ASSESSMENT REPORT

HEALTH NEEDS: BORNO STATE, NIGERIA

MARCH, 2020

Executive summary

The MENTOR Initiative, an organisation that specialises in integrated vector management (IVM) and emergency primary healthcare, has conducted assessments of Borno State, Nigeria. MENTOR identified significant gaps in the existing humanitarian response that, if addressed, would substantially reduce suffering and save lives.

The protracted humanitarian crisis in northeast Nigeria has now lasted over ten years, with no near-term solution in sight, disproportionately impacting civilians through the displacement of millions and the destruction of critical infrastructure. Throughout 2019 and early 2020, Armed Opposition Groups (AOGs) increased their areas of operation creating ever greater restrictions on humanitarian access and placing innocent populations at even greater risk of disease outbreaks. Malaria is the number one cause of morbidity and mortality all year round with peak disease burden during and immediately following the rain season June-September. Other vector-borne diseases that are present in Nigeria such as dengue and yellow fever, with recent outbreaks being reported, will continue to escalate as conditions worsen for IDPs and host communities, as well diarrheal diseases (such as cholera) spread by pathogens in unsanitary conditions and mechanically by common flies. Compounding all of these disease risks is the prevalence of malnutrition amongst at-risk communities and IDPs, causing higher rates of infection, more severe and dangerous symptoms, and complications in treatment. This can be illustrated clearly by the fact that adults are contracting malaria at far higher rates than children under five in a region where they would normally have developed a natural immunity, and consequently underlines the need for effective disease prevention strategies that target all demographics.

This combination of risk factors means it is critical that IDPs and host-communities receive effective disease prevention strategies in combination with essential primary healthcare. However, existing disease control strategies are totally inadequate for effective disease prevention. Furthermore, the significant damage to healthcare infrastructure has left many communities without access to the essential primary healthcare they need.

Actions identified as urgently needed:

- Targeted indoor residual spraying (IRS) to protect IDPs in camp settings to reduce malaria morbidity and mortality while also controlling fleas, lice, mites, and other biting ectoparasites that spread disease.
- Targeted hygiene disease control and health education across IDP camps and host communities.
- Improved coordination between WASH and Health actors for the management of containerised water in order to reduce mosquito vector breeding sites and aedes borne disease transmission (dengue, yellow fever, etc).
- Improved waste management to reduce fly and other insect breeding sites, controlling diarrheal disease transmission including cholera.
- Technical training and capacity building in OTP's and Stabilisation Centres for the treatment of malaria in malnourished patients.
- Community case management of malaria, particularly in areas with inadequate access to primary health care services
- Technical capacity building, supply chain, and supervision support to targeted health facilities in identified underserved wards, in order to significantly expand access to essential life-saving healthcare.
- Improved epidemiological recording and data collection, to better inform disease surveillance and outbreak responses.

With no solution to the conflict in sight, the need for agile humanitarian agencies that can deliver programmes in highly insecure settings is critical to ensure that these underserved communities and IDPs are accessed and their needs met.

The MENTOR Initiative

The MENTOR Initiative was formed in 2002 in partnership with WHO and Roll Back Malaria (RBM) to tackle disease control in the most challenging settings in Africa, Asia, the Americas, and the Middle East. Since its formation, MENTOR has been delivering successful programmes in Burma, Indonesia, Haiti, Liberia, Angola, Mozambique, Chad, Cameroon, Sudan, South Sudan, Central African Republic (CAR), Ethiopia, Sierra Leone, Kenya, and Somalia. At the same time, MENTOR serves as the lead technical specialist agency on WHO expert committees for malaria and leishmaniasis, participates in the Alliance for Malaria Prevention (AMP) and as core partners in the RBM vector control working group workstream on Vector Control in Humanitarian Emergencies. Furthermore, MENTOR is a member of the NTD NGO Network (NNN), engaging with cross-cutting groups for WASH and Onchocerciasis and is currently developing a new cross-cutting group for neglected tropical diseases (NTDs) in humanitarian emergencies and conflict zones. As part of this, MENTOR panelled a plenary session and ran a workshop with SightSavers International and the Carter Centre at the NNN conference in September 2018.

The MENTOR team includes specialists experienced and skilled in tropical disease control in emergency situations. The core expertise provided through this specialist technical and operational team includes epidemiology, emergency field assessment and planning, malaria surveillance, vector control and personal protection, laboratory diagnosis and investigation, case management, community mobilization, technical training of health workers, applied operational research and impact evaluation. In doing this The MENTOR Initiative has become the established emergency vector borne disease (VBD) and NTD support agency for many MoH teams and most international NGOs (including OXFAM, MSF H, MSF B, IRC, MEDAIR, Goal and many others), ICRC, IFRC and MoH teams and local organizations across the most austere settings in the world.

In addition to direct emergency country support, The MENTOR Initiative has now also trained over 1,400 senior emergency managers from over 20 MoH national teams, 100 international NGOs, donor representatives, UN agencies, and private sector companies through the implementation of the RBM/WHO intensive training programs on vector borne disease control in emergencies which it has implemented since October 2002 in international hubs, serving emergency sites around the world.

Between October 2019 and February 2020, The MENTOR Initiative conducted a assessments of health needs in Borno State, liaising with partners and ministries on the ground to develop a picture of the existing health response and identifying critical gaps that, if addressed, would reduce significantly death and suffering amongst both IDPs and host communities in Borno state.

The MENTOR Initiative extends its gratitude to all partners, ministries, and agencies that collaborated with MENTOR including: the Ministry of Health (MoH), National Primary Healthcare Development Agency (NPHCDA), State Primary Healthcare Development Agency (SPHCDA), Borno State Environmental Protection Agency (BOSEPA), State Emergency Management Agency (SEMA), Health Cluster Sector, UNOCHA, IOM, INSO, and partner INGOs. In particular, MENTOR thanks Solidarites International for their support and facilitation of this assessment.

Borno State: Humanitarian Overview

The protracted humanitarian crisis in northeast Nigeria has now lasted over ten years, with no near-term solution in sight. The crisis, caused by regional armed conflict between non-state actors and the government of Nigeria, continues to disproportionately impact civilians through widespread forced displacement, crimes against humanity, and the repeated disruption of essential infrastructure including access to primary healthcare. In 2019, 7.1 million

people (2.3 million girls, 1.9 million boys, 1.6 million women and 1.3 million men) were in need of humanitarian assistance in northeast Nigeria as a result of the crisis. This includes 1.8 million Nigerians who have fled from their homes and are internally displaced, the majority in Borno State which remains the epicentre of the crisis with an estimated 264 camps hosting over 800,000 people. Of these displaced people, 80 per cent are women and children, with one in four under the age of five[1].

