
# Morbidity, healthcare needs and barriers to access medical care amongst local and displaced populations in west Dar'a and Quneitra, Southern Syria.

# Morbidity, healthcare needs and barriers to access medical care amongst local and displaced populations in west Dar'a and Quneitra, Southern Syria.


## Protocol

Operational Centre Amsterdam, Jordan – Southern Syria Project

| | |
|---|---|
| **First version** | 8 June 2017 |
| **Second version** | 20 September 2017 |
| **Study design** | Mixed methods design – cross sectional household survey, health actor assessment |
| **Survey type** | 2-stage cluster sampling with systematic random sampling |
| **Study period** | November -December 2017 [data collection] |
| **Survey site** | Western Dar'a governorate and eastern Quineitra governorate, |

| | |
|---|---|
| | Syria |
| **Principal investigator** | Tobias Homan Ph.d, mission epidemiologist, MSF-OCA Jordan |
| **Co-investigators** | ▪ Dr. Muhammad Shoaib (MedCo)<br>MSF-OCA, Amman, Jordan<br>▪ Allan de Rosa (PC Southern Syria project)<br>MSF-OCA, Amman, Jordan<br>▪ Imad Aldin Alfadel (PC assistant Southern Syria project)<br>MSF-OCA, Amman, Jordan<br>▪ Susan Stein (PMR Southern Syria project)<br>MSF-OCA, Amman, Jordan<br>▪ Dr. Fadi Khalaileh (MAM Southern Syria project)<br>MSF-OCA, Amman, Jordan<br>▪ Nahed Al-Khalouf (Head of Mission Advisor)<br>MSF-OCA, Amman, Jordan<br>▪ Karla Bil (Health advisor)<br>MSF-OCA, Amsterdam, Netherlands |
| **Data collection and analysis** | Collection by MSF-OCA supported staff and Nama<br>Analysis by MSF-OCA |
| **Protocol and study design** | ▪ Tobias Homan (Mission epidemiologist)<br>MSF-OCA, Jordan, Netherlands<br>▪ Dr. Muhammad Shoaib (MedCo)<br>MSF-OCA, Amman, Jordan |
| **Collaborating institutions** | Directorate of Health, Dar'a<br>Directorate of Health, Quneitra<br>Nama local NGO, Dar'a |

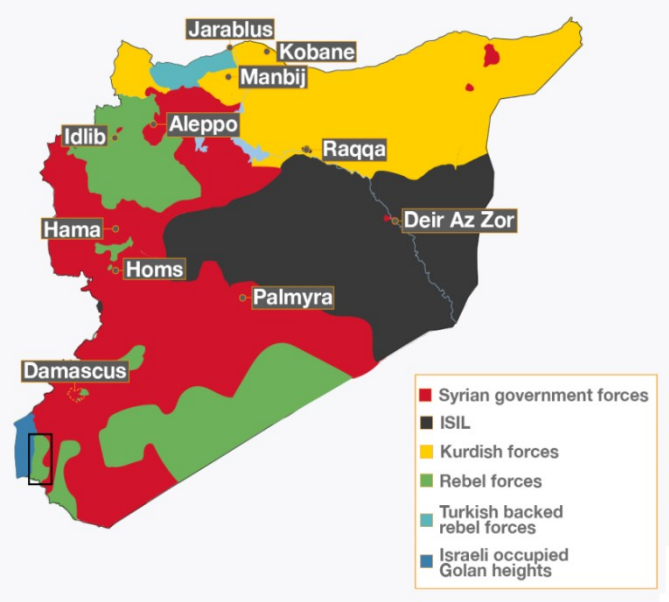
# Table of Contents

# 1. Introduction

## 1.1 Background

The civil war in Syria experienced its 6th anniversary on March 17th 2017. The nature of the conflict became untenable after the Arab spring sparked a revolt by several parties[1] opposing the Government of Syria [GoS]. The Syrian civil war broke out starting in the Southern governorate of Dar'a when anti-regime demonstrations started to be repressed. Recent resources report that ever since, the war has claimed almost half a million human lives and displaced over 12 million people of which an estimated six million people are currently displaced throughout the country [2]. Millions of displaced Syrians found asylum in neighbouring countries, with about 2 million crossing the border with Jordan and 1.5 million to Lebanon. The Syrian civil war has divided the country into a patchwork of regions controlled by roughly three main actors (Fig. 1). The Islamic State of Iraq and the Levant [ISIS] controlled large areas in the north and central regions of Syria, as well as a patch (black) in Dar'a (Fig. 2)[3], however due to offences of international coalitions in 2017 their power is steadily decreasing . The opposing forces (rebel groups against the GoS), the Free Syrian Army [FSA], have claimed control over two main regions, one in the Northwest (Idlib) and the governorates of Dar'a and Quneitra in the south[3].

**Figure 1:** Territories and forces during the Syrian civil war, July 2017. West Dar'a and Quneitra indicated in the south-west. *Source: Institute for the study of war*




**Syrian crisis in the governorates of Dar'a and Quneitra**

Consequently, Southern Syria has been a stronghold of the opposition and therefore the GoS clashes with opposition forces from day one of the war. As a result of the continuous threat of conflict and combat, by May 2017, over 345,000 (almost half of the resident population) are considered internally displaced people [IDPs] in both Dar'a and Quneitra[2]. The conditions of the IDP populations and their access to services are subject to the local governance of the region they settle in. This makes them extremely vulnerable and poses different challenges that disproportionally impact IDP as well as local populations in these areas[4]. Due to this highly

1 *The Arab spring: the end of post-colonialism*. November 2012 [H. Dabashi]

2 *Syria in Focus*. June 2017 [UNHCR update report]

3 *Syria: who controls what?* July 2017 [Institute for the study of war]

4 *The Syrian public health and humanitarian crisis: A 'displacement' in global governance*? 1–17, 2017 [ S. Akbarzada, Glob. Public Health]

dynamic and insecure situation as bombings and aerial attacks in Dar´a continued, hospitals and medical structures in the area have been targeted leaving remaining clinics and hospitals with diminutive capacity according to the World Health Organisation [WHO]. However, since July 2017 a truce was signed by the FSA and the GoS, which may alter the medical demands of the population.

1.2 ContextMany Syrians continue to try and flee the country, escaping to the western and southern borders via Dar'a to avoid the violence in skirmish zones in ISIS occupied areas. The United Nations High Commissioner for refugees [UNHCR] in 2017 has documented increasing amount of displaced populations in Dar'a and Quneitra looking for shelter.[5]

The political instability, armed conflict, breakdown of government services, limited access to healthcare, insufficient vaccination coverage, food shortages and the lack of qualified medical staff and supplies have contributed to an increase in morbidity and mortality among civilians living in Southern Syria[6]. As the conflict remains, IDPs are suffering from the deterioration of their health situation due to a heavily compromised access to health care. This is putting IDPs at risk of infectious diseases, malnutrition, the aggravation of non-communicable diseases due to absence of continued care, the lack of access to maternal, neonatal and child care, ware related surgery and vaccinations[7][8].

