Overall study design

A mixed-methods design was used, based upon the Reach Effectiveness Adoption Implementation Maintenance (RE-AIM) framework (see [http://www.re-aim.hnfe.vt.edu/](http://www.re-aim.hnfe.vt.edu/)). RE-AIM is a widely used framework to evaluate the impact of public health interventions by assessing five key domains:
reach, effectiveness, adoption, implementation and maintenance. This mixed methods approach is being used in order to address the study objectives within the overarching RE-AIM framework. Further details on the study indicators and data sources are available in the protocol and in Annex 1. In brief, the research methods included:

a) Secondary analysis of pre-existing cross-sectional survey data
b) Routine cohort data analysis,
c) Clinical audit,
d) Self-administered medication adherence survey,
e) Qualitative study
f) Descriptive costing analysis from the provider perspective

Ethical considerations: This study protocol was granted approval by the MSF Ethics Review Board and LSHTM Ethics Committee. Written authorisation to implement the study was obtained from the MoH of Jordan.

4.3 Secondary analysis of pre-existing cross-sectional survey data

The programme coverage was determined using previously reported data from a Household Access and Utilisation Survey conducted by MSF in 2016.

This cross-sectional survey included Syrian refugees’ households living outside of camp settings in Irbid governorate, selected using a two-stage cluster design.

4.3.1 Data collection, management and analysis

Household survey data were collected in 2016 by trained interviewers using an electronic tablet-based survey tool and uploaded to a password-protected server. The prevalence of specific self-reported NCDs (diabetes type I or II, hypertension, cardiovascular disease, thyroid disease, chronic respiratory disease and cancer) was determined by collecting self-reported morbidity information for each household member. One randomly selected adult per household with any relevant self-reported NCD was interviewed about their experience of and barriers to accessing NCD care in Jordan within the previous six months.

4.4 Routine cohort data analysis

The routine cohort data analysis included data from all patients aged six years and above enrolled in MSF’s NCD clinics with at least 2 visits, using files of patients admitted from January 2015 through to December 2017. To be enrolled in the programme, patients had to fulfil both of the following criteria:

(1) Socio-demographic: Syrian refugee, refugee from another origin or vulnerable Jordanian (defined as patients who were identified as vulnerable according to the Ministry of Social Development National Aid Fund list).

(2) Medical: new or existing diagnosis of confirmed CVD (including angina pectoris, myocardial infarction, ischaemic stroke, peripheral vascular disease), CVD risk factors (HTN), COPD, Asthma and/or DM Type I or II.
Of note, the majority of patients presented with previously diagnosed disease were already established on treatment. New cases of diabetes, hypertension and CVD were diagnosed in accordance with the MSF clinical guideline. New cases of asthma and COPD were diagnosed using spirometry. However, self-reported diagnoses of chronic respiratory illness were not confirmed nor distinction made between COPD and asthma with spirometry.

4.4.1 Data collection, management and analysis

Routine paper-based clinical data were collected by MSF data clerks and entered into a password-protected Excel software database developed for the NCD programme. Cohort data from both clinics was aggregated and analysed using RStudio v1.0.136 (RStudio, Boston, MA 02210, USA). Descriptive statistics were used to explore patient demographics and clinical outcomes.

To explore trends in BP in hypertensive patients and HbA1c control in patients with DM II from the programme perspective, we plotted the systolic and diastolic BP or HbA1c measurement at every visit and the mean per visit BP and HbA1c per month since programme initiation, including all patients ever enrolled with the relevant diagnosis. To examine trend in clinical outcomes, we plotted the mean per patient BP or Hba1c at baseline, 6 months (+/- 30 days) and 12 months (+/- 30 days) in patients diagnosed respectively with hypertension or Diabetes Type 2 at baseline. P-values compared the difference in means between baseline and 6 months, baseline and 12 months, and 6 and 12 months. The model was adjusted for repeated measures in the same patient.

4.4 Clinical audit

The clinical audit used a random selection of patient charts from patients who had been enrolled for at least 12 months in the program. A sample of 65 charts of patients with asthma was randomly selected to represent the approximately 300 patients enrolled with asthma (precision 10%). Clinical audit data were collected on a paper-based checklist from routine patient records and entered into a purpose-designed Excel spreadsheet by a clinical staff member. They were analysed using simple descriptive statistics.

4.5 Medication Adherence Survey

4.5.1 Study population

A convenience sample of MSF patients aged eighteen years or older attending either MSF clinic on consecutive days over a two–week data collection period in September 2017, were approached to fill the questionnaire, in order to give a sample size of 300 (based on previous studies).

4.5.2 Survey data collection

The survey involved a 17-item self-report questionnaire, which included demographic information, the MARS-5 (Medications Adherence Report Scale – 5 item) and the BMQ –S (Beliefs about Medicines Questionnaire Specific). Demographic information included gender, nationality, age group, education level, household size, number of NCD medications, and number and sources of other medications. MARS-5 is a five-item self-report measure of medication adherence. Respondents are asked to rate the frequency they engage in each of the adherence-related behaviours on a five-point scale, where 5 = ‘never’, 4 = ‘rarely’, 3 = ‘sometimes’, 2 = ‘often’ and 1 = ‘always’. Scores for each item are summed to give a total score; higher scores indicate higher levels of reported adherence. The MARS-5 may be used to distinguish between intentional and unintentional adherence, which may guide intervention strategies to improve adherence. The BMQ-S consists of 10 statements about medications scored using a 5-point Likert scale (from 1 = strongly
disagree to 5 = strongly agree). Five questions relate to the perceived necessity of medications and five relate to patients’ concerns about taking medication.

Two trained data collectors took written informed consent from patients and presented questionnaires in Arabic. Patients were asked to fill the form themselves and the data collectors assisted those with limited literacy. Paper data were held securely and were entered into a purpose designed excel tool for analysis.

4.5.3 Survey data analysis

Data were analysed using simple descriptive statistics. Frequencies, mean, median and standard deviations were calculated for the individual and sum scores of the MARS-5. For the BMQ, the total per patient score for “necessity” questions (possible scores 5 to 25) and “concerns” questions (possible scores 6 to 30) was calculated. The individual MARSS scores were transformed to a 0 to 1 scale to allow for logistic regression. For each variable, the MARS total and individual question scores and the BMQ necessity and concerns scores were described using univariate analysis. P-values for heterogeneity were applied. Multivariate logistic regression analysis tested the effect on adherence of medication beliefs (necessity–concerns difference scores AND necessity scores AND concerns scores), demographic variables (age, gender, nationality, marital status, educational experience, household size) or clinical factors (number of diagnoses, number of prescribed medicines, number of medication sources).

4.6 Qualitative study

We conducted a qualitative study to further explore the RE-AIM domains as described below. This involved a combination of focus group discussions with patients; semi-structured patient, staff and key stakeholder interviews; and participant observation to explore their experiences of the MSF OCA Irbid NCD Programme and of NCD care for Syrian refugees in Jordan more generally.

4.6.1 Qualitative data collection

Two same-sex focus groups discussions (FGDs) were conducted, each with eight adult NCD patients to assess the appropriateness of areas included in our topic guide. The FGDs were limited to Syrian patients and split by gender on the advice of local staff, as this was culturally most appropriate. Semi-structured interviews were conducted with 16 adult patients, 18 staff members and six key stakeholders to enable in-depth exploration of an individual’s perception of key themes or phenomena. During a two-week period, all patients due to attend for consultation stratified by NCD diagnosis and then were randomly selected to be asked by their doctor for permission for the study staff to contact them to invite them for interview. Patients were then phoned by study staff and invited to attend at a specified time and place for a focus group. Those for whom this time didn’t suit were invited to an individual interview at a time of their convenience. Jordanian patients were selected for individual interview only. Additional patients were approached in the waiting room of each clinic to be invited for interview; these patients were purposively selected to ensure that both genders, both main nationalities, key target NCDs, and those accessing both clinic locations and each specialised service element (MHPSS, HLO, Home Visit) were represented. MSF staff were purposively selected to represent a range of clinical, support and managerial staff with additional staff interviewed on the basis of management staff recommendation. More medical staff than other staff cadres were selected since one of our objectives was to evaluate acceptability and implementation of the MSF NCD guideline. Key stakeholders were selected to represent different levels of the MOH, other NGOs involved in delivering NCD care in Jordan and a representative of the Syrian community.
Eligible participants were provided with a full explanation and given an information sheet with the details of the study objectives. The interviewer emphasised that participation in the study was strictly voluntary and would not impact on their access to care or on their employment, as appropriate. None of the invited participants refused to participate and all participants signed an informed consent form to participate and to be audio-recorded. We conducted individual patient interviews until data saturation was achieved (i.e. additional interviews did not uncover new themes related to our research question), which was achieved with a relatively small sample size since we were interested in broader, over-arching themes rather than in finer themes. The number of staff and stakeholder interviews were based on practical time limitations.

Patient interviews included nine male and seven female patients, of whom ten were Syrian and six were Jordanian. The majority (n=13) had two or more NCD diagnoses, three had attended MHPSS services, two attended the HLO and one was a home visit patient (Annex 5).

The topic guide opened with introductory questions about the patient’s NCD or the participant’s role in relation to NCD care and was followed by prompts relating to each domain of the RE-AIM framework, broadly as follows:

(i) Reach: coverage of the NCD service and its components of the intended target population; available resources and support;

(ii) Effectiveness: patient and providers perspectives on effectiveness of programme components - clinical review, medications, HE, HLO, MHPSS, HV; perceived benefits versus costs;

(iii) Adoption and implementation: e.g. perceived availability and accessibility of NCD service and programme components, implementation challenges; adaptations to local and to humanitarian setting, compatibility with values, resources, complexity, suggestions for improvement;

(iv) Maintenance: support, activities to support sustainability, key patient and provider – perceived challenge in maintaining medical treatment or in altering lifestyle; alignment with organisational mission; modifications made for maintenance.

Within this framework, we also focussed on specific components of NCD care (e.g. service provision, clinical consultation, medication prescription and adherence, health education, MHPSS and/or support from the HLO, home visit service).

The complete English-version topic guides for the FGDs, and patient, staff and stakeholder interviews are included as Annex 6a-d respectively. All FGDs, patient interviews and three staff interviews were conducted in private rooms in the MSF clinics (or in the patient’s home in the case of the home visit patient) in Arabic by two, trained research assistants (HT, male, current HLO; SE, female, former HLO with the programme). The remaining interviews were undertaken in private rooms in English by EA (female, public health researcher at LSHTM) in MSF clinics or offices or at stakeholders’ offices. Interviews with former MSF staff were undertaken via Skype.

Interviews were audio-recorded, translated into English (as necessary) and/or transcribed by EA or trained third-party researchers not otherwise involved in the study. A second team member and/or EA performed quality checks of translation and transcription.

Participant observation was undertaken at both clinics over a two-week period by EA. This involved observation of patient flow through the reception, waiting area, pharmacy and consultations rooms; a medical team meeting; and a psycho-education session held in the clinic waiting room. Clinical
consultations were observed for three of the four doctors on duty on three weekdays over the observation period. Informed verbal consent was obtained from patients, doctors and counsellors involved in the clinical meeting, psycho-education session and clinical consultations. All patients had been informed of the evaluation via posters displayed on clinic walls.

4.6.2 Qualitative data analysis

Data were coded in NVivo11© and analysed by EA using template analysis, a subset of thematic analysis that has been used in psychology research and in public health research 26,27. The central tenet of this technique is the development of a coding template, usually based on an initial subset of data, then applied to further data and revised and refined iteratively. It allows for an integrated approach to developing a coding structure, employing both a deductive organising framework for code types and an inductive (ground-up) development of codes that are identified from the data. In this case, the organising framework is based on a set of a priori themes based on RE-AIM 25,28. Advantages include time efficiency and the fact that the technique lends itself team analysis and to working with larger data sets.

To become familiar with the data, transcripts, field notes and interviewer feedback sheets were reviewed. EA and LM performed initial open coding on a subset of five English transcripts, representing a cross-section of the data and SE performed open coding on the Arabic transcripts as an additional quality control measure. Secondly, the initial themes were organised into meaningful groups, using the a priori themes as appropriate, defining how they related to each other within and between groups. Thus, an initial coding template was defined and was then applied to a further round of three interviews independently by EA and LM. The template was then revised iteratively by EA and the final version was applied to all of the dataset. The data were then analysed by participant subset i.e. patient, staff or stakeholder.

Finally, themes were checked with reflexive practice to mitigate against the insertion of preconceived assumptions. Themes were then related back to the research question and to existing literature. Negative cases or exceptions were examined to explore what set them apart. Both analysts reviewed the final template to enhance inter-rater reliability and analytic credibility. The findings are reported in accordance with the Consolidated Criteria for Reporting Qualitative Research checklist for transparency 29.

4.7 Costing study

This retrospective costing study was undertaken from the provider perspective and used both ingredients-based and step-down costing approaches. Ingredients-based costing requires the identification and specification of each resource component, or input, used for delivering an individual service in order to calculate a total unit cost, e.g. how many minutes each staff cadre spends with the patient during the consultation. The step-down costing method is used to allocate clinic overhead costs or resources in a step-wise fashion to all the overhead departments and then to final cost centres 30, in this case, clinical consultation for NCD patients. Annual financial costs, i.e. those costs resulting from actual expenditure on goods and services, were estimated for the study period 2015 to 2017.

4.7.1 Costing data collection

The annual total and unit financial costs of providing NCD clinical care were determined from the provider’s perspective. The analysis was informed by an activity-based cost collection and
Mixed methods evaluation of MSF primary care based NCD service in Irbid, Jordan: February 2017 - February 2018

Expenditure review. Information pertaining to the nature, location and mode of delivery of the NCD services was collected during a field visit by the lead investigator and was supplemented by informal interviews with medical supervisory staff. A data collection tool was devised to record the relevant financial costs incurred at coordination, project and clinic level and a project timeline was developed with input from management staff. Cost data were collected for the study period January 2015 to December 2017 from the management and drug supply chain using financial information (e.g. monthly expenditure data, MSF salary scales, drug purchase inventories, consumption data and the MSF Green List of drug prices), activity data (e.g. operational reports) and discussion with management and clinical staff.

Costs were classified into capital and recurrent costs and were collected at each level by MSF finance, human resources and logistics staff. Capital costs included building works and purchase of biomedical equipment, office equipment, furnishings and vehicles whose nominal cost was greater than 100 Euro. Recurrent costs included personnel (contracted staff salaries, insurance and training; temporary workers’ fees; experts’ visits); logistics (building rent, maintenance and operation; office supplies and furnishings); vehicle maintenance and operation; biomedical equipment and consumables; external laboratory costs; and drugs. Drug costs were determined using consumption data and unit costs. Expatriate salary, per diem and travel costs were attributed to the project personnel budget; expatriate accommodation costs were attributed to project-level logistics costs. Coordination level costs were broadly categorised into capital, recurrent and personnel costs.

4.7.2 Costing data analysis

Capital costs were annualised using straight-line depreciation and given a lifespan of 20 years for building, 5 years for vehicles and 3 years for equipment. Salaries of all facility and project office staff were attributed at 100% to the NCD programme, while the epidemiologist’s and mental health activities manager’s salaries were allocated at 50% to the programme as these roles were shared with other projects. Salaries and expenses of coordination level staff were allocated according to the annual allocation factor; this was determined by management staff’s estimates of the proportion of coordination annual activity devoted to the Irbid NCD programme.

Drug costs were analysed as a separate input, using consumption data and unit purchase prices, as they were anticipated to account for a high proportion of total cost. Items categorised as drugs included medications and drug delivery systems dispensed to patients (such as spacer devices, glucometers, lancets, glucometer strips and insulin needles). Drugs are locally purchased from pre-approved Jordanian wholesale suppliers (which meet MSF’s strict quality control criteria) as this is required by Jordanian law; unit purchase prices were available only for 2016 and 2017. Missing prices were substituted with the other year’s price, after appropriate inflation or deflation; deflated 2016 prices were used to calculate 2015 drug costs. Consumption figures included wastage. Annual total drug cost and cost per drug were calculated.

Costs were incurred in Jordanian Dinar (JOD) and Euro in different years (range: 2014–2017). They were inflated to the base year 2017 and then converted to International Dollars (INT$) using the general purchasing power parity (PPP). The PPP index is recommended for comparing costs across countries as it adjusts for differences in relative prices between economies. Total and unit costs
are presented in 2017 Euro as this is the programme’s operational currency, using a nominal exchange rate derived from World Bank data.\(^\text{11}\)

The annual total cost of NCD clinical care was calculated for each of 2015, 2016 and 2017 by adding the allocated capital and recurrent costs incurred at facility, field and capital level. Unit costs were expressed as cost per patient active at the end of each year, and cost per visit per year (using total annual new and follow up medical visits as the denominator). Total financial costs were calculated and the major cost drivers were identified.

One-way sensitivity analyses were performed to identify the effect of removing field-level and/or coordination level costs. A two-way sensitivity analysis varied the coordination activity allocation factor to a minimum of 20% and a maximum of 40%, based on the minimum and maximum estimates provided by management staff. Multifactorial sensitivity analyses were performed around drug and personnel costs since these contributed significantly to the total cost. Drug costs were recalculated using 100% MSF Green List prices with 10% added to account for importation costs. A scenario analysis was performed to determine the impact on costs by altering allocation of staff to patients by varying: (1) the proportion of consultations task shared to nurses from 6% (based on monthly medical report data) to 75% (based on cohort data analysis); (2) the proportion of stable patients from 60 to 75%; (3) the size of the total active cohort to a maximum of 4000.

In addition, an incremental cost analysis was performed to determine the 2017 annual costs incurred by the addition of a mental health and psychosocial support service (MHPSS) and a home visit (HV) service. For the MHPSS, a proportion of clinic level building and maintenance was allocated at 16% based on the relative amount of floor space used by the service. Other irrelevant clinic level recurrent costs e.g. drugs; biomedical equipment and laboratory costs were excluded. Salaries and expenses for counsellors and the Mental Health Activities Manager’s activity were included at 75% and 37.5% respectively for 2016, since the service commenced in April. There were increased to 100% and 50% respectively in 2017. Project level and coordination level expenses were allocated based on the proportion of individual counselling sessions versus total consultations carried out in 2016 and 2017 in both clinics (at 3.75 and 5%, respectively). Building and maintenance costs were allocated based on approximate floor space used. The home visit service was allocated 100% of the salary of a HV nurse, doctor and driver as well as maintenance and operation of one vehicle. To account for the expansion of the team in September 2017, 25% of the annual salary of an additional nurse and physiotherapist and one seventh of the salary of a MHPSS counsellor and health educator were included. In addition, clinic-level recurrent costs (such as drugs, laboratory testing, biomedical equipment and consumables), project-level and coordination-level costs were allocated at 5.6 % in 2016 and 5.5% in 2017. This was based on the proportion of HV consultations vs. total medical consultations that occurred in 2017.

\(^{11}\) The World Bank does not provide a JOD to Euro exchange rate. Since JOD are pegged to United States dollars at a constant exchange rate of 0.71100, the 2017 Euro to USD exchange rate101 was multiplied by this figure to give a JOD to Euro exchange rate of 1.25
5 Results

The evaluation results are presented broadly in accordance with the RE-AIM domains: reach, acceptability and adoption, effectiveness, implementation and maintenance.

5.1 REACH AND ACCESS

5.1.1 Does the programme reach its target population?

The programme is aimed at Syrian refugees and vulnerable Jordanians who have one of the target NCDs defined earlier.

For the MSF Access Survey, 2589 Syrian households in Irbid governorate were interviewed in mid-2016. These households comprised 17,579 individuals, of whom 45.7% (n=8041) were adults aged 18 years or over. Among adult household members (≥18 years), self-reported estimates of NCDs were as follows: 21.8% (95%CI 20.9-22.8) reported one or more named NCDs; 14% (n=1126, 13.2-14.8) reported hypertension; 9.2% (n=740, 95%CI 8.5-9.9) reported diabetes (not distinguished between Types 1 or 2); 5.7% (n=456, 5.1-6.2) reported CVD; and 3.2% reported chronic respiratory disease. These self-reported diagnoses were not corroborated with medical records.

By March 2018, there were an estimated 69,816 Syrian refugee adults (≥ 18 years) living in Irbid governorate (according to UNHCR registration figures with 5% added to account for unregistered Syrians12). Using the MSF survey estimates of self-reported NCD prevalence, we can estimate that 15,220 Syrian adults in Irbid governorate may have at least one previously diagnosed relevant NCD; 9774 may have hypertension; 6,423 may have diabetes Type 1 or 2; 3980 may have CVD; and 2234 may have a diagnosis of chronic respiratory disease. By the end of 2017 there were 3540 active patients still attending the MSF OCA Irbid NCD Programme. Thus, approximately 23% of adult Syrian patients with known, previously–diagnosed relevant NCDs in Irbid governorate were being reached by the MSF OCA service in Irbid. This may be an overestimate of coverage since patients who travel from other governorates were included in the numerator.

The MSF mission was initially concerned with ensuring the programme reached Syrian refugees who had not registered with UNHCR and were therefore not entitled to MOH emergency and primary care services (provided free-of-charge to registered refugees at the start of the crisis). Repeated surveys have estimated this group to account for as few as 5% of Syrian refugees23,34 The Irbid cohort reflects this with 94.5% of the 3664 enrolled Syrian patients reporting they were registered with UNHCR. However, only 75.2 % reported having an active Ministry of Interior (MOI) Card (17.4% had an unknown MOI status), which is required to access MOH services. Unregistered refugees can access primary healthcare through the UNHCR partner, JHAS, and patients interviewed for this evaluation perceived that this care was both accessible and satisfactory.

Jordanian patients were asked about their insurance status on enrolment as a measure of “vulnerability”, although none were excluded based on their insurance status. On enrolment, 67.8%

12 A UNHCR/WHO/John Hopkins Health Access survey performed in 2014 34 estimated that 5% of Syrians were not registered as persons of concern with UNHCR, a figure corroborated by the MSF Household Access Survey.
Jordanian patients (N=1365) reported having no public or private insurance (Annex 2). All interviewed Jordanian patients had public health insurance and one described his Jordanian acquaintances leaving the programme in favour of military medical services because they offered greater continuity than MSF. Most clinical and management staff mentioned the challenges around appropriately targeting the programme to reach the most vulnerable Jordanian patients and were in the process of piloting a vulnerability screening tool. Several were uncomfortable with the idea that MSF was providing care for insured Jordanian patients who could access free MOH services.

5.1.2 Patient demographics
A total of 5045 patients were ever enrolled in the program to the end of the reporting period, of whom 72.6% were Syrian, 27.1% were Jordanian and 0.3% were refugees from Iraq or Palestine. Table 1 shows demographics for 5029 Syrian and Jordanian patients only. The mean age for all patients was 54.7 years (SD 15.7) and 59.8 % of patients were female. Impaired mobility was reported by 9.9% of the cohort, while 14.4 % of enrolled patients reported having no formal education. Significantly more Jordanian patients (40.4%, n=552) reported receiving secondary or higher level of education compared to Syrian patients (12.4%, n=456). Syrian patients were from larger households with 47.5% (n=1738) having 7 or more household members vs. 20.6% (n=281) of Jordanian (Table 1). Figure 1, below, shows the age and gender breakdown of enrolled Syrian and Jordanian patients.

Table 1. Demographics by country of origin of 5029 Syrian and Jordanian patients enrolled in Irbid NCD Programme 2014-2017

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Total</th>
<th>%</th>
<th>Syrian</th>
<th>%</th>
<th>Jordanian</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country of Origin</td>
<td>Male</td>
<td>2021</td>
<td>40.2</td>
<td>1429</td>
<td>39</td>
<td>592</td>
<td>43.4</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>3008</td>
<td>59.8</td>
<td>2235</td>
<td>61</td>
<td>773</td>
<td>56.6</td>
</tr>
<tr>
<td>Age &lt;5</td>
<td>18</td>
<td>0.4</td>
<td>14</td>
<td>0.4</td>
<td>4</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Age 5-15</td>
<td>150</td>
<td>2.9</td>
<td>119</td>
<td>3.2</td>
<td>31</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>Age 15-40</td>
<td>498</td>
<td>9.9</td>
<td>384</td>
<td>10.5</td>
<td>114</td>
<td>8.4</td>
<td></td>
</tr>
<tr>
<td>Age 40-65</td>
<td>3035</td>
<td>60.3</td>
<td>2163</td>
<td>59</td>
<td>872</td>
<td>63.9</td>
<td></td>
</tr>
<tr>
<td>Age &gt;65</td>
<td>1328</td>
<td>26.4</td>
<td>984</td>
<td>26.9</td>
<td>344</td>
<td>25.2</td>
<td></td>
</tr>
<tr>
<td>Education level</td>
<td>None</td>
<td>724</td>
<td>14.4</td>
<td>613</td>
<td>16.7</td>
<td>111</td>
<td>8.1</td>
</tr>
<tr>
<td></td>
<td>Not asked/answered</td>
<td>1874</td>
<td>37.3</td>
<td>1472</td>
<td>40.2</td>
<td>402</td>
<td>29.5</td>
</tr>
<tr>
<td></td>
<td>Primary</td>
<td>1423</td>
<td>28.3</td>
<td>1123</td>
<td>30.6</td>
<td>300</td>
<td>22.0</td>
</tr>
<tr>
<td></td>
<td>Secondary or higher</td>
<td>1008</td>
<td>20</td>
<td>456</td>
<td>12.4</td>
<td>552</td>
<td>40.4</td>
</tr>
<tr>
<td>Household size</td>
<td>1-3</td>
<td>889</td>
<td>17.7</td>
<td>480</td>
<td>13.1</td>
<td>409</td>
<td>30.0</td>
</tr>
<tr>
<td></td>
<td>4-6</td>
<td>1743</td>
<td>34.7</td>
<td>1143</td>
<td>31.2</td>
<td>600</td>
<td>44.0</td>
</tr>
<tr>
<td></td>
<td>7+</td>
<td>2019</td>
<td>40.2</td>
<td>1738</td>
<td>47.5</td>
<td>281</td>
<td>20.6</td>
</tr>
<tr>
<td></td>
<td>Not asked/answered</td>
<td>378</td>
<td>7.5</td>
<td>303</td>
<td>8.3</td>
<td>75</td>
<td>5.5</td>
</tr>
<tr>
<td>Impaired mobility</td>
<td>Yes</td>
<td>498</td>
<td>9.9</td>
<td>358</td>
<td>9.8</td>
<td>140</td>
<td>10.3</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>4381</td>
<td>87.1</td>
<td>3207</td>
<td>87.5</td>
<td>1174</td>
<td>86.0</td>
</tr>
<tr>
<td></td>
<td>Not asked/answered</td>
<td>150</td>
<td>3.0</td>
<td>99</td>
<td>2.7</td>
<td>51</td>
<td>3.7</td>
</tr>
</tbody>
</table>
Of the 2167 (59.1%) enrolled Syrians for whom place of origin was known, 48% were from Dara’a in South Syria, with place of origin unknown for 40.9%, (Figure 2).

Figure 2: Governorate of origin of Syrian population, including only patients for whom this information was known (n=2167)
5.1.3 CVD risk factors at enrolment

At enrolment risk factors were recorded and the results are presented in Table 2. 22.7% (n=1144) reported current smoking and 62.6% (n=2,555) were obese. Among males, 40.8% were current smokers (n=825) compared to 10.6% of women (n=319). Women, in particular, had high levels of obesity and inactivity at 73.5% (n=1756) and 43.6% (n=1319) respectively. Current alcohol intake was reported by only 0.3% of the cohort (n=15).