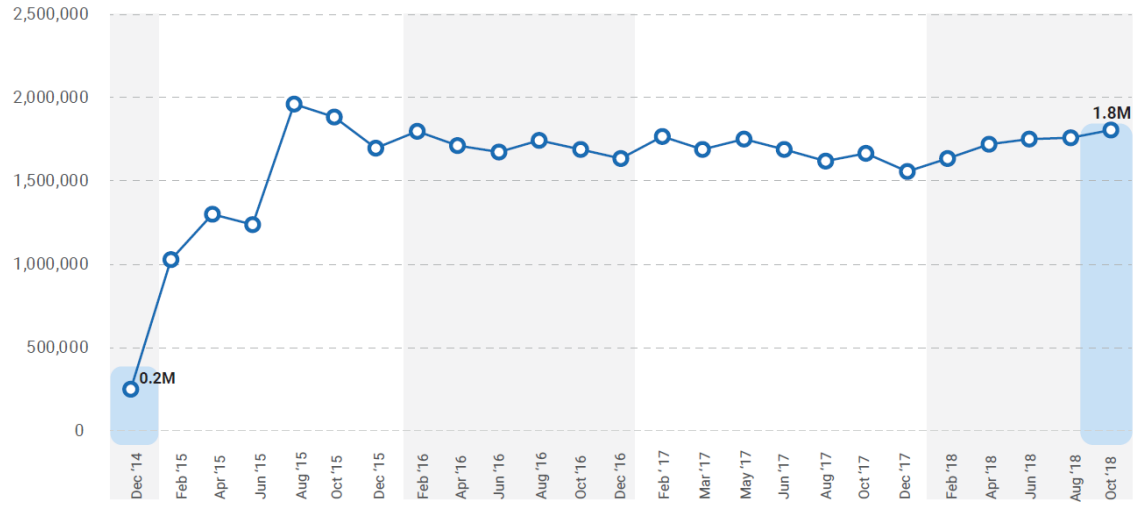

Figure 1: Number of displaced people in NE Nigeria over time since December 2014 (HNO 2018)

Figure 1 illustrates the protracted nature of the crisis in the northeast of Nigeria with the number of internally displaced people (IDPs) effectively remaining constant since mid-2015 to October 2018 where the number of displaced people was 1.8 million. Throughout 2019 this trend continued with IOM reporting in May an increase in total displaced people at 1.98 million people recorded across the northeast states, the vast majority being in Borno[2]. With there being no sign of the conflict easing, it can be assumed that numbers of those displaced will only continue to rise through 2020.

ISWAP, JAS, & Humanitarian Access

Insecurity and restricted humanitarian access has caused significant limitations in health services being available to those at need. The primary cause of such restricted access is the advent of Boko Harams insurgency in the northeast and its subsequent split in 2016 into Islamic State in the West African Province (ISWAP) and Jama'tu Ahlis Sunna Lidda'awati wal-Jihad (JAS).

Both ISWAP and JAS, each a splinter of Boko Haram, are growing in power and influence. From their territorial bases on the banks and islands of Lake Chad, these jihadist groups are waging a guerrilla war across north-eastern Nigeria and elsewhere on the lake's periphery. In the past year, both groups have significantly increased their territorial areas of operations, surrounding major towns and even overlapping in areas. ISWAP primarily operating in the northern regions of Borno state into Adamawa, and JAS primarily operating in the south of Borno and into Yobe. A shift in the military strategy initiated by the Theatre Commander in Maiduguri has seen a regrouping of troops around major towns into what are often described as "super camps" (see Figure 2). Partners working in locations where static forces have been withdrawn are concerned that this new strategy will increase insecurity in these areas and impede the delivery of ongoing assistance.

[1] 2019 Humanitarian Needs Overview
[2] DTM Nigeria Baseline Dashboard – Round 27 (May 2019)

This expansion of AOG territory has had significant implications on the ability for humanitarian organisations to access populations that are in need of assistance. Humanitarian organisations have been forced to largely abandon the use of roads and resort to transporting staff via UNHAS flights and military convoys made available by the Nigerian armed forces in the region. Such restrictions on access continues to significantly hamper humanitarian efforts to fulfil the health needs of both internally displaced people and host-communities.