**Health care services and actors Dar'a and Quneitra**

The sheer demand for health services places enormous strain on public health infrastructure, and has resulted in overwhelming patient caseloads, overworked health staff and shortages of medicines and equipment[8]. Since the destabilisation of Dar'a and the closure of the border with Jordan in 2016, many civilians are seeking secure villages in Dar'a. IDP's in Quneitra tend to cluster together close to borders or in relatively quiet areas. Before the war, health care

**Figure 2:** Distribution of territories of forces in the Dar'a and Quineitra governorates. Green areas are FSA, red areas are GoS and black areas are ISIS, May 2017. *Source: southfront.org*

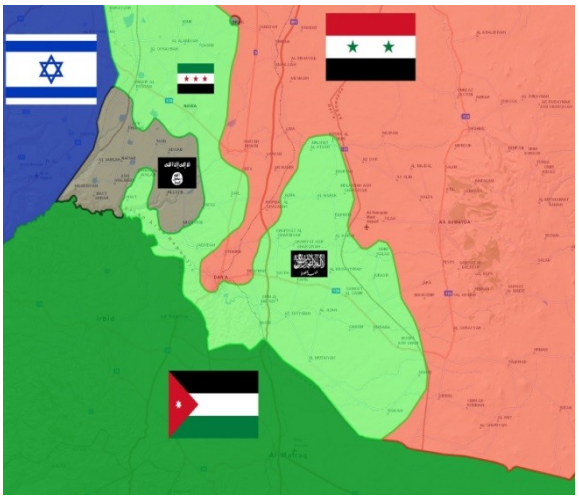
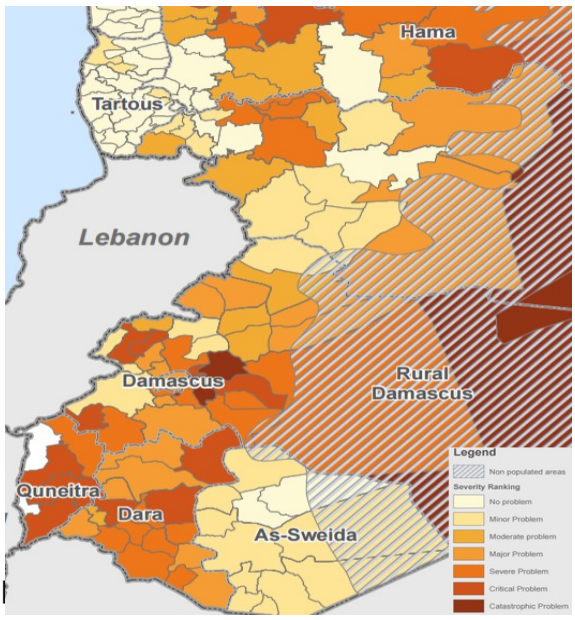


**Figure 3:** State of health care services in Southern Syria. *Source: WHO, humanitarian response. info, health sector severity ranking.*




5 *Summary of UNHCR Syria IDP operations*. June 2017

6 *Syria in Focus*. June 2017 [UNHCR update report]

7 *EWARN epi bulletins*. Jan-June 2017 [Early warning and response network, Southern Syria]

infrastructure was well established, conversely six years of conflict has harmfully affected the health care system delivery[9]. This breakdown of the health care services (Fig. 3) has severely affected the local and IDP population's ability to reach out to basic health care. Consequently, appropriate surveillance of current health care needs and knowledge about access to health care is deficient, resulting in gaps of information about the provision of essential health care[10].

Nevertheless, the health system led by the Directorates of Health [DoH] of both governorates, are present, often heavily relying on aid from United Nations [UN] agencies[10] (UN Office for the Coordination of Humanitarian Affairs [UNOCHA], WHO) and international Non-Governmental Organizations [NGO]. Based on a health facility mapping by WHO in May 2017, there are few health facilities (health centres, clinics, hospitals) in the governorates of Dar'a and Quineitra, which vary in terms of functionality, quality of care as well as resources available, including medical supplies and equipment. The services provided range widely, with the most important medical actors being: International Medical Corps [IMC], Medecins Sans Frontieres [MSF] (sections France, Holland and Spain), International Committee of the Red Cross [ICRC], Medecins du Monde [MDM], International Rescue Committee [IRC], Syrian American Medical Society [SAMS], WorldVision and MedAir[11]. In terms of health surveillance systems operating in Syria there are currently two organizations: the Syrian government Early Warning and Response System [EWARS] is associated and supported by the WHO and operates since 2012 in government controlled areas. In non-government controlled areas, the independent Early Warning and Response Network [EWARN] has been implemented in 2013 and is administered by the Assistance Coordination Unit [ACU], mainly with support from the Centre of Disease Control [CDC]. The EWARS currently covers 1100 sentinel sites across Syria the exact locations are unknown. The EWARN is based on 526 sentinel sites all over Syria, which includes 27 facilities in Dar'a and 5 sites in Quneitra[12].

Reports on morbidities and generally identified health care needs in Dar'a and Quneitra are scarce. Nonetheless, WHO and UNHCR reported on some critical health care issues. Besides Medecins Sans Frontieres, Operational Center Barcelona [MSF-OCBA] conducted a health household survey in east Dar'a in July 2017, which has many demographical and health care related similarities. They emphasize that vulnerable populations are at heightened risk of communicable diseases due to overcrowding, substandard housing, limited access to safe water and sanitation and varying degrees of access to primary health care [PHC] services. Furthermore, sudden increases in cases of mumps and measles have been abundant over the past two years. Subsequently, the need for routine immunization of children against vaccine-preventable illnesses remains a key priority. Additionally, management of non-communicable

8

9 Syrian Arab Republic Humanitarian Response Plan. 2017 [WHO report]

10 *Health care in Syria before and during the crisis*. July 2012 [M. Kheralla, Avicenna J Med]

11 *Syrian Arab Republic Humanitarian Response Plan. 2017* [WHO report]

12 http://www.emro.who.int/syr/information-resources/ewars-bulletins-2017.html [EWARS website]

http://www.acu-sy.org/en/early-warning-alert-and-response-network [EWARN website]

diseases is a major challenge. High prevalence of hypertension, diabetes and cardio-vascular diseases among Syrian IDPs continues to spur demand for early diagnostic services and medicines[10]. Moreover, the need for emergency care remains, with surgical trauma and intensive care for severely injured patients from conflict areas requiring considerable inputs of equipment and resources. Ensuring the provision of adequate and appropriate emergency obstetric and neonatal care services at primary, secondary and tertiary levels, and family planning services, is also essential as well as counselling on birth registration as part of pre-natal services[13][14].

**MSF-OCA in Dar'a and Quneitra**

The Dutch section of MSF, operational centre Amsterdam [MSF-OCA] supports 2 hospitals in West Dar'a, Tafas and Tal Shihab, and one in Quinetra, Ar Rafeed (See red crosses Fig 4). MSF-OCA is supporting Tal Shihab Hospital for vascular and trauma related surgery, Ar Rafeed hospital for emergency room [ER] and operating theatre [OT] linked to the trauma related surgeries. Whereas MSF-OCA is supporting Tafas by a scaled up support to secondary level hospital with the exception of cancer treatment, dialysis and advanced diagnostics such as computed tomography [CT] scan. MSF-OCA is supporting these hospitals through incentives, medical supply donations, administrative and logistic support, additionally technical support is provided through remote support by a team based in Amman, Jordan. Historically MSF response has been mainly linked to trauma related surgery support in these hospitals however for the last one year MSF-OCA has been also addressing non-trauma related health needs especially in Tafas Hospital. About 80% of the patients treated in these facilities are above 5 years old. Male patients account for roughly 2/3 of the patients. Of the number of injuries 40% is war related in Tafas, whereas 25% is war related in Tal Shihab and Ar Rafeed. War related injuries remain one of the major morbidities amongst the supported hospitals. Acute curative consultations include upper and lower respiratory tract infections [URTI, LRTI], diarrhoea, gastritis, urinary tract infections [UTI], anaemia, skin and eye disease and few cases of leishmaniosis and tuberculosis as well as psychological disorders. Chronic curative consultations at these facilities include hypertension, diabetes, respiratory disorders, epilepsy and musculoskeletal disease. Ar Rafeed conducts a substantial number of ante/post-natal consultations, whereas Tafas and Tal Shihab to a lesser extent. Tafas has much surgical capacity, while Al Rafeed and Tal Shihab to a lesser extent. Referrals to other hospitals due to complications are regularly done, if appropriate and possible. MSF Operational Centre Paris [MSF-OCP] supports a large hospital with comprehensive care in the town of Nawa in the north of west Dar'a.

## 1.3 Justification for survey

Limited information is available on the medical situation of the local population and IDPs in Southern Syria. Additionally, since a peace agreement in July was signed by parties in the south, it is likely that a new context is created that will attract refugee populations back into Dar'a and Quneitra thereby increasing health care burden. According to WHO and UNHCR, people living under opposition control have constrained access to primary healthcare services and essential treatment. Moreover, the immunization services are almost completely lacking. Given such poor conditions the IDPs and local people are expected to be highly vulnerable. Since information is scarce and there has been little accurate data on the health conditions of

13 *Regional refugee and resilience plan, regional strategic overview*. 2017 [UNHCR report]

14 *Unpublished health survey report east Dar'a*. 2017 [MSF-OCBA Jordan]

the local and IDP population in Southern Syria, the proposed assessment can provide crucial information in order to effectively address and respond to critical health care needs by MSF-OCA and other actors in the field. It will advance our understanding of the implications of the crisis on the health services which will help us improve and better define our operational strategy. Subsequently, a cross sectional survey will provide concrete quantitative indicators to better understand the health situation of the new IDPs in order to tailor its response strategy to their immediate healthcare needs. Moreover, reliable data on the underlying health conditions and the vaccination coverage would help in advocating and liaising with stakeholders for targeted interventions to reduce morbidity and mortality in the population.