Table 2: Cardiovascular Risk Factors at Enrolment for the cohort 2015 - 2017

<table>
<thead>
<tr>
<th></th>
<th>Total (N=5045)</th>
<th>%</th>
<th>Male (N=2023)</th>
<th>%</th>
<th>Female (N=3022)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current smoker</td>
<td>1144</td>
<td>22.7</td>
<td>825</td>
<td>40.8</td>
<td>319</td>
<td>10.6</td>
</tr>
<tr>
<td>Inactivity (moderate/total)</td>
<td>1879</td>
<td>37.2</td>
<td>560</td>
<td>27.7</td>
<td>1319</td>
<td>43.6</td>
</tr>
<tr>
<td>Obesity (BMI&gt;30)*</td>
<td>2555</td>
<td>62.6</td>
<td>799</td>
<td>47.2</td>
<td>1756</td>
<td>73.5</td>
</tr>
<tr>
<td>Current alcohol intake</td>
<td>15</td>
<td>0.3</td>
<td>12</td>
<td>0.6</td>
<td>3</td>
<td>0.1</td>
</tr>
</tbody>
</table>

*Based on first available BMI measurement; N=4082 (1692 men and 2390 women).
5.1.4 Diagnoses

Diagnoses managed at last recorded consultations for every enrolled patient (N=5045) were explored (Table 3). The most common diagnoses per patient, in descending order, were: Hypertension (60.4%), Type 2 Diabetes (53.1%), Cardiovascular Disease (25.9%), Hypothyroidism (7.6%) and Asthma (7.0%). Musculoskeletal disease was recorded in 296 (5.9%) of consultations, while Diabetes Type 1 was managed at 3.1% of last visits. 71% (n=3582) of enrolled patients had two or more target NCD conditions (Annex 3).

Table 3: Per patient diagnoses at last visit for all patients enrolled in the Irbid NCD Programme 2015-2017 by age and gender

<table>
<thead>
<tr>
<th>NCD</th>
<th>Total n=5045</th>
<th>Age Category</th>
<th>Gender</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>05-15 n=151</td>
<td>15-40 n=501</td>
<td>40-65 n=3041</td>
<td>&gt;65 n=1334</td>
<td>Male n=2023</td>
<td>Female n=3022</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>3047</td>
<td>60.4%</td>
<td>3%</td>
<td>2.0%</td>
<td>60.5%</td>
<td>1796</td>
<td>59.1%</td>
<td>945</td>
<td>70.8%</td>
<td>1135</td>
<td>56.1%</td>
<td>1912</td>
<td>63.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CVD total (1)</td>
<td>1306</td>
<td>25.9%</td>
<td>0%</td>
<td>0.0%</td>
<td>73%</td>
<td>700</td>
<td>23.0%</td>
<td>533</td>
<td>40.0%</td>
<td>762</td>
<td>37.7%</td>
<td>544</td>
<td>18.0%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DM I (2)</td>
<td>155</td>
<td>3.1%</td>
<td>56%</td>
<td>37.1%</td>
<td>89%</td>
<td>17.8%</td>
<td>10%</td>
<td>0.3%</td>
<td>0.0%</td>
<td>76%</td>
<td>3.8%</td>
<td>79%</td>
<td>2.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DM II</td>
<td>2680</td>
<td>53.1%</td>
<td>2%</td>
<td>1.3%</td>
<td>308%</td>
<td>61.5%</td>
<td>1659</td>
<td>54.6%</td>
<td>711%</td>
<td>53.3%</td>
<td>1095%</td>
<td>54.1%</td>
<td>1585%</td>
<td>52.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothyroid</td>
<td>383</td>
<td>7.6%</td>
<td>13%</td>
<td>8.6%</td>
<td>123%</td>
<td>24.6%</td>
<td>207%</td>
<td>6.8%</td>
<td>40%</td>
<td>3.0%</td>
<td>37%</td>
<td>1.8%</td>
<td>346%</td>
<td>11.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>352</td>
<td>7.0%</td>
<td>77%</td>
<td>51.0%</td>
<td>117%</td>
<td>23.4%</td>
<td>124%</td>
<td>4.1%</td>
<td>34%</td>
<td>2.5%</td>
<td>142%</td>
<td>7.0%</td>
<td>210%</td>
<td>6.9%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COPD (3)</td>
<td>71</td>
<td>1.4%</td>
<td>0%</td>
<td>0.0%</td>
<td>5%</td>
<td>1.0%</td>
<td>35%</td>
<td>1.2%</td>
<td>31%</td>
<td>2.3%</td>
<td>57%</td>
<td>2.8%</td>
<td>14%</td>
<td>0.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSK (4)</td>
<td>296</td>
<td>5.9%</td>
<td>0%</td>
<td>0.0%</td>
<td>30%</td>
<td>6.0%</td>
<td>169%</td>
<td>5.6%</td>
<td>97%</td>
<td>7.3%</td>
<td>90%</td>
<td>4.4%</td>
<td>206%</td>
<td>6.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neurological</td>
<td>78</td>
<td>1.5%</td>
<td>0%</td>
<td>0.0%</td>
<td>14%</td>
<td>2.8%</td>
<td>40%</td>
<td>1.3%</td>
<td>24%</td>
<td>1.8%</td>
<td>27%</td>
<td>1.3%</td>
<td>51%</td>
<td>1.7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td>2555</td>
<td>50.6%</td>
<td>13%</td>
<td>8.6%</td>
<td>449%</td>
<td>89.6%</td>
<td>1606%</td>
<td>52.8%</td>
<td>487%</td>
<td>36.5%</td>
<td>799%</td>
<td>39.5%</td>
<td>1756%</td>
<td>58.1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DM II + HT (5)</td>
<td>706</td>
<td>14.0%</td>
<td>0%</td>
<td>0.0%</td>
<td>169%</td>
<td>33.7%</td>
<td>437%</td>
<td>14.4%</td>
<td>100%</td>
<td>2.2%</td>
<td>338%</td>
<td>16.7%</td>
<td>368%</td>
<td>12.2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DM II + HT + CVD</td>
<td>702</td>
<td>13.9%</td>
<td>0%</td>
<td>0.0%</td>
<td>25%</td>
<td>5.0%</td>
<td>374%</td>
<td>12.3%</td>
<td>303%</td>
<td>6.6%</td>
<td>369%</td>
<td>18.2%</td>
<td>333%</td>
<td>11.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HT + CVD</td>
<td>449</td>
<td>8.9%</td>
<td>0%</td>
<td>0.0%</td>
<td>10%</td>
<td>2.0%</td>
<td>241%</td>
<td>7.9%</td>
<td>198%</td>
<td>4.3%</td>
<td>232%</td>
<td>11.5%</td>
<td>217%</td>
<td>7.2%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Patients with multi-morbidity will be counted more than once so total number of diagnoses exceeds total number of patients. **Obesity (BMI > 30) has been applied to all ages. However, age adjusted growth charts are preferred for people < 20 years of age as BMI may be inaccurate
(1) CVD = Cardiovascular Disease (includes history of angioplasty or coronary artery bypass grafting; myocardial infarction; congestive heart failure; peripheral vascular diseases; stable angina; unstable angina and stroke). (2) DM = diabetes mellitus. (3) COPD = Chronic Obstructive Pulmonary Disease. (4) MSK = musculoskeletal. (5) HT = hypertension.
5.2.3 Accessibility

Can patients access the MSF programme and NCD care more broadly?

The majority of patients considered the clinic physically accessible and conveniently located as it could be reached by public transport. While some patients were willing to pay for transport since other aspects of care were free, others found transport costs challenging, particularly those living at a distance. Certainly, staff confirmed that many patients prioritised medical consultations over other services and that transport costs were a barrier to patients attending group MHPSS, health education sessions or the laboratory.

“They said we can pay for transport to come for the medication but it’s difficult for me to come for follow up for the mental health...first of all the transportation is high here; some of our patient live in the villages because the villages is less in the cost for accommodation so it will be more expensive for him for the transportation.” Clinical staff member.

Staff described good community awareness of the programme. Both patients and staff perceived there was a large unmet need for free primary level NCD care among the Syrian population. Patients and staff were aware of family members or neighbours who had waited months to be registered and staff described people repeatedly begging to be enrolled.

Patients’ main frustration was MSF’s siloed approach to care, the perceived lack of treatment offered for conditions other than MSF’s target conditions and the lack of affordable referral options to services managing NCD complications. From patients’ perspectives the main gaps in MSF care were the inadequate prescribing of painkillers and antibiotics, and the lack of referral to orthopaedics, ophthalmology and dentistry. Several described doctors’ lack of engagement around non-target medical conditions, or their impractical suggestions to attend a private clinic or buy expensive medications from a pharmacy:

Female patient: “(the doctor) told me to bring it and told him I can’t buy it. So what should I do and then he told me go and buy it because... ‘we don’t have except the one for NCD’.

The majority of patients perceived the clinic to be inaccessible outside of their set appointment times, and most had not tried to access MSF when in need. Some suggested that phone access to the clinic would be helpful. From the staff perspective, while some encouraged certain patient groups (e.g. insulin users) to phone the clinic for advice or offered their personal phone numbers, it appeared that most patients were strongly encouraged to access the clinic strictly via the appointment system only. Many staff felt frustrated when patients did not adhere to appointment times and it appears patients were not readily facilitated if they missed appointments:

“(Maybe, the patient) forgot or he had something that impeded him to come in the same day or in the same hour, they wouldn’t accept him ...and they told him I will check the appointments...I don’t find a place for you...even when I was saying that I can see him. Sometimes they don’t do it because they don’t want to break their system,” Clinical staff member.
While several staff ensured that those who missed appointments had an adequate supply of medication while they awaited the next available slot, some patients’ accounts contradict this.

A minority mentioned access issues specific to women who must be accompanied by a family member and have permission from their husband to attend. MHPSS staff described this as a barrier to accessing their services in particular. One staff member also describes Syrian refugees’ fear of the Jordanian authorities and refoulment, which made them reluctant to attend the clinic if there were police in the vicinity. Disabled or housebound patients outside the home visit team catchment area were also unable to access MSF services.

**Accessibility of other services**

Syrian patients described weighing up the costs and convenience of various providers to determine the cost efficient way to manage their medical conditions. This applied to their NCD conditions before being enrolled in MSF’s clinics, to problems not covered by MSF, or during periods when MSF services were unavailable e.g. weekends. Many described attending MOH clinics, private clinics or obtaining medications from private pharmacies, family or neighbours. One patient attended a private specialist who waived all or part of his fee for Syrian refugees.

Their experience of the MSF service contrasted with their experience of other services. At MOH clinics, many described a lack of availability of their prescribed medication, overworked doctors who rushed the consultation and didn’t listen, long wait times and preferential treatment of some patients. Syrian patients generally described the co-payments for consultation, testing and medications as unaffordable, although one woman described her local MOH clinic as providing good, efficient care and having medications available. One relatively well-off Syrian had paid over ten thousand JOD for private surgical care. Several mentioned JHAS, describing the care as of good quality and accessible. Two patients mentioned attending Syrian doctors, whom they trusted as “specialised”.

Jordanian patients were not as financially constrained in terms of accessing care for NCDs and all Jordanian participants were covered by national health insurance. In contrast to most Syrian patient’s reports, some described medication rupture in the MOH system as rare and reported that most of their acquaintances accessed care successfully through this system. Some Jordanian patients chose to purchase their preferred medicine or equipment from private pharmacies rather than using MOH supplies e.g. fine insulin needles.

### 5.2 ADOPTION and ACCEPTANCE

---

The Jordanian government offered free, UNHCR-funded, MOH services to Syrian refugees from the start of the crisis to December 2014 when co-payments, equivalent to those paid by Jordanians without public health insurance, were introduced. The policy changed again in January 2018, since these interviews and this data collection took place, to now require Syrian refugees to pay 80% of the full “foreigner” rate for MOH primary care services, medications and tests.
5.2.1 Clinic activity and retention in care

The mean time spent in the cohort per patient up to the end of 2017 was 579.5 days (SD=367) or 1.58 years. The median time in the cohort was 662 days, (IQR=711). The enrolment patterns and proportion of new versus follow-up consultations are presented in Figure 3, showing that few new patients were admitted between May 2016 and final quarter of 2017, when a number of “inactive” patients were identified and discharged, creating a small increase in capacity. Jordanian patients made up the majority of new enrolments for the five-month period from October 2015 to February 2016, when the project implemented the Jordanian government requirement that 30% of all patients should be Jordanian. From early 2016, the proportion of Jordanian versus Syrian follow up consultations is relatively static.

Of the whole cohort enrolled up to end of 2017 (n=5045) the mean number of visits per month was 1.02 with a median of 0.79 (IQR=0.68). This was calculated by dividing the number of days in the cohort by the number of visits during this time. The mean number of visits for Syrian patients, 1.07 (SD=0.62,IQR=0.69), was slightly greater than that for Jordanians, 0.9 (SD=0.75,IQR=0.65) (p-value=<0.001). Of note, “visits” constituted nurse or doctor consultations and did not include monthly drug pick-ups, health education or mental health visits. Of patients ever enrolled (5045), 85.2% (n=4297) were retained in care for six months or more.

Figure 3: Proportion of new versus follow up consultations per month by nationality for patients enrolled in Irbid NCD Programme from 2015 to 2017.
5.2.2 Participation

Few other NGOs provided primary level NCD care in north Jordan. These included MSF-Operational Centre Barcelona, International Medical Corps (IMC), and Al-Aoun, a local NGO. The Emirati hospital in Mafraq also provided some outpatient NCD care. Patients incurred co-payments or travel costs to attend each of these.

Patients and staff perceived there was good community awareness regarding the MSF service and the main barrier to patient participation was the cap on cohort size. Staff were keen to work for MSF and there was low turnover among clinical staff other than doctors. Fresh medical graduates tended to resign after gaining several months’ experience in order to pursue specialist training. This turnover was regarded as problematic by clinical supervisors and team members as continuity of care was seen as important.

Staffing, structures and tools

The structure of the clinical and management team for the Irbid programme in 2016 is attached as Annex 2. There are two clinic teams operating in parallel at two sites, operating from 8 am to 2pm on 6 days per week. The sites include a Ministry of Health primary care clinic, Ibn Sena, and a clinic operated by a private, not-for-profit NGO in a civic building, Ibn Rushd. In each clinic, there are two doctors (one specialist family medicine practitioner and one non-specialist), 3 nurses, 1 health educator and 1 receptionist. Individual counselling and wound care services are located at Ibn Rushd due to space restrictions at Ibn Sena. The management team is based in a separate project office and oversees both clinic teams. The medical and nursing supervisors, HLO, health educator and psychosocial counsellors travel between both sites.

Mental Health and Health Education Sessions

The programme started to record mental health comorbidity from April 2016 when the MHPSS component of the NCD service started. By the end of the reporting period, only 24 enrolled NCD patients had a mental health disorder recorded in their patient file14. Individual counselling sessions took place in Ibn Rushd, where there were private rooms set aside for this. Group sessions took place in meeting rooms in each clinic and in the waiting area, although space was limited in Ibn Sena and MSF competed for use of the meeting room with the MOH team also working there. In 2016, 154 NCD patients attended for individual counselling sessions and an average of 63 group sessions took place per month across both clinics. In 2017, an average of 66 group sessions took place per month across both clinics.

Nurses and health educators delivered specific health education sessions at each clinic site. Patients were supposed to attend for a health education session after their medical consultation. For patients active by the end of 2017, 66.9% (n=2683) attended a session after their medical consultation.

---

14 There was no clear definition of the term ‘mental health disorder’, which was differently understood by different doctors using non-standardized screening tools during the study period January 2015 to December 2017. Some doctors classified patients as having a ‘mental health disorder’ when there was a psychiatric disorder, while others did not specify.
5.2.3 Referral needs and available pathways

Ophthalmology and Cardiology were the most common external referrals documented by doctors in the patient files, respectively accounting for 38.6 % (n=1527) and 25.5% (n=1010) of all referrals. The referral needs were similar among men and women (Table 4).

Ophthalmology, cardiology and nephrology consultations and interventions were provided via a bilateral fixed-term agreement between MSF and the Qatari Red Crescent (QRC). QRC ran discrete short-term interventions whereby they flew in teams from Qatar to provide angioplasty and cardiothoracic surgery. At the time of data collection, the one-year contract to provide ophthalmology services had expired and was awaiting renewal of QRC donor funding.

Table 4: Total number of external referrals made from 2015-2017 for the whole cohort.

<table>
<thead>
<tr>
<th>Service</th>
<th>Total (N=3958)</th>
<th>%</th>
<th>Male (N=1632)</th>
<th>%</th>
<th>Female (N=2336)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital/ER</td>
<td>256</td>
<td>6.5</td>
<td>126</td>
<td>7.7</td>
<td>131</td>
<td>5.6</td>
</tr>
<tr>
<td>Podiatrist</td>
<td>26</td>
<td>0.7</td>
<td>12</td>
<td>0.7</td>
<td>14</td>
<td>0.6</td>
</tr>
<tr>
<td>Ophthalmologist</td>
<td>1527</td>
<td>38.6</td>
<td>586</td>
<td>35.9</td>
<td>942</td>
<td>40.3</td>
</tr>
<tr>
<td>Surgeon</td>
<td>124</td>
<td>3.1</td>
<td>54</td>
<td>3.3</td>
<td>72</td>
<td>3.1</td>
</tr>
<tr>
<td>Cardiologist</td>
<td>1010</td>
<td>25.5</td>
<td>412</td>
<td>25.2</td>
<td>600</td>
<td>25.7</td>
</tr>
<tr>
<td>Endocrinologist</td>
<td>56</td>
<td>1.4</td>
<td>18</td>
<td>1.1</td>
<td>38</td>
<td>1.6</td>
</tr>
<tr>
<td>Pulmonologist</td>
<td>59</td>
<td>1.5</td>
<td>27</td>
<td>1.7</td>
<td>32</td>
<td>1.4</td>
</tr>
<tr>
<td>Nephrologist</td>
<td>221</td>
<td>5.6</td>
<td>119</td>
<td>7.3</td>
<td>103</td>
<td>4.4</td>
</tr>
<tr>
<td>Other</td>
<td>679</td>
<td>17.2</td>
<td>278</td>
<td>17.0</td>
<td>404</td>
<td>17.3</td>
</tr>
</tbody>
</table>

5.2.4 Acceptability

Overall, patients related very positive experiences of the MSF clinic. They valued the MSF service because it provided reliable, free consultations, medication and laboratory testing in a caring environment:

A female patient stated: “(MSF is) honestly caring about the patient, caring about his appointments even the medication availability. We have never come here and told us that the medication is not available. Their performance is great.”

They trusted the quality of MSF care and medications. In particular, they valued the time taken with them, the respectful and caring attitude of medical staff and the privacy they were afforded. They valued the appointment system, including the SMS reminder system and flexibility to choose appointment times, and the fact that patients were seen by appointment time and not prioritised based on influence. In addition, those that had been referred for ophthalmology or cardiology
review or were provided equipment such as glucometers, valued these aspects of care. While a few patients described obtaining no physical benefit, the majority noted improvements after taking MSF medications and adhering to lifestyle advice:

Jordanian patient: “(Since coming to) the clinic to be honest, I feel relieved and comfortable since the first day I came here, I felt the difference in my disease, before I used to take pills for diabetes and hypertension but nothing changed.”

As mentioned above, patients were dissatisfied with the siloed approach to care and the lack of affordable onward referral options. Others were unhappy that they were not provided with equipment they perceived as necessary e.g. sphygmomanometers and glucometers for home-based testing and some chose to purchase these from pharmacies. One patient mentioned a lack of privacy at reception and several described challenges when discussing missed appointments with the registrar. In particular, they were embarrassed to disclose financial hardship as a reason for this.

Staff believed the service was highly acceptable to patients and better than any alternative NCD service available. The programme was also highly acceptable from a staff perspective. They were very committed, altruistic and proud to work in the programme and with the organisation; several mentioned winning MSF’s “golden flag” award for best project:

Clinic staff member: “It’s about the whole organisation. It seems like it’s a humanitarian organisation honestly not like other organisation and how they treat the people it’s very nice and the experience with them also its nice”

Clinic staff commented positively on the collegiality and support of the team and valued the opportunity to gain experience and to help patients.

Clinic Staff member: “Many lessons (have been learned) really. I learned here how to see others problems, something we don’t see every time, the disaster they are coming from, what has happened to them; how we work here like a team or a family for the benefit of the patients; how you can give to the people...without taking, with nothing in return.”

Management staff also discussed the acceptability of the programme within MSF as an organisation. They believed it was seen as a flagship or pilot project and that MSF was proud of it. All staff were confident of the quality of the service and many offered examples of patients making improvements in clinical parameters, in psychological wellbeing and, less commonly, in making lifestyle changes.

Overall the stakeholders interviewed from UNHCR, MOH and the Syrian community valued the MSF programme as addressing a significant health burden amongst Syrian refugees and relieving the burden on the MOH. Each of them called for MSF to do more, either by expanding the reach of the current programme or by extending the scope e.g. by providing secondary or tertiary referral services. The NGO and UNHCR participants concurred with MSF staff in describing: the perceived high cost of NCD care in Jordan, particularly of medicines purchased in the Jordan market by NGO providers and by patients from private pharmacies and the burden of unmet need amongst the Syrian refugee population.
5.2.5 Guidelines acceptability/usability

The clinical guideline was overall seen as a useful tool that covered the majority of medical consultations. It was perceived as improving quality and consistency of care and as a tool to help doctors negotiate patient demands. However, it was also seen as promoting medicalisation and polypharmacy. It did not cover the complex, multi-morbid patients with renal impairment or the elderly, frail patient who would benefit from de-prescribing. Doctors did not stick to it rigidly but used their personal knowledge and experience. Supervisors reported that national doctors believed that the guidelines reduced their autonomy. In addition, supervisors believed some doctors perceived MSF care as “second-class”, compared to their previous practice in Jordan, particularly as their prescribing options were limited by the guideline. Some staff mentioned that guidelines are relatively novel in Jordanian medical culture and this may pose a barrier to its implementation.

5.2.6 Medications adherence

Patients’ self-reported adherence to medication was explored under the domain of programme “acceptability”.

A convenience sample of patients attending clinic for routine appointments, was approached until 300 medication adherence surveys were filled. The response rate was approximately 75%. 45.3% (n=136) of respondents were female, the majority (75.7%, n=227) were aged 50 or above and 70% (n=212) of the sample were Syrian, reflecting the make-up of the total patient cohort. 80% (n=240) were married and the majority (77.7%, n=233) had received primary level education or less. The most common NCD diagnoses reported were hypertension and diabetes. Of note, approximately a third (32.7%, n=98) had more than 3 NCD diagnoses; 76% (n=228) reported taking 4 or more MSF medications, while a quarter took 7 or more medications (Table 5).

The majority (59.7%, n=179) took medications from other sources: 167 (55.7%) purchased from a pharmacy, 5.7% (n=17) from the Ministry of Health, 2.3% (n=7) from another NGO, and <=1% each from family and friends (n=1) or from a private clinic (n=4). It was not specified if these were for the same conditions being treated by MSF or for other conditions.

The majority of patients (89%, n=267) self-reported total MARS-5 score was over 20, which has been used in the literature to denote high adherence. The frequency of total scores is displayed in Figure 5. Most patients (range: 80.7-84.3%; n=201-253) answered “never” to the individual MARS-5 components concerning intentional non-adherence, meaning they never engage in these non-adherent behaviours. For MARS question 1, “I forget to take them”, the only question about unintentional non-adherence, 32.3% (n=96) patients reported they “rarely” or “sometimes” forgot. (Figure 4).
Table 5: Demographics of 300 adult patients of the Irbid NCD programme who responded to a medication adherence survey in September 2017.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>&lt;50</td>
<td>73</td>
<td>24.3</td>
</tr>
<tr>
<td></td>
<td>50-59</td>
<td>100</td>
<td>33.3</td>
</tr>
<tr>
<td></td>
<td>60-69</td>
<td>86</td>
<td>28.7</td>
</tr>
<tr>
<td></td>
<td>70+</td>
<td>41</td>
<td>13.7</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>99</td>
<td>33.0</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>136</td>
<td>45.3</td>
</tr>
<tr>
<td></td>
<td>Not answered</td>
<td>65</td>
<td>21.7</td>
</tr>
<tr>
<td>Nationality</td>
<td>Jordanian</td>
<td>87</td>
<td>29.0</td>
</tr>
<tr>
<td></td>
<td>Syrian</td>
<td>212</td>
<td>70.7</td>
</tr>
<tr>
<td>Marital status</td>
<td>Married</td>
<td>240</td>
<td>80.0</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>12</td>
<td>4.0</td>
</tr>
<tr>
<td></td>
<td>Widow(er)</td>
<td>48</td>
<td>16.0</td>
</tr>
<tr>
<td>Education Level</td>
<td>None</td>
<td>42</td>
<td>14.0</td>
</tr>
<tr>
<td></td>
<td>Primary</td>
<td>191</td>
<td>63.7</td>
</tr>
<tr>
<td></td>
<td>Secondary +</td>
<td>90</td>
<td>30.0</td>
</tr>
<tr>
<td>Diagnoses</td>
<td>Diabetes</td>
<td>212</td>
<td>70.7</td>
</tr>
<tr>
<td></td>
<td>Asthma</td>
<td>11</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>Lung disease</td>
<td>2</td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>Thyroid</td>
<td>28</td>
<td>9.3</td>
</tr>
<tr>
<td></td>
<td>Hypertension</td>
<td>230</td>
<td>76.7</td>
</tr>
<tr>
<td></td>
<td>CVD</td>
<td>109</td>
<td>36.3</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>51</td>
<td>17.0</td>
</tr>
<tr>
<td>No NCD Diagnoses</td>
<td>1</td>
<td>84.0</td>
<td>28.0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>118.0</td>
<td>39.3</td>
</tr>
<tr>
<td></td>
<td>3+</td>
<td>98.0</td>
<td>32.7</td>
</tr>
<tr>
<td>MSF medications</td>
<td>1-3</td>
<td>76.0</td>
<td>25.3</td>
</tr>
<tr>
<td></td>
<td>4-6</td>
<td>152.0</td>
<td>50.7</td>
</tr>
<tr>
<td></td>
<td>7-15</td>
<td>72.0</td>
<td>24.0</td>
</tr>
<tr>
<td>No other sources of meds</td>
<td>0</td>
<td>121.0</td>
<td>40.3</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>162.0</td>
<td>54.0</td>
</tr>
<tr>
<td></td>
<td>2+</td>
<td>17.0</td>
<td>5.7</td>
</tr>
</tbody>
</table>
We compared proportions of adherence for sum MARS score and for each individual MARS question. (Annex 2). Total self-reported adherence rates were overall high (approximately 90%) and were similar across age, gender, and civil status groups. Patients with lower levels of education appear to report higher levels of adherence (95.2%) versus those with university level education (89.4%) but this was not statistically significant (p value 0.1 for heterogeneity). Syrians reported marginally higher adherence than Jordanians (92.1 versus 88.3%. p= 0.021).
5.3 EFFECTIVENESS

Effectiveness was determined by examining quality of care and clinical outcome indicators as well as patient- and programme-level trends in clinical outcomes.

5.3.1 Quality indicators

Among diabetic patients, 1944 (70%) had a foot check documented, while 43.7% of diabetic patients taking an ACEi had creatinine testing performed within the year before their last visit. Among 1431 enrolled CVD patients, only 25.8% were prescribed statin treatment while 70.4% were taking at least one antihypertensive at their last recorded visit. Just over half (50.1%) were prescribed aspirin at their last visit (Clopidogrel prescribing was not investigated) (Table 6).

5.3.2 Clinical outcomes

A number of indicators were selected to reflect clinical effectiveness, using intermediate clinical outcomes denoting disease control (Table 6). Just over half (53.2%, n=1478) of enrolled diabetic patients attained clinical targets (Hba1c < 8%) at last visit. 63.4% of enrolled hypertensive patients with a completed BP check (n=1996) had controlled blood pressure (BP < 140/90 mmHg) at last visit.