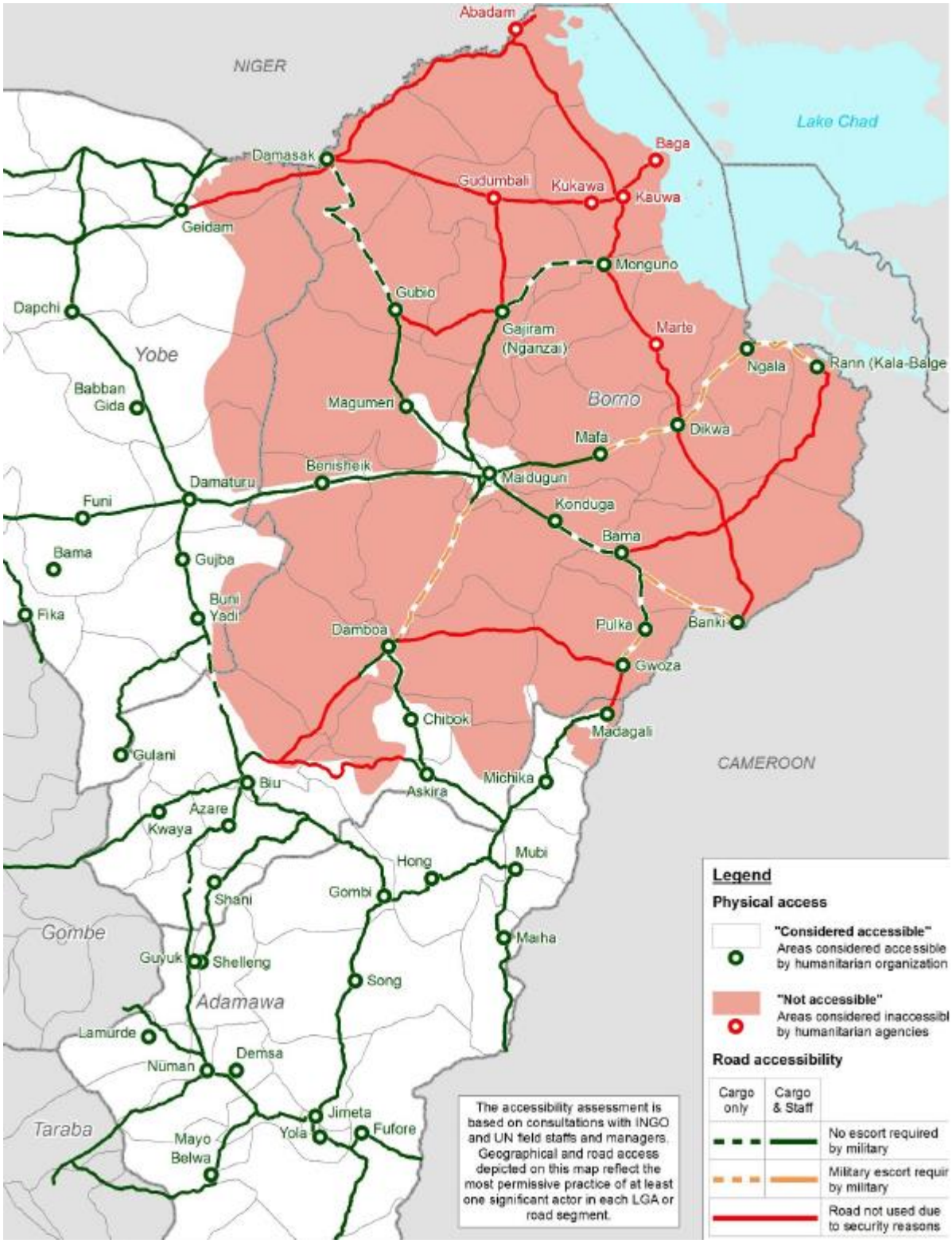

Figure 2: Illustration of accessibility in Borno state. Many of the green roads out of Maiduguri are now considered higher risk, such as the road to Damaturu, and the road to Monguno as a result of kidnapping and AOG attacks on these roads.

The unpredictable security situation hampers movements of health workers, drugs and other medical supplies and health service delivery continues to be hindered by the breakdown of infrastructure and shortage of skilled health care workers who have relocated to safer areas. Concurrently, reliable humanitarian access has been reduced to small areas surrounding towns that have a military "super camp" providing a level of protection from AOG attacks.

Disease Burden

In north-east Nigeria, 5.3 million people, including 2.9 million women and girls, are in need of life-saving and essential health services, with the majority of these needs being in the state of Borno, according to the 2019 Humanitarian Needs Overview. Malaria, cholera, and other diarrheal diseases are endemic to the region, which in combination with seasonal weather patterns, damaged or destroyed healthcare infrastructure, and poor or no access to clean water and basic sanitation with high rates of malnutrition, creates a high disease burden all year-round.

Malaria

The main disease of concern in this context is malaria, accounting for the majority of mortality and morbidity in the region. According to the WHO World Malaria Report 2019, Nigeria contributed to 25% of global malaria which accounts for 24% of the global estimated malaria deaths. Due to limited control measures, increased risk factors of exposure to VBDs due to large rates of displacement and temporary shelter, and limited functionality or access to health facilities for timely case management, means that those in Borno state are of particular high risk of VBD related mortality and morbidity. Malaria is hypoendemic in Borno with peak transmission occurring during the rains of June through October. The crisis in the region has complicated the burden of malaria and other health conditions, and remains a major public health challenge especially during the wet months. P. falciparum, the most fatal form of malaria, is responsible for almost all malaria cases reported in the state.

Figure 3: Malaria rates over time in Borno State – Blue Arrows illustrates link between onset of rainy season and sharp rise in malaria rates

The increasing conflict also increases people's vulnerability to malaria, cutting access to diagnostics and treatment. Approximately 58% of health facilities are not functioning due to insecurity. These would have otherwise provided malaria prevention and case management services[3]. Indeed, malaria interventions have been highlighted as a priority need following analysis from the WHO, identifying malaria as the number one health risk to populations

[3] Humanitarian Needs Overview, 2019

across north-east Nigeria[4] who are in the grip of an escalating malaria problem, with disease transmission exacerbated by displacement, increased exposure to biting mosquitoes, reduced immune statue due to malnutrition and multiple compounding disease infections at the same time.

This high risk of disease outbreaks and epidemics in Borno state is clearly illustrated by figure 3 which details the routine increase of malaria cases during the rainy season in the second half of the year. Cumulative data from the end of 2019 showed Malaria (suspected n=551,406; confirmed n=372,938) as the leading cause of morbidity reported through EWARS (36.7%) as well as the leading cause of mortality accounting for 31.3% of deaths in 2019[5]. Estimates indicate that in 2018 malaria combined with malnutrition accounted for more deaths than all other known causes of death combined, including cholera, measles and hepatitis E1[6]. Also illustrated in figure 3, we can see there has been a steady average increase in malaria cases as the crisis continues. This trend suggests that malaria cases will continue to increase annually unless strengthened prevention measures are implemented.

It is very concerning that the number of reported malaria cases has increased despite reduced humanitarian access and thus ability to record cases in many areas. For example, data from EWARS will show Guzamala reporting 0 cases of malaria. This also happens to be an LGA where humanitarian partners have some of the most restricted access due to the acute insecurity in such LGAs, and so reporting mechanisms are poorly functioning. The lack of functioning, and therefore reporting, health facilities in LGAs will be significantly impacting the cases recorded. For example, Kaga, Gubio and Mobbar, have roughly the same total population as Monguno, Damboa and Biu, yet the latter three are reporting multiple higher cases of malaria. Given the endemicity of the disease, as well as the geographic proximity of these areas and the similarity in their climate and seasonality, it is highly unlikely that the former areas (more remote and harder to access) will happen to also have far less cases of malaria. Thus, it can be assumed that these areas share a concerning level of malaria cases that are going unreported.