# 2. Objectives

## 2.1 Primary objective

To determine the health care needs for local population and IDP's in west Dar'a and Quneitra by estimating the prevalence of underlying morbidities, vaccination coverage and identifying barriers to access to health care, in order to obtain a baseline that can guide MSF and actor response.

## 2.2 Secondary objectives

The relevance of subjects for the (secondary) objective(s) has been informed by insights from reports of, and explorative meetings with MSF and medical NGOs active in southern Syria (section 3.2.3). Of the secondary objectives identified, similar objectives are reflected in MSF-ERB approved protocols for surveys conducted in the region. We formulated the objectives (and related indicators on page 15) as much as possible on basis of these approved secondary objectives[15][16][17][18].

15

*Health Service Access Survey among Non-camp Syrian Refugees in Irbid Governorate, Jordan.* January 2016 [Survey protocol MSF-OCA, Jordan]

16

*Morbidity and vaccination coverage survey, IDP and Refugee camps in Sulaimaniyah Governorate, Kurdistan Region, Iraq. October 2015.* [Survey protocol MSF-OCA, Iraq]

17

*Understanding the health status and humanitarian impact of the recent events in the internally displaced population (IDPs) in Tal Abyad and Manbij districts, northern Syria*. June 2017 [Survey protocol MSF-OCA, North Syria]

18

*Health Surveillance Program east Dar'a, Southern Syria; community based assessment*. April 2017 [Survey protocol MSF-OCBA, Jordan]

I. To describe the socio-demographic characteristics of the surveyed population including age, gender and household characteristics.

II. To estimate the prevalence of self-reported morbidities in previous two weeks, an estimate of the prevalence of non-communicable diseases, and the main reasons for requiring medical care.

III. To estimate the vaccination coverage for key vaccine preventable diseases in children aged 6-59 months.

IV. To characterise health care utilisation, the degree of access to healthcare for common morbidities in the population (health seeking behviour) and determine the most common barriers to access to health care.

V. To estimate the global acute malnutrition [GAM] rate of in children aged 6-59 months.

VI. To estimate the prevalence of conflict-related trauma experienced during the recall period.

VII. To what extent maternal and reproductive health services are utilized by assessed crisis-affected women of 15-49 years of age in this area.

VIII. To estimate the retrospective mortality and cause of mortality, over the past 6 months (since Ramadan 2017).

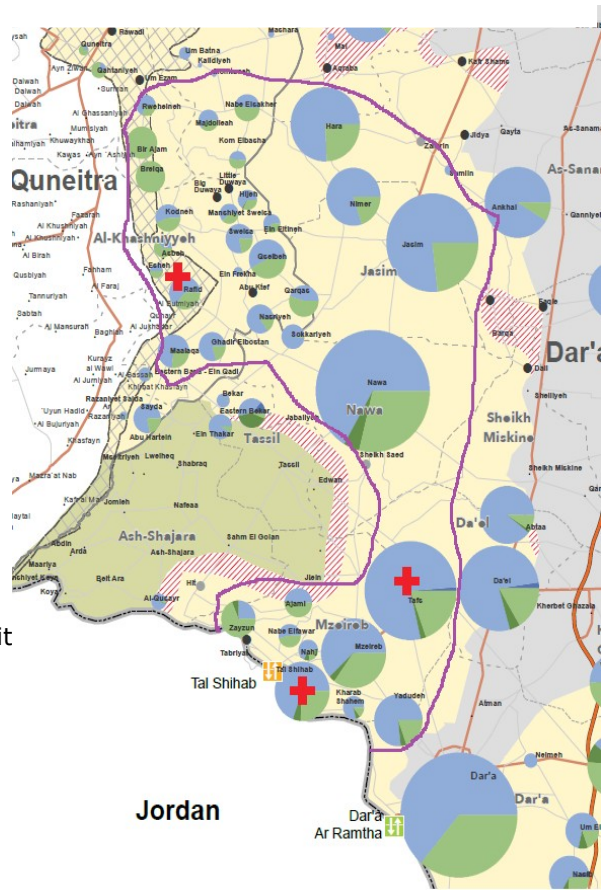
IX. To better understand the configuration of the health system following the crisis, the characteristics of care-seeking and the quality of the services.

# 3. Study design

## 3.1 Study population and area

The study will be conducted in the western part of Dar'a governorate and eastern part of Quneitra governorate in Southern Syria on IDPs as well as the local population. This excludes areas where ISIS is in power (green zone Fig. 4) in addition to areas where the GoS has control (grey zones Fig. 4) but includes most of the FSA controlled areas marked in yellow in Fig. 4. The catchment area includes roughly the boundaries set by the purple line. Dar'a is situated in the south-west of the country and covers an area of 3,730 km². The governorate had a population of 998,000 (2010 census office estimate)[19]. The capital is the city of Dar'a. The governorate of Quneitra had a population of 87,000 at the 2010 estimate. Geographically the study area is a large valley and therefore with very little elevation differences, about 100 meters above sea level. Medium sized town are

**Figure 4:** Population distribution in west Dar'a and Quneitra. Red crosses are hospitals supported by MSF-OCA. IDP (green) and local population (blue) expressed by circle diagrams. *Source: UNOCHA population maps* Southern *Syria, June 2017*




19 http://www.daraa-gov.org/ [Dar'a governorate websit

scattered around west Dar'a whereas smaller villages are found in Quineitra. Both governorates harbour multiple in size varying IDP populations. Quneitra and Dar'a are characterized by tribes possessing land for farming. Traditionally these areas have been economically exploited for agricultural practices. No large industry is found here. Approximately 775,000[20] people are left in the governorates combined, of which a third is made up by IDPs. The projected size of the study population (purple boundaries Fig. 4) is approximately 300,000.

## 3.2 Survey design

MSF-OCA is supporting hospitals by incentivising hospital staff in west Dar'a and Quneitra, but no MSF staffs are present. This makes the proposed assessment and survey more challenging in terms of logistics and quality control. In order to reduce information bias resulting from addressing the objectives only by collecting data from the care receiver side, we assume it to be essential to triangulate information sources. Taking into account the community's and care provider's views on the health care gaps and access to health care will increase the certainty of the findings and allows for a validation mechanism for information found among different sources. Hence we propose to use 3 different quantitative instruments and qualitative approaches targeting different groups to address our objectives:

**Quantitative**:

- A household survey: a cross-sectional population based health survey using multi-stage cluster sampling based on the assessed context, geographical setup and the target population; to obtain socio-demographic information, to characterise access to health care and to estimate the prevalence of morbidities and mortalities and vaccination coverage amongst local population and IDPs. (sub-objective I to VIII: section 3.2.1)
- Patient questionnaires at clinics and hospitals: a survey amongst patients visiting health clinics and hospitals to obtain insight on morbidities and information on access to health care and critical health care needs, maternal health and war related care. (sub-objective II, IV, VI, VII, IX: section 3.2.2)
- Secondary data review: a review of reports and data from health actors (DoH UN agencies and NGOs) working in Dar'a and Quneitra, to compare how any similar health information collected matches MSF-OCA quantitative findings from the survey and our supported hospitals. (sub-objective I to IX: section 3.2.3)

**Qualitative:**

- Semi structured interviews with the DoH, NGO's, UN agencies and key informants. (sub-objectives I, IV, VII, IX: section 3.2.4)

### 3.2.1 Household survey

**Definitions**

*Definition of household:*

- A household is defined as a person or a group of people, who live together in the same unit (shelter, house, apartment) and who are under the responsibility of the head of

20 *Southern Syria: Resident Population & Internally Displaced Persons.* June 2017 [UNOCHA population map]

household. The whole household will be included, no matter the age of the household member or the relation with the other members. The household definition includes all individuals who have been living in the household at any time during the recall period, including those who arrived or departed within the recall period. Visitors who are not considered under the responsibility of the household head will not be considered as household members.