Table 6. Clinical Effectiveness and Quality of Care Indicators per diagnosis or service type for patients enrolled in the Irbid NCD Programme

<table>
<thead>
<tr>
<th>Disease/Service</th>
<th>Indicators^</th>
<th>N</th>
<th>no</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes II</td>
<td>Proportion of DM II patients with urinary protein testing performed in the last year#</td>
<td>2202</td>
<td>953</td>
<td>43.3</td>
</tr>
<tr>
<td>Diabetes II</td>
<td>Proportion of DM II patients with annual foot check documented in the last year</td>
<td>2776</td>
<td>1944</td>
<td>70</td>
</tr>
<tr>
<td>Diabetes II</td>
<td>Proportion of DM II patients on ACEi with creatinine testing performed in the year before last visit*</td>
<td>2776</td>
<td>1212</td>
<td>43.7</td>
</tr>
<tr>
<td>CVD</td>
<td>Proportion of CVD patients on statin treatment at last visit</td>
<td>1431</td>
<td>369</td>
<td>25.8</td>
</tr>
<tr>
<td>CVD</td>
<td>Proportion of CVD patients on aspirin treatment at last visit</td>
<td>1431</td>
<td>717</td>
<td>50.1</td>
</tr>
<tr>
<td>CVD</td>
<td>Proportion of CVD patients prescribed at least one anti-hypertensive drug** at last visit</td>
<td>1431</td>
<td>1007</td>
<td>70.4</td>
</tr>
<tr>
<td>Health Ed</td>
<td>Proportion attended HE session at last visit*</td>
<td>4011</td>
<td>2683</td>
<td>66.9</td>
</tr>
</tbody>
</table>

Clinical Effectiveness Indicator

<table>
<thead>
<tr>
<th>Disease/Service</th>
<th>Indicators</th>
<th>N</th>
<th>no</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes II</td>
<td>Proportion of DM II patients with HbA1c &lt; 8% at last visit</td>
<td>2776</td>
<td>1478</td>
<td>53.2</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Proportion of hypertensive patients with BP &lt; 140/90 mmHg at last visit</td>
<td>3148</td>
<td>1996</td>
<td>63.4</td>
</tr>
<tr>
<td>All patients</td>
<td>Proportion of enrolled patients in cohort &gt; 90 days with drop of &gt;= 0.5 mmol total cholesterol from baseline</td>
<td>2595</td>
<td>651</td>
<td>25.1</td>
</tr>
<tr>
<td>Asthma</td>
<td>Proportion of asthma patients free from exacerbations in the 6 months prior to last visit</td>
<td>382</td>
<td>11^ &amp;</td>
<td>2.9</td>
</tr>
</tbody>
</table>

^ For each indicator, the proportion of patients ever enrolled with the specific disease and with more than one visit was included. Indicators in italics also relate to the fidelity of programme delivery, discussed in the “implementation” results section. & Refers to number of visits in the last 6 months at which an asthma exacerbation was recorded; may have included exacerbations within the same person. * Includes enalapril, valsartan, atenolol, bisoprolol, hydrochlorothiazide, amlodipine (not spironolactone, frusemide). Denotes patients active at end of 2017; HbA1c = haemoglobin A1c; BP=blood pressure
5.3.3 Trends in clinical outcomes

Other than during the first month of the reporting period, mean systolic BP per visit per month was lower than the target of 140 mmHg with an overall downward trend over time. The peak systolic BPs occurred in month 12 and month 24 (Figure 6a). Diastolic BP followed a similar pattern (Figure 6b).

**Figure 6: Scatter plot of mean a) systolic and b) diastolic blood pressure of all visits per study month in hypertensive patients**

a) Systolic blood pressure

![Systolic BP Scatter Plot](image1)

b) Diastolic blood pressure

![Diastolic BP Scatter Plot](image2)

The estimated mean systolic BP at baseline was well within target at 130.11 mmHg (95%CI: 129.5 to 130.68), this dropped by 1.67 mmHg to 128.44 mmHg at 6 months (95%CI: 127.7 to 129.13, p=0.000) and by a further 0.3 mmHg to 128.11 mmHg at 12 months (95%CI: 127.4 to 128.79, p=0.114) (Figure 7a). The boxplot (Figure 7b) shows that the median BP was below target at each time point, while the maximum and minimum BP had moved closer to target by 6 and 12 months post enrolment. The mean diastolic BP at baseline was 80.15 mmHg (95%CI: 79.80 to 80.49) and this
dropped to 79.17 mmHg at 6 months (95%CI: 78.74 to 79.60, p=0.000) and 78.07 mmHg at 12 months (95%CI: 77.65 to 78.49, p=0.000) (Data not shown).

Figure 7: a) Mean per patient systolic blood pressure at baseline, 6 months and 12 months post enrolment for all hypertensive patients, adjusted for repeated measures

Figure 8 shows that mean monthly per visit HbA1c did not meet the target of 8% for much of the first ten months of the programme but reached the target thereafter (Figure 10).
Mean estimated HbA1c among Type 2 Diabetic patients at baseline reached target at 7.81% (95%CI: 7.73 to 7.90). Again, Figure 9 illustrates that while the median per patient HbA1c has remained similar (and within target) from baseline to 6 months and 12 months post enrolment, control is overall better within the cohort as the maximum and minimum HbA1c levels are closer to target.

Looking at fasting capillary blood glucose (FBG) among patients with Type 2 Diabetes, the mean at baseline was 165.47 mg/dL (95%CI: 162.50 to 168.45). This dropped significantly to 159.22 mg/dL (95%CI: 154.98 to 163.47, p=0.000) at 6 months and again to 153.43 mg/dL at 12 months post-enrolment (95%CI: 149.07 to 157.79, p=0.045)(Figure 10).
5.3.4 Loss to follow up

Of 5054 patients enrolled in 2015-2017, 29.5% exited. The cumulative defaulter rate at the end of the study period was 12.5% (n=632); 2.6% died (n=139); 6.9% (n=348) exited voluntarily and 4.5% (n=227) screened negative (Table 7). Loss to follow up was defined by the programme as patients who have no contact with the programme for more than 90 days. Deaths were determined by word of mouth from other patients and following a defaulter survey, and accounted for 9% of all programme exits. A defaulter survey performed by the Irbid programme team (Box 1) determined that 1.5% of patients successfully traced had died. The other major reasons for defaulting were: being too busy, unable to attend the appointments, unable to afford transport costs, moved from the area, returned to Syria, no longer required services or were otherwise lost to follow up.

15 A defaulter was initially defined as a patient who had not attended any NCD clinic appointments within the previous 90 days, was not known to have died or moved out of the area, and had not been successfully contacted by phone on two occasions by the clinic registrar. The definition was changed in October 2016 to reflect the newly extended appointment interval for stable patients to: two consecutive missed appointments; not known to have died, moved out of the area, or become immobile and ineligible for home care; and not been successfully contacted by phone on two occasions by the clinic registrar. Death was defined as confirmed death reported by family or community member. Voluntary exits were those patients who informed staff that they were withdrawing from the programme e.g. they moved out of the area. Screened negative refers to patients who attended the service but were later determined as not meeting inclusion criteria.
Table 7. Patient exits from Irbid NCD Programme by type for the reporting period 2015 to 2017

<table>
<thead>
<tr>
<th>Exit Category</th>
<th>n</th>
<th>% of exits (n=1489)</th>
<th>% of enrolments (n=5054)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Exits</td>
<td>1489</td>
<td>100</td>
<td>29.5</td>
</tr>
<tr>
<td>Death</td>
<td>139</td>
<td>9.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Defaulted</td>
<td>632</td>
<td>42.4</td>
<td>12.5</td>
</tr>
<tr>
<td>Screened negative</td>
<td>227</td>
<td>15.2</td>
<td>4.5</td>
</tr>
<tr>
<td>Voluntary exit</td>
<td>348</td>
<td>23.4</td>
<td>6.9</td>
</tr>
<tr>
<td>Other</td>
<td>143</td>
<td>9.6</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Box 1. Defaulter Survey performed by Irbid NCD Programme Team in 2017

- 580 patients were recorded as defaulters by mid-2017.
- Staff attempted to reach all by phone with the assistance of UNHCR and JHAS.
- 100 patients couldn’t be traced: 50% Syrian refugees; 50% Jordanians
- Reported reasons for defaulting were: being too busy, unable to attend appointments, unable to afford transport cost, finding a more suitable pathway (private pharmacy, UNHCR/JHAS program). Of 480 defaulters contacted:
  - 32 patients reported they wanted to return to MSF program
  - 69 patients where not with another health provider
  - 30 patients were living in other cities
  - 7 patients died

5.3.5 Behaviour change
At each health education session patients were asked to categorise their exercise level as active, inactive, moderately active, and moderately inactive but it was not otherwise quantified. Of 3347 patients enrolled for at least 90 days, 610 (18.2%) reported improved activity between first and last available measurement, but this was not statistically significant ($\chi^2 = 0.284, p=0.594$); 593 (17.7%) reported decreased activity and 2144 (64.1%) were stable. We could not determine whether smoking behaviour had changed since it was not quantified and patients’ self-reported smoking behaviour change was only recorded relative to their previous visit.
5.4 IMPLEMENTATION

5.4.1 Fidelity of programme delivery
To determine to what extent the intervention was delivered as intended, we examined process indicators (as described above in Table 6) and performed a clinical audit.

Clinical Audit
The clinical audit was performed on a subset of randomly selected patient charts. Among 128 hypertensive patients, 64% had a CVD risk score recorded (Figure 11). Among 51 audited asthma patients, 94% had a control review recorded (Figure 12).

Figure 11: Clinical audit of 128 randomly selected hypertensive patients: proportion who had a CVD risk score recorded and, of these, proportion that were correct on recalculation*.

Figure 12: Clinical audit of 51 randomly selected asthma patients: proportion who had a control review recorded and proportion of these whose control status was identified correctly^.

*This refers to the proportion of asthma patients who had a control review recorded by the doctor or health educator within the last 12 months; control status was considered correct if the patient was identified as controlled and no features of uncontrolled asthma were recorded in the HE or doctors’ notes.
Table 8: Clinical audit of 130 randomly selected diabetic patients showing proportion fulfilling each criterion

<table>
<thead>
<tr>
<th>Domain</th>
<th>Criterion</th>
<th>Correct action (%)</th>
<th>Incorrect action (%)</th>
<th>N/A*</th>
</tr>
</thead>
<tbody>
<tr>
<td>INPUT</td>
<td>Was urinary ACR (or PCR) checked within previous 12 months?</td>
<td>83.8</td>
<td>16.2</td>
<td>0</td>
</tr>
<tr>
<td>INPUT</td>
<td>Was creatinine checked in the last 12 months?</td>
<td>98.5</td>
<td>0.8</td>
<td>0</td>
</tr>
<tr>
<td>INPUT</td>
<td>Was cholesterol checked at least once since enrolment?</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PROCESS</td>
<td>Among patients with cholesterol checked, was CVD risk score recorded since enrolment?</td>
<td>73.8</td>
<td>23.8</td>
<td>1.5</td>
</tr>
<tr>
<td>PROCESS</td>
<td>Is the documented CVD risk score correct? (n=82 with risk score)</td>
<td>89.0</td>
<td>9.8</td>
<td>1.2</td>
</tr>
<tr>
<td>OUTPUT</td>
<td>Was a statin prescribed correctly according to CVD risk score documented in patient file? (n=82 with risk score)</td>
<td>65.9</td>
<td>31.7</td>
<td>1.2</td>
</tr>
<tr>
<td>INPUT</td>
<td>Fundoscopy done OR referred retinal screening last 12 months?</td>
<td>50.8</td>
<td>49.2</td>
<td>0</td>
</tr>
</tbody>
</table>

*Correct action means the doctor took the correct action i.e. fulfilled the criterion or there was a justified exception for not doing so. N/A = not applicable to this patient. *This indicator was used in a previous audit and so was repeated here. Doctors are advised not to wait for a cholesterol result before calculating a CVD risk score and should automatically prescribe statins to those with a known history of CVD (if no contraindications) without calculating a CVD risk score.

5.4.2 Facilitating factors and barriers to implementing the programme from a patient, provider and programmatic perspective

Patient perspectives

The main barriers to managing their health condition recounted by Syrian patients were the psychological effects of war and their refugee status. Some Syrian and Jordanian patients found cost a barrier and many described specific barriers to lifestyle change and medication adherence. The main facilitators were the accessibility, low cost and caring atmosphere of the MSF service (as described above) and family and community support.

Psychological effects of war and refugee experience

The majority of Syrian patients described psychological trauma, anxiety and grief:

“...the suffering in which our people went through wasn’t witnessed by any other people in the earth,” Syrian patient.

Some patients expressed deep despair and hopelessness. They describe the loss of family members, homes and livelihoods and painful separation from family members. Almost all linked the psychological distress of their war experience with the onset or exacerbation of their NCD condition:

“The hypertension goes high not all the time but when I get sad and remember my sons in Syria and they tell me what happens with them I keep crying and crying then my hypertension goes high or goes down I don’t know then I take a hypertension pill to settle down whenever I read some news about them,” Syrian patient.
They described the difficulty in managing their NCD condition when they were psychologically distressed and suggested that mental wellbeing was more important than medications.

“Let me tell you, I have tried when I’m mentally comfortable, everything is good and it helps more than medication...It affects more than medication.” Female Syrian patient.

While one interviewee attended individual counselling and another joined a group session in the waiting room, the majority of Syrian patients were unaware that any psychological services were offered by MSF. In addition, only one patient was aware of mental health services provided by another NGO.

Most patients did not raise mental health issues with doctors, as they believed that mental health did not fit the medical consultation model, either from their own or the doctor’s perspective. Rather, the consultation focussed on interpreting laboratory results and vital signs and prescribing medications.

Syrian patient: “... if I told them (that I feel upset or can’t sleep), they don’t react because it’s not their business...their mission us to give me medication only. They don’t examine at all. They check our chest and so but not what happened with us and they give us medicine.”

The patients’ view of the consultation was corroborated during observation of medical consultations. If stress or anxiety were discussed, some patients described a lack of engagement by the doctors or being offered limited advice, such as to get more sleep. Some patients felt they had no control over their mental health and circumstances, as it was in God’s hands, while others described it as something they must cope with alone.

Syrian patient: “So what would I say to them here, that I have family still at Syria, what would they do, or how can they help, I only say thanks Allah for everything.”

Cost

All Syrian and some Jordanian patients described financial stresses. They described dwindling personal finances, very limited financial support from international actors and legal restrictions on working. Furthermore, the available work was physically demanding and suited only to younger family members. One Syrian male patient related:

“The Syrian is poor, broken. You know that we as people are broken, we have nothing.”

Most incurred out of pocket costs for their healthcare. They had limited resources and were pragmatic in how they allocated them. They prioritised paying for transport to attend the MSF clinic for medications over one for laboratory tests. They described how Syrians weighed up the costs of attending different providers. For example, if their medications were available at low cost at a local MOH primary care clinic, which did not require travel, they chose to attend there over the MSF clinic. Several described being unable to afford the recently
increased MOH primary care fees and fees for MOH hospital services. Many spent significant amounts of money paying for private health care or buying drugs from pharmacies. Syrian patient: “...before (MOH primary care) was at UNHCR expense, for free, for more than two years... (it) became that you’re dealt with as Jordanian, the Jordanian without insurance...you pay the minimal, like doctor consultation only 40 piasters at public medical centre, but if you want to go to private clinic you would need 5 JD.”

Patients also described foregoing medical consultations and not filling prescriptions because of prohibitive costs. Financial worries added significantly to their mental distress:

Female patient: “sometimes poor finance also this makes me anxious, sometimes I keep all the day awake talking to myself from where I will get money ... so I go to our neighbour and ask him to give me 5 JD and tell him once I have money I will pay you back”

Facilitators to self-management of NCD condition

The main facilitator to lifestyle change and medication adherence was family support, mainly from their children, or from extended family. Daughters and daughters-in-law often prepared separate food and encouraged them to follow diet and medication recommendations. Several elderly Syrian patients had no family support, which they found difficult. Other patients were self-sufficient and described independent self-care. There appears to be a degree of community support available as Syrian patients described learning about available services from others in their community and shared medications and financial resources with neighbours, both Syrian and Jordanian.

Syrian patient: “I know a lot of people. If there is a family that can’t bring medicine, we collect it pills from here and here, so people help each other ... because there is extra. So people give each other. I know a kid who takes insulin...I give people. I’m forced to help people.”

MSF staff support was also a key facilitator. Patients emphasised the time, care and attention given to them by the MSF team, especially the regular support and explanation provided by health educators (although some patients described attending HE sessions only once):

“They teach us and take care of us. So I’m strict on myself,” Female Syrian patient.

Most patients were confident in their disease knowledge and were familiar with the health education messaging. The diet messages they related were simple: “don’t eat fat, don’t eat sugar, don’t eat salt, don’t eat carbohydrates” and may not have been practical from the patients’ perspective as they felt there were few dietary options remaining to them. Nonetheless, many stated they were “committed” to the diet and a number reported having made positive changes such as reducing portion size and avoiding sweets. Barriers to following diet advice included financial, psychological, lack of understanding, lack of willpower and the need to cook and eat separately to the family:
Syrian patient: “I mean the psychological circumstances, I’m out of hard circumstances so all of these affect (me), and when the financial situation is difficult as well, or when you want to play sport or do walking but the weather does not help, and these are the circumstances.”

Interestingly, most men said they had little will power to change their diet.

Male patient: “It is difficult to make break, or control myself concerning eating, and...I eat in ordinary way... I have a weak will.”

Several diabetic patients describe eating erratically and consuming high sugar foods as their main meal:

Diabetic patient: “sometimes I do not have appetite, so when I wake up at 10 am I make cup of coffee and eat with it dates or biscuits, and stay on this till 2 pm and then have breakfast, sometimes I eat again at sunset and sometimes not, I eat vegetables if available, if not I eat nothing”

Male patients, in particular, walked regularly as advised. However, musculoskeletal problems, perceived age and infirmity and psychological restrictions acted as barriers to others carrying out the exercise advice. Several male patients stated they were unable to cut down smoking due to lack of will power or they perceived non-heavy smoking as acceptable. Both men and women described smoking as a means of stress reduction.

Provider perspectives

Facilitators

Staff-perceived facilitators to implementing NCD care included: excellent patient-staff relationships, the trust and rapport built through repeated patient contact; staff satisfaction and positive experiences of supervision, support and training; and the good communication and teamwork developed among the staff.

Staff were enthusiastic, committed and motivated to help patients. They were proud of the service, felt a sense of ownership and derived satisfaction from seeing patients improve. They viewed MSF as a good employer, providing opportunities to learn:

“But we try our best. I think we have now a good communication between us, between the patients, between the staff. al-Hamduullilah! I think our group is very good. We take the golden flag (an MSF award) and this is a sign that we have a great job here,” Clinic staff member.

The majority of staff felt well supported by supervisors and colleagues, whom they described as “like a family”. Some described receiving regular internal training and external training and having adequate feedback opportunities, availability and responsiveness from supervisors. Supervision was generally seen as promoting quality.

They also felt they had the necessary tools to carry out their jobs, as related by one clinician:

“It is a good experience to work for a humanitarian organisation such as MSF. And experience in NCD is very good to me... this was the first time that I have these resources, for
example, the labs…the medications also... and sometimes when they don’t find me, they find a daily worker or someone who is covering me, the next time they will be very happy because they saw me... so, this is satisfying.”

Staff were proud of the team approach taken to managing patients. For example, doctors would flag a medication adherence issue to the health educator and pharmacist, who would then engage the patient more deeply on this issue.

From a management perspective, the availability of well qualified, committed staff, engaging frontline staff in decision making and providing adequate and respectful supervision were all seen as important in facilitating the implementation of the project. Medical supervisors’ key role was in supporting doctors to deal with complex, multi-morbid patients and in negotiating patient demands.

Staff also perceived that that there were several patient-level facilitators to implementation of NCD care included patients feeling safe and secure or deciding to settle in Jordan; involvement of family in care, particularly in supporting patients with low literacy to take medications correctly; patient engagement in self-care, regularly attendance at appointments and the use of smartphone apps by some patients.

Challenges

The major challenge encountered by staff was around the delivery of NCD care to the distressed Syrian population. These challenges could be categorised as follows: stress related to experience of conflict or refugee status; poverty; intrinsic patient characteristics; and healthcare seeking behaviour.

Staff described patients’ exposure to violence, their loss or separation from family members, social isolation and the breakdown of traditional community structures. Staff perceived that patients’ psychological stress caused or exacerbated their NCD conditions. The resultant hopelessness, despair and disempowerment limited Syrian patients’ ability to engage in lifestyle change and medication adherence, as described by one clinical staff member:

“Okay, now the financial challenges, the social challenges, are the most important factor in anxiety existence and other psychological disorders for NCDs patients which can affect their medical readings ... despite of taking medications... the tension medications will not do their effect, or sometimes the patient might have depression (and) (be) cause of this, he/she would stop taking medications....”

Staff also perceived that Syrian patients’ desire to return to Syria and the feeling of transience in Jordan exacerbated their stress and lack of engagement in medical care.

Staff described patients’ poverty; their vulnerability to exploitation; their crowded, poor quality living conditions and their regular movement to avoid unpaid debt, which made it more difficult for
the home visit service to reach patients. They reported that financial hardship prevented patients from engaging in formal exercise activities and limited their ability to buy healthy foods.

Factors intrinsic to the Syrian patients, which were perceived as challenging, included: lower education and literacy, and their perceived greater medical complexity, severity and frailty compared to Jordanians. Cultural differences with staff also complicated the delivery of care to this population, particularly in terms of their understanding of medication regimes:

Interviewer: “Which kind of things did you see for the first time?”
Clinical staff member: “The, medical (problems)... if he can understand what you are saying, if he is taking his medication or not, the education, many of them they are illiterate and they can’t understand anything the first time. You have to say everything every time, every time.”

Jordanian patients were perceived as being more engaged in self-management of their condition with greater agency to change, to have higher levels of education and literacy, as well as greater financial means and access to alternative NCD care via public insurance. Several staff related that the more demanding patients, who exerted pressure on doctors to prescribe or failed to adhere to appointment times, tended to be Jordanian.

Aspects of both Syrian and Jordanian patients’ health seeking behaviour were also considered challenging by staff. Patients’ failure to adhere to their appointment times or days was frustrating for staff. Patient’s tendency to attend several providers concurrently and to procure medications from several sources without informing MSF was noted as especially challenging by one medical supervisor. This was particularly true of Jordanian patients with means but was also observed in Syrian refugee patients:

“You notice this particularly when you went to visit people at home, because of course, you had access to all the medication that they had been prescribed, whereas when you saw them in the clinic they just brought what they wanted you to see.” Clinical supervisor.

Patients reportedly also preferred medication, self-testing and laboratory tests to lifestyle intervention and could exert significant pressure on doctors to prescribe:

“There was a kind of … appetite for medication amongst patients. They were keen to have as much as possible. I think there are possibly cultural reasons for that.” Clinical supervisor.

Conversely, patients were perceived to be resistant to taking insulin due to associated stigma. Staff also mentioned having to deal with their own stress levels and feelings of inadequacy in managing traumatised Syrian patients. They coped by talking to family and friends and had been provided training and support by the MHPSS team.

Programmatic perspectives

Certain challenges were noted around work practices, organisational culture, programme design and the broader MSF ethos.

A number of staff felt that the paper-based appointment system and paper patient files were inefficient and should be replaced by a computer-based system.
Clinic staff struggled at times with MSF structures and hierarchy i.e. with separation between clinic and office staff; high turnover of international staff bringing inconsistencies in approach and an appetite for perceived unnecessary change; and the inflexible nature of MSF management and communication structures, which could lead to tension. Some felt that international staff did not heed clinic staff’s concerns and suggestions.

From a management perspective, the perceived high rate of staff sick days, the reportedly high turnover of doctors and the different medical culture emphasising a highly medicalised approach to patient care proved challenging. A number of management staff also questioned whether efficiency could be improved by performing more consultations per day and reviewing patients less often.

Staff noted that this was the first NCD programme run by OCA. It was a source of pride and presented an opportunity for the organisation to learn. However, they described a lack of organisational experience in delivering this type of care, including the inevitable need to refer a proportion of patients for specialist opinion or intervention. Management staff described their ethical dilemma in pitching service provision at the primary care level only, when the team was aware of patients’ referral needs and the few accessible options available to them.

The programme was perceived to be expensive compared to other MSF programmes, driven primarily by medication costs. Management staff were keen to explore cost saving measures such as negotiating importation of medications with the Jordanian authorities. The tension between the perceived development nature of the programme and the humanitarian remit and practice of the organisation was also evident, as described by one of the management staff:

“An NCD Programme is a relatively recent departure for the MSF and it is getting very close to the dividing line between humanitarian and developments aid. So, what actually is MSF’s direction here, I think, partly is driven by the general sense of the urban community is that NCDs are an epidemic and need to be dealt with, but I am not sure we have the exact hypothetical basis for an exact view of how this should be managed, apart from the traditional primary care measures.”

5.4.3 What are the essential components and adaptations necessary to deliver an NCD service in this setting?

Certain aspects of the programme were seen as essential to delivering a high quality primary level NCD service.

Mental health service

A mental health service was introduced in 2015 and initially focussed on psychological issues, which could potentially impact on medication adherence. The service evolved in response to an initially slow rate of referrals from the medical team, the perceived burden of unidentified mental ill health and the breadth and scale of psychological morbidity identified. One team member recounted:

“As I was hearing the stories I thought…this man’s problem is not that he’s smoking too much. His problem is that he … experienced sexual violence, physical violence in prison in Syria… these two are linked.” Clinical supervisor.
“And then more intimate partner violence...yeah, the lady has diabetes but...the reason she is not taking her medicine is ...all these other home psychosocial factors...” Clinical supervisor.

While anxiety and depression were the major morbidities encountered, psychosis, suicidality, self-harm and sexual and gender-based violence were also identified by MHPSS staff. The key therapeutic approaches taken by the MHPSS staff included motivational interviewing, solution focused counselling and stages of change.

Staff highlighted the initial lack of engagement from the medical staff with the service. One clinic staff member stated:

“The doctor would say that I am doctor and there is a specific health condition, I prescribed him medications, and gave him health education, gave him everything needed, what else is missing? But the missing part is the mental health aspect so we have to send him to a counsellor to find out the problem, as a continuation to the medical aspect.”

Doctors cited their own initial lack of trust in the quality of the service, their belief that only doctors should diagnose mental disorders and the perceived lack of clear feedback from the MHPSS team as barriers to their utilisation of the service. Supervisors commented that mental health was a relatively new area of clinical focus in Jordan and that doctors tended to compartmentalise mental and physical ill health. They felt a large burden of psychological morbidity among the Irbid cohort was going unrecognised by clinicians, who were using their own informal screening methods, especially when compared to the significant mental health needs identified among patients of MSF-OCA’s surgical project in neighbouring Ramtha.

Management staff also highlighted the lack of formal mental health screening and the absence of a high quality, reliable referral pathway for patients requiring psychiatric care and prescription of psychoactive drugs. Patient-level barriers to delivering the MHPSS service included: lack of awareness of the service, the stigma attached to mental health issues and resistance to being referred or to attending follow-up appointments:

MSF clinical staff: “unfortunately I see that people are not capable of admitting that they have a psychological aspect that would affect their bodies. You have to admit this and ask for help, inform the staff that I need someone to support me through psychological counselling or support.”

To address these challenges, MPHSS services expanded their focus from medication adherence to broader psychological morbidity. With the support of headquarters specialist advisors and their local supervisor, the MPHSS staff provided training for their colleagues; improved communication with the medical team; introduced psycho-education sessions in the waiting room (which increased awareness and encouraged patients to self-refer); revised tools; and introduced Living Well groups for men, women and teenagers with diabetes and their parents.
At the time of the interviews, management proposed increasing MHPSS supervisor time in Irbid to full-time and introducing screening at each consultation using a validated depression screening tool, PHQ-9 (Patient Health Questionnaire-9 item), which was used for screening in the MSF-OCBA NCD programme in Ramtha. This was met with initial resistance from the medical team, who perceived it as overly time consuming. When nurse-initiated screening was introduced in November 2017 (after these interviews took place), the numbers of patients identified as needing MHPSS referral overwhelmed the system and screening was temporarily halted. Management staff discussed several options to address the lack of adequate referral options, including collaboration with the other MSF sections in Jordan; provision of MSF mental health training for one Irbid MD with addition of basic psychoactive drugs to the formulary; or identification of an alternative referral partner.

**Referral System**

Challenges around the referral system were mentioned by all staff and by many patients. While the successful collaboration with Qatari Red Crescent in delivering ophthalmology and cardiology referral services was cited by many, the overall existing referral pathways were described as opaque, complex, inconsistent, unreliable, and difficult and time consuming for patients to navigate. Information about existing services did not filter down to doctors at clinic level and there was a lack of feedback from referral partners, which doctors found frustrating. Patients were usually referred to MOH secondary or tertiary services via JHAS, the UNHCR implementing partner. JHAS played a gatekeeper role and was perceived as monopolistic and of a lower standard than MSF. Stakeholders concurred regarding the complex and unsatisfactory nature of this referral pathway.