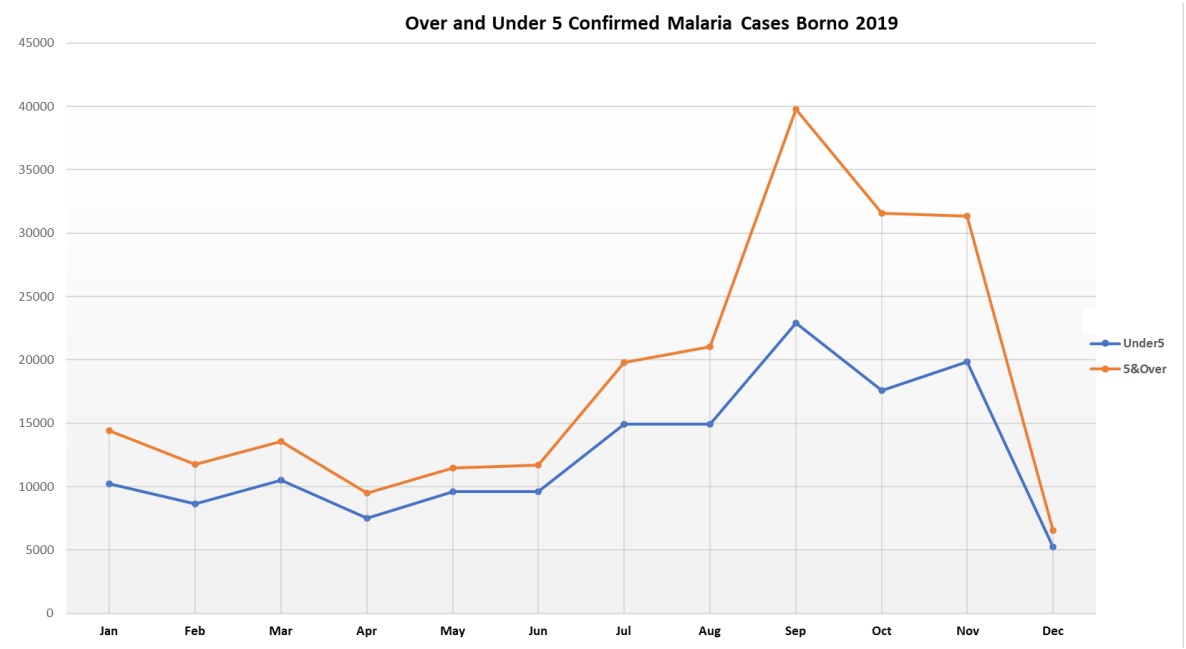

Figure 4: Confirmed malaria cases over time in Borno State (EWARS)

Similar trends can be seen in the cases reporting of acute respiratory infections (ARI) across Borno state over the same time period. Despite decreasing humanitarian access, the overall cases reported are increasing but a number

[4] WHO Global Malaria Programme, 2019
[5] EWARS W52 Epidemiological Bulletin W52
[6] ACLED, Year in Review 2018

of hard to access LGAs continue to report 0 cases, drawing into question the efficacy of reporting systems. Even in areas which retain access and some health facility functionality, the health cluster have highlighted that unavailability of network coverage continues to negatively affect submission of health data[7].

However, there are still critical conclusions that can be drawn from available data. For example, what we can draw from the data shown in figure 4 is that cases amongst adults are higher than those amongst under-fives. This illustrates how the population is immunocompromised from malnutrition and other existing diseases such as skin disease and respiratory infections. Normally in settings where malaria is endemic, adults and those over the age of five will have developed a natural immunity to malaria from receiving multiple infections in the early course of their life. However, in this case, the poor state of the populations overall health is leading to over-fives and adults suffering from increased morbidity and mortality from malaria. As seasonal malaria chemoprevention (SMC) which targets under-fives has been implemented in Borno in 2019, although somewhat sporadically and not achieving blanket LGA coverage, may also have somewhat contributed to the lower rates of malaria in under-fives. The data shows that despite such interventions, cases continue to increase annually, and that any future interventions much consider being able to target all ages in order to prevent the majority of malaria cases in Borno.

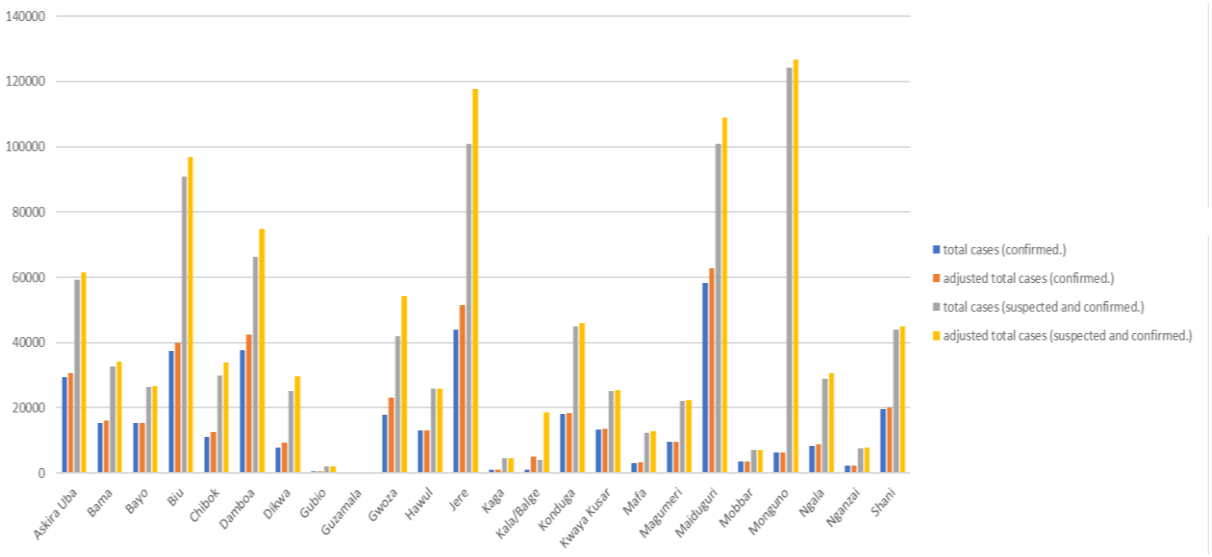

Figure 5: Confirmed, and confirmed + suspected malaria cases in Borno State over 2019 (EWARS). Adjusted cases account for lack of reporting, and represent presumed malaria cases based on 100% health facilities reporting

Despite a huge number of health facilities not functioning, and therefore lower numbers of cases of malaria being reported, figure 5 and 6 still highlights the overwhelming burden of malaria across LGAs in Borno. Both data sets include adjusted number of cases based on 100% of all open health facilities reporting as well as the reported number of suspected and confirmed malaria cases. As we can see in Figure 6, Monguno and Damboa show the highest burden proportional to population, showing 45 and 42 predicted cases per 100 respectively. Damboa also reported the highest number of malaria related deaths in 2019 of all the LGAs. Figure 6 also shows Kala/Balge to be grossly underreporting cases, with only 22% health facility reporting completeness over 2019.

Areas of highest proportional cases of malaria are areas with some of the highest number of IDPs (proportional to overall population), as shown in Figure 7. Kala/Balge has the highest proportional number of IDPs, followed by Monguno, Dikwa and Ngala. This highlights the increased risk factors of those displaced to exposure to malaria and VBDs.