*Definition of head of household:*

- Adult household member, ≥18 years of age *and*
- Is identified/recognized as the leader of the group living together,
- Can give accurate information on all demographic and mortality issues in his/her household (can describe with reasonable accuracy the events that occurred during the recall period), *and*
- Has lived in the household the entire recall period, *and*
- Is present at the time of the survey

A household will be excluded from the survey if none of the household members fulfil all these criteria. If more than 1 person qualifies and/or acts as the head of household, these individuals will have to decide who will answer questions for the household. If there is no consensus, the household will be excluded from the survey.

**Inclusion and exclusion criteria**

A household will be included in the survey if the head of household meets the definition above, provides an informed consent and currently living in the selected household. A household will be excluded from the survey if we were not able to locate the potential participant (head of household) after two attempts of tracing and if the head of household refuses to participate in the survey. There will be no exclusion criteria regarding gender, religion and nationality.

The household head will be prioritized for the interview. Questions related to child health or ante natal care [ANC] will be preferably asked to the women/mother/care-taker directly. Similarly, questions related to non-communicable diseases [NCDs] will be preferably asked to the affected person directly. If these persons are not available, the household head or other suitable household member will be asked instead. General and specific inclusion and exclusion criteria are as follows:

A person will be included in the study if s/he satisfies all of the following criteria:

- Living in the selected household (see following paragraph for the definition of a household)

*And*

- Informed consent has been given by the head of the household (see section 6.1. for the details on the informed consent form)

A person will be excluded from the study if s/he:

- Refuses to participate in the study

Additional specific criteria for the different survey topics:

- General adult health: ≥ 18 years of age

- NCD adult: ≥ 18 years of age and living with one or more of the following conditions: hypertension, cardiovascular condition, diabetes, chronic respiratory disease, thyroid disease, neurological condition
- Child health: between 6 months 5 years of age
- ANC: female and aged 15-49 years old that are pregnant and/or had a birth (live, still or terminated in the past 6 months.

**Recall period**

- The recall period for questions related to morbidity in the household will refer to the previous two weeks. All household members that displayed illness/sickness in that period will be recorded with a brief description of the symptoms associated with the illness (this will also include NCDs).
- The recall period for all ANC related questions covers the time of the last pregnancy with birth.
- Otherwise, we aim to include a period of 6 months, and to try and minimise recall bias attach the beginning of the recall period to a memorable event (start of the Ramadan, which corresponded to May 26, 2017 in Syria).

**Sample size**

The target population in both governorates constitutes roughly 300.000 people (average of UNHCR, UNOCHA and local councils on populations of villages and towns), where household size is on average 6; which approximates about 50.000 households[21]. The target sample size of households will be calculated in a way that allows assessing the global acute malnutrition [GAM] among children in the target population. GAM has been chosen as threshold because it is the lowest prevalence condition, thus sample size is estimated based on what is expected to be lowest prevalence. A target sample size is designed that is sufficient to estimate a GAM of 20% [22] with the ability to construct a 95 per cent confidence interval. A hypothetical design effect of 2 is being used in the calculation of this sample size. Sample sizes for important other parts of the survey were also considered: mortality rate, vaccination coverage and the most common morbidities. Probability proportionate to size [PPS] is used for estimating sample sizes using Emergency Nutrition Assessment[23] [ENA] and OpenEpi software. The key criteria for sample size calculation are listed in Table 1.

| Parameter | Value | Comment |
|---|---|---|
| **Mortality survey sampling (ENA)** | | |
| Estimated death rate per 10,000/day | 1 | Emergency threshold |
| Desired Precision (%) | 0.5 | Epi advisor, on basis of context |
| Design Effect | 2 | Epi advisor, on basis of context |
| Average HH size | 6 | Based on UNHCR data (May 2017) |
| Recall period (days) | 183 | |

21 *UNOCHA populations estimates.* July 2017 [UNOCHA report]

22 *OCBA preliminary results of health survey east Dar'a.* Presentation. August 2017 [MSF-OCBA Jordan]

23 http://www.nutrisurvey.de/ena/ena.html

| | | |
|---|---|---|
| % non-response HH | 10 | Unknown potential non response rate |
| **Total sample population** | **917** | |
| **Total HH to be included** | **170** | |
| **Vaccination survey sampling (OpenEpi)** | | |
| Estimated vaccination coverage (%) | 50 | Assumed low coverage |
| Desired Precision (%) | 5 | Epi advisor, on basis of context |
| Design Effect | 2 | Epi advisor, on basis of context |
| Average HH Size | 6 | Based on UNHCR data (May 2017) |
| % of children 6-59 months | 20 | Based on UNHCR data (May 2017) |
| Average number children per HH | 1.2 | |
| % non-response rate | 10 | Unknown potential non response rate |
| **Children to be included** | **768** | Children |
| **Total HH to be included** | **704** | Households |
| **GAM (ENA)** | | |
| Estimated GAM prevalence (%) | 20 | Emergency threshold |
| Desired Precision (%) | 5 | Epi advisor, on basis of context |
| Design Effect | 2 | Epi advisor, on basis of context |
| Average HH Size | 6 | |
| % of children 6-59 months | 20 | |
| Average number children per HH | 1.2 | |
| % non-response rate | 10 | |
| **Children to be included** | **535** | |
| **Total HH to be included** | **551** | |
| **Morbidities (OpenEpi)** | | |
| Estimated prevalence (%) | 30 | NCD's: OCBA and OCA Irbid survey |
| Desired Precision (%) | 5 | Epi advisor, on basis of context |
| Design Effect | 2 | Epi advisor, on basis of context |
| Average HH Size | 6 | Based on UNHCR data (May 2017) |
| % non-response rate | 10 | Unknown potential non response rate |
| **Total sample population** | **645** | |
| **Total HH to be included** | **538** | |

**Table 1**: Criteria for the calculation of the sample size

**Sampling method**

A two-stage cluster sampling methodology will be chosen as an adaptation of the standardized method recommended by the WHO[24] and following the Standardized Monitoring and Assessment of Relief and Transitions [SMART][25] methods widely used by humanitarian organisations and practitioners.. An almost identical sampling method is proposed here as was used for the MSF-OCA health access survey in Irbid, Jordan in 2016[26], since it resembles the size of the area and

[24] Henderson RH, Sundaresan T. Cluster sampling to assess immunisation coverage: A review of experience with simplified sampling methodology. Bulletin of the WHO 1982(60):253-60

[25] *Sampling Methods and Sample Size Calculation for the SMART Methodology*, June 2014 [Survey SOP]

[26]

the scope of this assessment. Using a probability proportionate to size approach 704 households will be sampled from the population (GAM estimate). 101 clusters x 7 households will be randomly chosen (GIS based random sampling, see next paragraph) from town and villages in west Dar'a and Quneitra. For every cluster a systematic random sample will be applied, using a sample interval of 1515. With roughly 50,000 households and 700 household to be sampled theoretically 50,000/700 ≈ 70 would be the sample interval. Thus, the sampling interval would ideally be larger than every 15th household, but this would require too much time (security risk) and resources (funding). The direction of household selection starting from the random coordinate will be done by a 'spinning-the-pen' approach, following a pre-randomised direction created by ArcGIS software. If the cluster boundary has been reached, selection continues perpendicular from the initial set out track.

A GIS based random sampling method will be used to select one survey starting point per cluster in the villages, each of which leading to the 7 interviewed households. Using the Arc geographical information system (*ESRI 2016. ArcGIS Desktop: Release 10. Redlands, CA: Environmental Systems Research Institute*) and the Google satellite imagery of Dar'a and Quneitra governorate, the geographical boundaries of the selected villages or city district will be generated. Our third party, a grassroots organisation in close contact with town councils, provided us with detailed information per town to account for areas that are unpopulated in order to provide boundaries of populated areas as accurate as possible (see Annex I).