Doctors reported trying to address these challenges by referring directly to colleagues known to them and by personally following up their patients by phone. As mentioned, management staff perceived there was an ethical dilemma in the fact that clear patient referral needs and services were identified, yet MSF was not willing to invest in facilitating patients to access this care. The main solution proposed by staff was to carefully document the type and extent of patients’ referral needs in order to advocate within MSF and with other agencies to provide this care, potentially through further bilateral agreements. Senior management staff emphasised that MSF had chosen to provide primary-level care only to reach the maximum number of patients without incurring the enormous costs involved in secondary and tertiary care provision.

“The credibility of any service often depends on its ability to refer upwards, doesn’t it? That is just as true for people with angina and coronary artery disease (as it is) for mental health,”

Management staff.
Audit of referral quality performed by the Irbid Team in 2017

Aim: Assess the quality of care provided to patients referred for secondary or tertiary management of complications and comorbidities.

Method: 43 randomly selected referrals made in 1st quarter of 2017, assessed for information relating to target organization and specialty, clinical outcome, recording by referrer, communication from referee and satisfaction of referring medical team.

Result: Overall, only 14% of referrals were seen as satisfactory and all but one of these were made to the Emirati hospital in Mafraq. Most referrals (n=15) were made to JHAS and none was perceived as satisfactory. No referrals were made to QRC during this period as the Memorandum of Understanding with MSF had expired and was under review.

Conclusion: The established system for management of referrals for secondary and tertiary care does not provide an adequate level of service and there is a pressing need to identify alternative options.

Health Education

The original programme design included individual health education sessions for every patient at each medical consultation. The health education team received training in motivational interviewing and they reported making several adaptations to their tools and content following a visit from the headquarters advisor. All staff adapted lifestyle advice to patients’ limited means:

“I will specify what type of the food. And it is available, it is what they are eating, it is not something that they will buy, which is costly. It is from your daily diet, but with the small portions. We know that they are financially deprived,” Clinical staff member.

During group sessions, staff reported giving patients an opportunity to ask questions and share concerns. However, many medical, nursing and health education staff described an approach that was knowledge-based, paternalistic or castigating at times. Some, including doctors in particular, used fear and threats, e.g. of blindness, to try to motivate patients, while others used language around “punishing” patients:

“I think you have to give people more than just a bit of education in the clinic. You have to look at ways in which you can really empower people to look after themselves physically.” Management staff

“Some of the patients you have to be a bit tough with them... Yes and just some word of punishing - that, why you are came here?... Why you don’t do this?” Clinic staff member.

Clinical supervisory staff perceived the approach as “didactic” and “knowledge-based” and suggested that it could be “more about helping people to understand the choices that they make”.

Box 2: Audit of referral quality performed by the Irbid Team in 2017
Humanitarian Liaison Officer:

The HLO role was introduced in response to identified protection, financial and social needs among the Syrian population. The HLO was based in the MSF office and could receive referrals from medical, nursing or MHPSS staff. However, other than the MHPSS team, few staff mentioned referring patients to the HLO unless probed. The HLO felt under-utilised. Management staff mentioned that the team planned to develop explicit referral criteria to help increase referral rates.

Clinical guideline

The clinical guideline was seen as a useful tool overall that covered the majority of medical consultations. It was perceived as improving quality and consistency of care and as a tool to help doctors negotiate patient demands. However, it was also seen as promoting medicalization and polypharmacy. It did not cover the complex, multi-morbid patients with renal impairment or the elderly, frail patient who would benefit from de-prescribing. Doctors did not stick to it rigidly but drew on their personal knowledge and experience. Supervisors reported that national doctors perceived that the guidelines reduced their autonomy. In addition, supervisors believed some doctors perceived MSF care as “second-class”, compared to their previous practice in Jordan, particularly as their prescribing options were limited by the guideline. Other barriers to its use included lack of ready accessibility in the paper form provided to them at the time of the interviews; doctors suggested creating a mobile phone application to address this. Some staff mentioned that guidelines are relatively novel in Jordanian medical culture and this may have posed a barrier to faithful implementation of the MSF guideline.

Home visit service

Staff were proud of the home visit service, which was considered unique in Jordan and especially important in fulfilling the humanitarian remit of the programme since it served patients who otherwise could not access care:

“It’s not about physical (disability) only, we have lots of patient who got amputated, we have patients with CVA which means paralysis, we have patients who are very old, we have patients who are physically fit but blind, we have completely bed ridden patients, we have patients in a coma we need to take care of.” Home visit team member.

The service accepted referrals by word-of-mouth and from other NGOs. The logistical, physical and ethical difficulties involved in delivering this aspect of the programme were also discussed, including difficulties tracing patients who regularly moved home, the need to carry heavy equipment bags and the lack of mobility equipment and specialist supplies for bedbound patients e.g. mattresses and incontinence wear. Specific adaptations made to the home visit service involved lightening the load of treatment bags; enlarging the catchment area; expanding the team to include a second nurse, a physiotherapist and MHPSS and HE visits; and using GPS coordinates to identify patient addresses.

Additional Adaptations

Staff described continuously adapting the programme to meet identified patient and programmatic needs. Clinical staff adapted adherence support to patients with low literacy by involving family

---

16 Since these interviews took place, an updated version of the guideline was released, available in electronic format.
members and using graphic representations. Staff introduced appointment reminder systems, making reminder phone calls and sending reminder text messages, which the interviewed patients appreciated.

Management staff introduced measures to improve quality of care including: audits of clinical practice and reviews of defaulters, referral needs and missed appointments. Vulnerability criteria and criteria for referral to the HLO were introduced. Weekly medical and nursing training and supervision meetings were commenced. An Excel-based appointment system was also introduced since the interviews took place.

5.4.4 What were the costs of delivering such a service? Capital and recurrent costs.

The annual financial costs from 2015, 2016 and 2017 are presented in Table 2 by cost category (capital vs. recurrent). Costs are presented in 2017 Euro, using a nominal exchange rate from Jordanian Dinar (JOD), and in 2017 International Dollars, using Purchasing Power Parity (PPP) to convert JOD and Euro nominal costs. The proportions of total costs presented in Table 9 in International Dollars are different to those in Euro since the PPP conversion inflated the JOD costs to a much greater degree than the Euro conversion.

Of note, most costs are recurrent with the majority related to human resources (HR), which comprised from 38.9% of total Euro costs in 2015 to 42.6% in 2017. Drug costs were the next most costly input (and were the major driver of 2016 cost). They increased annually from € 648,207 in 2015 to €1,206,806 in 2016 and €1,223,188 in 2017. Laboratory costs accounted for 7% of total costs on average (range: 6.1 to 7.8%), while biomedical equipment accounted for 5.9% of expenditure in 2015 but only 0.1% in subsequent years. Underlying data show that this was largely driven by purchase of HbA1c machine cartridges in 2015. Capital costs were negligible, accounting for less than 2% of total annual costs.
Table 9: Annual cost per cost category for Irbid NCD Programme for 2015, 2016, 2017

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Euro (2017)1</td>
<td>% of total Euro costs2</td>
<td>Int $ (2017)1</td>
</tr>
<tr>
<td>CAPITAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building and furnishing</td>
<td>10,448</td>
<td>0.6%</td>
<td>22,852</td>
</tr>
<tr>
<td>Drug storage</td>
<td>1,491</td>
<td>0.1%</td>
<td>2,046</td>
</tr>
<tr>
<td>Vehicles</td>
<td>0.00</td>
<td>0.0%</td>
<td>0.00</td>
</tr>
<tr>
<td>Clinical equipment</td>
<td>8,368</td>
<td>0.4%</td>
<td>20,837</td>
</tr>
<tr>
<td>Coordination</td>
<td>2,145</td>
<td>0.1%</td>
<td>2,872</td>
</tr>
<tr>
<td>Total Capital</td>
<td>22,452</td>
<td>1.2%</td>
<td>48,606</td>
</tr>
<tr>
<td>RECURRENT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building rent and maintenance</td>
<td>105,135</td>
<td>5.7%</td>
<td>260,254</td>
</tr>
<tr>
<td>Transport4</td>
<td>27,534</td>
<td>1.5%</td>
<td>65,379</td>
</tr>
<tr>
<td>Coordination costs</td>
<td>76,803</td>
<td>4.1%</td>
<td>102,815</td>
</tr>
<tr>
<td>Drugs</td>
<td>648,207</td>
<td>34.9%</td>
<td>1,615,967</td>
</tr>
<tr>
<td>Biomedical</td>
<td>109,250</td>
<td>5.9%</td>
<td>270,516</td>
</tr>
<tr>
<td>Laboratory</td>
<td>144,427</td>
<td>7.8%</td>
<td>360,054</td>
</tr>
<tr>
<td>HR6</td>
<td>721,719</td>
<td>38.9%</td>
<td>1,476,616</td>
</tr>
<tr>
<td>Training</td>
<td>2,008</td>
<td>0.1%</td>
<td>5,006</td>
</tr>
<tr>
<td>Total Recurrent</td>
<td>1,835,083</td>
<td>98.8%</td>
<td>4,156,605</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,857,535</td>
<td>98.8%</td>
<td>4,205,212</td>
</tr>
</tbody>
</table>

1 Costs are presented in 2017 Euro (using nominal exchange rate from Jordanian Dinar) and 2017 International Dollars (Int) [using Purchasing Power Parity (PPP) to convert JOD and Euro nominal costs into Int$]
2 Proportions of total costs in International Dollars are different to those in Euro since the PPP conversion inflated the costs incurred in JOD to a much greater degree than the costs incurred in Euro
3 Building rent and maintenance includes: office furnishings, IT equipment, stationary and office supplies, utilities, maintenance and rent
4 Transport includes: vehicle operation and maintenance, fuel, taxi hire (other than to the international airport, which are included as an international staff cost).
5 HR= human resources;
6 HR includes: clinic, project office and coordination national staff salaries and insurance, international staff salaries, per diem and international travel costs and the costs associated with expert visits from headquarters.
<table>
<thead>
<tr>
<th>Rank 2017</th>
<th>Description</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INSULIN (30/70) 100 IU vial</td>
<td>6305</td>
<td>12.5%</td>
<td>13184</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60473</td>
<td>14.1%</td>
<td>14399</td>
</tr>
<tr>
<td>2</td>
<td>STRIP for glucometer</td>
<td>183424</td>
<td>10.0%</td>
<td>428545</td>
</tr>
<tr>
<td></td>
<td></td>
<td>51699</td>
<td>12.5%</td>
<td>361227</td>
</tr>
<tr>
<td>3</td>
<td>ATORVASTATIN 20 mg</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>SYRINGE insulin</td>
<td>209150</td>
<td>5.8%</td>
<td>459930</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30102</td>
<td>6.9%</td>
<td>461500</td>
</tr>
<tr>
<td>5</td>
<td>VALSARTAN 80 mg</td>
<td>224880</td>
<td>5.6%</td>
<td>601740</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29129</td>
<td>8.1%</td>
<td>501630</td>
</tr>
<tr>
<td>6</td>
<td>ENALAPRIL 10 mg</td>
<td>270569</td>
<td>6.6%</td>
<td>550031</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34074</td>
<td>7.2%</td>
<td>437117</td>
</tr>
<tr>
<td>7</td>
<td>SALMET/FLUTIC 50/250mcg</td>
<td>798</td>
<td>5.1%</td>
<td>660</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26468</td>
<td>2.3%</td>
<td>1496</td>
</tr>
<tr>
<td>8</td>
<td>AMLODIPINE 5 mg</td>
<td>110856</td>
<td>3.2%</td>
<td>285810</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16354</td>
<td>4.4%</td>
<td>304833</td>
</tr>
<tr>
<td>9</td>
<td>ATORVASTATIN 80 mg</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>ATORVASTATIN 10 mg</td>
<td>313590</td>
<td>6.7%</td>
<td>905554</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34495</td>
<td>10.3%</td>
<td>315412</td>
</tr>
<tr>
<td>11</td>
<td>SALMET/FLUTIC 50/500mcg</td>
<td>675</td>
<td>5.9%</td>
<td>520</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30538</td>
<td>2.4%</td>
<td>695</td>
</tr>
<tr>
<td>12</td>
<td>OMEPRAZOLE 20 mg</td>
<td>157448</td>
<td>4.1%</td>
<td>168715</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21411</td>
<td>2.4%</td>
<td>204397</td>
</tr>
<tr>
<td>13</td>
<td>GILBENCLOMIDE 5 mg</td>
<td>466122</td>
<td>3.0%</td>
<td>739135</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.03</td>
<td>2.6%</td>
<td>742992</td>
</tr>
<tr>
<td>14</td>
<td>ATENOLOL 50 mg</td>
<td>119723</td>
<td>1.5%</td>
<td>239933</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9936</td>
<td>2.1%</td>
<td>232239</td>
</tr>
<tr>
<td>15</td>
<td>METFORMIN 850 mg</td>
<td>597643</td>
<td>3.6%</td>
<td>1356217</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18755</td>
<td>4.4%</td>
<td>639820</td>
</tr>
<tr>
<td>16</td>
<td>HCTZ 25mg</td>
<td>76218</td>
<td>1.0%</td>
<td>184084</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5229</td>
<td>1.3%</td>
<td>229850</td>
</tr>
<tr>
<td>17</td>
<td>ENALAPRIL 20 mg</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td>VALSARTAN, 160 mg</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>ENALAPRIL maleate 5 mg</td>
<td>82672</td>
<td>1.6%</td>
<td>137675</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.10</td>
<td>1.4%</td>
<td>149569</td>
</tr>
<tr>
<td>20</td>
<td>RANITIDINE 75 mg</td>
<td>3918</td>
<td>0.0%</td>
<td>149185</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.06</td>
<td>0.9%</td>
<td>202588</td>
</tr>
<tr>
<td>21</td>
<td>BISOPROLOL 5 mg</td>
<td>147225</td>
<td>1.3%</td>
<td>321387</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6710</td>
<td>1.5%</td>
<td>164055</td>
</tr>
<tr>
<td>22</td>
<td>ASPRIN 100mg</td>
<td>331995</td>
<td>1.2%</td>
<td>603811</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6373</td>
<td>1.2%</td>
<td>578274</td>
</tr>
<tr>
<td>23</td>
<td>INSULIN Pen 30/70</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.63</td>
<td>0.0%</td>
<td>1359</td>
</tr>
<tr>
<td>24</td>
<td>FUROSEMIDE 40 mg</td>
<td>79785</td>
<td>0.8%</td>
<td>154691</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.05</td>
<td>0.8%</td>
<td>180360</td>
</tr>
<tr>
<td>25</td>
<td>FERROUS SULF. 80 mg</td>
<td>55465</td>
<td>0.9%</td>
<td>89715</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.08</td>
<td>0.8%</td>
<td>102110</td>
</tr>
<tr>
<td></td>
<td>Remaining drugs</td>
<td>98170</td>
<td>19.0%</td>
<td>119086</td>
</tr>
<tr>
<td></td>
<td></td>
<td>123058</td>
<td>12.4%</td>
<td>84372</td>
</tr>
<tr>
<td></td>
<td>TOTAL ANNUAL DRUG COSTS</td>
<td>517,109</td>
<td>19.0%</td>
<td>962,716</td>
</tr>
<tr>
<td></td>
<td></td>
<td>648,207</td>
<td>12.4%</td>
<td>1,206,785</td>
</tr>
<tr>
<td></td>
<td></td>
<td>975,802</td>
<td>8.6%</td>
<td>1,223,188</td>
</tr>
</tbody>
</table>

Key: UNIT COSTS IN BOLD are 2016 unit price (which was used to calculate 2015 and 2016 total costs) was not available and was inferred from the 2017 unit cost provided.
Drug costs

The breakdown of drug costs for the twenty-five most expensive drug items is presented in descending order of cost, using the 2017 rank, in Table 10. The full list of drug data, including the MSF Green List unit prices (used for a sensitivity analysis) are presented in Annex 1. Drug costs almost doubled from 2015 to 2016 from €648,207 to €1,206,806 but then remained similar in 2017 at €1,223,188. Insulin Mixtard was the most expensive drug item each year, accounting for 12.5-14.5% of total drug budget (€81,143 in 2015; €169,673 in 2107; and €177,154 in 2017). Glucometer strips were the second most expensive item, accounting for 10-12.5% of annual drug expenditure. Atorvastatin 20 mg was the third most costly item in 2017 at €97,833 (8%), whereas in previous years Atorvastatin 10 mg contributed the bulk of statin costs.

The twelve most costly drug items for 2017 (all formulations combined), accounting for 86% of total expenditure, are presented in Table 11. Insulin was the most costly, contributing 17% of total drug costs (€202,277). Atorvastatin accounted for 15% (€185,241). Glucometer strips and insulin syringes featured prominently amongst the most costly items.

Table 11: Top 12 most expensive drug items and proportion of total costs in 2017, all formulations combined, in 2017 JOD and Euro.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>PER DRUG ANNUAL COST (2017 JOD)</th>
<th>PER DRUG ANNUAL COST (2017 €)</th>
<th>% TOTAL 2017 DRUG COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. INSULIN</td>
<td>161,367</td>
<td>202,277</td>
<td>17%</td>
</tr>
<tr>
<td>2. ATORVASTATIN</td>
<td>147,777</td>
<td>185,241</td>
<td>15%</td>
</tr>
<tr>
<td>3. STRIP for glucometer</td>
<td>97,333</td>
<td>122,008</td>
<td>10%</td>
</tr>
<tr>
<td>4. SALMETEROL/FLUTICASONE</td>
<td>81,399</td>
<td>102,036</td>
<td>8%</td>
</tr>
<tr>
<td>5. VALSARTAN</td>
<td>77,494</td>
<td>97,140</td>
<td>8%</td>
</tr>
<tr>
<td>6. ENALAPRIL</td>
<td>76,528</td>
<td>95,929</td>
<td>8%</td>
</tr>
<tr>
<td>7. INSULIN SYRINGE</td>
<td>63,518</td>
<td>79,622</td>
<td>7%</td>
</tr>
<tr>
<td>8. AMLODIPINE</td>
<td>42,991</td>
<td>53,890</td>
<td>4%</td>
</tr>
<tr>
<td>9. OMEPRAZOLE</td>
<td>26,572</td>
<td>33,308</td>
<td>3%</td>
</tr>
<tr>
<td>10. GLIBENCLAMIDE</td>
<td>25,098</td>
<td>31,461</td>
<td>3%</td>
</tr>
<tr>
<td>11. METFORMIN</td>
<td>23,601</td>
<td>29,584</td>
<td>2%</td>
</tr>
<tr>
<td>12. ATENOLOL</td>
<td>18,426</td>
<td>23,097</td>
<td>2%</td>
</tr>
<tr>
<td><strong>TOP 12 DRUG ITEMS</strong></td>
<td><strong>842,103.10</strong></td>
<td><strong>1,055,594.03</strong></td>
<td><strong>86%</strong></td>
</tr>
<tr>
<td><strong>TOTAL 2017 DRUG COSTS</strong></td>
<td><strong>975,801.77</strong></td>
<td><strong>1,223,188.13</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Costs by level

The costs incurred at different service levels (clinics, field office and coordination office levels), the total annual financial costs, the per patient per year (PPPY) and annual per consultation costs are presented in Table 12. As would be expected, the majority of costs were incurred at clinic level. These consistently accounted for approximately 70% of total financial Euro expenditure each year (€1,303,623 in 2015; €1,978,888 in 2016; and €2,039,602 in 2017). Clinic level costs were primarily driven by drug costs and to a lesser degree by HR costs, while HR costs were the principle driver at field and coordination levels. The proportion attributable to clinical and field office national staff was consistently 59% of total HR costs per annum, including 2-3% attributable to temporary workers (€423,256, €651,677 and €725,0212 in 2015, 2016 and 2017 respectively). Field-level international
staff and total coordination level staff (both national and international) each contributed approximately 18 to 23% of total HR costs each year.

Field office costs increased, from €303,282 (16.3%) in 2015 to €549,443 (19.7%) in 2016 but remained similar in 2017 at €543,965 (18.2%). Coordination level costs increased by 52% from €267,793 to €407,854 due to an increase overall costs and in the estimated allocation factor.

The total annual financial cost was estimated as €1,857,535 for 2015, increasing by 51% to €2,796,124 in 2016 and again by 7% to €2,991,421 in 2017. Costs at all levels increased year on year (other than field level costs from 2016 to 2017). The cost per patient per year increased by 22% from €629 in 2015 to €765 in 2016 and by a further 7% to €845 in 2017. The per consultation cost similarly increased annually from €92 in 2015, to €108 in 2016 and to €112 in 2017 (Table 12).
Table 12: Annual cost per cost level, total financial costs and unit costs for Irbid NCD Programme for 2015, 2016, 2017, expressed in 2017 Euro and International dollars.

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Euro (2017)$^1$</td>
<td>% of total</td>
<td>Int $ (2017)$^1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Euro costs$^2$</td>
<td></td>
</tr>
<tr>
<td><strong>Clinic Level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital</td>
<td>13204</td>
<td>1%</td>
<td>31,223</td>
</tr>
<tr>
<td>Recurrent (excluding HR and drugs)</td>
<td>31253</td>
<td>17%</td>
<td>777,345</td>
</tr>
<tr>
<td>HR</td>
<td>329658</td>
<td>18%</td>
<td>821,830</td>
</tr>
<tr>
<td>Drugs</td>
<td>648207</td>
<td>35%</td>
<td>1,615,967</td>
</tr>
<tr>
<td><strong>Total Clinic</strong></td>
<td>1303623</td>
<td>70%</td>
<td>3,246,365</td>
</tr>
<tr>
<td><strong>Field Level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital</td>
<td>7103</td>
<td>0%</td>
<td>14,512</td>
</tr>
<tr>
<td>Recurrent (excluding HR)</td>
<td>76310</td>
<td>4%</td>
<td>185,132</td>
</tr>
<tr>
<td>HR</td>
<td>219869</td>
<td>12%</td>
<td>424,957</td>
</tr>
<tr>
<td><strong>Total Field</strong></td>
<td>303282</td>
<td>16%</td>
<td>624,600</td>
</tr>
<tr>
<td><strong>Coordination Level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital</td>
<td>2145</td>
<td>0%</td>
<td>2,872</td>
</tr>
<tr>
<td>Recurrent (excluding HR)</td>
<td>76803</td>
<td>4%</td>
<td>102,815</td>
</tr>
<tr>
<td>HR</td>
<td>171683</td>
<td>9%</td>
<td>229,830</td>
</tr>
<tr>
<td><strong>Total Coordination</strong></td>
<td>250630</td>
<td>16%</td>
<td>355,516</td>
</tr>
<tr>
<td><strong>Total Annual Cost</strong></td>
<td>1857535</td>
<td>14%</td>
<td>4,206,481</td>
</tr>
<tr>
<td>Cost per patient per year (%) change$^3$</td>
<td>629 (b/l)$^5$</td>
<td>1,424 (b/l)</td>
<td>765 (22%)</td>
</tr>
<tr>
<td>Cost per consultation (% change)$^4$</td>
<td>92 (b/l)</td>
<td>209 (b/l)</td>
<td>108 (14%)</td>
</tr>
</tbody>
</table>

Notes:
1 Costs are presented in 2017 Euro (using nominal exchange rate from Jordanian Dinar) and 2017 International Dollars [using Purchasing Power Parity (PPP) to convert JOD and Euro nominal costs into Int$]
2 Proportions of total costs in International Dollars may be different to proportions of total costs in Euro since the PPP conversion inflated the costs incurred in JOD to a much greater degree than the costs incurred in Euro
3 Cost per patient per year is based on total active patient at the end of year (see Table 1); % change = percent annual change
4 Cost per consultations is based on the total new and follow up medical consultations per year. It excludes individual health education or mental health sessions and group sessions. % change = percent annual change
5 (b/l) = baseline

Mixed methods evaluation of MSF primary care based NCD service in Irbid, Jordan: February 2017- February 2018
Sensitivity analyses

Our sensitivity analyses are presented in Table 13. Total and unit costs are most sensitive to the removal of coordination and field office management costs, such that costs at clinic level alone are approximately 30% less than total costs per year. Substituting MSF Green List prices (with an additional 10% added to account for importation costs) for local purchase prices results in a drop of between 16 and 21% of total costs.

Table 13: Sensitivity analyses (in Euro 2017)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total financial costs</th>
<th>Base case</th>
<th>Variations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Clinic level costs only</td>
<td>Without coordination costs</td>
</tr>
<tr>
<td>2015</td>
<td>Total financial</td>
<td>1,857,535</td>
<td>1,303,623</td>
</tr>
<tr>
<td></td>
<td>% change</td>
<td>0</td>
<td>-30%</td>
</tr>
<tr>
<td>2016</td>
<td>Total financial</td>
<td>2,796,124</td>
<td>1,978,888</td>
</tr>
<tr>
<td></td>
<td>% change</td>
<td>0</td>
<td>-29%</td>
</tr>
<tr>
<td>2017</td>
<td>Total financial</td>
<td>2,991,421</td>
<td>2,039,602</td>
</tr>
<tr>
<td></td>
<td>% change</td>
<td>0</td>
<td>-32%</td>
</tr>
</tbody>
</table>

A scenario analysis, presented in Table 7 explored the effect on cost of varying different elements of the consultation model using 2017 as a base case. In 2017, there were an average of 5 new and 2197 follow up consultations per month, with an average of 122 (6%) of follow-up consultations performed by nurses. Approximately 60% of patients could be categorised as stable or meeting clinical targets, based on the cohort data analysis. Five full time equivalent (FTE) doctors (2 specialists and 3 non-specialists) and 12 FTE nurses were employed in 2017, with the latter involved mainly in tasks other than consultations. Other baseline assumptions were that staff worked 48 weeks per year; 25 working days per month i.e. 6 days per week, for 6 hours per day with a 30 minute break. We assumed each doctor or nurse consultation slot lasted 15 minutes and a new patient required two of these (30 minutes).

The baseline cost included the current number of doctors employed and the nursing time required to perform medical consultation of stable patients at current rates (6%). Each of the scenarios explored (Columns A to I in Table 14) assumes that stable patients are seen on a 3-monthly basis (4 times per year) and unstable patients are seen on a monthly basis (12 times per year). By adhering to these review intervals with 60% of the patients categorised as stable and all other parameters remaining unchanged from baseline (scenario A), only 3 FTE doctors were required and thus a savings of 31% (€37,209) could be made. If the cohort were then increased to 4000, with 24 new patients seen per week, and other parameters the same as baseline, an additional 0.5FTE doctor would be required with the attendant costs (Scenario E). Simply increasing the proportion of stable
patients seen by nurses to 50% (from the baseline of 6%), with 10% of nurse reviews referred back to doctors (Scenario B) did not significantly alter costs from baseline since an extra 0.5 FTE doctor was required to cover these nurse-driven referrals. However, greater savings were made by classifying an additional 15% of patients as stable, thus fewer total annual visits were required (€55,814; 47%) (Scenario C). In Scenario D, 75% of the current patient cohort was classified as stable; nurses reviewed 100% with 10% referred back to doctors. Cost savings were diluted by the need for 0.5 FTE doctor to cover these nurse referrals. Economies of scale were realised by varying several parameters in Scenario I (cohort of 4000; 75% stable; 100% nurse review of stable patients; 5% referral rate to doctor; 50 new patients per month and 5 consultation slots per hour; and reducing to 1 specialist doctor), saving 37% of baseline costs. However, they were similar to savings achieved by having doctors perform the majority of consultations (cohort of 4000; 75% stable; 6% nurse review of stable patients; 10% referral rate; 4 consultation slots per hour; 2 specialists) while sticking to three-monthly review for stable patients (scenario F). It was more costly to have nurses perform all stable patient consultations with a 10% referral rate, (Scenario H) and savings were made if the referral rate was reduced to 5% (Scenario I). Of note, these scenarios do not account for nursing time devoted to triage and health education nor the additional pharmacist or registrar time required if the cohort were to increase.