[7] Health Sector Bulletin, Oct 2019

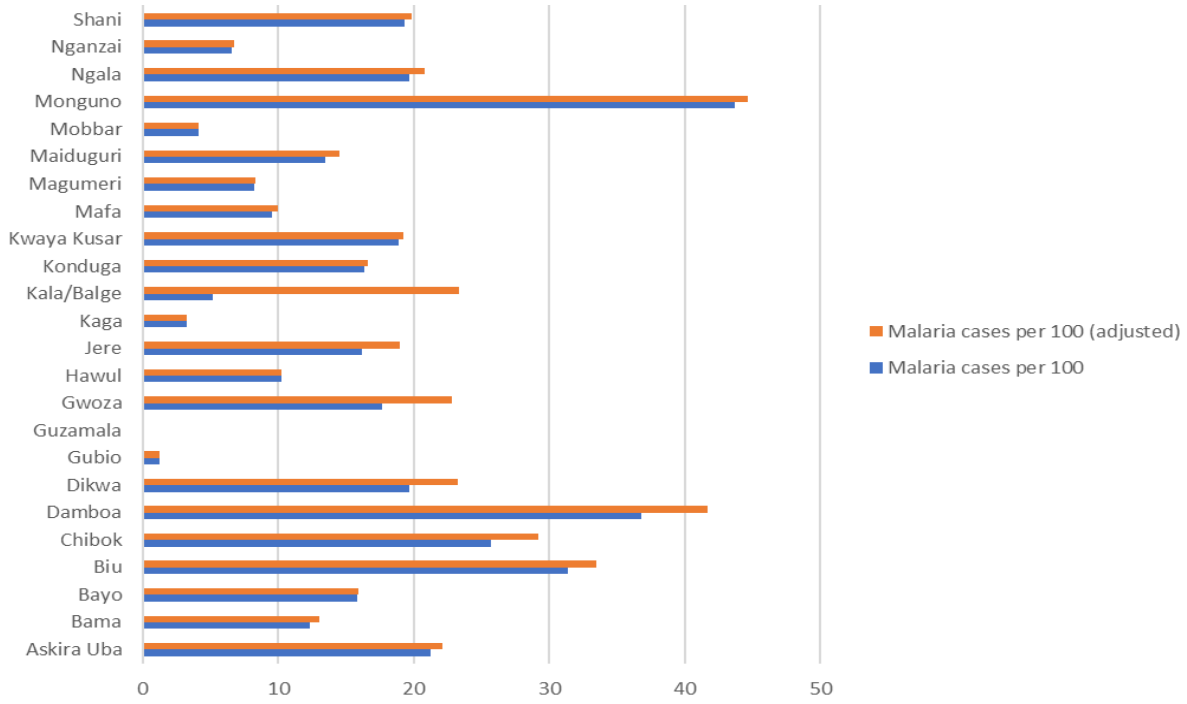

Figure 6: Confirmed plus suspected malaria cases per 100, per LGA in Borno State over 2019 (EWARS). Adjusted cases account for lack of reporting, and represent presumed malaria cases based on 100% health facilities reporting

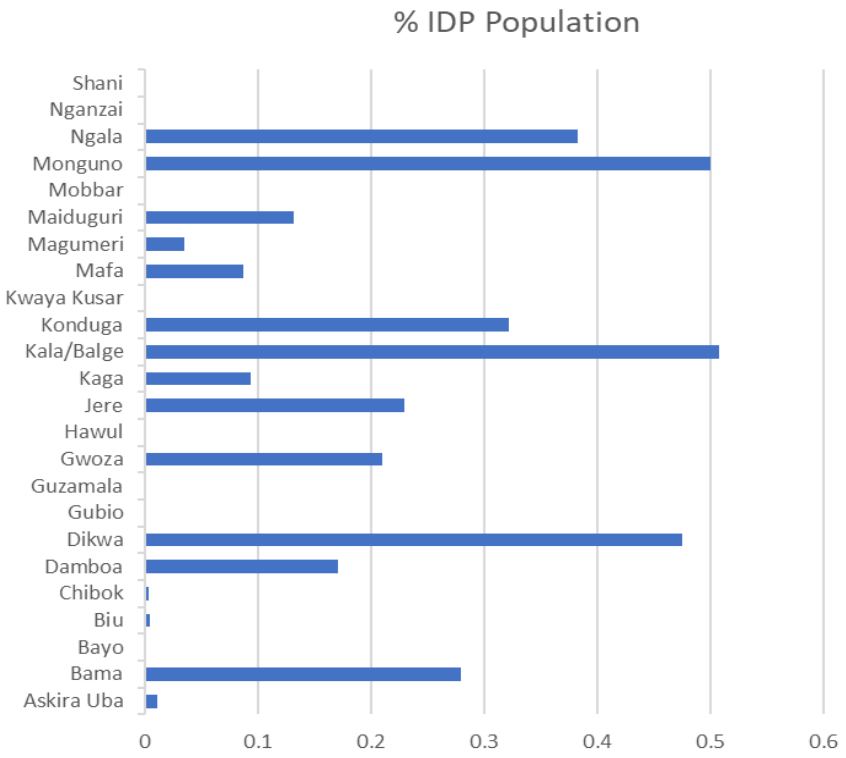

Figure 7: Proportion of population that is an IDP per LGA

There have been additional long-standing concerns that cases diagnosed as malaria are actually dengue fever, and that dengue cases are being missed and underreported, particularly in areas with high malaria cases. Dengue

is transmitted by aedes mosquitoes, rather than the malaria transmitting anopheles mosquitoes. Aedes mosquitoes behave very differently, and lay their eggs in water that is contained in buckets, water tanks, old tires, tin cans and any other domestic or waste containers that hold any amount of clean water. Adult aedes mosquitoes transmit the disease through their bite, whilst feeding on human blood. Unlike malaria mosquitoes, they bite mainly during daylight hours, both outdoors and indoors, and cannot be controlled using malaria prevention methods. DNV3 and DNV4 have recently been detected in Nigeria, with the emergence of dengue haemorrhagic fever for the first time. Recent reports suggest that dengue viruses are a major cause of acute fevers in Nigeria, and many cases are most likely being misdiagnosed as malaria [8] [9]. Numerous studies suggest endemicity of the disease across Nigeria, including Borno state, with a seroprevalence survey conducted in Maiduguri showing that 10.1% of participants were seropositive for dengue subtype-3 virus (DENV-3)[10]. Dengue haemorrhagic fever presents in a similar manner to Ebola and Lassa fever and is difficult to manage resulting in high rates of mortality. As aedes borne diseases do not have any curative therapies available, and patient care is limited to supportive case management alone, prevention relies on mass control of aedes breeding sites including community and household mobilization. Such large-scale prevention measures have not been conducted in affected and at-risk areas of Borno, and disease epidemic risk is high and very concerning.