Within the drawn boundaries, ArcGIS generates random coordinates, which will be used as starting points for the survey. The first household that will be interviewed is the one closest to the random GPS point. The following households are subsequently identified by skipping 14 households and enter the 15th. To reduce selection bias (compared to for instance snowball sampling) and considering limited logistical means a systematic random sampling will be used. GPS points of the starting coordinates will be exported to the computer tablets of interviewers, which will be used to for survey data collection. All polygons and random GPS points from all villages will be generated in advance. This systematic random sampling using the GPS points is applied till the required number of clusters and households have been exhausted. If for unforeseen reasons a selected cluster in a town cannot be visited, it will be replaced by selecting a new cluster as nearby as the situation (security reasons) allows. The sample of this survey will capture from every inhabited area as security constraints allow us. (see Annex I for detailed description of method implementing)

### 3.2.2 Patients at clinics

At the 3 MSF-OCA supported hospitals a convenience sample will be used to select patients. The applicable modules of the household survey will be administered to patients at each site.

**Eligibility criteria**

A patient will be included in the survey if informed consent is given and:

- Attending the outpatient department at a day of the week that the patient survey is being conducted.
- S/he is at least 18 years of age
- For children under the age of 18 attending the outpatient department, an adult that is a caretaker of the child and informed consent is given.
- Provides informed consent to participate in the questionnaire.

*Health Service Access Survey among Non-camp Syrian Refugees in Irbid Governorate, Jordan.* January 2016 [Survey protocol MSF-OCA, Jordan]

A patient is excluded if:

- For any reason s/he does not want to participate.
- They are too acutely ill that their medical care must be prioritised

There will be no exclusion criteria regarding gender, religion and nationality.

**Sample**
We aim to include 200 patients per hospital as part of our convenience sample. As we know the population of Dar'a is structured in that 20% are children 5-59 moths, 20% are persons from 5-18 years of age and 60% are persons older than 18 years of age, we will aim to include 40 patients 6-59 months, 40 patients 5-18 years and 120 patients aged 18 years or older.

**Modules**
For the age group 5-59 months old the vaccination and nutrition modules is administered. The household, mortality, morbidity, maternal health (female adults) and health access modules will be administered to all adults. Children between 5 and 18 years old will be subject to the morbidity and health access modules. The same recall periods as in the cross sectional household survey will be used.

**Process**
A poster with bullet points explaining the survey will be hung up in the clinic two weeks prior to the start of the survey. After the household survey, the enumerators recruited for the household survey with a medical background (see Annex 1, section 2.2) that perform interviews, data collection and general survey conduction most satisfactory, will be selected for the patient interviews at each hospital. The same data collection software and computer tablets used during the household survey are used.

The registrars at the hospitals will be asked to introduce to patients that they might be asked to participate in a 5-10 minutes survey on a voluntary basis. Once the patient has finished the consultation at the outpatient department, the interviewer will approach the patient.

The purpose of the survey is explained in more detail so the patient can decide to participate. If informed consent is given, the patient is taken to a separate room that is booked in advance. Verbal informed consent is obtained and documented with the same digital informed consent form used for the household survey (see Annex VII).

### 3.2.3 Secondary data review
Meetings with INGO's and DoH have already been held to clarify what type of operations are exactly done in Quneitra and west Dar'a. Data and reports are collected from these organisations, to guide the proposed assessment. All information and data collected from our assessment should be able to inform and/or improve response capacity of MSF-OCA and these health care actors. Secondly, a secondary data review will provide an opportunity to cross check results.

### 3.2.4 Qualitative research
Qualitative data will be collected from a variety of sources in order to compare and strengthen related conclusions collected in the quantitative component of this study. A series of semi structured interviews will be conducted with the following three target groups:

- with the DoH and general medical facilities to investigate their views on issues and solutions regarding health care delivery, critical health care need, access to care (Annex VI).
- with medical NGO's active in Dar'a and Quneitra and UN agencies to investigate their views on issues and solutions regarding health care delivery, critical health care needs, barriers to access to care, degree of health care utilisation and the configuration of the health system (Annex V).
- with key informants (men, women, young persons, people with different socio economic situations, IDPs, specialists and non-specialists, local authorities, persons with disabilities, service providers and service receiver) to investigate their views on issues and solutions regarding health care delivery, critical health care need, access to care, and other subjects addressed under the objectives (Annex IV).

With all of these actors (see next paragraph) we have already had explorative meetings, and discussed the scope of our survey. These discussions have informed us on the context, medical aid delivered/needed and provided guidance on essential subjects to incorporate in the survey.

DOH and medical facilities - all interviews will be carried out using Skype calls from our office in Amman, Jordan. Interviews with the DoH and medical facilities will be in Arabic. Our medical activity manager (Jordanian) and project coordinator assistant (Syrian) at the project in Amman will be performing the Skype interviews with DoH and medical facilities.

Medical NGO's and UN agencies - Whereas Skype calls will be used for interviews with the DoH in Dar'a and Quneitra, interviews with NGOs and UN agencies will be held in Amman, at the offices of the organisation selected. The UN agencies that are approached are: WHO, UN Fund for Population Activities [UNFPA] and OCHA. The NGO's we had explorative meetings with and will be interviewed are: IMC, Relief International, IRC, MSF-OCBA, MSF-OCP, WorldVision, MedAir, Handicap International and Medicines des Monde. The Head of Mission advisor (Jordanian) will be performing the NGO and UN agency interviews. Key informants - will be identified using MSF-OCA supported staff and Nama in Dar'a and Quneitra. Through purposeful sampling, we will identify different key persons in the community, using the by our supported hospitals' and Nama's connections to society by for instance community health workers and town councils. Such persons will be considered to be key informants. We may also use snowball sampling to help identify other persons in the community with a deep understanding of the population and their experiences to date. The enumerators with a medical background that are selected on their interview skills during the household survey to perform the patient interviews, will get additional training to also administer the qualitative interviews. All key informant interviews will be conducted in private spaces (identified at the time of the interview). All information collected during the key informant interview process will be anonymous. All interviews will be recorded for transcription and translation.

DoH, medical facility and key informant interviews will all be in Arabic. These interviews will be recorded (by the pretested microphone function of the computer tablets) and will be subsequently transcribed, translated into English and back translated to Arabic to ensure quality of the data. Our MSF-OCA translators in Amman will be an objective party to perform the transcription and translation work. Interviews with NGOs and UN agencies will be in English and therefore only transcribed.

Written informed consent will be asked from all individuals participating in the qualitative interviews. For each of the three target groups, full information about the purpose and uses of

participants' contributions as well as clarification of how contributions will be shared will be explained during the informed consent process (See annex IV, V, VI). All individuals participating in the qualitative interviews will be given the choice to whether or not quotes will be assigned to the personal names. In Annex IV, V and VI, next to the tick box that indicates if a person gives consent, a tick box is created for people to either use or not use their name to be linked to the data.

# 4. Data collection

## 4.1 Third party

MSF-OCA has no contracted staff in Southern Syria, which limits our capacity to manage and coordinate the household survey directly in the field. In order to get access to areas, review security situations and enjoy insight knowledge and information a third party will be used to conduct the household survey: Nama. MSF-OCA Jordan head of mission and head of mission advisor have worked on surveys with Nama during their time with Handicap International. The work delivered was reported as highly satisfying and reliable. MSF-OCA will provide trainings on questionnaires and survey implementation and methods (see Annex I) and will provide our own data collection software and introduce an appropriate data quality assurance system (for examples survey teams of 2 will consist of one MSF incentivized staff with medical knowledge, and a staff from the third party) (see chapter 5).

*Nama*

Within the medical sector, they are the logistic support for the DoH of Dar'a Governorate and they are responsible for coordinating and facilitating the transportation of the medication and the medical supplies/consumables from the main warehouse in Tal Shehab to field hospitals in Dar'a. Nama organizes the transportation of the items from the Southern Syrian borders to the facilities or to the beneficiaries. In terms of surveying, Nama has social workers in capacity to make assessment of the displacement area and the internal displaced people. Furthermore, Nama has substantial human resources network with more than 50 community workers distributed between east, west and centre of Dar'a governorate in addition to Quneitra. Nama doesn't have any contract with local, national or international donors. The main source for funding its activities is the partnership with several INGOs who provide the required financial support to implement the humanitarian activities including the staff salaries, running cost and the activities cost (see more details on Nama in Annex I).