Table 14. Scenario analysis based on consultation costs for 2017 with varying elements of work pattern

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>BASE CASE</th>
<th>SCENARIOS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Annual total cost (€ 2017)</td>
<td>119,733</td>
<td>82,523</td>
</tr>
<tr>
<td>% Change from base</td>
<td>0%</td>
<td>-31%</td>
</tr>
</tbody>
</table>

Key: Dr=doctor; f/u=follow up; Req’d = required; /mth=per month; /day=per day; /yr=per year; figures in red have been changed from base case

Notes: 1 Annual total cost of doctors and nurse required to perform medical consultations.
The incremental cost of adding an MHPSS and Home Visit to the Irbid programme is presented in Table 15. The total incremental cost of the MHPSS service increased from €76,835 in 2016 to €109,324 in 2017. This increase partly accounted for the fact the service commenced only in April 2016; it expanded in 2017 with the addition of staff (increasing HR costs from €35,233 to €49,185) and overall field and coordination level costs increased during this period. Overall, the MHPSS service accounted for 3.4% of total programme costs. The total incremental cost of the home visit service increased by 10% (from €205,062 to €226,396) and contributed 7.3 and 7.6% of total programme costs in 2016 and 2017 respectively. The home visit cost per consult was around 50% higher than the average programme cost per consult (€150 versus €108 in 2016; €154 versus €112 in 2017).
5.5 MAINTENANCE

5.5.1 Challenges and facilitating factors for patients to remain in the programme

Medication prescribing and adherence

The majority of patients had no practical problem taking medications. They stressed their importance and were committed to taking them. They believed they were well educated by the MSF team; they were familiar with their drug regime, could manage it themselves or with support from family, and they had few concerns over the amounts, quality or necessity of medications. One female Syrian patient recounted:

“I’m independent in everything. You must take this medication; you can’t ignore it. We’re used to it and you have to take it.”

However, when probed, a number of patients described reducing doses or temporarily stopping certain medications, which was more common in Jordanian than in Syrian patients. This was due to side effects, feeling “bored” or a belief that the medicines were no longer required when asymptomatic. Syrians also shared medications with others. Most patients described having family members remind them to take medication or assist with reading instructions if they had low literacy skills.

Staff also reported patients being non-adherent for reasons that are found universally: forgetting to take them, losing them (particularly as elderly parents can move frequently between the homes of their children), or choosing not to take them due to side effects.

5.5.2 Programmatic challenges and adaptations made to maintain the programme

Project cycle and work practices

One of the management staff described the programme as being at a typical stable phase in the MSF project cycle when staff may become frustrated and demotivated. Several managers described staff feeling “stuck in a rut”, which echoed staff comments regarding the lack of perceived promotion opportunities, lack of perceived job security, high workload generally and the physical challenges involved in delivering the home care service. In addition, the majority of staff were unhappy with a six-day working week.

“Actually I have nothing too wrong with the program itself, it is the expectations of ...workers ...Expat expecting to go on mission and saving the world or going on mission and being, and taking a power position that you cannot take back home ... National staff, that is a little bit now the challenges that I believe that the program is going through now, because of the time. Frustration.” Management staff.
Task shifting

Task shifting was described by management staff as being repeatedly discussed but not successfully implemented at the time of the interviews. It was proposed to potentially increase capacity i.e. to have nurses review stable patients and reserve doctor review for patients with poor disease control. Staff described the main barriers to task shifting as: the lack of clear understanding or documentation of clinical activity and patient flow, lack of clear eligibility criteria for nurse review, patients’ preference to be seen regularly by doctors, a protectionist approach to specialist medical care in Jordan and regulatory barriers to nurse prescribing. Limited pharmacy capacity was perceived as the biggest bottleneck to task shifting and pharmacy assistants had been added to enhance capacity. Plans to better document patient flow and define eligibility criteria for nurse review were underway.

Staff suggested numerous changes or adaptations to further strengthen the programme. They emphasised the need treat the patient holistically and to intervene in the community and home environment. Several mentioned the need to strengthen community engagement to assist with targeting the most vulnerable patients, tracing defaulters, and sensitising the community around NCDs, with one staff member suggesting MSF organise a community sporting event:

Management staff: “I think we do need to improve our community liaisons so we can improve our ways of identifying the most vulnerable patients...I think still much of this is going to depend on individual contacts, word of mouth...There are many members of our staff who have links to the Syrian Community and can guide us in that...it is an untapped resource. We are using it, but I think we could probably use it to a greater extent.”

Many suggested re-opening registration and adding a third clinic site, while others suggested consolidating to a single site, with more management staff in favour of the latter.

Sustainability and exit strategy

Several of the management staff discussed the sustainability of the current programme; the lack of clear exit strategy and the tension between the team’s desire to continue to improve and add complexity to the programme and the need to consider an eventual handover. Some questioned whether the vertical programme model was an appropriate choice, as this might complicate a potential hand over.

A number of staff mentioned possible future exit scenarios for the programme, e.g. if the Syrian population returned to Syria, the remaining Jordanian patients could be referred to the MOH; contingency planning for this eventuality was being discussed. However, some suggested that if the Syrian population remained in Jordan for decades, MSF would face a dilemma. Staff described the need to engage with the MOH as the likely handover partner but pointed to the gulf between the current MSF and MOH models of NCD care. Several described the need for simplification of the programme while maintaining acceptable quality of care during such a potential process.

Contextual challenges

Specific contextual challenges to MSF delivering NCD care in Jordan related to the population’s preference for and availability of hyper-caloric food, the perception that exercise is a formal and
costly leisure activity, the lack of public spaces and amenities, car dependence, and cultural acceptance of smoking:

“[In Jordan], there is no area to practice exercise...We focus on increase the awareness towards walking... the simple one, not using a car for everything!” stakeholder.

A number of challenges were identified in relation to MSF operating within the Jordanian government and legal framework. NGOs are required to purchase drugs through local manufacturers or suppliers, rather than importing drugs and supplies from abroad, which is MSF’s usual approach. The MSF coordination team had determined that significant cost savings could be made if they successfully advocated with the government to be allowed to import. The lack of specific legislation or government focal point for NGOs also proved challenging as MSF (and other NGOs) had to negotiate with several programme departments, which was time consuming and duplicated effort. Individual authority figures had been at times uncooperative or obstructive. The government required UNHCR and all NGOs to work with the local NGO, JHAS, as a gatekeeper to MOH services, which again led to inefficiency and disempowerment of MSF in terms of negotiating access or referral pathways for their patient cohort. MSF had to adjust its practices to working in a country with strong legislation, regulation and enforcement practices, which contrasted significantly with their experience in other regions.

When asked about improving Syrian refugees’ access to specialist referral, the UNHCR interviewee did not foresee a change to the status quo i.e. the JHAS gatekeeper system and subsidised MOH care but felt that patients needed better education to understand that the co-payments were affordable and the system was accessible. MOH, UNHCR, other NGOs and MSF alike all mentioned the cut to UNHCR funding as major barrier to future provision of NCD care to Syrian refugees in Jordan. The only solution offered by the UNHCR participant was to advocate with donors and other international NGOs, such as QRC, to provide specialist services in parallel to the MOH / UNHCR system.
Box 3: Stakeholder view of NCD care within the Jordanian MOH system

MOH interviewees at central and district level were confident that adequate commitment, policies, tools, drug procurement and supply systems, guidelines, training and supervision were in place to deliver good quality primary level NCD care within the MOH system. They described the existence of guidelines, policies and multi-annual plans at central level. However, there is a perceived need to strengthen the multi-sectoral, inter-departmental approach at this level. At district level, there is an NCD Department and a Lead of NCD Training and NGO liaison. The system experiences significant retention challenges, as there is a “brain drain” of publically trained doctors to the private system or to wealthier countries in the region.

Challenges were encountered in implementing the existing policies and tools at clinic level. Most Jordanian patients have unlimited, free, walk-in access to their local MOH clinic and can access a neighbouring clinic or a specialist for a small fee. Doctors are reportedly unable to cope with the patient load and time pressures result in poor clinical record keeping and conceding to patients’ demands for prescriptions.

*MOH staff:* “There is no appointment (system). Everyone can come just when he wants. He wants medications, antibiotics ... or anti cough mixture... and you have to write (the prescription). This is very stressful... Sometimes actually the doctor is sure that the patient has enough medications for NCDs and he is prescribing to make him go.”

The pressure on doctors is compounded by the reported understaffing of doctors, underutilisation of nurses, lack of comprehensive patient filing systems and lack of technical supervision and oversight of NCD care.

Drug supplies were reportedly relatively reliable; there was a specific policy in place to maintain drug supplies at clinic level and central stores would rapidly provide emergency stocks if available. Patients could also access drugs at another MOH clinic though, reportedly, were often unwilling to do so. Thus, the major challenges in drug supply were related to the inability to forecast due to the unpredictable patient load, potentially inappropriate re-prescribing for patients who frequently presented at clinic, and the lack of supply at central stores by year-end. The referral system was reliable and responsive for emergencies but was perceived to involve undue delay for some routine referrals.

The healthcare seeking behaviour of Jordanian patients also proved challenging for MOH staff, such as the perceived appetite for medications in general, preference for a familiar or branded drug, preference for private health care and tendency to attend multiple providers and take medication from multiple, duplicate sources concurrently. The MOH introduced an NCD prescription book to address this but, reportedly, doctors did not fill it out consistently. Indeed, according to the senior MOH interviewee, the decision in 2014 to introduce 20% co-payments for Syrian refugees to access MOH primary care was designed to reduce doctor “shopping” and to “filter” out those truly in need. In addition, patients’ perceived lack of understanding or engagement in making healthy lifestyle choices was seen as a major challenge. To tackle this, the government had begun to form new partnerships with community-based organisations that could implement lifestyle change initiatives.
6 Discussion

This is the first study to our knowledge to elucidate the patient and provider experience of primary level NCD care for Syrian refugees in Jordan.

6.1 Reach and access

According to UNHCR, 21% of registered Syrian refugees in Jordan live in Irbid governorate. Based on estimates of self-reported NCD prevalence derived from the MSF Household Access Survey, over one fifth of adult Syrians in Irbid governorate had been diagnosed with at least one NCD targeted by MSF. Among those surveyed, only 14% had self-reported, previously diagnosed hypertension although there may be a significant burden of undiagnosed hypertension among this population. Based on WHO estimates and regional STEPS survey data, the true prevalence of hypertension may be as high as 20 to 30%. The high levels of smoking among men and notably high level of obesity and inactivity among women reflect the growing prevalence of these NCD risk factors in the Arab world. The most common disorders managed (hypertension and diabetes) in the MSF programme reflect reports on NCD prevalence in Syria and among Syrian refugees seeking care in Jordan.

The Irbid cohort represents a group of older, multi-morbid and potentially disabled patients, with almost 10% classifying themselves as having impaired mobility on enrolment. Whereas only 4.1% of UNHCR-registered non-camp dwelling Syrians are aged over 65 years, one quarter of the MSF cohort are older than 65, reflecting the fact that chronic disease prevalence increases with age. Indeed, approximately 7.5% of Syrian and 4% of Jordanian patients are over 80 years of age, and constitute a group particularly vulnerable to disability, psychological distress, social isolation and exclusion from services and decision making. MSF had put in place many of Help Age International’s recommendations to address exclusion of older people in humanitarian crises – providing the home visit service, providing assistive devices to certain patients and informally enlisting the support of family in patient care. A more formal treatment supporter approach, similar to that used in HIV chronic care, may be particularly useful for older, frail patients. MSF is filling an important humanitarian need in reaching the vulnerable Syrian and Jordanian patient cohort served by the home visit service. The team has significantly improved symptom control and functionality for many patients and has offered carer training and support, a service not otherwise available in Jordan.

The majority of Syrian refugees were registered with UNHCR (94.5%) and 72.5% had an active MOI card and were therefore entitled to access MOH primary care. The MOI status was not answered for 17% of patients, which may imply that they are living illegally outside of formal camps as legal “bail-out” is required to qualify for an MOI card. Patients falling into this category would still have access to primary care via JHAS and qualitative accounts from patients confirm that many Syrian patients find this service accessible and acceptable. The mean time spent in the cohort by end of 2017 was 1.5 years. This duration reflects the fact that the cohort had quickly filled to the pre-defined capacity of 4000 patients and was largely closed to new admissions from mid-June 2016 until the last quarter of 2017.

Household surveys have described cost as the principal self-reported barrier to healthcare access for NCD care for Syrian refugees in Jordan. Since these surveys were performed the Government of Jordan introduced co-payments in late 2014, which the MOH and UNHCR stakeholders interviewed for our study perceived as affordable. However, our patient accounts emphasised that Syrians perceived these fees to be prohibitive and many elected to forego consultation or treatment due to...
worsening poverty and indebtedness, lack of adequate available financial support or employment opportunities. While the programme reached about 23% of Syrian adults in Irbid governorate with known, self-reported relevant NCDs, many staff and patients described a cohort of patients for whom access to alternative services was limited, mainly by cost, and who coped by sharing medications or buying them from private pharmacies, as reflected in the literature.

In January 2018, MOH co-payments were significantly increased to 80% of the full “foreigner” rate, payable directly to the MOH facility, and UNHCR has estimated that this resulted in a doubling of consultation fees and drug costs for an MOH primary level NCD consultation (from 9-10 Jordanian Dinar to 18-22). They predicted that these price increases would push more Syrian refugees to purchase drugs on the open market, foregoing clinical consultation and monitoring. Work by the MSF Access Campaign has shown that most individual NCD drugs, other than insulin, were affordable for Syrian refugees at MOH procurement prices. This calculation was based on self-reported household income from the MSF Household Access Survey, and used price relative to daily income as a measure of affordability. However, patients in the MSF NCD cohort take multiple daily drugs, with more than half (57.3%; n=2891) being prescribed five or more regular MSF NCD drugs (excluding antibiotics, analgesics and antacids). In addition, over half of those taking part in the medication adherence survey took drugs from at least one other source. Therefore, performing a study of NCD care costs from the patient perspective, delineating direct medical and non-medical costs, indirect costs, and the impact of medical costs on household income would help us better understand the true impact of these fee changes on access and affordability and may further elucidate patients’ healthcare seeking behaviour.

Government regulation requires that 30% of international NGO beneficiaries should be Jordanian. The programme intended to target “vulnerable” Jordanians, initially defined as those without public or private health insurance (and thus subject to co-payments for MOH services). They targeted Jordanian patients in receipt of Ministry of Social Development Services, including financial assistance. It is estimated that 75% of Jordanians are covered by at least one type of public health insurance. Among Jordanian patients of the MSF NCD service interviewed for this study, all were covered by public insurance and many attended the MOH for other services. Several staff expressed discomfort at the fact that relatively wealthy, employed Jordanians attended MSF services. The project team performed an internal survey of 184 Syrian and Jordanian patients in 2017 to explore aspects of vulnerability including household size, income, expenditure and debt and access to water and sanitation. They determined that being a Syrian refugee automatically implied vulnerability and implemented an abbreviated tool, focussing on income, to determine vulnerability before enrolling new Jordanian patients. From 2017, revised admission criteria therefore included 3 factors: 1) medical eligibility 2) meeting vulnerability criteria – Syrian refugee or uninsured Jordanian fulfilling checklist 3) not under the care of another provider.

Patients felt unable to access the MSF services outside of set appointment times and reported a punitive approach from staff when they missed appointments. Some ran out of medications while waiting their rescheduled appointment. Patients may not be accustomed to strict medical appointment systems, as they don’t appear to be used within the MOH, and in staff’s efforts to train patients to adhere to the system they may have taken an overly rigid approach. By 2018, adherence to appointment times was at 90% (personal correspondence with MSF management). Options to address these access issues include: reserving one emergency appointment slot per doctor per day,
involving a member of the clinical team (nurse or pharmacist) in discussion with patients over rescheduling missed appointments and providing a dedicated phone access slot per day for patients.

6.2 Adoption and acceptance

One of the overriding themes to emerge from the qualitative data analysis was the acceptability and accessibility of MSF and other NCD services in Jordan.

The MSF Irbid NCD programme was viewed as highly acceptable to patients, staff and stakeholders and was seen as meeting significant clinical and humanitarian needs for Syrian refugees in a caring and respectful environment. While distance and cost proved challenging for some, most described being able to afford transport to attend MSF services. However, they clearly prioritised medical consultation over attending for MHPSS, HE or lab services.

Patients were frustrated by the vertical or siloed approach to care and felt that they were not listened to when they expressed a medical need that was beyond the scope of MSF’s target conditions. The lack of accessible or affordable referral options was also a source of dissatisfaction for patients.

Self-reported medication adherence is extremely high with the majority of patients (89%, n=267) scoring over 20 on the MARS-5 questionnaire, which has been used in the literature to denote high adherence 46. This may reflect social desirability bias as some patient and staff accounts contradict this high level of adherence. The majority of interviewed (especially Syrian) patients declared themselves to be “very committed” to taking their medications and appeared to value receiving free medications above all other components of the programme. However several described stopping medications, taking them intermittently and sharing medications with those in need within their family or community. Thus this self-report measure may not be appropriate for use in this patient population and perhaps ought to be triangulated with other measures of medication adherence, such as pill counts or pharmacy dispensing records in future studies 24. However, these approaches would be compromised by the fact that patients and staff both report that patients use medications prescribed from several sources and sometimes mix MSF medications with those obtained from elsewhere.

6.3 Effectiveness

The programme had a relatively high attrition rate with approximately one third of enrolled patients exiting, of whom 12.5% (n= 632) defaulted (meaning they had no contact with the programme for over 90 days). Some of this is explained by the patient and staff accounts that this is a somewhat mobile population and that patient choice of providers is largely influenced by cost – i.e. if it is less costly to procure drugs locally from an MOH clinic or private pharmacy than to travel to MSF’s clinics, they will choose the former. The defaulter survey confirmed that access and cost of transport were a barrier for some patients to attend the MSF service, while others found alternative care pathways 45. The death rate amongst enrolled patients was 2.6%, and 1.5% among those traced in the defaulter survey. A “cascade of care” study, similar to those performed in HIV chronic care settings 47-49 may help to identify particular patient groups who experience barriers to access or continued attendance. Exploring risk factors for death among the cohort may help to target particularly vulnerable groups or determine if additional referral pathways are required. The Irbid team has also started to explore how palliative care could be integrated into the programme 41.
In examining markers of quality of care, it appeared that cholesterol tests were ordered in accordance with the clinical guideline. This reflects the observation from patients, clinical supervisors and the research team that medical consultations are very “numbers” focussed, with doctors focussing on blood test results and vital signs. It may also reflect patients’ penchant for tests and the pressure they reportedly placed on doctors to order them. Annual urinary protein testing in type 2 diabetic patients appeared under-performed, although results from the cohort analysis (43.3%) and the clinical audit (83.8%) do not match, potentially because data captured in a paper file review were not well recorded in the database. Annual retinopathy screening using fundoscopy or referral to other providers was done in approximately half of Type 2 diabetic patients only, principally because the memorandum of understanding with the QRC to provide retinopathy screening had expired and QRC was awaiting funding approval before renewing the agreement. Thus, potential microvascular diabetic complications were being missed, which would have warranted important medication adjustments e.g. statin initiation and adjustment or avoidance of reno-toxic medications.

CVD secondary prevention, which is considered one of the “best buys” in reducing NCD impact in LMICs, appears to be suboptimal. According to the clinical audit, diabetic and hypertensive patients all received cholesterol testing. Based on the results of a previous audit, which identified statin under-prescribing, programme policy recommends CVD risk calculation and appropriate initiation of statin treatment without waiting for cholesterol results. Despite this, and even with cholesterol test results available for most, only 74% and 64% of audited diabetic and hypertensive patients, respectively, had CVD scoring done. In addition, only 25.8% of enrolled CVD patients were prescribed a statin, despite automatically qualifying for statin prescription without needed a risk score to be performed.

Two thirds (63%) of the ever-enrolled hypertensive cohort achieved BP control at their last visit. Patients were required to have both diastolic and systolic BP at target to be considered controlled. This figure doesn’t account for length of time in the programme and included exited patients. Had we examined only patients active at the end of the reporting period or those that had been in the programme for a minimum of 6 months, the control rate may have been higher. Our models show that the mean per patient and per visit systolic BP was at target throughout the reporting period and, overall, the control in the cohort improved as patients remained in the programme and as the programme evolved with time, with the greatest per-patient improvement occurring in the first six months post-enrolment.

There may be room to improve diabetes control, with 53.2% (n=1478) of ever-enrolled type 2 diabetic patients achieving target HbA1c (<8%) at their last visit. Again, this figure did not account for length of stay in the cohort, and included exited patients. The models of glycaemic control in this group showed that, while the mean was above target, there was an overall improvement in FBG control from baseline to six and again at twelve months. There were also improvements in mean HbA1c since the programme began, which may reflect either improved programme quality over time or perhaps that exited patients may have had poorer control. Further analysis, such as multiple linear regression models examining the effect of programme exit, length of stay in the cohort (as well as other variables such as gender, nationality, age and multi-morbidity) would shed light on this.
6.4 Implementation

A second major theme to emerge from patient and staff interviews was the impact of war and the refugee experience on NCD care and self-management.

A UNHCR report recently summarised the MHPSS needs of Syrian refugees affected by armed conflict. The on-going difficulties and violence associated with the conflict in Syria have had pervasive effects on the mental health and psychosocial wellbeing of Syrian refugees. These traumatic experiences are intensified by the chronic stressors associated with refugee life, including social isolation and loss of social supports, discrimination, poverty, lack of or poor access to basic services, risk of exploitation and violence, including domestic violence, and worry about family left behind. Each of these challenges is reflected in the patient or staff accounts reported here. Staff and patients both emphasised the negative impact mental distress had on medication adherence and behaviour change. In addition, the stigma associated with mental disorder, the fear of being labelled “crazy” and the tendency to somaticize mental distress among this population described by participants have also been reported by other authors. In any population, chronic physical medical conditions and mental illness or distress often co-exist and there is a complex and synergistic relationship between them. Chronic physical disease is a risk factor for the development of depression and anxiety, while having a co-morbid mental disorder is associated with reduced help-seeking, poorer treatment adherence, and poorer prognosis for chronic physical conditions. There is an increasing body of evidence linking stressful life events or chronic perceived stress to the onset of chronic disease and a recent study has shown that perceived stress is a strong direct risk factor for developing Type 2 diabetes, independent of its effect on hypertension, exercise and BMI. This is reflected in patients’ accounts associating the trauma and stress they have experienced with the onset or exacerbation of their NCD condition.

Participants described Jordanian clinicians’ compartmentalisation of MH and physical NCDs, some staff’s perceived lack of skills or confidence in dealing with mental health issues and the relative lack of focus on MH at primary care level in Jordan. This mirrors the lack of emphasis on MH in the WHO’s ‘25x25’ approach to NCD management and more broadly in the global NCD discourse. To tackle this, there have been growing calls for integration of MHPSS with care for physical NCDs at primary level, which may involve community workers and strengthening of social supports, and the MSF experience in Jordan illustrates the importance of this integration.

Several staff propose that the MSF approach should be more holistic, solution-focussed and with greater emphasis on social support and community engagement. Specific to the Syrian refugee community, Hassan et al suggest that mental health workers should focus on resilience and recovery-based approaches, that labelling people with a mental health condition should be limited, and that clinical intervention should be combined with social support and interventions to improve conditions of daily living. They echo the call to integrate MHPSS at primary care level, along with appropriate referral mechanisms, and suggest primary care physicians should be enabled to assess and manage the majority of MH and substance abuse cases in the Syrian refugee population. Indeed, since the interviews for this study took place, the Irbid management team has trained at least one programme doctor in primary level mental health care and expanded the MSF drug list to include basic psychoactive medications in line with the mhGAP guidance.
While the Irbid team had made great strides in addressing the mental health and psychosocial needs of their cohort, through expansion and reorientation of their mental health service and addition of a humanitarian liaison officer, many staff still felt there was an additional unmet burden of psychological morbidity. Since these interviews for this study took place, the team introduced depression screening using the PHQ-9 tool, which has been validated in other chronic disease populations and was in use in the MSF-OCBA project in Ramtha. Blanket screening took place over 12 weeks from September 2017 but was suspended as the amount and severity of morbidity identified (including 168 people with moderate to severe depression), overwhelmed MHPSS service capacity. The mental health advisor has since recommended screening with abbreviated PHQ-2 depression and GAD-2 anxiety tools at enrolment and subsequently at pre-defined intervals or on clinical suspicion, with PHQ-9/GAD-7 questionnaires performed if initial screening is positive. PHQ-2 is a highly sensitive but less specific screening tool than the widely validated PHQ-9, and is likely to identify large numbers requiring further screening. However, this two-stage approach is largely in keeping with WHO mhGAP. It may be useful to monitor the effect on workload for those performing screening and the MHPSS counsellors of using each tool.

Interviewed staff also recommended that all clinical team members should be able to screen and refer; and also that patients should be well-informed of the MHPSS service, with an emphasis on “living well” to minimise stigma, and should be encouraged to self-refer. Finally, offering tiered levels of intervention appropriate to patients’ needs, ranging from support delivered by medical and nursing staff, to psycho-education, living well and support groups for patients with mild symptoms to individual or group counselling for patients those with moderate to severe symptoms, should help to balance workload with patient access to support services, in keeping with the integrated MHPSS approach.

Challenges related to medication adherence and lifestyle change

Challenges related to medication adherence and lifestyle change were identified at patient, program and context level. Patient level factors identified here reflect the literature on NCD self-management, which cites barriers including: lack of knowledge or understanding, forgetfulness, perceived lack of personal control over their disease. In older adults with multi-morbidity, greater morbidity, increased physical dysfunction, less social activity, persistent depressive symptoms, and greater financial constraints were also important. Staff and the programme made several adaptations to tailor health education and adherence support to perceived patient barriers to medication adherence, such as providing pictorial cues, introducing adherence questionnaires, introducing higher doses of medications to reduce pill burden and referral to the MHPSS team for additional support.

There is a large body of evidence from the chronic disease literature, including HIV/TB chronic care literature, showing that strengthening family, community and psychosocial support and education improves patients’ self-management, including medication adherence. A recent study has also emphasised the need to focus on socioeconomic circumstances as a risk factor for NCD mortality, independent of the “25 x 25” risk factors. Family and psychosocial support are particularly relevant in a refugee setting and the team has addressed this to a degree by informally engaging family members in treatment adherence support and introducing the humanitarian liaison officer role. At the time of the interviews, there was a sense from staff that the HLO was...
underutilised and that there was a great burden of unidentified humanitarian and protection needs among patients. This is likely compounded by many patients’ reticence to discuss financial hardship and non-medical issues with the medical team. A recent trip report from headquarters advisory staff confirmed that the referral rate to the HLO continues to be very low. An explicit set of referral criteria as proposed by the team, further sensitisation work with the medical team around protection and psychosocial issues and increasing patients’ awareness and creating a direct access pathway for patients to the HLO may help to address this gap.

While there is a growing body of literature on behaviour change theory, there is mixed evidence on successful behaviour change interventions in chronic disease management in any context. However, it seems sensible to tailor lifestyle advice to patients’ limited financial means; a recent study from an MSF NCD programme in Mweso, DRC emphasised a similar finding on dietary advice in a chronic conflict setting. However, the diet messages related by some patients in Irbid: “don’t eat white things... salt... sugar... bread” appear oversimplified. Although some reported making positive changes, most patients felt they lacked willpower or had psychological barriers to change, compounded by their war and refugee experience.

Local health promotion staff collaborated with the headquarters advisor on the design of checklists and tools and received training in health promotion. They were encouraged to strengthen community engagement and utilise mobile phone technology to contact patients but this had not yet been put into practice at the time of the interviews. In general, behaviour change theory has moved away from the didactic and knowledge-based approach that many staff describe using here in favour of a solution-focused, patient centred approach. Michie et al recently proposed a new framework for behaviour change intervention design, COM-B, with a 'behaviour system' involving three essential conditions: capability, opportunity, and motivation at its core and a behaviour wheel of interrelated interventions and policies, which may be useful to incorporate into future NCD programmes.