Malnutrition and its wider impact on disease and health

Malnutrition is a significant factor impacting the morbidity and mortality rates across Borno state. The combined effect of malnutrition and disease is well known, particularly in the case of malaria. A patient presenting with malaria and concurrent malnutrition is more likely to deteriorate into severe disease, and the chances of death increase significantly. Clinical treatment of malaria is far more challenging because, when malnourished, absorption of oral medication is reduced by up to 50% due to changes in the intestinal lining, and thus not achieving therapeutic levels of treatment. Recent research has shown that severe acute malnutrition (SAM) results in lower lumefantrine bio-availability in children treated with artemether-lumefantrine (A-L) for uncomplicated malaria [11]. First line treatment for uncomplicated malaria in Nigeria is A-L, and thus is incredibly concerning when considering the worsening nutritional situation in Borno state.

Combined with restricted livelihood opportunities, populations in conflict-affected areas of the northeast are facing Crisis (IPC Phase 3) and Emergency (IPC Phase 4) outcomes. Populations in inaccessible areas are likely facing similar or worse outcomes relative to adjoining accessible areas[12], considering that even in those areas which still remain accessible have elevated levels of SAM. For example, in Ngala and Dikwa, the prevalence of acute malnutrition (child) based on GAM(WHZ) remains high (14.3% and 10.4% respectively) [13]. Malnutrition is not only affecting children, but also adults. A recent SMART survey conducted in Bama, Ngala, Dikwa and Damboa found existence of acute malnutrition among mothers using MUAC to identify nutrition status [14]. This, again, highlights the levels of malnutrition in adult populations which contribute to the high burden of malaria in adults. This can be seen in figure 8, which shows how malaria and SAM are intrinsically linked and have seasonal peaks with increasing overall trends. This is important to consider as successful treatment of malaria in cases of high malnutrition requires specific training and non-oral routes of drug administration. People suffering SAM and infected with malaria are also unlikely to show defined clinical malaria symptoms. This situation leads to the strong possibility that the patient will die of malaria having not been diagnosed, or diagnosed only when the disease has

[8] Ayukekbong JA. Dengue Virus in Nigeria: Current Status and Future Perspective. British Journal of Virology. 2014
[9] Out, A. *et al*, 2019
[10] Idris AN, Baba MM, Thairu Y, Bamidele O. Sero-prevalence of dengue type-3 Virus among patients with febrile illnesses attending a tertiary hospital in Maiduguri, Nigeria. Int J Med Med Sci. 2013
[11] Chotsiri, p. et al, 2019
[12] FEWSNET Key Message Update 26/11/19
[13] Smart Survey Report: Conducted in Banki(Bama), Damboa, Dikwa and Ngala LGAs, Borno State, Nigeria (26th September to 9th October, 2019)
[14] Ibid

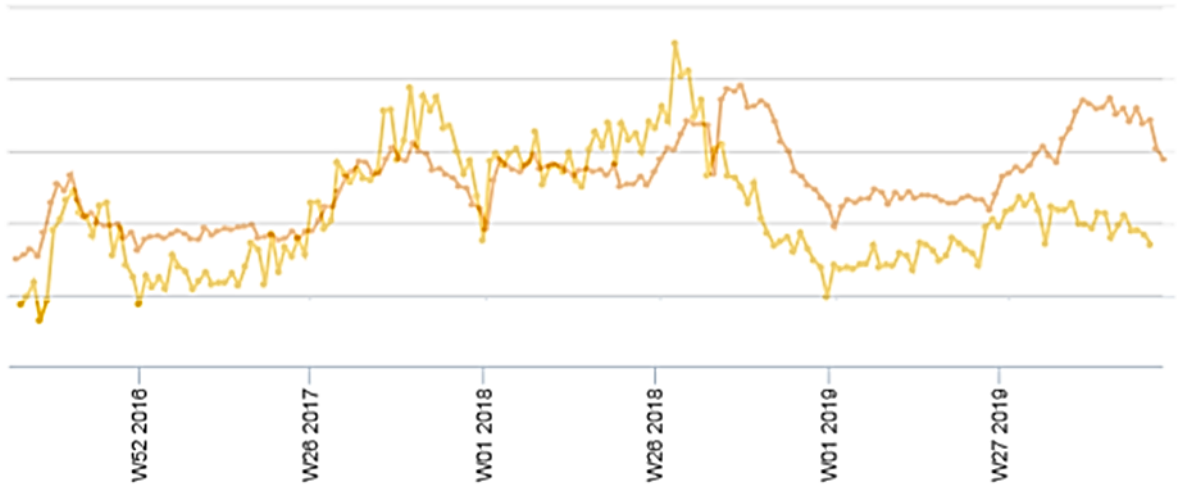

Figure 8: Recorded trends of malaria (red) and SAM (orange) in Borno state over time (EWARS)

become too severe to survive. In these cases, effective case management also relies on the availability of injectable artesunate (first line treatment for severe malaria in Nigeria), or pre referral treatment of IM or rectal artesunate which is currently not being used in Borno. Treatment for severe malaria therefore relies completely on the patient having access to appropriate and timely health facility access. However, worsening access due to insecurity is making it more difficult for people to access such treatment, and is also impeding the supply chain of these required medications to areas of most need. Also considering the increasingly limited access to, and huge reduction in, functioning health facilities in Borno, those with malaria are firstly more likely to present further on in their illness. Secondly, due to the factors such as malnutrition as discussed, those in Borno state are more likely to develop severe malaria. Worsening SAM of children also puts them at higher risk of having treatment failure of uncomplicated malaria when receiving standard oral AL therapy and increased likelihood of deteriorating rapidly into severe malaria and death. Existing food insecurity, in combination with endemic disease, places both the host and IDP populations at significant year-round risk of infection and death from disease.

Increased risk factors of vector borne disease

The majority of IDPs displaced from the ongoing conflict now live in temporary shelter camps or settlements, with some living in the homes of their relatives or in the host community. While progress was made to establish camps, camp committees and gap monitoring mechanisms, the living conditions in IDP camps remain poor and puts this population at particular risk of poor health outcomes, and in particular of VBDs. Both informal (Image 1) and formal (image 2) camps pose conditions which increase people's risk to VBDs, through increased exposure, cramped living conditions, increased vector breeding sites, reduced nutrition and immunity, and inadequate WASH facilities.