## 4.2 Questionnaire

The questionnaire will be administered to the household head and will cover questions related to the following aspects:

- Household demographics and mortality
- Household morbidity
- Household chronic disease symptoms
- Access to health care and health utilization
- Vaccination status of children aged 6-59 months
- Nutritional status of children aged 6-59 months and pregnant women
- Maternal health care
- War related injuries

Most of the subjects will be covered by the quantitative as well as the qualitative research. The household questionnaires, clinic patient questionnaires and semi-structured interview topic guides are available in Annex III, IV and V. The questionnaire will be translated to Arabic and back translated to English to ensure consistency of language by the medical activity manager and the assistant project coordinator (Syrian nationality) of the Southern Syria Project. The questionnaires will be piloted in the field with a convenience sample of households during the training to ensure they are understood (see Annex I). The main indicators to be derived are listed in table 2.

| **Indicator** | Sub objective | Source (MSF surveys) | Rationale |
|---|---|---|---|
| ***Household variables*** (Age, gender, living condition. Number of people and size household. Literacy level of head of household. Type of dwelling. Occupation. Household income) | 1 | 23,25 | Risk factors for indicators |
| ***Shelter size*** (% of population with <3.5m² per person) | 1 | 23,24,25,26 | Risk factors for indicators |
| ***Prevalence of self-reported morbidities*** *(*incidence or % of the total population over the past 4 weeks) | 2 | 24,25 | Advocacy purposes |
| ***Non-communicable disease*** (prevalence per type of NCD, and if care provided) | 2 | 23,24,25,26 | Response capacity and operational |
| ***Main reasons for requiring care*** (over the past 4 weeks) | 2 | 2 | Response capacity and operational |

[27] *Health Service Access Survey among Non-camp Syrian Refugees in Irbid Governorate, Jordan.* January 2016 [Survey protocol MSF-OCA, Jordan]

[28] *Morbidity and vaccination coverage survey, IDP and Refugee camps in Sulaimaniyah Governorate, Kurdistan Region, Iraq. October 2015.* [Survey protocol MSF-OCA, Iraq]

[29] *Understanding the health status and humanitarian impact of the recent events in the internally displaced population (IDPs) in Tal Abyad and Manbij districts, northern Syria*. June 2017 [Survey protocol MSF-OCA, Northern Syria]

[30] *Health Surveillance Program east Dar'a,* Southern *Syria; community based assessment*. April 2017 [Survey protocol MSF-OCBA, Jordan]

| | | | |
|---|---|---|---|
| ***Prevalence of vaccination coverage in children*** (MMR, Polio, DTP) | 3 | 23,24,25,26, 27 | Response capacity and operational |
| ***Health utilization rate*** (% of the total population who received medical services within 30 days of interview) | 4 | 23,25,26 | Response capacity and operational |
| ***Health care seeking behaviour/access to health care*** (% of population that did not seek health care when needed, what type of health care) | 4 | 25,26 | Response capacity and operational |
| ***Global acute malnutrition rate*** (Prevalence of children 6-59 months with Mid-Upper Arm Circumference [MUAC] less than 125mm) | 5 | 24,25 | Response capacity and operational |
| ***War related injuries*** (% of population affected by war injuries, what type) | 6 | 25,26 | Advocacy purposes |
| ***Surgery*** (% of people that received surgery and how many are war related) | 6 | - | Response capacity and operational |
| ***Crude mortality ratio [CMR]*** (number of deaths per 10.000 per day, and cause of death) | 7 | 23,24,25,26 | Advocacy purposes |
| ***Skilled birth attendant [SBA] assisted delivery*** (% of pregnant women who deliver assisted by skilled health personnel (midwife, doctor, nurse) | 8 | 26 | Response capacity and operational |
| **Antenatal care (ANC):** % of mothers of children under two years of age who had 2 or more comprehensive antenatal visits when they were pregnant with their youngest child | 8 | 26 | Response capacity and operational |

**Table 2:** Assessment indicators

## 4.3 Mobile data collection

Dharma Mobile™ software will be used for data collection, storage, and management. An independent evaluation among available data collection software and platforms of MSF-OCA ranked Dharma as the most practical, secure and user friendly[32]. Considering that the proposed household survey is managed remotely and coordinated by a third party, choosing the data collection platform that is most convenient is essential.

Interviewers will use MSF-OCA provided mobile data collection devices (Lenovo computer tablets) for all collection activities. Access to the MSF-OCA Web Portal will be available prior to

31

32 *Syrian Arab Republic: WHO and UNICEF estimates of immunization coverage*. 2017 revision

*Personal communications*. July 2017 [MSF Manson Unit]

the commencement of data collection, at which point MSF staff and approved external actors will be able to view analysed data from the affected community in 'real-time'. Oversight and management of interviewers and data collection supervisors will be performed jointly via the MSF-OCA Southern Syria Project in Amman and the third party Nama. The remote management of the Dar'a survey will be conducted via the use of Dharma mobile and web components. MSF and technical advisory supervision during train, monitor, and evaluate study will be done on real-time to meet the needs at field-level. A mobile data collection tool will be used for the *MSF-OCA Health Assessment in west Dar'a and Quneitra.* An external agency, Dharma Platform™, may provide all software and IT support to the investigators during all stages of piloting/training, collection, and analysis. The mobile platform precludes the need for extensive data cleaning, paper storage, and data clerks.

## 4.4 Data

**Management**

All data will be anonymised (neither names nor exact location of the household will be collected) and electronic files stored password-protected by MSF. Only study investigators will have access to these data files. Data cleaning will be done to check for inconsistencies in data entry and responses. Since name-related data will be collected during the survey no participants will be identifiable after the survey has been completed. No GPS-data will be collected that allows the location of the household, however, the GPS coordinates of the clusters will be recorded and households will be related to the respective starting point, which will be GPS-tagged (see sampling strategy for more details). Hence, the identification of single households will not be possible.

Regarding the patient interviews data management, plans are similar to the household survey. Data management for the qualitative research: all interviews will be recorded. DoH and medical facility interviews over skype are taped and saved to a secure server. NGO and UN interviews in Amman are recorded using pre-tested recording devices; data is stored at a secured server and erased from the recording tool. Similarly, regarding key informant interviews conducted by the most satisfactory enumerators, and additionally trained, data will be recorded using the computer tablet. After uploading the data to the secured server in Amman, all data will be erased on a daily basis.

If data collection is stopped at an early stage, the project will have to decide if sufficient for publication. If this is not the case, unusable data will be deleted from all servers.

**Analysis**

The data generated by this sampling methodology is hierarchical in nature and observations will be expected to exhibit certain patterns of dependence corresponding to household membership and cluster location. Appropriately accounting for this design-induced 'clustering' is crucial in order to accurately describe the level of precision of all reported estimates. All observations, both at the household and individual level, will be considered to have equal sampling probability. All indicators will be calculated as proportions with 95% confidence intervals (95%CI). Estimates of actual design effect will also be calculated for each variable and those with effects greater than 1 will be reported. Where appropriate, differences in proportions will be measured using Pearson $\chi 2$ test and p-value (p) will be presented. Risk factors for not accessing general, maternal and NCD health care, of the population will be identified using a generalised linear mixed model, incorporating a random factor for design effect. Statistical

significance will be determined using Likelihood Ratio test. Additionally, the continuous outcome measure of the proposed indicators will be mapped using ArcGIS software and interpolation techniques, to identify areas where needs are greatest.

The mortality rate will be calculated as number of deaths per 10.000 per day. The person-time will be counted individually for every household member using the beginning of the recall period till the day of departure from the household or the day of death of the household member. The sum of individual person-days will be used as denominator. Ninety-five percent confidence intervals will be calculated and adjusted for the design effect. Data analysis will be conducted using R Studio (*R version 3.3.2 and RStudio 1.0.136*).