Dietary advice may be more difficult to follow still in Jordan’s obesogenic environment. Urbanisation and economic development have contributed to increased NCD mortality rates and prevalence of NCD risk factors throughout the Middle East, including Jordan and Syria. These countries have passed through the nutrition transition when low fat, high fibre traditional diets have been replaced by hyper-caloric, processed and salted foods (which are likely to be cheaper and therefore more available to impoverished refugees). Smoking rates are increasing and exercise rates are low, particularly amongst women who face cultural restrictions on exercise and outdoor activity. Over 70% of adult women in Jordan are overweight or obese.

Programme costs

To our knowledge this is one of the first studies to provide a detailed description of the costs of providing vertical, primary-level NCD care to Syrian refugees and the local vulnerable population in the Middle East region. Our findings showed that the costs were primarily driven by human resources and drug costs and that addressing these areas could result in greater cost efficiency.

The total annual financial cost of delivering the MSF OCA NCD programme in Irbid increased annually. The significant increase in total cost from 2015 (€1,857,535) to 2016 (€2,796,124) reflects the increase in total number of active patients (Table 1) and the gradual addition of staff and services throughout 2015, including the home visit service, mental health service and additional
counselling, pharmacy, medical and nursing staff (Programme Timeline). The 7% year-on-year increase in 2017 to €2,991,421 reflects the increased HR costs related to further expansion of the MPHSS and HV programme, despite having fewer active patients at the end of 2017 versus 2016. In 2017, a greater proportion of coordination activity was allocated to Irbid as other mission projects wound down.

The major cost drivers were HR and drugs, with HR leading in 2015 and 2017. International staff costs at field level contributed approximately one fifth of the total HR budget but the major component was the cost of highly qualified Jordanian medical, paramedical and support staff, which contribute approximately two thirds. Scenario analyses regarding delivery of medical consultations demonstrated that these costs were most sensitive to frequency of patient review rather than to a change from doctor-delivered to nurse-delivered consultations. However, this was largely due to the assumption that nurses would need to refer 10% of all patients they see back to a doctor for review.

Drugs were the second major cost driver. As discussed earlier, Jordan legislation requires NGOs to purchase drugs via the local market. MSF has strict quality assurance requirements and purchases from a limited number of approved suppliers. It is particularly notable that the cost involved in insulin therapy (insulin, glucose reagent strips and lancets) feature prominently. Atorvastatin is the third most expensive item. Thus if statin under-prescribing is addressed, the budget impact will need to be anticipated.

The total annual drug cost would be halved if MSF were to import all drugs at MSF warehouse prices, with drugs potentially costing €317,755, €568,586 and €619,544 in successive years. This represents a drop of between 49 and 53% per annum. With the addition of 10% to account for importation charges, the savings were still significant at 44-48% per annum. There may be greater room to manoeuvre in terms of gaining cost efficiencies by addressing drug prices, as a reduction in HR costs would require significant re-structuring of the programme and clearly MSF has to operate within the local legislative framework.

From a cost structure perspective, costs other than HR and drugs contributed only one fifth of the total. Capital costs were negligible since MSF rented its premises and the few costs incurred were for minor refurbishment works.

Despite greater patient throughput, the per patient per year cost (PPPY) increased by 22% from €628.82 in 2015 to €764.80 in 2016, likely reflecting delivery of a more complex programme with greater HR costs. The PPPY cost increased by a further 10% in 2017. Similarly, the cost per consultation increased by 18% from 2015 to 2016 (from €92.28 to €107.91) but by only a further 4% in 2017, primarily because the increased numbers of medical consultations diluted the effect of the increase of total costs. Notably, per patient laboratory costs decreased significantly on an annual basis (Table 9), which likely reflects the team’s efforts to rationalise ordering of tests. Our sensitivity analyses (Table 13) indicated that the 2017 programme could be delivered for as little as €576.16 if the costs of MSF’s extensive coordination, logistical and medical supervisory support, at central and local level were removed. For example, this price may potentially reflect the cost of delivering such a service at national scale. The unit prices were also sensitive to a change in total drug price using MSF drug prices, which led to a drop of approximately one fifth (e.g. from €845.03 to €662.30 PPPY in 2017). Our incremental cost analysis showed that MHPSS accounted for only 3-4% of total costs, while the home visit service accounted for around 7.5% of total costs, with the cost per home visit consultation double that of the average consultation cost, as would be expected.
To our knowledge, there is no available published data to compare unit costs of delivery of primary level NCD care either in the Middle East region or in humanitarian settings. Unpublished MSF data report PPPY costs of INT$222 (2015) and INT$441 (2016) respectively of delivering diabetes care in a chronic conflict setting in Mweso, Democratic Republic of Congo and NCD care integrated with HIV services in a high-HIV prevalence setting in Swaziland. However, comparisons must be made cautiously given different programme and procurement structures and local HR costs.

A recent Kenyan study described the patient level direct annual costs of treatment for NCDs (hypertension, diabetes, asthma, COPD) at a quasi-public health facility (including data collected from MSF-Operational Centre Belgium Kibera Health Facility). Consultation fees, cost of medications and of admissions for acute exacerbations were included with total annual costs ranging from $25.64 to $ 372.45 (USD 2015) \(^85\). The limited data on NCD care available from countries affected by the Syrian crisis focus on secondary or tertiary level care. A Turkish study showed that annual per patient cost for outpatient drugs and follow up was 553.48 Lira (€110.49, 2015) for heart failure patients but the cost ingredients used were not reported \(^86\).

There is a dearth of available data to allow comparison of costs structures in the delivery of NCD care in LMICs. However, unpublished MSF studies referred to above show are consistent with this study in that HR and drugs account for the bulk of costs.

**Cost of medications**

Our study reflect those of NCD care in the Middle East and other settings, which point to the relatively high cost of insulin and related equipment. An assessment of medicine procurement prices for drugs provided in UNRWA (United Nations Relief and Works Agency for Palestinian Refugees in the Near East) primary care clinics in 2010 underscored the high cost of anti-diabetic and anti-hypertensive medications; Insulin 30/70 proved the most costly drug, as in our study. UNRWA procures most medications via central tender from pre-qualified suppliers with the minority procured locally. The authors suggest that savings could be made through regular review of medication prices, competitive negotiation with suppliers and selective participation in Jordan’s Joint Procurement Department or the Gulf Cooperation Council effective pooled procurement tender processes \(^87,88\).

A recent Lebanese paper discussed the prohibitively high cost of statins and the likely attendant negative impact on adherence in the Middle East region, and calls on health officials to offer solutions to reduce their cost within a human rights framework \(^89\). It is also notable that UNRWA, a major humanitarian provider of primary level NCD care in the region, has not included lipid-lowering medications on their essential drug list due to prohibitive costs \(^90\).

While this study did not focus on costs from the patient perspective, outside of the setting of an MSF programme (where medications are provided free-of-charge), medication and consultations fees may constitute a significant barrier to Syrian and uninsured Jordanian NCD patients accessing NCD care, as discussed earlier \(^3\). Thus it is timely that MSF has begun an in depth assessment of access and affordability of NCD medications in Jordan and the region \(^43\). We also echo other authors’ suggestion that the WHO Regional Office for the Eastern Mediterranean would establish a regional procurement price database similar to that developed by the WHO Regional Office for the Western Pacific \(^87\).
Challenges and facilitators to implementation related to staff, programme design and the broader context.

Staff acceptance of a programme or intervention is key to its implementation and job satisfaction is important in retaining staff. MSF staff were proud of the programme, highly qualified, committed and caring. They valued the rapport developed with patients, the ‘family’ like atmosphere and the teamwork with other colleagues. The disconnect that was evident between the medical and MHPSS teams and the underutilisation of the HLO may be addressed by introducing a multi-disciplinary team approach, where medical, pharmacy and psychosocial staff meet to discuss specific patients with particular needs. Most staff felt they had adequate tools and equipment to carry out their roles. However, several suggested introducing electronic patient records, appointment systems and guidelines to enhance efficiency and patient follow up.

The MSF NCD guideline was perceived as a useful tool although it had some limitations, including perceived overemphasis on medicalization of patients, polypharmacy and lack of guidance on complex, multi-morbid patients with renal impairment or frail, end-of-life patients who would benefit from de-prescribing and palliation. The programmatic guidance regarding the level of service provision to engage in was also perceived as inadequate. An unexpected benefit was that staff could use it as a tool to negotiate patient demands for additional medications and testing. The MSF NCD guideline is one of the first available amid a dearth of clinical guidance for NCDs in humanitarian settings. The teams’ experience of its implementation will be valuable to share within the organisation and the broader humanitarian community.

The traditional MSF programmatic structure, with short term posting of international staff in management roles, frequent reporting, indicators designed for other settings e.g. death and defaulter rates, may need to be revised for chronic care programmes. The tension between MSF’s traditional humanitarian emergency ethos and the belief among some respondents that a more “development” approach was needed was notable. Recent discourse around humanitarian organisations’ response to NCDs has suggested that such organisations may need to engage in health system strengthening and capacity building to ensure sustainability of the response, particularly in protracted crises, as discussed further below.

Broader contextual challenges identified by participants involved medical cultural and healthcare seeking behaviour and the humanitarian response and regulatory environment. The medical culture in Jordan was described variably by participants as traditionally doctor- and hospital-focused with an active private sector, which is seen to promote dependence on and the irrational use of tests and medications. Participants also described Syrian and Jordanian patients’ penchant for medication, medication hoarding, and “doctor shopping”, which complicates care delivery, prescribing and adherence in both the MSF and MOH setting. Accessing multiple providers of care or medications was also identified as a barrier to medication adherence in a recent study of Palestinian diabetic patients’ living in Jordan.

The complex, opaque, inconsistent or inadequate referral system was one of the key challenges and sources of frustration for staff and patients alike. Several staff also mentioned the ethical dilemma inherent in identifying significant and serious referral needs among patients and knowing that services exist, particularly in the private sector, but are inaccessible to patients. Spiegel, formerly of UNHCR, and colleagues support the approach taken in Jordan by UNHCR regarding access to health services for conflict affected non-camp based refugees i.e. integrating with the national service,
ensuring the establishment of primary and emergency services before focusing on secondary care, and establishing clear referral guidelines, creating a referrals committee to adjudicate expensive cases and finding donors or international organisations to pay for certain additional services. MSF often works with referral partners in other contexts and here, MSF has partnered with other international NGOs to provide different aspects of the NCD care package, including referral for screening and treatment of diabetic retinopathy and angioplasty and for provision of specialised equipment for disabled and housebound patients. However, these agreements do not constitute a definitive solution, as they are dependent on short-term cycles of donor funding.

6.5 Maintenance

In terms of programme maintenance or sustainability, a number of key subthemes emerged. One was the need to reorganise to attain greater efficiency; the cost of the programme, which is perceived to be more expensive than other MSF programmes; the need for greater community engagement and building on existing links with the community; and the need for more definitive solutions around referrals.

Key solutions suggested were to involve the MSF Access campaign in mapping the costs of medications in Jordan and the region (which has since begun) and engaging in advocacy with GOJ regarding the requirements for local purchase or more broadly with suppliers and manufacturers in the region to reduce prices. While other MSF sections have dedicated a portion of their NCD programmes’ budget to providing limited referral services, the key solutions proposed for Irbid were to audit the cohort’s referral needs, and negotiate with other actors to establish key free-of-charge referral pathways.

An overriding theme brought up by management staff was the need to plan for the future and for a potential exit strategy. At the time of the interviews, the discussion centred around the potential need for an exit strategy and handover partner to cover Syrian patients should they remain long term in Jordan (given that most Jordanian patients had other options). Most foresaw the MOH as the most logical referral partner but emphasised the gaps between the two models of care provision and the potential ethical dilemma if MSF were forced to reduce quality to facilitate handover.

Jordan is one of the more advanced countries in the region in terms of the existence of NCD guidelines and public health policies to address NCD risk factors. Some of the barriers to delivering high quality NCD care at MOH primary level identified in this study could be tackled by health system strengthening and capacity building e.g. supporting appointment and supply systems, training and supervision. However, since the key barrier to implementing Jordanian guidelines seems to be the lack of medical manpower, working with the Jordanian government on a model of task shifting with nurses may be relevant. This would require acceptance by government, patients, medical and nursing staff and a change to the regulatory environment. The efforts currently underway to increase task shifting within the Irbid programme could inform such a model.
7 Limitations

This analysis did not examine direct costs from a patient perspective or indirect costs of NCDs in this population. Patient-level data were not examined in terms of service use. Each patient was treated the same regardless of diagnosis, date of entry to cohort, duration of follow-up or whether an active or defaulting patient. Human resource costs for cadres other than doctors were based on staff estimates, rather than on formal staff time observation, which may have reduced the accuracy of these costs. Social desirability bias may have influenced results of the self-report medication adherence survey, which was mainly administered by the data collectors rather than by patients as intended, and the qualitative data collection.

8 Key findings and lessons learned

8.1 Reach and access

- The MSF-OCA NCD Programme reached approximately 20% of the adult Syrian population with previously diagnosed NCDs in Irbid governorate in 2017. There was still a significant group of Syrian patients who struggled to meet the costs of accessing NCD care through UNHCR/MOH, private sector or private pharmacies and affordability and accessibility is likely to be further impacted by the change in Government of Jordan (GOJ) policy in early 2018 to significantly increase MOH co-payments.
- The majority of Syrian patients could manage physical access, distance and transport costs to reach MSF clinics for their medical care or pharmacy needs. However, they carefully balanced very limited household finances and chose to attend medical consultations instead of laboratory, health education or MHPSS sessions. Thus, cost was a barrier to accessing these aspects of the MSF programme at the time of interviews. Equally, interviewed patients described the co-payments required to access MOH primary care consultations, medications and investigations as a barrier.
- Patients appreciated many aspects of the appointment system, including SMS reminders. Staff strongly encouraged adherence to the appointment system and had achieved a 90% adherence rate. Despite some staff providing their personal phone numbers to support selected patients, most patients and some staff perceived the appointment system as rigid, and inaccessible outside of prescribed appointment times. In addition, patients and staff described a punitive approach being taken when patients missed appointments, with some patients reporting resultant treatment interruption. 
- There is a lack of accessible, affordable and consistent secondary and tertiary referral options covering NCD complications or conditions not covered by MSF. The UNHCR/JHAS system for Syrian refugees to access secondary/tertiary MOH services was described as complex, opaque and inadequate. Other than the successful QRC collaborations (the

---

17 This refers to the initial highly subsidized co-payments for Syrian refugees to access MOH primary care services, introduced in 2014, which were equivalent to those paid by Jordanians without public health insurance. As earlier noted, larger co-payments, equivalent to 80% of the “full foreigner rate” were introduced in January 2018 since the interviews and data collection for this evaluation took place.
periodic collaboration for cardiology intervention and the now suspended collaboration for ophthalmology), there were few other adequate, good quality referral options available free-of-cost to patients.

- In fulfilling the GOJ requirement that 30% of beneficiaries should be Jordanian, staff perceived that many insured Jordanians, who could access alternative services, had been enrolled in the programme rather than vulnerable, uninsured Jordanians as intended. The team has learned that a set of simple, practical vulnerability criteria is required to appropriately target MSF services to the local community in this setting and introduced these from late 2017.

- Lack of patient awareness, stigma, limited medical team sensitisation or trust in the service and the cultural approach to mental health issues had proven barriers to patients accessing MHPSS and HLO services. Training by supervisors, shared medical and MHPSS training sessions, and ad hoc group psycho-education sessions in the waiting room also helped to address this.

8.2 Adoption and acceptance

- The programme was highly acceptable to patients, staff and stakeholders.

- Patients perceived that they received good quality care in a caring and respectful environment; they valued the free medications, regular laboratory and vital sign testing most highly.

- Patients were frustrated by the vertical or siloed approach to care and felt that they were not listened to when they expressed a medical need that was beyond the scope of MSF’s target conditions. The lack of accessible or affordable referral options was also a source of dissatisfaction for patients. This finding may influence future design of MSF NCD programmes towards a more integrated approach.

- There are appeared to be some stigma associated with the MHPSS both from patients and staff, which is in keeping with the broader cultural context. Efforts were made by staff to address this as described above.

- Stakeholders, including MOH and community representatives, and MSF staff, valued the service and would have liked to see it expanded in reach and/or scope.

8.3 Effectiveness

- Over half of Type 2 diabetic patients and hypertensive patients achieved control at their last visits (when all patients ever enrolled were included). Models show that levels of BP, HBA1c and FBG improved 6 and 12 months after enrolment in the programme. Trends in clinical target attainment also improved as the programme evolved over time.

- There appeared to be room to improve in certain aspects of quality, for example in: statin prescribing for CVD patients, CVD risk scoring and statin prescribing in general, and performance of annual urinary protein testing in diabetic patients.

---

18 The blanket mental health screening introduced in November 2017 also helped to address this and was suspended in December 2017 as the available MHPSS services were overwhelmed by the amount of morbidity.
Self-reported medication adherence was extremely high, possibly due to social desirability bias. It may need to be further elucidated, particularly as some patients and staff described both intentional and unintentional non-adherent behaviours. While the majority of interviewed (especially Syrian) patients declared themselves to be “very committed” to taking their medications, several described stopping medications, taking them intermittently and sharing medications with those in need. Staff and patients both emphasised the negative impact of mental distress on medication adherence.

8.4 Implementation

The key challenge to implementing and maintaining effective NCD care in the Syrian refugee population was the impact of the war and refugee experience. This had profound implications for Syrian patients’ ability to engage with the programme in terms of medication adherence, dietary and lifestyle advice, and affordability of access. The programme has made great strides in addressing this by introducing the HLO role and specific HLO referral criteria; expanding and reorienting the MPHSS services; and planned introduction of depression screening with the PHQ-9 tool.

However, the number of patients identified by PHQ-9 screening, which was introduced since this study took place, overwhelmed the existing MHPSS and thus adequate downstream services need to be in place if screening is introduced\textsuperscript{19}.

Staff have learned to adapt their health education messages to patients’ literacy, education levels and financial means and have involved family members as informal treatment supporters. Space, transport costs and limited patient engagement have proven to be challenges in delivering group-based sessions. However, the overall individual-based approach seems didactic and knowledge-based rather than patient-centred. Additional challenges encountered by the team included: cultural dietary norms and acceptance of smoking (especially in men), the obesogenic environment and the perception and expectation that medicine will provide solutions.

Patients’ healthcare seeking behaviour and tendency to access multiple providers and sources of medications is likely to influence medication adherence. Doctors, pharmacists and adherence supporters may need to be aware of this and address it in adherence counselling. As has been successfully done in other settings, adopting the model of concordance, individualising a multi-faceted treatment support approach and formally involving treatment supporters may prove valuable here.

In 2017, the guideline covered most clinical scenarios that doctors encountered, but it had limitations, including inadequate programmatic guidance, lack of immediate accessibility in its paper-based form, perceived promotion of polypharmacy and limited guidance on complex, multi-morbid patients with renal impairment or frailty\textsuperscript{20}.

\textsuperscript{19} In early 2018, the team planned to introduce abbreviated 2-item depression and anxiety screening (PHQ-2 and GAD-2) and it may be worth evaluating which tool best balances sensitivity with efficiency in this setting.

\textsuperscript{20} An updated version of the MSF NCD guidelines has since been released and is available in electronic format.
In keeping with increasing complexity and patient throughput, programme cost per patient per year (PPPY) has increased annually from €629 in 2015 to €845 in 2017. While the major cost drivers are similar (drugs and human resources), the PPPY cost appears greater than those of NCD care delivered by MSF in Swaziland or Democratic Republic of Congo. However, comparisons must be made with caution since the programme content and the prevailing HR costs and drug procurement regulations are very different in each setting.

The MHPSS and HV services accounted for 4% and 7% incremental cost including their associated HR components.

8.5 Maintenance

The GOJ regulatory environment is a challenge to maintenance of the programme, including: the requirement that medications are locally purchased in Jordan rather than imported; the lack of single focal point or set of regulations governing NGOs; and the significant bureaucratic delays that MSF has encountered. Since the interviews took place, the Jordanian government has introduced an online system for humanitarian agencies to access governmental departments.

Planning for the maintenance of the programme will need to take account of increasing costs of medicines and human resources.

In exploring the potential cost efficiencies that may be realised from reorganisation of medical consultation workflow, the most important factors were the frequency of review and the proportion of patients categorised as stable, and therefore suitable for nurse review or longer doctor review intervals.

9. Recommendations

9.1 Implications and recommendations for the Irbid programme and Jordan mission

This iterative and collaborative evaluation, including a field visit and interviews that took place in August 2017, has helped to formulate and document some of the challenges faced by the team and to crystallise solutions. The following recommendations are based on the evaluation and several have come from the team in the field. The programme is dynamic and constantly evolving and, thus, many of these recommendations are currently being addressed by the team.

1. This evaluation and the Household Access survey have identified that Syrian patients face barriers to accessing NCD care in Jordan, mainly due to cost. The team should continue to monitor the impact of increased MOH co-payments on Syrian refugees, potentially performing a costing study from the patient perspective. It is also vital to continue the lobbying, which the mission is already engaged in, with UNHCR and other actors, including international donors, on maintaining/increasing funding for the Syrian crisis and on improving access to free or low-cost primary care for Syrian refugees in Jordan.

2. Increase patient access to the clinic outside of their scheduled appointment times by including e.g. one emergency slot per doctor per day. It may also be worth exploring staff’s
suggestion to dedicate a clinical staff member to answer cohort patients’ phone queries for a pre-defined period e.g. one-two hours per day.

3. Continue to apply vulnerability screening, based on medical need and financial means, to better target patients for inclusion in the broader cohort and in the home visit service.

4. In order to build on the humanitarian remit of the programme and further restore dignity and reduce suffering amongst the Syrian population, work on further integration of mental health care with care for physical chronic conditions is recommended and implementation of the following is planned:

a. Increase awareness of and access to MHPSS services via continued engagement with the broader clinical team and communication with patients e.g. through psycho-education sessions, posters and videos in the waiting room, text messages.

b. Monitor the effect on workload and MHPSS capacity of introducing a new tool (PHQ-2/GAD-2) and screening interval. It may be appropriate to screen patients on enrolment and on a six-monthly basis with the possibility of referral being triggered by clinical review in the interim.

c. Triage of patients, strengthening of existing systems of tiered layers of complementary psychosocial supports with referrals between the different layers, which may include: psychiatric support; individualised counselling; emotional and practical support through individual, family or group interventions (by MSF or ideally through partner organisations); and integrated existing community support mechanisms. Thus strengthening of links with other actors providing this type of care may be warranted.

d. Expand group psychoeducation, peer support and living well groups. Consider providing transport costs with monitoring and evaluation of its effectiveness or alternatively, bringing group sessions to the community by holding them on a rotating basis in areas of Irbid governorate where patients are concentrated.

e. To continue to address the perceived lack of adequate, good quality referral options for psychiatric care, build on the training of one family practitioner in primary-level mental health care that took place in early 2018. Invest in on-going training and close supervision for these staff and monitor referral rate, uptake and outcomes of this enhanced service. Expand the MSF drug list to include basic psychoactive drugs included in mhGAP (WHO Mental Health Gap Action Programme). Work with the broader team around mental health stigma.

5. There is overwhelming evidence that statin and antiplatelet prescribing significantly reduces mortality and morbidity. There is room to improve on this in the programme. Further emphasis could be placed on statin prescribing especially to known CVD and DM patients with microvascular complications; antiplatelet prescribing in CVD patients may need to be improved although it may be underestimated as Clopidogrel prescribing was not examined. A simple re-audit of statin, antihypertensive and antiplatelet prescribing in CVD patients could be performed in 6 months.

6. Health education may be more effective if a patient-centred, solution-focused approach is taken and is targeted at patients with specific needs. This may require additional exploration with HE, medical and nursing staff and reinforcement of techniques they have been trained in such as motivational interviewing. Much of the basic health education and lifestyle advice is applicable to all patients and could be delivered in a group setting. However, specific targeted advice, e.g. insulin
initiation, inhaler technique and focus on patients with adherence challenges could be reserved for one-to-one HE sessions.

7. Based on the costing analysis performed as part of this evaluation, the mission could explore cost savings through several avenues:

a. Continue to work with the Jordan mission / Access Campaign team to advocate for improved access to affordable primary NCD care and relevant referrals. Map the out-of-pocket direct medical and nonmedical costs that would be incurred by the multi-morbid, elderly Syrian NCD patient typical of the MSF programme if attending MOH services, especially in light of GOJ’s decision in January 2018 to significantly increase MOH fees for Syrian refugees.

b. While the Access Campaign work has shown that drugs are procured relatively cheaply within the MOH system, MSF purchases drugs from the private sector. This study has confirmed that significant savings could be made by importing some or all of the top line drugs from the Amsterdam procurement unit, particularly insulin, statins, inhalers, and Access Campaign work has shown that there may be scope to negotiate with private suppliers or directly with manufacturers (particularly on an intersectional level).

c. Explore innovative options around procurement such as joining GOJ, Gulf region or UNRWA procurement processes for some or all items.

8. Most patients have blood pressure either at target or close to target. Review and potentially revise criteria to categorise patients as stable and therefore eligible for nurse review and less frequent visits. Monitor criteria revised in 2017 for patients to be seen on a 3 or 6-monthly basis by nurses with doctor review on a less frequent basis.

9. Continue to engage with UNHCR and other actors regarding provision of free-of-cost, reliable secondary and tertiary referral options for patients, especially for ophthalmology, cardiology and nephrology. Focus on task shifting with on-going evaluation of patient flow, establishment and monitoring of criteria for nurse follow up and doctor review and management of pharmacy capacity. Monitoring the proportion of patients that require referral by nurses back for doctor review would help with service planning.

10. It would be ideal to implement full task shifting, involving nurse initiation and adjustment of drugs. However, this would require significant negotiation and advocacy with the MOH, licensing and regulatory authorities, and with clinical staff and patients themselves. However, it would likely bring cost-savings and may result in a model that other actors, including the MOH, could emulate.

11. Formalise the teamwork already evident in the programme, by introducing a multidisciplinary team approach e.g. hold regular case conference meetings with all members of the clinical team to discuss specific patients with increased needs.

12. Introduce a formal treatment supporter model, building on MSF experience in HIV care, especially targeting certain patients e.g. frail, elderly or insulin users. Treatment supporters could facilitate and encourage medication adherence and lifestyle change.

13. Provide transport costs for certain, targeted activities e.g. group health education and MHPSS and monitor effectiveness of this initiative, as mentioned above, e.g. how many people did
not attend at all once referred and how many sessions were missed by those attending before and after implementation.

14. Review content and process of health education and ensure regular supervision to make more patient centred, solution-focused, and inclusive of motivational interviewing techniques. Individual health education may be most suited to adherence and treatment support and change in lifestyle e.g. diet, smoking and exercise may be better suited to group sessions. Obese women and men who smoke seem to be key groups to focus on. Practical classes, such as exercise classes, walking groups, cooking groups may help to address both behaviour change and provide social support and strengthen community ties for the programme. As above, patients may be encouraged to attend MHPSS/HE group sessions if transport costs are provided by MSF.

15. Strengthen community engagement activities and build on community links. Consider introducing community outreach workers and community adherence or support groups as has been shown to be successful in the HIV setting. These could be patient-led or could involve MSF staff travelling to deliver sessions in the community. Consider an awareness-raising event e.g. run or walk involving the community.

16. Consider increasing access and acceptability of HLO service by defining specific referral criteria, increasing patient awareness and by allowing patients direct access to the HLO.

17. Introduce a referral focal point that can keep abreast of changes in the referral environment, keep medical teams updated and support patients through the referral process and document referral needs and outcomes. A detailed survey of patients’ referral needs would facilitate advocacy within MSF and with other partners. Acknowledging the significant work done by the team in the area, it is recommended to continue to advocate with other actors to reduce barriers to secondary and tertiary care referral. Options may include further negotiation with the MOH re direct access for MSF to MOH services, advocacy with other international NGOs leading to further bilateral agreements, identification of a referral pathway utilising the private sector.

18. Introduce more interaction between staff of both clinics and between the office and clinics to foster a sense of teamwork and cooperation.