The onset of the rainy and lean season is expected to limit humanitarian relief access further and exacerbate the shelter, food and health situation, with direct risks related to sanitation, nutrition and VBD. It is not just those in camps who are being put at increasing health risks due to the ongoing conflict. Reduced access to health care facilities, increased pressure on WASH facilities, cramped living conditions of those hosting IDPs and large-scale food insecurity also puts host communities at worsened health outcomes. The increased vulnerabilities of these groups were highlighted in the heavy flooding experienced in August 2019 in Borno state, where heavy flooding required the immediate response of humanitarian actors. By the end of August, more than 21,000 families had been affected by flooding in BAY states, and 13,181 shelters were reported to have been either partially or completely damaged. These seasonal impacts also triggered secondary displacements, and humanitarians responded by relocating families, providing urgent shelter, WASH, and health services. In areas such as

Image 1: Typical shelter in an informal camp in Borno state

Image 2: Typical shelter in a formal camp in Borno state

Kala/Balge, the combination of increased insecurity and heavy rains results in almost complete inaccessibility for partners to this area during rainy season. This leaves this population even more unlikely to be able to receive health care provision at a time where malaria rates soar due to the increase in mosquito breeding sites caused by rains. With increased risk of VBD, and reduced health care access, both displaced and host communities are increasingly vulnerable to poor health outcomes.

Health Response Needs in Borno State

Many health facilities across Borno state are still non-functional or partially functional while those that are functioning have limited or varying capacity to deliver standard health care packages. In hard-to-reach and newly accessible areas, communities face serious challenges in accessing health services due to various reasons, including lack of medical staff, unavailability of drugs and supplies, security barriers, transportation issues and damaged/destroyed health facilities. Critical gaps also remain in functional primary and secondary health services such as capacity issues and regular stock outs of medication and commodities. Other common challenges in accessing health services are related to high direct and indirect costs associated with healthcare, including the price of quality medicines[15]. Not only is there reduced functioning primary and secondary health care facilities, but there is also an almost total lack of community case management of malaria and other VBDs, except the WHO CORPS program which is aimed at under fives. As the majority of malaria cases are, as described, in the over fives age category, there is a gap in need regarding increased capacity at community level for case management.

Across LGAs, insecurity continues to limit the duration of clinical activities in host communities and there are ongoing issues with stocking of medical supplies. There has been particular concern regarding anti-malarial drugs shortage in LGAs such as Ngala. There is an additonal lack of secondary health care facilities for referrals of severe cases [16] across all LGAs, but particularly of concern in Rann where 24-hour services are not currently being achieved due to increasing insecurity and thus restricting partner support. There is an overwhelming lack of any effective LLIN coverage in camps or host communities, with DTM assessments showing very low ownership across all camps assessed. The coverage of LLINs in IDP camps is totally inadequate, and despite those reporting owning a mosquito net, usage for prevention is not known. LLINs are not recommended for use in tents or temporary shelters as they are difficult to hang up and maintain in small spaces. Indoor residual spray (IRS) of shelters, or insecticide treated shelter materials is better adapted to camp settings. Spatial repellents may also be useful in

[15] Health Sector Bulletin, Oct 2019
[16] OCHA Sit Rep, Sept 2019

such settings. Ongoing garbage and solid waste management gaps, lack of hand washing stations, unhygienic latrines, and widespread practice of open defecation also put this population at increased risk of diarrheal disease. Again, there is complete absence for aedes mosquito control or fly control and zero access to more effective means of malaria prevention such as indoor residual spray.

In LGAs such as Dikwa, where there are partners present in IDP camps, there are gaps in facilities which are functioning adequately in host communities with limited partner support, which is resulting in the host community population utilising the health facilities in the IDP camps. These health facilities are also having to serve the host communities with incredible pressure being put on these services. Given that malaria remains the highest cause of morbidity and mortality in Maiduguri and surrounding areas, preventative activities such as IRS (and LLIN distributions where shelters are suitable to hang them) would be highly beneficial for the populations and would have the added benefit of reducing the burden on health facilities in the area.

Prevention: Vector Control

With such significant health needs and massively reduced health facility access, disease prevention measures are key in improving health outcomes of both IDPs and host communities across these identified LGAs of priority. To address the main disease of concern in these areas (malaria), WHO recommends universal coverage of the population at risk of malaria with effective vector control. The aim of vector control is to reduce the number of people that may get malaria, reducing morbidity and mortality, as well as reducing onward malaria transmission. Vector control is therefore both a disease and a transmission-reduction tool. In order to address malaria, the most prevalent cause of morbidity and mortality in Borno, universal coverage of vector control is required, which involves indoor residual spraying (IRS) or long-lasting insecticidal nets (LLINs) (if suitable structures allow for their use) to be deployed in accordance with relevant WHO guidelines. A WHO assessment in North East Nigeria identified the need for interventions as being:

- Strengthening the surveillance system
- Increasing the population's access to case management, including use of RDT and ACT.
- Vector control based on IRS at all IDP camps as well as mass distribution of LLINs
- Chemoprevention (SMC) to all children less than 5 years (ideally 4 to 5 monthly rounds) and to all pregnant women (IPTp) [17]

There is also an urgent need to work across the Health and WASH sectors to ensure water container management and waste management is implemented to reduce the risk and transmission of aedes borne diseases as well as fly borne diarrheal diseases. This can easily be deployed in harmony with existing IEC health and hygiene campaigns in camps and host communities.

Due to lack of health facilities which are functioning, and previously described issues regarding reporting, there still remains important gaps in disease surveillance. Increasing access to case management is vital in areas with identified gaps, and needs a partner to support health facilities in currently unsupported areas to ensure an essential primary healthcare service is provided by trained staff. Such case management systems remain increasingly hampered, due to lack of health facilities being able to provide malaria diagnosis and treatment, and issues with commodity and medication stock outs.

[17] WHO, Broad Principles of Malaria Control and Response to Malaria During Humanitarian Crisis in Northeast Nigeria 2017

IRS has not been conducted in Borno state despite great willingness for its use amongst authorities as they recognise how IRS would dramatically improve the existing malaria crisis. However, seasonal malaria chemoprevention (SMC) was conducted across targeted LGAs in Borno, with the last reported WHO campaign being in 2018 (Figure 11) with some LGAs having had smaller campaigns in 2019 by individual health partners. As SMC is only effective for 4 months, and campaigns rely on adequate household access to all areas, there is concern regarding sufficient coverage of protection for this at-risk population. Guidelines for mass drug administration (MDA) advise that wherever there is a security risk and access to populations is hampered, that any MDA should be coupled with either IRS and/or LLINs as appropriate [18]. Thus, with inconsistent SMC and very limited LLIN coverage, further prevention measures such as IRS is required to provide sufficient prevention of malaria. If delivered, reductions of 50-60% in malaria cases would be achievable resulting in a significant mortality reduction.