The questionnaire modules administered are the same for the household survey as well as the patient interviews. However, this data will not be analyzed together since the study population is different; patients visiting MSF clinics versus the general population. The data of the patient interviews will be analyzed in the same way though, as the household survey. The aim will be to compare the end results and indicators from both sources to see if there are difference in outcomes that may direct us at gaps and pockets of health care needs among households in West Dar'a and Quneitra.

**Quality assurance**

There are several ways in which this remote assessment and survey attempts to safeguard the quality of data (collection):

Household survey:

- Two interviewers (MSF and Nama) per field team having different profiles (medical and non-medical, MSF and non-MSF teams). This will improve the quality and reduces *observer bias* of medical data collected by using complementing profiles.
- Perform random checks (calling) to confirm with the MSF supported interviewers if it matches the data that was collected the day before (time, location, events).
- Data collection software will contain questionnaires using skip logic and constraints to reduce *entry bias*.
- Have questionnaire and survey piloting and training to reduce *information bias* among teams.
- Time stamp to monitor the duration of household questionnaires and GPS tracks to assure interviewers are visiting the clusters.
- A multiplicity of the sources of information (primary and secondary, bearers and receivers of the service) to cross check data.
- A combination of different data and information collection techniques (questionnaires, interviews).

Qualitative component:

- Testing and adapting, where necessary, of interview questions. Testing will exist of practicing the questionnaire guides, different scenarios, and examining the comprehensibility and time required to administer the interview. This will be performed between the interviewer and project members in Amman and between the appointed interviewer in the field and enumerators.
- Appropriate training of interviewers (especially for the interviews done in the field), including specific directions to the interviewer on how to proceed with the interview

process and content (e.g., when and how to apply questions about the health of children under five in a household)
- Record any issues or unexpected circumstances that interviewers think may have affected the responses (e.g., inability to provide a private space for interviewing a child in a household) and how these should be addressed by or discussed with fieldwork supervisors.
- Identification of logical inconsistencies in the data. Such errors should, ideally, be identified right away (if not by the interviewer, then by the fieldwork supervisor) to allow the interviewer to obtain further clarifications.

**Qualitative research**

Firstly the recorded semi-structured interviews will be transcribed and translated from Arabic into English by professional translators of MSF-OCA. Subsequently, the analysis of the semi structured interviews we will follow a 5-step approach[33]. During the first steps in the qualitative analysis of the interview data observations are developed into preliminary descriptive and interpretive categories based on evidence from the transcripts (see Annex IV for themes) and the secondary data review. Subsequently, examinations of these preliminary codes are performed to identify connections and develop pattern codes and determine basic themes and clusters of comments. Finally we delineate predominant themes contained in the data across the transcripts. All analysis will be done by the Principal investigator. NVivo qualitative data analysis software (*QSR International Pty Ltd. Version 10, 2012*) will be the analysis package of choice.

# 5. Survey implementation

## 5.1 Logistics

**Human resources**

There will be 5 areas, 4 in west Dar'a and 1 in Quneitra, each containing number of clusters made up from villages and towns. 8 teams made up by 1 male and one female interviewer, one MSF incentivised (medical background, see more details Annex 1) and one from Nama will be surveying the study population. There is one survey manager, the chief of Nama, and 2 field supervisors who both have 4 teams to coordinate. Teams will leave on a daily basis for surveying from one central point in the 5 areas: Tafas, Tal Shihab Ar Rafeed, Quneitra, (all 3 MSF supported) and Nawa, Nimer. Teams will be equipped with a Lenovo computer tablet which has the Dharma data collection and questionnaires configured as well as OpenStreetMap© mapping software for navigation to the clearly indicated clusters. All interviewers and supervisors will be subject to a job interview with the project in Amman.

General selection criteria for all interviewers:

- Able to read and write in Arabic (English would be an asset) *and*
- Fluent in the local language Arabic *and*
- Available for the ENTIRE time of the survey (training and interview days), *and*
- Motivated to participate in the survey, *and*

33

*Analysis of semi-structered interview data.* 1998. [ Piercy K.W. Utah State University, department of Family, Consumer & Human Development]

- As much as possible not biased in expectations of the outcome of the survey
- Experience with interviews in difficult settings and survey populations would be an advantage
- Live in the area of surveying

Interview teams will be deployed each day to the designated cluster per the assignment pre-planning. Interview staff will then proceed to systematically sample the selected area until the target has been met. When the systematic sampling of the cluster is completed, interview staff will then move to the following cluster as designated by their group supervisor and project manager per their daily mapped cluster assignment sheet. A detailed planning of when each team has to visit what cluster will be shared and discussed with the supervisors and teams in advance. All vacant homes and refusals, in addition to completed surveys, will be documented daily by the group supervisor and included in the total sample size calculation using the sample size tally sheet.

**Transportation**

The transportation of the teams is arranged by Nama. Several cars will be available from the central points in the 5 areas. In 4 of the 5 areas there are large town, which allows up to 3 teams to use one car. When teams have to visit villages further away from each other, Nama will be able to arrange additional transport.

**Support MSF-OCA**

Supervisors and the survey manager report on the daily activities with the epidemiologist in the Southern Syria project in Amman using Skype calls. Data will be uploaded on a daily basis and issues encountered in the field related to household visits, cluster navigation, questionnaires are discussed. Separate checks with the interviews teams will be randomly performed from the project in Amman to assess the data quality. Briefly, every second day by WhatsApp groups (see communications section 2.4 in Annex I), the interview teams will be asked some questions on data of households that they have surveyed before; like number of people, age, and some morbidities. A debrief form will be filled out by the supervisors on a daily basis, recording the number of households surveyed, what clusters have been visited and any issues encountered by the teams (see supporting document section in Annex I).

Furthermore the Southern Syria project will provide:

- Daily updates on progress and issue with the supervisors and field teams by the mission epi, the project medical activity manager (Jordanian MD) and the PC-assistant (Syrian).
- Preparation of all necessary documents (protocol, questionnaires, informed consent forms) for the survey
- Preparation of the field component of the survey (training of the survey teams, survey areas) together with Nama in the field
- Data analysis
- Report writing

## 5.2 Training and piloting

A comprehensive training and piloting plan is attached in section 3 of Annex I.

## 5.3 Security

MSF-OCA has no physical presence on the ground or an MSF staff in the field; hence we have very limited capacity to provide support with security in the field. The responsibility for safety

and security of the teams in the field is therefore completely with Nama. As a grass root organization in Dar'a they have many formal and informal connections to the areas to be surveyed. Consequently, information on access to villages and towns and up to date security news are guiding and will provide the necessary safety measures for interviewing teams. However, we will put in place specific security rules and evacuation plans which are requested to Nama. There is one exception; MSF-OCA supported hospitals when patient clinic interviews are conducted. MSF-OCA at any time will received a security update through Liaison Officers in the supported hospitals will be shared accordingly to the survey team focal person.

### 5.4 Limitations of household survey

We are well aware that of the assessment proposed here, the cross sectional household survey will have several limitations. Mostly because the survey will be conducted remotely, hence no MSF-OCA staffs is present in Southern Syria. Limitations:

- We will rely on a third party (Nama) to provide logistical assistance. The day to day activities (transportation to MSF-OCA indicated clusters, distribution of MSF-OCA computer tablets containing pre-programmed software, security information etc.) will be managed by 2 supervisors and a survey manager from Nama. However, we will have daily contact (updates on data collection and issues encountered) with them as well as the field teams, by WhatsApp.
- The interview teams, comprising of 2 people will be recruited (half of them Nama staff, half either MSF incentivized) by Nama and vetted over Skype remotely by the Southern Syria team in Amman by a native Arabic speaker (our medical activity manager). Having face-to-face interviews with MSF staff would have made the recruitment procedure more robust.
- Training and piloting of the survey and questionnaire will be done remotely on Skype; as too will be the extra training on the survey and MSF principles in advance for the supervisors. Remote training may have a disadvantage for thoroughly understanding the survey.
- Randomisation is not optimal. As we have estimates and no exact data on populations of towns and villages. A systematic random sampling method with a spinning-the-pen approach on basis of randomly selected GPS coordinates within the survey area is not ideal. Taking every 15$^{th}$ household can be a challenge in areas affected by war, as migration rates are high and it may be unclear if people are living in some dwellings. Using the spinning-the-pen approach in a pre-randomised direction to track households cannot be perfect and may be affected by practical challenges like pockets of inaccessible residential areas and geographical challenges.