---

21 A referral focal point was introduced in late 2017.
9.2 Lessons learned and recommendations for NCD programmes in other humanitarian contexts

MSF experience is consistent with global observations that mental illness is extremely prevalent in people with chronic diseases in humanitarian settings (including a number of specific psychiatric disorders, which are themselves chronic diseases), but integration of MH and NCD services may be suboptimal. It is vital to ensure that mental health and psychosocial support are included as an integral part of primary level NCD services in humanitarian settings.

2. Provide a tiered approach to mental health and psychosocial support so that patients are triaged to receive the appropriate level of care e.g. define those in need of clinical mental health services delivered by trained clinicians or counsellors versus those for whom focused psychosocial support services, which may be delivered by trained non-specialists, is more appropriate.

3. In the next revision of the MSF NCD guideline, focus on the issue of the vertical approach to each disease, polypharmacy, multi-morbidity, frailty and palliation. One option would be to include vignettes of several complex patients or clinical scenarios. An evaluation of guideline usability in other settings may be warranted.

4. Design and evaluate streamlined, algorithm driven protocols, which are appropriate to the local setting. In Jordan, this could involve using flow charts to guide statin prescribing. In other settings it may include the use of fixed-dose combination drugs. It may be effective to focus on big wins or best buys such as appropriate statin prescribing in those that automatically qualify and achieving a clinically significant drop in blood pressure in CVD and diabetic patients.

5. Design and evaluate an algorithm-driven, context-specific approach to further explore task shifting to nurses, and reduction of pill burden and staff workload. Extensive stakeholder engagement from the outset would be required, especially as, depending on the medical culture and context, a simplified regime may not be acceptable to patients, staff and broader community. Integrate lessons from HIV programmes around the use of treatment supporters and family and community engagement.

6. Since a predictable proportion of patients will require referral for screening, diagnosis or treatment of NCD related complications, ensure essential referral pathways are in place and are appropriate, acceptable, accessible and affordable for patients. Explore innovative ways to address this need e.g. the use of mobile phone technology for retinal screening.

7. Integrate with host country health systems in humanitarian settings where possible and engage in health system strengthening to facilitate sustainability if this is appropriate to the local context. This may include supporting the introduction, adaptation or innovation of longitudinal delivery systems, and/or implementation of lifelong care and community engagement. Chronic care data collection and monitoring, supply chain strengthening, and training and capacity building of local staff may also be relevant. Work with country partners around regulation and licensing to facilitate nurse prescribing.

8. MSF may need adapt structures and reporting mechanism to reflect chronic care such as: a) reducing frequency of medical reporting to three- or six-monthly intervals; b) developing a quality monitoring framework appropriate to NCD services, which may include adopting indicators.
developed in Jordan to reflect longitudinal care (e.g. measuring retention in care, treatment interruption, mean visit interval and mean change in clinical parameter from baseline to six months); and c) introducing regular, 3-monthly patient file reviews.

10 Conclusion

MSF is providing a high quality, free, reliable and holistic primary level NCD service for Syrian refugees and the Jordanian host population in a caring environment. The programme is highly acceptable to patients, staff and stakeholders and is achieving good clinical outcomes. MSF is further fulfilling their humanitarian remit by the provision of specific mental health and psychosocial support (MHPSS) services and a home visit service targeting disabled patients.

However, the costs are high, and it seems plausible to simplify the model of care for patients and staff by further exploring some strategies such as reliable, accessible and direct referral pathways, task shifting, simplification of treatment (e.g. combination therapy for cardiovascular secondary prevention), innovative models for procuring drugs and reducing cost barriers for patients to access all aspects of NCD care. Additionally, it is important to build on efforts to comprehensively identify and address the mental health and psychosocial needs of the population.

Long-term sustainability of this complex and costly programme is, undoubtedly, a challenge but simplification of the model of care, reduction of costs, and engagement with the Jordanian government and other actors could maximize its potential long-term success.
**11 Proposed Indicators for future NCD programmes**

**A. Programme activity indicators**

1. Number/proportion of ever enrolled patients that have exited the programme (broken down into: deaths, planned exit, loss to follow up)
2. Number/proportion of patients active at start of year who have exited the programme during that year, including deaths amongst those ever enrolled and deaths amongst those active at the end of the reporting period.
3. Number of established versus new diagnoses
4. Number of new versus follow up appointments per month
5. Mean length of stay in the programme
6. Mean visit interval
7. Proportion retained for more than six months post-enrolment

**B. Indicators of complexity of care**

1. Proportion of patients active at the end of the reporting period with 2 or more target disease diagnoses (including HIV or TB)
2. Proportion of patients active at the end of the reporting period prescribed 5 or more known NCD medications

The following two categories of indicators refer to: **patients active at end of the reporting period who have been in the programme for at least six months with the diagnosis of interest documented at last visit** (i.e. includes those with the diagnosis at enrolment or with a new diagnosis at any time since enrolment until the end of reporting period; includes those with the diagnosis of interest with +/- any other morbidities):

**C. Clinical effectiveness indicators**

1. Proportion of Type 2 diabetics with last recorded HBA1c = 4.0-8.0%
2. Proportion of Type 2 diabetics with last recorded FBG = 75-150 mg/dL
3. Proportion of Type 2 diabetics with last recorded BP < 140/90 mmHg
4. Proportion of Type 1 diabetics with last recorded HBA1c = 4.0-7.9%
5. Proportion of Type 1 diabetics with last recorded FBG = 75-150 mg/dL
6. Proportion of Hypertensive patients with last recorded BP <140/90 mmHg
7. Proportion of Type 2 diabetic patients with last recorded BP <140/90 (or below local target)
8. Proportion of CVD patients with last recorded BP <140/90

**D. Indicators of clinical quality**

1. Proportion of CVD patients prescribed statin at last visit
2. Proportion of CVD patients prescribed at least one anti-hypertensive at last visit
3. Proportion of CVD patients prescribed antiplatelet at last visit (aspirin or clopidogrel)
4. Proportion of CVD patients prescribed all 3 of above at last visit
### 12 Dissemination Plan

In accordance with the Mission Strategy for Jordan, and the OCA NCD Strategic Plan, we propose dissemination of several important findings from this evaluation.

<table>
<thead>
<tr>
<th>Audience</th>
<th>Suggested dissemination materials or outlets</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country/regional</strong></td>
<td></td>
<td>Meeting may include UNHCR, MOH, INGOs, staff and stakeholders</td>
</tr>
<tr>
<td></td>
<td>• Locally appropriate leaflets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Booklets or infographics in English &amp; Arabic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Meeting with key stakeholders</td>
<td></td>
</tr>
<tr>
<td><strong>MSF movement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Internal report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Various media (e.g. MSF blog post, website)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• MSF NCD Technical working group</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• MSF Access Campaign</td>
<td></td>
</tr>
<tr>
<td><strong>Public health and humanitarian community</strong></td>
<td>• Scientific publication of papers on key themes with MSF, MOH, LSHTM authors</td>
<td>Key themes:</td>
</tr>
<tr>
<td></td>
<td>• Presentation at scientific conferences and meetings</td>
<td>1. Clinical outcomes and quality of care delivered by an evolving MSF NCD programme in a humanitarian setting</td>
</tr>
<tr>
<td></td>
<td>• LSHTM blog post</td>
<td>2. Financial costs of an evolving MSF NCD programme in a humanitarian setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Medication Adherence amongst Syrian refugees in an MSF NCD programme in Jordan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Integrating mental health care within an MSF NCD primary care clinic in Jordan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. MSF experiences of providing multidisciplinary primary level NCD care in a humanitarian setting: an implementation study guided by the RE-AIM framework</td>
</tr>
</tbody>
</table>
13 References


56. Chowdhury R, Khan H, Heydon E, et al. Adherence to cardiovascular therapy: A meta-


117


### 14 Annexes

#### Annex 1: Evaluation indicators using the RE-AIM framework

<table>
<thead>
<tr>
<th>Objective (Questions)</th>
<th>Domain</th>
<th>Indicator</th>
<th>Methods</th>
</tr>
</thead>
</table>
| Reach                 | Coverage | Target population prevalence of diabetes & CVD  
Number of people eligible for care for diabetes & CVD (inclusion/exclusion criteria)  
Number of people receiving care for diabetes & CVD  
Representativeness of those reached  
Prevalence of NCD and identified, relevant MH comorbidity; eligibility for MHPSS services; numbers referred/receiving care; representativeness of those receiving MHPSS service |  
Existing cross-sectional survey previously conducted by MSF  
Routine facility cohort data  
2 focus groups with patients  
Approximately 16 semi-structured patient interviews  
Key informant interviews |
| Adoption/ initial acceptance | Participation | Description of intervention location, cadres of staff and qualifications;  
inclusion/exclusion criteria of staff/settings delivering service  
Sources and perceptions of information and support for participation in NCD service & components (e.g. HE, MHPSS)  
Experience of receiving and providing NCD care including use of clinical guideline  
How programme participation has influenced patient/staff well-being and staff ways of working. |  
Routine facility cohort data  
2 Focus groups with patients  
Semi-structured interviews with approximately 12 clinic staff and 16 patients |
| Accessibility/ acceptability | Accessibility | Patient characteristics of those accessing individual programme components (e.g. HE, HLO, MHPSS, foot care)  
Staff (e.g. ratio of staff per patient)  
Structures and tools  
Treatment continuity/rupture  
Staff and patient perceptions of availability and accessibility / barriers to access of service components (clinical review, HE, HLO, MHPSS, HV, Foot care)  
Staff perspectives on acceptability / usability of NCD guideline  
How stakeholder views on acceptability and accessibility of MSF NCD service and components (e.g. MSF, MoH, NGO staff,)  
Self-reported medication adherence levels and medication beliefs |  
Routine facility cohort data  
Key informant interviews  
Participant observation  
2 focus groups with patients  
Semi-structured interviews with approximately 12 clinic staff and 16 patients  
Self-report medication adherence questionnaire |
| Implementation | Fidelity of programme delivery | Extent to which clinical guideline delivered as intended:  
Number / % of eligible patients with HTN with annual FPG performed during the reporting period  
Number/ % of eligible patients with diabetes that have had an annual foot check/eye check performed during the reporting period  
Number / % of DM patients that have micro-albuminuria or urinary protein testing during the reporting period  
Number / % of DM patients on ACE inhibitor (ACEi) with Creatinine testing during the reporting period  
Number / % asthmatics and COPD with control review (spirometry or clinical) during the reporting period |  
Clinical audit  
Participant observation  
Routine health facility cohort data |
What are the essential components and adaptations necessary to delivering an NCD service in this setting?

<table>
<thead>
<tr>
<th>Adaptations</th>
<th>NCD care adaptations to the local setting (e.g. cultural adaptations; dietary and exercise, smoking advice) Programme adaptations related to humanitarian setting and role e.g. response to patients’ psychosocial needs and NCD-relevant mental health co-morbidities</th>
</tr>
</thead>
</table>

What are the start-up and incremental costs of delivering such a service?

<table>
<thead>
<tr>
<th>Cost</th>
<th>Staff time Start-up and recurrent implementation costs (indirect, intermediate and final cost centres) Average unit costs and unit costs stratified by morbidity</th>
</tr>
</thead>
</table>

“Effectiveness”/Quality of Care

What are the trends in clinical outcomes and quality indicators of the programme?

<table>
<thead>
<tr>
<th>Clinical Outcomes</th>
<th>No./% patients with hypertension that have a most recent BP &lt;= 140/90 6 and 12 months post enrolment and trend from baseline Number / % of patients with diabetes that have a most recent BP &lt;= 140/90 6 and 12 months post enrolment and trend from baseline Number / % of patients with diabetes with last HbA1c &lt; 8.0 %/ 7.0 % 6 and 12 months post enrolment and trend from baseline Number/% with a reduction of &gt;= 0.5 mmol/L in cholesterol level from baseline 6 and 12 months from enrolment Number/% of patients with asthma / COPD free from exacerbations/admissions in the previous 6 months Number / % of patients who report decreased/quitting smoking in reporting period Number / % of patients who report increased levels of exercise from baseline during reporting period Trend recommended referrals to another facility for acute complications/specialist care, as a proportion of active cohort</th>
</tr>
</thead>
</table>

What are the perceived benefits/unintended consequences from a patient and provider perspective?

<table>
<thead>
<tr>
<th>Quality Indicators</th>
<th>Proportion of recommended referrals to other services that are appropriate as per guideline Number/ % of patients with CVD prescribed a statin during reporting period Number/ % of patients with CVD prescribed aspirin during reporting period Number/ % of patients with CVD prescribed at least one anti-hypertensive during reporting period Number/% of patients with COPD/asthma with inhaler technique check documented Number /% of times when appropriate clinical action taken based on clinical or laboratory findings according to guideline (see Annexe 2d for detail) Trend in defaulters as a proportion of active cohort Description of cohort deaths (patient characteristics)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Perceived Effectiveness</th>
<th>Patient and providers perspectives on effectiveness of programme components (clinical review, medications, HE, HLO, MHPSS, HV)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Number/% of patients active 6 months post enrolment in reporting period</th>
<th>____________________________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance</td>
<td>Individual Level</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>What are the challenges and facilitators for patients to remain in the programme?</td>
<td>Numbers of medications and daily pill count at last consultation during reported period</td>
</tr>
<tr>
<td>What are the costs involved in maintaining the programme?</td>
<td>Self-reported medication adherence rates and medication beliefs</td>
</tr>
<tr>
<td>What are the programmatic challenges and adaptations made to maintain the programme?</td>
<td>Qualitative measure of individual-level maintenance: Key challenges in maintaining medical treatment (including medication concordance) Key challenges in altering lifestyle (diet, exercise, smoking) Key mental health/psychosocial challenges Types of support available and strengths and challenges of the support (health education, MHPSS, HLO, family and community support)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Measures of cost of maintenance</td>
</tr>
<tr>
<td></td>
<td>Institutionalisation of the programme/modifications made for maintenance</td>
</tr>
</tbody>
</table>
Annex 2. Organogram of Irbid NCD Programme
### Annex 3. Supplementary Demographic Data

#### 3a) Self-reported legal status of Syrian patients and

#### 3b) Self-reported insurance status of Jordanian Patients

a)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Syrian (n=3664)*</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refugee status</td>
<td>Yes</td>
<td>3575</td>
<td>97.6</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>16</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Not asked/answered</td>
<td>73</td>
<td>2</td>
</tr>
<tr>
<td>UNHCR registration</td>
<td>Yes</td>
<td>3464</td>
<td>94.5</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>108</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>Not asked/answered</td>
<td>92</td>
<td>2.5</td>
</tr>
<tr>
<td>MOI Card</td>
<td>Yes</td>
<td>2757</td>
<td>75.2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>215</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>In progress</td>
<td>53</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>Not asked/answered</td>
<td>639</td>
<td>17.4</td>
</tr>
</tbody>
</table>

*All Syrian patients ever enrolled were included

<table>
<thead>
<tr>
<th>Insured</th>
<th>Jordanians (n=1365)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>365</td>
<td>26.7</td>
</tr>
<tr>
<td>No</td>
<td>926</td>
<td>67.8</td>
</tr>
<tr>
<td>Not asked/answered</td>
<td>74</td>
<td>5.4</td>
</tr>
</tbody>
</table>

Jordanians insured, cohort 2015-2016, (no Jordanian patients enrolled in 2017)
Annex 4: Number of NCDs and NCD drugs* at the last visit, cohort 2015-2017 by age

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>Total</th>
<th>%</th>
<th>5-15</th>
<th>%</th>
<th>15-40</th>
<th>%</th>
<th>40-65</th>
<th>%</th>
<th>&gt;65</th>
<th>%</th>
<th>Male</th>
<th>%</th>
<th>Female</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(n=5028)#</td>
<td></td>
<td>(n=151)</td>
<td></td>
<td>(n=501)</td>
<td></td>
<td>(n=3041)</td>
<td></td>
<td>(n=1334)</td>
<td></td>
<td>(n=2023)</td>
<td></td>
<td>(n=3022)</td>
<td></td>
</tr>
<tr>
<td>Number of</td>
<td>0</td>
<td>220</td>
<td>4.4</td>
<td>19</td>
<td>12.6</td>
<td>57</td>
<td>11.4</td>
<td>113</td>
<td>3.7</td>
<td>25</td>
<td>1.9</td>
<td>72</td>
<td>3.6</td>
<td>148</td>
<td>4.9</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1243</td>
<td>24.6</td>
<td>106</td>
<td>70.2</td>
<td>247</td>
<td>49.3</td>
<td>677</td>
<td>22.3</td>
<td>204</td>
<td>15.3</td>
<td>556</td>
<td>27.5</td>
<td>687</td>
<td>22.7</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1549</td>
<td>30.7</td>
<td>233</td>
<td>15.2</td>
<td>117</td>
<td>23.4</td>
<td>975</td>
<td>32.1</td>
<td>1432</td>
<td>32.4</td>
<td>6469</td>
<td>30.1</td>
<td>940</td>
<td>31.1</td>
</tr>
<tr>
<td></td>
<td>3-4</td>
<td>1130</td>
<td>22.4</td>
<td>121</td>
<td>2.0</td>
<td>68</td>
<td>13.6</td>
<td>1035</td>
<td>34.0</td>
<td>542</td>
<td>6.6</td>
<td>226</td>
<td>7.9</td>
<td>996</td>
<td>33.0</td>
</tr>
<tr>
<td></td>
<td>&gt;=5</td>
<td>903</td>
<td>17.9</td>
<td>12</td>
<td>0.0</td>
<td>12</td>
<td>2.4</td>
<td>241</td>
<td>7.9</td>
<td>131</td>
<td>9.8</td>
<td>652</td>
<td>32.2</td>
<td>251</td>
<td>8.3</td>
</tr>
</tbody>
</table>

Number of 

| Number of | 0 | 426 | 8.4 | 30 | 30 | 120 | 24.0 | 198 | 6.5 | 67 | 5.0 | 138 | 6.8 | 288 | 9.5 |
| 1-4 | 1728 | 34.3 | 121 | 305 | 60.9 | 1047 | 34.4 | 248 | 18.67 | 25 | 35.8 | 1003 | 33.2 |
| 5-8 | 2199 | 43.6 | 0 | 68 | 13.6 | 1408 | 46.3 | 723 | 54.2 | 2873 | 43.2 | 1326 | 43.9 |
| >=9 | 692 | 13.7 | 0 | 8 | 1.6 | 388 | 12.8 | 296 | 22.2 | 2287 | 14.2 | 405 | 13.4 |

*NCD drugs include those prescribed by MSF other than antibiotics, analgesics, proton pump inhibitors at the last visit.
## Annex 5: MARS-5 Logistic Regression results

### Comparison of proportion of adherence for each MARS characteristic and BMQ dimension

<table>
<thead>
<tr>
<th>Var1</th>
<th>N</th>
<th>mar.t</th>
<th>mar.1</th>
<th>mar.2</th>
<th>mar.3</th>
<th>mar.4</th>
<th>mar.5</th>
<th>mar.i</th>
<th>bmn</th>
<th>bmc</th>
<th>bmd</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rushd</td>
<td>192</td>
<td>91.02</td>
<td>86.20</td>
<td>90.89</td>
<td>91.80</td>
<td>93.88</td>
<td>92.32</td>
<td>92.22</td>
<td>83.91</td>
<td>27.08</td>
<td>56.82</td>
</tr>
<tr>
<td>Sina</td>
<td>108</td>
<td>90.88</td>
<td>88.66</td>
<td>90.51</td>
<td>92.82</td>
<td>91.90</td>
<td>90.51</td>
<td>91.44</td>
<td>82.55</td>
<td>25.27</td>
<td>57.28</td>
</tr>
<tr>
<td><strong>p-val</strong></td>
<td></td>
<td>0.9269</td>
<td>0.3287</td>
<td>0.8799</td>
<td>0.6627</td>
<td>0.3175</td>
<td>0.4616</td>
<td>0.6063</td>
<td>0.5210</td>
<td>0.4943</td>
<td>0.8838</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-50</td>
<td>73</td>
<td>88.08</td>
<td>86.64</td>
<td>86.64</td>
<td>90.75</td>
<td>90.75</td>
<td>85.62</td>
<td>88.44</td>
<td>85.00</td>
<td>34.70</td>
<td>50.30</td>
</tr>
<tr>
<td>50-59</td>
<td>100</td>
<td>91.10</td>
<td>86.50</td>
<td>91.25</td>
<td>92.50</td>
<td>92.50</td>
<td>92.75</td>
<td>92.25</td>
<td>83.00</td>
<td>26.25</td>
<td>56.75</td>
</tr>
<tr>
<td>60-69</td>
<td>86</td>
<td>92.50</td>
<td>88.95</td>
<td>91.86</td>
<td>93.90</td>
<td>95.35</td>
<td>92.44</td>
<td>93.39</td>
<td>85.35</td>
<td>24.32</td>
<td>61.03</td>
</tr>
<tr>
<td>70-99</td>
<td>41</td>
<td>92.56</td>
<td>85.37</td>
<td>94.51</td>
<td>90.24</td>
<td>94.51</td>
<td>98.17</td>
<td>94.36</td>
<td>77.56</td>
<td>16.57</td>
<td>61.00</td>
</tr>
<tr>
<td><strong>p-val</strong></td>
<td></td>
<td>0.1085</td>
<td>0.7846</td>
<td>0.2076</td>
<td>0.6885</td>
<td>0.3194</td>
<td>0.0110</td>
<td>0.0396</td>
<td>0.1000</td>
<td>0.0002</td>
<td>0.0438</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>136</td>
<td>90.40</td>
<td>87.13</td>
<td>90.81</td>
<td>90.81</td>
<td>93.01</td>
<td>90.26</td>
<td>91.22</td>
<td>84.08</td>
<td>27.18</td>
<td>56.91</td>
</tr>
<tr>
<td>Male</td>
<td>99</td>
<td>92.32</td>
<td>87.12</td>
<td>93.43</td>
<td>94.44</td>
<td>93.43</td>
<td>93.18</td>
<td>93.62</td>
<td>80.35</td>
<td>25.59</td>
<td>54.76</td>
</tr>
<tr>
<td><strong>p-val</strong></td>
<td></td>
<td>0.2570</td>
<td>0.9969</td>
<td>0.3304</td>
<td>0.1461</td>
<td>0.8497</td>
<td>0.2952</td>
<td>0.1614</td>
<td>0.1222</td>
<td>0.5824</td>
<td>0.5289</td>
</tr>
<tr>
<td><strong>Civil Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>married</td>
<td>240</td>
<td>91.00</td>
<td>86.88</td>
<td>90.52</td>
<td>92.92</td>
<td>93.44</td>
<td>91.25</td>
<td>92.03</td>
<td>84.56</td>
<td>27.05</td>
<td>57.51</td>
</tr>
<tr>
<td>other</td>
<td>12</td>
<td>90.83</td>
<td>97.92</td>
<td>87.50</td>
<td>93.75</td>
<td>83.33</td>
<td>91.67</td>
<td>89.06</td>
<td>79.17</td>
<td>13.89</td>
<td>65.28</td>
</tr>
<tr>
<td>widow(er)</td>
<td>48</td>
<td>90.83</td>
<td>85.42</td>
<td>92.71</td>
<td>88.02</td>
<td>94.27</td>
<td>93.75</td>
<td>92.19</td>
<td>78.75</td>
<td>26.48</td>
<td>52.27</td>
</tr>
<tr>
<td><strong>p-val</strong></td>
<td></td>
<td>0.9956</td>
<td>0.1694</td>
<td>0.6857</td>
<td>0.2741</td>
<td>0.1018</td>
<td>0.7413</td>
<td>0.7226</td>
<td>0.0775</td>
<td>0.1296</td>
<td>0.2282</td>
</tr>
<tr>
<td><strong>Nationality</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jordanian</td>
<td>87</td>
<td>88.33</td>
<td>82.47</td>
<td>88.51</td>
<td>88.22</td>
<td>92.24</td>
<td>90.23</td>
<td>89.80</td>
<td>82.59</td>
<td>21.79</td>
<td>60.80</td>
</tr>
<tr>
<td>Syrian</td>
<td>212</td>
<td>92.05</td>
<td>88.92</td>
<td>91.63</td>
<td>93.75</td>
<td>93.63</td>
<td>92.33</td>
<td>92.84</td>
<td>83.68</td>
<td>28.07</td>
<td>55.61</td>
</tr>
<tr>
<td><strong>p-val</strong></td>
<td></td>
<td>0.0175</td>
<td>0.0153</td>
<td>0.2363</td>
<td>0.0261</td>
<td>0.5077</td>
<td>0.4184</td>
<td>0.0593</td>
<td>0.6261</td>
<td>0.0235</td>
<td>0.1128</td>
</tr>
<tr>
<td><strong>HS_over.15</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0_2</td>
<td>114</td>
<td>90.66</td>
<td>86.40</td>
<td>89.91</td>
<td>91.45</td>
<td>94.52</td>
<td>91.01</td>
<td>91.72</td>
<td>84.12</td>
<td>30.15</td>
<td>53.97</td>
</tr>
<tr>
<td>3_4</td>
<td>98</td>
<td>91.33</td>
<td>86.73</td>
<td>92.09</td>
<td>93.11</td>
<td>92.60</td>
<td>92.09</td>
<td>92.47</td>
<td>83.62</td>
<td>24.49</td>
<td>59.13</td>
</tr>
<tr>
<td>5_+</td>
<td>88</td>
<td>90.97</td>
<td>88.35</td>
<td>90.34</td>
<td>92.05</td>
<td>92.05</td>
<td>92.05</td>
<td>91.62</td>
<td>82.27</td>
<td>23.77</td>
<td>58.50</td>
</tr>
<tr>
<td><strong>p-val</strong></td>
<td></td>
<td>0.9255</td>
<td>0.7907</td>
<td>0.7288</td>
<td>0.8248</td>
<td>0.5257</td>
<td>0.9091</td>
<td>0.8761</td>
<td>0.7532</td>
<td>0.0698</td>
<td>0.2792</td>
</tr>
<tr>
<td><strong>HS_under.16</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>115</td>
<td>90.74</td>
<td>85.87</td>
<td>91.52</td>
<td>91.09</td>
<td>91.52</td>
<td>93.70</td>
<td>91.96</td>
<td>82.26</td>
<td>22.54</td>
<td>59.72</td>
</tr>
<tr>
<td>1_2</td>
<td>85</td>
<td>92.06</td>
<td>89.41</td>
<td>91.76</td>
<td>92.65</td>
<td>92.94</td>
<td>93.53</td>
<td>92.72</td>
<td>81.82</td>
<td>27.30</td>
<td>54.52</td>
</tr>
<tr>
<td>3_+</td>
<td>100</td>
<td>90.30</td>
<td>86.50</td>
<td>89.00</td>
<td>93.00</td>
<td>95.25</td>
<td>87.75</td>
<td>91.25</td>
<td>86.10</td>
<td>30.17</td>
<td>55.93</td>
</tr>
<tr>
<td><strong>p-val</strong></td>
<td></td>
<td>0.6070</td>
<td>0.4689</td>
<td>0.5830</td>
<td>0.7477</td>
<td>0.2514</td>
<td>0.0621</td>
<td>0.7337</td>
<td>0.1717</td>
<td>0.0360</td>
<td>0.3252</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>none</td>
<td>42</td>
<td>95.24</td>
<td>89.88</td>
<td>95.83</td>
<td>95.24</td>
<td>98.81</td>
<td>96.43</td>
<td>96.58</td>
<td>81.43</td>
<td>26.79</td>
<td>54.64</td>
</tr>
<tr>
<td>primary</td>
<td>191</td>
<td>90.42</td>
<td>86.26</td>
<td>90.97</td>
<td>91.88</td>
<td>91.88</td>
<td>91.10</td>
<td>91.46</td>
<td>84.03</td>
<td>26.85</td>
<td>57.18</td>
</tr>
<tr>
<td>secondary</td>
<td>24</td>
<td>90.62</td>
<td>88.54</td>
<td>85.42</td>
<td>92.71</td>
<td>92.71</td>
<td>92.71</td>
<td>93.75</td>
<td>91.15</td>
<td>80.00</td>
<td>23.09</td>
</tr>
<tr>
<td>university</td>
<td>43</td>
<td>89.42</td>
<td>87.21</td>
<td>87.79</td>
<td>90.12</td>
<td>93.60</td>
<td>88.37</td>
<td>89.97</td>
<td>84.53</td>
<td>26.07</td>
<td>58.47</td>
</tr>
</tbody>
</table>