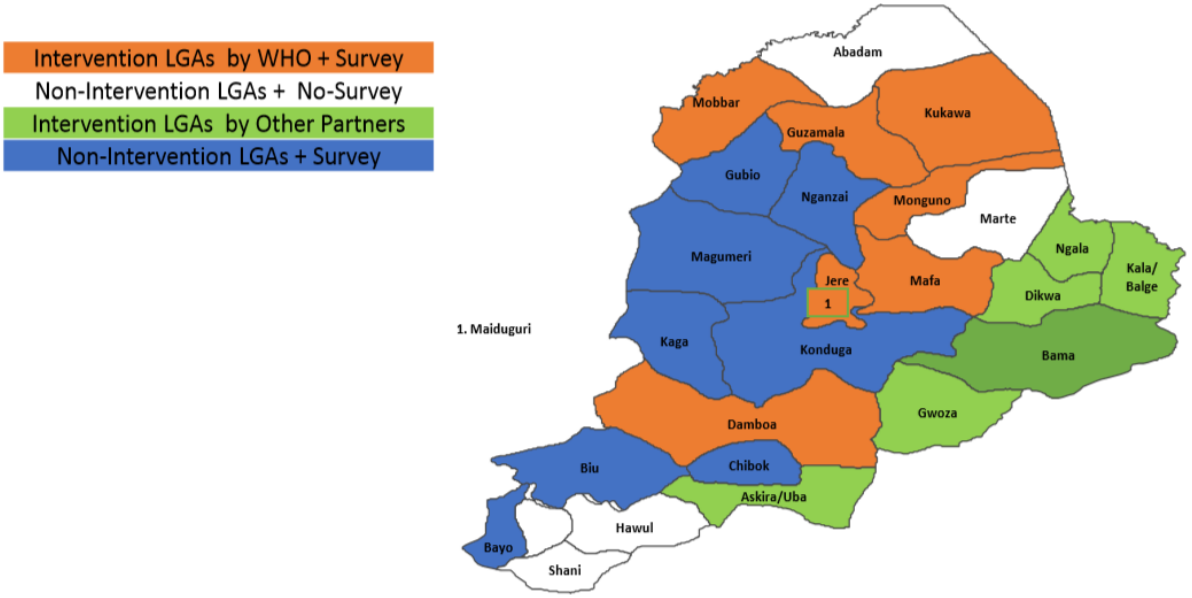

Figure 8: LGAs covered by WHO and other partners for malaria survey and SMC

Education and BCC

With rising numbers of IDPs, increasing rates of disease and worsening conditions, education is also key in addressing the huge burden of preventable disease. Community education is important firstly to improve health service seeking behaviour, in raising awareness of conditions and informing communities when and where to seek health care support. A recent SMART survey conducted in Damboa, Dikwa and Ngala showed a large gap in need for such an intervention and highlighted the need for increased community messaging about health seeking behaviours. Analysis on association between primary caregiver education level and health seeking pattern revealed that caregivers with no education were likely not to visit a health facility for the treatment of their ill children representing 66.9%, 71.6% and 86.5% in Damboa, Dikwa and Ngala respectively. Across all LGAs, health seeking patterns (<20%) of children who reported ill their caregivers did not seek treatment. This implies that education is an important pillar especially in creating awareness on health and nutrition services available, in utilization of services and adoption of good health seeking behaviour by the primary caregiver with consequent implication on maternal and child health. Moreover, the health cluster has reported that although the MOH have printed IEC information on malaria earlier in 2019, this is currently not adequate and further IEC is required [19].

[18] (Broad principles for malaria control and prevention WHO assessment in North East Nigeria, 2017)
[19] Health Cluster Minutes, Dec 2019

Education is also key in preventing diarrheal disease and preventing further cholera outbreaks. Hygiene promotion is the tool used to encourage households and individuals to change behavior in such a way as to reduce their risk of exposure to diseases and infection. In this setting, hygiene promotion is going to be vital to reducing transmission of several life-threatening diseases, including diarrheal diseases, and aedes mosquito borne diseases. The SMART survey conducted also found that hand washing practices for at least 3 or more critical times was below 50% across the surveyed LGAs, with the exception of Ngala (69.4%). Cross tabulation between diarrhoea and handwashing practices revealed that caregivers who did not observe critical handwashing practices had their children with diarrhoea illnesses representing (6.1%), (6.3%) and (8.5%) in Damboa, Dikwa and Ngala respectively. The Health Cluster have also raised concerns in regards to trachoma across Borno state and the need for interventions, however trachoma surgery has not been able to be implemented due to insecurity and access. Therefore, hygiene promotion and education also has the cross benefit in the prevention of other fly borne disease such as trachoma, however such IEC should be integrated with standard WASH, hygiene, and VBD prevention methods, as well as correct health service seeking messaging in order to achieve maximum impact in reducing and preventing infection rates.

Conclusion and Recommendations:

The protracted conflict and resulting health needs of affected populations in Borno state is worsening and requires an integrated and coordinated approach by partners. The extreme burden that malaria continues to have on both displaced and host communities is critical, especially when considering the increasing state of malnutrition which exacerbates morbidity and mortality of those affected. The huge reduction in health service access not only puts strain on the remaining health facilities functioning, but reduces effective case management of preventable disease. Therefore, further control measures such as IRS is urgently needed, as per WHO guidelines, in order to provide community wide and effective protection. Limited community education further reduces health care seeking behaviour, and presents a gap in hygiene and health messaging as a key preventative tool for malaria, aedes borne disease and diarrhoeal disease.

Prevention measures are needed urgently across both IDP camps and host communities which targets all age groups. IRS is the most appropriate and effective tool in this case, whereby no community follow up is needed, does not rely on behavioural change, and protects all members of the household. These interventions are particularly urgent in areas of highest proportional cases of malaria such as Monguno and Damboa, and those LGAs with highest proportional numbers of IDPs living in camps which increases their risk of exposure to VBDs. Areas such as Rann (Kala/Balge) which are inaccessible come rainy season, also require long term prevention measures to provide protection over a time when health partner support is diminished and therefore case management services unavailable, which is coincides with a huge spike in seasonal transmission of malaria due to flooding and increase in mosquito breeding sites.

With inadequate primary and secondary health care services due to access and lack of functioning facilities, it is becoming vital that case management services are available in the community to account for the lack of functioning PHC services, and to prevent avoidable morbidity and death. Timely identification and treatment of malaria is particularly vital in this population, who have poor nutritional status which puts this group at a higher likelihood of deteriorating into more severe disease. The concerning rates of malnutrition across this population also means that there needs to be technical capacity of nutrition staff in treating those who are malnourished with malaria. Therefore, it is important that staff working in nutrition centres (community, OTPs and stabilisation centres) are trained to ensure that cases of malaria in those who are malnourished are managed appropriately.

In order to improve the health outcomes of this vulnerable population, an integrated approached which targets surveillance, prevention and case management is imperative in reducing the worsening health burden of those affected in Borno state. Fulfilling such activities would significantly reduce disease burden and save lives.

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