# 6. Ethical considerations

The study will be conducted in accordance with the World Medical Assembly Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects[34]. The study protocol will be submitted to the Ethics Review Board of MSF. Approval for this assessment is sought with the DoH of Dar'a and Quneitra.

34

[http://www.wma.net/en/30publications/10policies/b3/] (accessed April 22, 2017)]

Participant names will not be collected by the investigators at any point during the household survey and patients at clinics survey. Identifying markers (household: x, member: y) will be kept on a password protected database and will be used as primary study identifications for this research. Unique respondent identifiers will be kept secure by means of encryption. All data will be stored in a password-protected folder on the MSF central server and accessed by investigators and authorised collaborators only. The west Dar'a and Quneitra survey database will be maintained for a minimum time frame per MSF standard operating procedures after the completion of the study and throughout the program cycle. All data collected will be encrypted and password protected on the MSF central server in Amsterdam. The key informants are explicitly told, during the informed consent, that their names and contacts are separately kept, to be re-contacted later to help with results dissemination. Only the principle investigator will have access to this password encoded and encrypted list.

A specific code of conduct for the interviewers will be prepared and share with Nama, on which they will have to sign. Furthermore, during interviews with households, if we identify cases in need of immediate assistance or protection, referral possibilities will be identified with Nama in advance.

## 6.1 Consent form

Verbal consent will be sought from all heads of households participating in the study (without documenting the name), which will be recorded prior to the interview. The interviewers will explain the study and (digital) informed consent form to the head of household and all persons eligible for questionnaires present at once. The household head will provide verbal consent for overall household members, and each selected individual interviewed for subsequent questionnaire sections will be asked for verbal consent. The consent of the head of household for the overall household member will be recorded in the data collection tool by means of a digital PDF form marked with the household ID; and a digital tick box that confirms verbal informed consent was given. (See informed consent Annexes II, IV, V, VI, VII) For children, the consent of the guardian will be obtained. Regarding emancipated minors (15-17 years) verbal assent will be sought. If these persons provide verbal assent, then they themselves will answer the question. If they do not wish to provide verbal assent, no questionnaire will be conducted on this person. However, if the person is not there to provide verbal assent, the head of household or an adult may answer the questions for this person.

For the patient interviews and key informant interviews the digital consent form and study will be discussed prior to the interview as well. By means of ticking a tick box on the digital PDF forms (as signature) the interviewer confirms that verbal informed consent was given (See informed consent Annexes).

All data will remain anonymous throughout the data entry and analysis process. All subjects included in the surveys will have the survey procedures explained to them in Syrian Arabic, and an information sheet about the study containing contact information of the survey manager (Nama) will be provided. Everyone will be offered the opportunity to refuse participation in the study at any time without penalty and no incentives or inducements will be provided to any respondents. Everyone is completely free to participate or not. Consent forms for the household survey, key informants and NGO's/UN are attached in Annex II, IV and V.

## 6.2 Risk and benefits

Risk to participants: Based on prior surveys in Jordan, Syria and Iraq using the same methodology and instrument, there are no direct risks to study participants anticipated.

Benefits to Participants: This study does not present any direct benefit to the participants. However the study does provide an opportunity to gain a better understanding of current medical conditions and health seeking behaviours of people in the region. However, the assessment and overall information provided by the program allows for a better understanding of the current medical conditions and health seeking behaviour of the participants and therefore for better operations targeted to their current needs and services gaps.

# 7. Community engagement

MSF has been actively supporting the local health authorities in providing healthcare to the IDPs and local populations in Quneitra and west Dar'a. MSF's connection to the community has been limited due to the ongoing fighting. Nevertheless, since the truce in July MSF is planning on deploying contracted staff in our supported hospitals in order to liaise with the community also away from the hospitals. To date it has focused mostly on providing primary healthcare and several secondary health care components (see page 7). MSF's ongoing community engagement strategy is to support the local authorities through improving access to emergency care including surgical capacity. A disease surveillance response team is planned thereby establishing a network with the community leaders and community members, to monitor health status and provide response capacity to potentials outbreak or any other event with public health impact

# 8. Timeline

| Activity Month | May | June | July | Aug | Sept | Oct | Nov | Dec | Jan |
|---|---|---|---|---|---|---|---|---|---|
| Explorative discussion | | | | | | | | | |
| Writing concept paper | | | | | | | | | |
| Writing protocol | | | | | | | | | |
| Design survey | | | | | | | | | |
| Submit protocol to HQ | | | | | | | | | |
| Submit protocol to ERB | | | | | | | | | |
| Identify catchment areas | | | | | | | | | |
| Identify data collectors | | | | | | | | | |
| Meetings with actors | | | | | | | | | |
| Field preparations | | | | | | | | | |
| Train and pilot | | | | | | | | | |
| Qualitative research | | | | | | | | | |
| Conduct survey | | | | | | | | | |
| Data management | | | | | | | | | |
| Data analysis | | | | | | | | | |
| Report writing | | | | | | | | | |

# 9. Dissemination

MSF-OCA will use the information to guide programming of MSF operations, and inform health actors in Southern Syria who may have and can respond.

All data will be available to organisations active in Southern Syria for programmatic, strategic and operative purposes. All the INGO we interviewed are the most important medical actors in

Southern Syria, and we see it as an important responsibility to deliver the data to those INGOs in order to contribute to a timely response to findings. Moreover, in the monthly WHO South Syria health cluster meetings, all these actors are well informed and aware of this survey. A report and datasets are announced to be available as soon as time allows.

An executive summary will be written in a for the participant understandable manner. Through DoH, town councils and the key informants we will disseminate these results back into the community. If the data collection is stopped prematurely, we will use the key informants and city councils to, as much as possible, convey this message back to the study participants.

The findings and results will be written up by the principal investigator into an internal report which will be shared with all collaborators for their input. If relevant, a manuscript will be prepared for submission to a peer-reviewed journal. We may also use some of these findings to write reports for advocacy purposes.

# Abbreviations

Ante natal care [ANC]
Assistance Coordination Unit [ACU]
Centre of Disease Control [CDC]
Computed tomography [CT]
Crude mortality rate [CMR]
Directorate of Health [DoH]
Early waning and response network [EWARN]
Early Warning and Response System [EWARS]
Emergency Nutrition Assessment [EMA]
Emergency room [ER]
Free Syrian Army [FSA]
Global acute malnutrition [GAM]
Government of Syria [GoS]
Internally displaced people [IDPs]
International Committee of the Red Cross [ICRC]
International Medical Corps [IMC]
International Rescue Committee [IRC]
Medecins Sans Frontieres [MSF]
Medecins Sans Frontieres, Operational Center Amsterdam [MSF-OCA]
Medecins Sans Frontieres, Operational Center Barcelona [MSF-OCBA]
Medecins Sans Frontieres, Operational Center Paris [MSF-OCP]
Medicins des Monde [MDM]
Mid-Upper Arm Circumference [MUAC]
Non-communicable disease [NCD]
Non-Governmental Organizations [NGO]
Operating theatre [OT]
Primary health care [PHC]
Probability proportionate to size [PPS]
Skilled birth attendant [SBA]
Syrian American Medical Society [SAMS]

The Islamic State of Iraq and the Levant [ISIS]
UN Fund for Population Activities [UNFPA]
UN Office for the Coordination of Humanitarian Affairs [UNOCHA]
United Nations [UN]
United Nations High Commissioner for refugees [UNHCR]
Upper and lower respiratory tract infections [URTI, LRTI]
Urinary tract infections [UTI]
World Health Organisation [WHO]

# Annexes

**Annex I:** Implementation plan

**Annex II:** Information sheet and consent form

**Annex III:** Questionnaire household survey

**Annex IV:** Key informant information sheet and consent form

**Annex IVb:** Key informant topic guide

**Annex V:** NGO/UN information sheet and consent form

**Annex Vb:** NGO/UN topic guide

**Annex VI:** DoH, medical facilities information sheet and informed consent

**Annex VIb:** DoH, medical facilities topic guide

**Annex VII:** Annex VII. Patient interviews at hospitals information sheet and informed consent