**Mixed methods evaluation of MSF primary care based NCD service in Irbid, Jordan: February 2017- February 2018**
<table>
<thead>
<tr>
<th>No. NCD diagnoses</th>
<th>p-val</th>
<th>0.1042</th>
<th>0.7620</th>
<th>0.1680</th>
<th>0.6682</th>
<th>0.1042</th>
<th>0.2829</th>
<th>0.0688</th>
<th>0.6058</th>
<th>0.8868</th>
<th>0.9192</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p-val</td>
<td></td>
<td>0.8122</td>
<td>0.8586</td>
<td>0.9612</td>
<td>0.0239</td>
<td>0.9096</td>
<td>0.1702</td>
<td>0.8068</td>
<td>0.0006</td>
<td>0.4337</td>
<td>0.0053</td>
</tr>
<tr>
<td>No. MSF Medications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1_3</td>
<td>76</td>
<td>0.9079</td>
<td>0.816</td>
<td>0.9178</td>
<td>0.9243</td>
<td>0.9145</td>
<td>0.9013</td>
<td>0.9145</td>
<td>0.8013</td>
<td>0.2429</td>
<td>0.5584</td>
</tr>
<tr>
<td>4_6</td>
<td>152</td>
<td>0.9158</td>
<td>0.8832</td>
<td>0.9079</td>
<td>0.9293</td>
<td>0.9375</td>
<td>0.9211</td>
<td>0.9239</td>
<td>0.8349</td>
<td>0.2654</td>
<td>0.5695</td>
</tr>
<tr>
<td>7_15</td>
<td>72</td>
<td>0.8986</td>
<td>0.8333</td>
<td>0.8958</td>
<td>0.9028</td>
<td>0.9375</td>
<td>0.9236</td>
<td>0.9149</td>
<td>0.8674</td>
<td>0.2847</td>
<td>0.5826</td>
</tr>
<tr>
<td>p-val</td>
<td></td>
<td>0.6158</td>
<td>0.2177</td>
<td>0.8123</td>
<td>0.6334</td>
<td>0.5754</td>
<td>0.7475</td>
<td>0.8193</td>
<td>0.0729</td>
<td>0.5122</td>
<td>0.8497</td>
</tr>
<tr>
<td>No. Other sources of medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>121</td>
<td>0.9132</td>
<td>0.8554</td>
<td>0.9277</td>
<td>0.9360</td>
<td>0.9339</td>
<td>0.9132</td>
<td>0.9277</td>
<td>0.7934</td>
<td>0.2176</td>
<td>0.5758</td>
</tr>
<tr>
<td>1</td>
<td>162</td>
<td>0.9056</td>
<td>0.8796</td>
<td>0.8904</td>
<td>0.9167</td>
<td>0.9259</td>
<td>0.9151</td>
<td>0.9120</td>
<td>0.8596</td>
<td>0.2999</td>
<td>0.5597</td>
</tr>
<tr>
<td>2+</td>
<td>17</td>
<td>0.9235</td>
<td>0.8971</td>
<td>0.9265</td>
<td>0.8676</td>
<td>0.9706</td>
<td>0.9559</td>
<td>0.9301</td>
<td>0.8824</td>
<td>0.2574</td>
<td>0.6250</td>
</tr>
<tr>
<td>p-val</td>
<td></td>
<td>0.7806</td>
<td>0.5457</td>
<td>0.3011</td>
<td>0.3594</td>
<td>0.5587</td>
<td>0.7155</td>
<td>0.5521</td>
<td>0.0035</td>
<td>0.0075</td>
<td>0.5787</td>
</tr>
</tbody>
</table>
### Annex 6: Topic guide – Focus group discussions with NCD patients

<table>
<thead>
<tr>
<th>Key area</th>
<th>Themes</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Study aim and agencies involved</td>
<td>Why invited to participate? Consent &amp; any questions?</td>
</tr>
<tr>
<td>Participant Background</td>
<td>Getting to know each other + building rapport</td>
<td>Could you tell us a bit about yourself? Prompt: e.g. profession, what area live in, when you were first diagnosed with [NCD condition]?</td>
</tr>
</tbody>
</table>
| Reach | Access | What do you know about your NCD condition[s]? Prompt – e.g. causes, types, who gets it, treatment  
Could you tell me about how you came to learn about your NCD condition[s]? ? Prompt – e.g. from friends/family, from the radio (or other media), when diagnosed at hospital.  
What were you told about NCD condition[s] when you were enrolled in the MSF clinic? Prompt – probe understanding of NCD condition[s] such as causes, risks and its management (medication and diet).  
What do you think might prevent people from attending this service for their NCD condition[s]? Prompt: lack of knowledge, lack of services, costs, time, quality of services, stigma etc.  
How could access to healthcare for NCD condition[s] be improved? |
| Adoption and implementation | Information Support | How did you feel when you were enrolled into this clinic? Prompt: counselling/support experience. Prompt: subsequent days/weeks experience  
Who did you talk to about your experience at the clinic? Prompt: E.g. family members, friends.  
What were you told about managing your NCD condition[s] after you were enrolled in clinic (by the NCD staff)? Prompt: medicine types and usage, managing medicines, diet changes, risks and symptoms, frequency of check-ups etc.  
What sources of support did you receive in managing your NCD condition? Prompt: emotional support from family/friends, information support from health workers, MHPSS from health workers.  
What made it easier for you to access care – initially and continuing care?  
What made it difficult for you to access care – initially and continuing care?  
What made it easier for you to self-manage your NCD condition at home?  
What made it difficult for you to self-manage your NCD condition at home?  
How acceptable do you find the NCD service / treatment? Prompt: e.g. logistically, socially, culturally etc., differences with previous experience of treatment/ service?  
What has been your experience of the psychosocial services offered by the programme – group sessions/individual counselling? |
| Maintenance | Challenges Supportive factors To support adoption and implementation | What have been the main challenges in maintaining your medical treatment for your NCD condition? Prompt: time, costs, information, drug supply, pill burden, stigma/shame etc.  
What have been the main challenges in altering your diet? Prompt: information, costs, support  
What have been the main challenges in increasing your levels of exercise? Prompt: information, suitable facilities or locations, physical condition, support, costs  
What have been the main challenges in reducing or quitting smoking? Prompt: information, support, costs, desire  
What could have made accessing care easier for you? Prompt: e.g. Information given – content and way it was delivered; costs; type and quality of care and support; focus on role of the NCD programme/services;  
What could have made achieving lifestyle changes easier for you? Prompt: e.g. information given – content and way it was delivered; costs; type and quality of care and support; focus on role of the NCD programme/services;  
What support is available to help you to continue to attend the clinic and self-manage your condition?  
What additional supports regarding your NCD condition would you like to have? |
| Effectiveness | Unintended consequences Benefits | What have been the negative consequences of taking NCD treatment / attending the service? Prompt: physical, psych, costs, time.  
What have been the benefits of receiving NCD treatment / attending the service? Prompt: e.g. physical, psychological, social, economic.  
What have been the benefits or negative consequences of attending group sessions/ individual counselling? |
| Thanks and close | Anything else to add Questions/Thanks, feedback info | Anything else to add on topic that we haven’t discussed today? Any questions for me? Feedback again on how the discussion will be used and fed back. |
## Annex 6b: Topic guide – Semi-structured interviews with NCD patients

The topic guides for the semi-structured interviews are indicative and they will be refined based on findings from the focus groups.

<table>
<thead>
<tr>
<th>Key area</th>
<th>Themes</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>Study aim and agencies involved</td>
<td>Could you tell us a bit about yourself? Prompt: e.g. profession, what area live in, when you were first diagnosed with NCD condition?</td>
</tr>
<tr>
<td></td>
<td>Why invited to participate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consent &amp; any questions?</td>
<td></td>
</tr>
<tr>
<td><strong>Participant Background</strong></td>
<td>Getting to know each other + building rapport</td>
<td></td>
</tr>
<tr>
<td><strong>Reach</strong></td>
<td>Knowledge in community</td>
<td>What do you know about your condition? Prompt – e.g. causes, types, who gets it, treatment</td>
</tr>
<tr>
<td></td>
<td>Access to testing for [NCD condition]</td>
<td>What has been your experience in accessing healthcare and medications for your condition? Prompt – in Syria, in Jordan, other NGOs or clinics, why choose to come to MSF clinic, does experience differ?</td>
</tr>
<tr>
<td></td>
<td>Barriers to testing</td>
<td>Do you think a lot of people have your NCD condition in your community?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What do you think prevents people from accessing healthcare/medications for NCD conditions?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What do you think would make it easier for people to access healthcare / medications for NCD conditions?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If MSF were not providing this service what would you do to manage your condition?</td>
</tr>
<tr>
<td><strong>Adoption and</strong></td>
<td>Information and other support provided</td>
<td>What type of information provided to you about your condition and its treatment when you were enrolled in the MSF clinic? Prompt: causes, who gets it, chronic nature, medicine types and usage, managing medicines, diet changes, risks and symptoms, frequency of check-ups etc.</td>
</tr>
<tr>
<td><strong>implementation</strong></td>
<td>Adjusting to condition</td>
<td>What sources of support did you receive? Prompt: emotional support from family/friends, information support from health workers, psychosocial support from health workers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What other support would you have liked to receive?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do you find it easy to come in to the clinic from the beginning? Prompt: facilitators or barriers e.g. logistically, socially, culturally</td>
</tr>
<tr>
<td></td>
<td></td>
<td>How has having your NCD condition changed your daily life/routine? Prompt: e.g. difficulties in changing your daily routine, in Syria or in Jordan?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What is your experience of the MHPSS part of the programme (group sessions or individual counselling)?</td>
</tr>
<tr>
<td><strong>Maintenance</strong></td>
<td>Barriers/challenges to adhering to appointments and prescribed medicine/ lifestyle change.</td>
<td>Do you come in regularly for all your appointments?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do you find it easy or difficult to do so? Why? (e.g. travel, time, stigma)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What is your experience when you come to the clinic?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do you experience any difficulties when you are visiting the clinic for follow up?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What could be done to make it easier for you to come to the clinic?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do you take your medicines as often as you are prescribed? Why? (Prompt: don’t think it’s important, unsure how to take them, can’t read the instructions, too many pills, share with family/friends, supply rupture)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do you find it easy or difficult to do so? Why? (Prompt difficult to remember)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do you feel any pressure not to take your medicines (Prompt: stigma from family or community, cost, medication shifting)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What could be done to make it easier for you to take your medications?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do you find it easy to maintain the recommended diet, exercise levels, smoking cessation for your condition?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What has helped you to make lifestyle changes? Prompt: health education, medical staff, family or community support?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What challenges do you face in adapting your diet, exercise levels and smoking habits?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do you thing MHPSS is important?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What challenges do you face in taking part in or attending MHPSS support (group sessions, or individual counselling)?</td>
</tr>
<tr>
<td><strong>Effectiveness</strong></td>
<td>How coming to the clinic has affected patient’s condition</td>
<td>What have been the negative consequences of taking treatment for the condition / attending the service? Prompt: physical, psych, costs, time.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What have been the benefits of receiving treatment for your condition / attending the service? Prompt: e.g. physical, psychological, social, economic.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What have been the positive and negative consequences for you in attending the MHPSS sessions (group or individual counselling)? (Prompt: feel supported, feel better, assists with managing NCD condition, upsetting, difficult)</td>
</tr>
<tr>
<td><strong>Thanks and close</strong></td>
<td>Anything else to add</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Questions/Thanks, feedback info</td>
<td></td>
</tr>
</tbody>
</table>
Annex 6c: Topic guide – Semi-structured interviews with NCD health care providers and staff

The topic guides for the semi-structured interviews are indicative and they will be refined based on findings from the patient focus groups.

<table>
<thead>
<tr>
<th>Key area</th>
<th>Themes</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Study aim and agencies involved</td>
<td>You could tell us a bit about yourself? Prompt: e.g. professional, involvement in the NCD service in Irbid (and previously if relevant)?</td>
</tr>
<tr>
<td></td>
<td>Why invited to participate</td>
<td>Consent &amp; any questions?</td>
</tr>
</tbody>
</table>
| Participant Background        | Getting to know each other + building rapport                         | Why invited to participate? Consent & any questions?

| Reach                         | Access                                                                 | What are the key challenges for patients to access healthcare (medications, regular clinical review, investigations; interventions) for their NCD condition(s) e.g. knowledge, costs, time, availability or quality of care [expand], stigma etc. How could access to healthcare for NCD condition be improved? Prompt: improve knowledge (e.g. outreach, radio, health workers etc.)
|                               | Barriers to NCD care provision                                       | improve availability of services, quality of services etc.                                                                                                                                               |
|                               | Ways of reducing barriers                                            |                                                                                                                                                                                                          |

| Adoption and implementation   | Information and support                                               | What types of information are provided to patients when they are enrolled in/attend the NCD service?                                                                                                    |
|                               |                                                                        | What sources of support are offered to patients when they are enrolled in/attend the NCD service?                                                                                                                                                          |
|                               |                                                                        | How acceptable do you think the MSF NCD programme, including treatment, is for patients? Prompt: e.g. quality, responsiveness, socially, culturally etc.                                                                                           |
|                               |                                                                        | What is your experience with implementing the new MSF NCD guideline? Prompt: e.g. quality, responsiveness, socially, culturally etc.                                                                                                                   |
|                               |                                                                        | What sources of support and information were available to you to facilitate implementing the guideline?                                                                                               |

| Maintenance                   | Challenges                                                            | What do you think are the main challenges facing NCD patients here in terms of managing their condition? Prompt: medicines/testing/attendance - time, costs, information, drug supply etc.; lifestyle changes – knowledge, social/cultural pressures etc. |
|                               | Supportive factors                                                   | What could be done to make it easier for NCD patients to access care? Prompt: e.g. information given – content and way it was delivered; costs; type and quality of care and support; [note: focus on role of the [NCD condition] programme/services]. |
|                               | To support adoption and implementation                                | What do you think are the main challenges facing staff here in terms of delivering the NCD care programme in Irbid? Prompt: time, training, clinical support/supervision, guidelines or tools |
|                               |                                                                        | What could be done to make it easier for staff to deliver this NCD care programme? Prompt: knowledge, time, training, clinical support/supervision, guidelines or tools |
|                               |                                                                        | What are the benefits of using the MSF NCD guideline?                                                                                                                                            |
|                               |                                                                        | What are the challenges around using the MSF NCD guideline?                                                                                                                                       |
|                               |                                                                        | What could be done to facilitate implementation of the guideline?                                                                                                                                   |

| Effectiveness                 | Unintended consequences                                              | What are the benefits of the NCD care programme in Irbid? Prompt: more efficient, less complications, for patients, for staff, for system, for community etc. |
|                               | Benefits                                                              | What are negative consequences of the NCD care programme in Irbid? Prompt: time, complexity, costs etc. for patients, for staff, for system, for community |
|                               |                                                                        | What particular aspects of the programme have helped or hindered NCD care? Prompt: clinical aspects, task shifting, introduction of HLO, MHPSS, HV, structures, tools, systems |
|                               |                                                                        | What particular aspects of the guideline have helped or hindered NCD care? Prompt: supports decision making, ease of use, contradictory, not acceptable to patients, different to usual practice in Jordan. |
Annex 6d: Topic guide – Semi-structured interviews with key stakeholders

The topic guides for the semi-structured interviews with key stakeholders are indicative and they will be refined based on findings from the patient focus groups and interviews and will vary depending on respondent type.

<table>
<thead>
<tr>
<th>Key area</th>
<th>Themes</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>Study aim and agencies involved</td>
<td>Could you tell us a bit about yourself? Prompt: e.g. professional, involvement in the NCD service in Irbid (and previously if relevant)?</td>
</tr>
<tr>
<td></td>
<td>Why invited to participate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consent &amp; any questions?</td>
<td></td>
</tr>
<tr>
<td><strong>Participant Background</strong></td>
<td>Getting to know each other + building rapport</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Access Ribbon to NCD care provision</td>
<td>What are the key challenges for patients to access healthcare (medications, regular clinical review, investigations, interventions) for their NCD condition(s) e.g. knowledge, costs, time, availability or quality of care [expand], stigma etc.</td>
</tr>
<tr>
<td></td>
<td>Ways of reducing barriers</td>
<td>How could access to healthcare for NCD condition be improved? Prompt: improve knowledge (e.g. outreach, radio, health workers etc.), improve availability of services, quality of services etc.</td>
</tr>
<tr>
<td><strong>Adoption and implementation</strong></td>
<td>Information and support</td>
<td>How acceptable do you think the MSF NCD programme, including treatment, is for patients? Prompt: e.g. quality, responsiveness, socially, culturally etc.</td>
</tr>
<tr>
<td></td>
<td>Supportive factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>To support adoption and implementation</td>
<td></td>
</tr>
<tr>
<td><strong>Maintenance</strong></td>
<td>Challenges</td>
<td>What do you think are the main challenges facing NCD patients in this area in terms of managing their condition? Prompt: medicines/testing/attendance - time, costs, information, drug supply etc.; lifestyle changes – knowledge, social/cultural pressures etc.</td>
</tr>
<tr>
<td></td>
<td>Supportive factors</td>
<td>What could be done to make it easier for NCD patients to access care? Prompt: e.g. information given – content and way it was delivered; costs; type and quality of care and support; [note focus on role of the [NCD condition] programme/services].</td>
</tr>
<tr>
<td></td>
<td>To support adoption and implementation</td>
<td>What do you think are the main challenges facing staff here in terms of delivering the NCD care programme in Irbid? Prompt: time, training, clinical support/supervision, guidelines or tools</td>
</tr>
<tr>
<td></td>
<td>Supportive factors</td>
<td>What could be done to make it easier for staff to deliver NCD care programme? Prompt: knowledge, time, training, clinical support/supervision, guidelines or tools.</td>
</tr>
<tr>
<td></td>
<td>To support adoption and implementation</td>
<td>What are the benefits of using the MSF NCD guideline? [ask if appropriate]</td>
</tr>
<tr>
<td></td>
<td>Supportive factors</td>
<td>What could be done to facilitate implementation of the guideline? [ask if appropriate]</td>
</tr>
<tr>
<td><strong>Effectiveness</strong></td>
<td>Unintended consequences</td>
<td>What are the benefits of the NCD care programme in Irbid? Prompt: more efficient, less complications, for patients, for staff, for system, for community etc.</td>
</tr>
<tr>
<td></td>
<td>Benefits</td>
<td>What are negative consequences of the NCD care programme in Irbid? Prompt: time, complexity, costs etc. for patients, for staff, for system, for community.</td>
</tr>
<tr>
<td></td>
<td>Benefits</td>
<td>What particular aspects of the programme have helped or hindered NCD care? Prompt: clinical aspects, task shifting, introduction of HLO, MHPSS, HV, structures, tools, systems</td>
</tr>
<tr>
<td></td>
<td>Benefits</td>
<td>What particular aspects of the guideline have helped or hindered NCD care? Prompt: supports decision making, ease of use, contradictory, not acceptable to patients, different to usual practice in Jordan.</td>
</tr>
<tr>
<td><strong>Thanks and close</strong></td>
<td>Anything else to add questions</td>
<td>Anything else to add on topic that we haven’t discussed today? Any questions for me? Feedback again on how the discussion will be used and fed back.</td>
</tr>
<tr>
<td></td>
<td>Thanks, feedback info</td>
<td></td>
</tr>
</tbody>
</table>
Annex 6e: Patient self-report medication adherence and beliefs questionnaire

### Section 1

#### Age (tick one):

- 16-19
- 20-29
- 30-39
- 40-49
- 50-59
- 60-69
- 70-79
- 80-89
- 90-99

#### Gender (tick one):

- Male
- Female

#### Marital status (tick one):

- Single
- Married
- Widow(er)
- Divorced

#### Household size (tick one from (a) and one box from (b)):

(a) How many people aged 16 or older live with you currently, including non-relatives.

- 0
- 1-2
- 3-4
- 5-6
- > 6

(b) How many children under 16 years of age live with you currently, including non-relatives.

- 0
- 1-2
- 3-4
- 5-6
- > 6

#### Highest education level reached (tick one):

- None
- Primary
- Secondary
- High School
- University

#### Diagnosis (tick all that apply):

- Diabetes
- Asthma
- Chronic Lung Disease (other than asthma)
- Thyroid
- Hypertension
- Ischaemic Heart Disease / Angina
- Peripheral Vascular Disease
- Stroke / Transient Ischaemic Attack
- Other

Please specify:

Please indicate the number of REGULAR medications on your most recent prescription from the MSF clinic (include tablets or insulin only; exclude equipment e.g. glucose strips etc.)

1.8

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7-10
- 11-15
- 16-20
- > 20

- Do you take medications that you get from other sources?

- Yes
- No

- If Yes, (circle all that apply):

- Pharmacy
- Family/friends
- NGO clinic
- MOH clinic
- Private clinic
Section 2

- Many people find a way of using their medicines which suits them.
- This may differ from the instructions on the label or from what their doctor has said.
- We would like to ask you a few questions about how you use your medicines.

Here are some ways in which people have said that they use their medicines.
For each of the statements, please tick the box which best applies to you:

<table>
<thead>
<tr>
<th>Your own way of using your medicines</th>
<th>Always</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 I forget to take them</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 I alter the dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3 I stop taking them for a while</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.4 I decide to miss out a dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5 I take less than instructed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Over the last 7 days how much of your medicine have you used?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>None used</td>
<td>(0%)</td>
<td>All used</td>
<td>(100%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Over the last MONTH how much of your medicine have you used?

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>None used</td>
<td>(0%)</td>
<td>All used</td>
<td>(100%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MARS_5VA RH2002
Medication Adherence Report Scale _5 ©R Horne University of Brighton, 1999.
Section 3

For each question, please circle one answer from 1 to 5:

(1=strongly disagree, 2=disagree, 3=uncertain, 4=agree, 5=strongly agree)

3.1 My health, at present, depends on my medicines 1 2 3 4 5
3.2 Having to take my medicines worries me 1 2 3 4 5
3.3 My life would be impossible without my medicines 1 2 3 4 5
3.4 I sometimes worry about long-term effects of my medicines 1 2 3 4 5
3.5 Without my medicines, I would be very ill 1 2 3 4 5
3.6 My medicines are a mystery to me 1 2 3 4 5
3.7 My health in the future will depend on my medicines 1 2 3 4 5
3.8 My medicines disrupt my life 1 2 3 4 5
3.9 I sometimes worry about becoming too dependent on my medicines 1 2 3 4 5
3.10 My medicines protect me from becoming worse 1 2 3 4 5
3.11 These medicines give me unpleasant side effects 1 2 3 4 5


4.1 TO BE ANSWERED BY MSF STAFF MEMBER

Questionnaire filled by (circle on option): Patient 1
MSF Staff 2
**Annex 7: Individual Interview Participant Details**

### Patient Details

<table>
<thead>
<tr>
<th>Code</th>
<th>Diagnosis</th>
<th>Origin</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT01</td>
<td>DM, HTN</td>
<td>Jordanian</td>
<td>Male</td>
</tr>
<tr>
<td>PT02</td>
<td>DM, HTN</td>
<td>Jordanian</td>
<td>Female</td>
</tr>
<tr>
<td>PT03</td>
<td>DM</td>
<td>Syrian</td>
<td>Female</td>
</tr>
<tr>
<td>PT04</td>
<td>CVD asthma</td>
<td>Jordanian</td>
<td>Male</td>
</tr>
<tr>
<td>PT05</td>
<td>DM, CVD, MH</td>
<td>Syrian</td>
<td>Male</td>
</tr>
<tr>
<td>PT06</td>
<td>DM, HTN,</td>
<td>Syrian</td>
<td>Male</td>
</tr>
<tr>
<td>PT07</td>
<td>HTN</td>
<td>Syrian</td>
<td>Male</td>
</tr>
<tr>
<td>PT08</td>
<td>DM, HTN</td>
<td>Syrian</td>
<td>Male</td>
</tr>
<tr>
<td>PT09</td>
<td>DM</td>
<td>Jordanian</td>
<td>Female</td>
</tr>
<tr>
<td>PT10</td>
<td>MD, MH, HLO</td>
<td>Syrian</td>
<td>Female</td>
</tr>
<tr>
<td>PT11</td>
<td>DM, asthma, MH</td>
<td>Syrian</td>
<td>Female</td>
</tr>
<tr>
<td>PT12</td>
<td>DM, CVD</td>
<td>Syrian</td>
<td>Male</td>
</tr>
<tr>
<td>PT13</td>
<td>DM (wife of patient)</td>
<td>Jordanian</td>
<td>Female</td>
</tr>
<tr>
<td>PT14</td>
<td>DM, HTN</td>
<td>Jordanian</td>
<td>Male</td>
</tr>
<tr>
<td>PT15</td>
<td>DM, HTN, CVD, HLO</td>
<td>Syrian</td>
<td>Female</td>
</tr>
<tr>
<td>PT16</td>
<td>HTN, CVD, HV</td>
<td>Syrian</td>
<td>Male</td>
</tr>
</tbody>
</table>

### Staff Details

<table>
<thead>
<tr>
<th>Code</th>
<th>Role</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST01</td>
<td>Psychosocial counsellor</td>
<td>Female</td>
</tr>
<tr>
<td>ST02</td>
<td>Psychosocial counsellor</td>
<td>Female</td>
</tr>
<tr>
<td>ST02</td>
<td>Registrar</td>
<td>Female</td>
</tr>
<tr>
<td>ST04</td>
<td>MD</td>
<td>Female</td>
</tr>
<tr>
<td>ST05</td>
<td>MD</td>
<td>Male</td>
</tr>
<tr>
<td>ST06</td>
<td>Health educator</td>
<td>Female</td>
</tr>
<tr>
<td>ST07</td>
<td>Home visit nurse</td>
<td>Male</td>
</tr>
<tr>
<td>ST08</td>
<td>Pharmacist</td>
<td>Female</td>
</tr>
<tr>
<td>ST09</td>
<td>MD (family medicine specialist)</td>
<td>Female</td>
</tr>
<tr>
<td>ST11</td>
<td>Medical Coordinator</td>
<td>Female</td>
</tr>
<tr>
<td>ST12</td>
<td>Project Coordinator</td>
<td>Female</td>
</tr>
<tr>
<td>ST13</td>
<td>Mental Health Activities Manager</td>
<td>Female</td>
</tr>
<tr>
<td>ST14</td>
<td>Medical Activities Manager</td>
<td>Male</td>
</tr>
<tr>
<td>ST15</td>
<td>Medical Activities Manager</td>
<td>Male</td>
</tr>
<tr>
<td>ST16</td>
<td>Project Coordinator</td>
<td>Male</td>
</tr>
<tr>
<td>ST17</td>
<td>Medical Coordinator</td>
<td>Male</td>
</tr>
<tr>
<td>ST18</td>
<td>Intersectional Pharmacist</td>
<td>Male</td>
</tr>
</tbody>
</table>

### Stakeholders Details

<table>
<thead>
<tr>
<th>Code</th>
<th>Role</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>KS01</td>
<td>NGO</td>
<td>Male</td>
</tr>
<tr>
<td>KS02</td>
<td>MOH District</td>
<td>Male</td>
</tr>
<tr>
<td>KS03</td>
<td>MOH District</td>
<td>Female</td>
</tr>
<tr>
<td>KS04</td>
<td>MOH Clinic</td>
<td>Male</td>
</tr>
<tr>
<td>KS05</td>
<td>MOH Central</td>
<td>Male</td>
</tr>
<tr>
<td>KS06</td>
<td>Syrian Community Member</td>
<td>Male</td>
</tr>
<tr>
<td>KS07</td>
<td>NGO</td>
<td>Female</td>
</tr>
</tbody>
</table>

Key: CVD=cardiovascular disease; DM=Diabetes Mellitus; HLO=humanitarian liaison officer; HTN=hypertension; HV=home visit; KS=key stakeholder; MD=medical doctor; MH=mental health; MOH=Ministry of Health; NGO=non-governmental organisation; PT=patient; ST=staff