Bangladesh/Myanmar: Rakhine Conflict 2017

Public Health Situation Analysis And Interventions

28 September 2017

Photo credits: WHO Country Office, Bangladesh

World Health Organization
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Acronyms and abbreviations

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<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AOG</td>
<td>Armed opposition group</td>
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<tr>
<td>CCCM</td>
<td>Camp coordination and camp management cluster</td>
</tr>
<tr>
<td>IDP</td>
<td>Internally displaced person</td>
</tr>
<tr>
<td>ICDDR B</td>
<td>International Centre for Diarrhoeal Disease Research, Bangladesh</td>
</tr>
<tr>
<td>ICRC</td>
<td>International Committee of the Red Cross</td>
</tr>
<tr>
<td>ICSG</td>
<td>Inter Sectoral Coordination Group</td>
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<tr>
<td>IFRC</td>
<td>International Federation of Red Cross and Red Crescent Societies</td>
</tr>
<tr>
<td>IOM</td>
<td>International Organization for Migration</td>
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<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MSF</td>
<td>Doctors Without Borders/Médecins Sans Frontières</td>
</tr>
<tr>
<td>NGO</td>
<td>Nongovernmental organization</td>
</tr>
<tr>
<td>OCHA</td>
<td>Office for the Coordination of Humanitarian Affairs</td>
</tr>
<tr>
<td>PHC</td>
<td>Primary health care</td>
</tr>
<tr>
<td>PTSD</td>
<td>Post-traumatic stress disorder</td>
</tr>
<tr>
<td>SGBV</td>
<td>Sexual and gender-based violence</td>
</tr>
<tr>
<td>STI</td>
<td>Sexually-transmitted infection</td>
</tr>
<tr>
<td>UNFPA</td>
<td>United Nations Population Fund</td>
</tr>
<tr>
<td>UNHCR</td>
<td>Office of the United Nations High Commissioner for Refugees</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children's Fund</td>
</tr>
<tr>
<td>WASH</td>
<td>Water, sanitation and hygiene</td>
</tr>
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<td>WHO</td>
<td>World Health Organization</td>
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Preface

The purpose of this public health situation analysis is to provide all health sector partners, including professionals of local and national authorities, non-governmental organizations (NGOs), donor agencies and United Nations agencies currently working with populations affected by the emergency in Bangladesh/Myanmar, with up-to-date technical guidance on the major public health threats faced by the affected population.

The topic areas addressed have been selected on the basis of the burden of morbidity, mortality and potential for increased burden of disease in the affected areas.

Public health threats represent a significant challenge to those providing health-care services in this evolving situation. It is hoped that this risk assessment will facilitate the coordination of activities among all partners working among the populations currently affected by the crisis and that it helps in guiding needs assessments and the orientation of emergency health response strategies.
Executive summary

August 25, 2017 was not the first time that Bangladesh saw a massive wave of arrivals from its neighbour, Myanmar. Even though more than a million Rohingya have been living in Myanmar for generations, they do not have a legal identity or citizenship. The only status they have is that of being illegal immigrants, notwithstanding their long history and presence in the area. The biggest influxes to Bangladesh came in 1978 followed by the early 1990’s when many fled to Bangladesh. The country was already home to 200 000 Rohingya before episodes of violence between the Myanmar Army and Arakan Rohingya Salvation Army (ARSA) once again erupted on 25 August 2017.

These attacks occurred in 30 border police and military posts in Buthidaung, Rathedaung and Maungtaw townships in northern Rakhine State claimed the life’s of security forces, government service personnel and innocent people, leaving many injured, homeless and traumatized. This was the beginning of what has turned out to be the largest movement to date of the Rohingya minority group into neighbouring Bangladesh, seeking shelter in Cox’s Bazar (border between Rakhine State and Cox’s Bazar). As of 27 September, 2017, over 486 000 Rohingya have fled Myanmar to seek refuge in Cox’s Bazar and approximately 26 747 have been internally displaced from northern Rakhine, seeking temporary shelters around Sittwe city in Myanmar.
A month into the crisis and the bulk of Rohingya population (old and new arrivals) is now concentrated in 10-11 locations. The two predominant sites are Kutupalong and Balukhali which have collapsed into one large site with an approximate population of 400 000. Smaller sites that have about 15,000 to 60,000 Rohingya population include Mainnerghona, Burma para, Tasnimarkhola, Hakimpara and Jamtoli. Recognizing the need to create more space and also to free up the areas that had been taken over in the other two sites, a third site has been allocated by the government on a 2000 acre land which will have a new settlement between Kutupalong and Balukali makeshift settlements.

This vulnerable and affected population in both sites is going through one of the most severe humanitarian crisis it has seen so far. Living spaces are stretched. There is a massive struggle to get shelter and other lifesaving needs. In the first few weeks, the sites had virtually no access to water and sanitation facilities, raising the risks of an outbreak of disease. Shanties, tented structures and tarpaulin covered tenements were seen everywhere with maximum demand being for shelter materials. Relief and aid supplies have been pouring in. Site development task force has been established with Ministry of Disaster Management and Relief, Government of Bangladesh working closely with donor and multilateral agencies, NGOs and iNGOs. The Inter Sector Coordination Group (ISCG) was assigned the task of coordinating all the work on the sites, operating as a one stop information hub for agencies like WHO, MSF, IOM, UNHCR, UNFPA, UNICEF, ACF, HI, IFRC, ICRC, BRAC, BDRCS, ICRC, MUKTI and ICDDR,B. Since 25 August, 30 000 households, 150 000 people have been provided emergency shelter kits in the Kutupalong, Balukhali, Shamlapur and Leda makeshift settlements in addition to Roikhong/Unchiprang.
Overwhelming the health system

The sheer magnitude of new arrivals has inevitably put massive pressure on all health services and the cramped living conditions, presenting significant public health risks. Poverty ridden and without access to resources they are completely dependent on what the Bangladesh government and the relief agencies can provide for them, be it primary and secondary health care, trauma care and rehabilitation, reproductive, maternal, neonatal, child health and mental health services and psychosocial support. The existing facilities in Cox’s Bazar and around have reported a 150-200% increase in patients, overwhelming current capacity and resources. It is estimated that it will take up to two more months (October and November) to provide basic emergency shelter coverage and WASH services.

Emerging health needs of the vulnerable population include conducting immunization drives and campaigns for vaccine preventable diseases, providing support to pregnant women, referrals to health facilities, amongst others. One of the biggest concerns of public health experts during this period has been to establish early warning and surveillance systems so as to be better prepared in the event of a communicable disease outbreak.

Setting priorities

Based on these health needs, priority interventions were identified and introduced. With arrivals of Rohingya's reducing in numbers as of 27 September and air loads of supplies, relief and shelter materials being received, a more streamlined and systematic health response is being developed. Health planning at the new locations is being undertaken with government and partners to ensure that health risks of men, women, children and the elderly in the settlements are minimized and precautions are taken to diffuse build up of any disease outbreak. Some of the urgent next steps that are being strengthened include:

- Establishing health posts within the new settlements especially in areas where people are newly settling and there are no immediate health services in the vicinity. One health post will aim to cover 20,000 population and will include space and services for outpatient services, RMNCAH+ including family planning, nutrition, family planning, MHPSS, SGBV and disability support services.
- Providing immunization and nutrition support through the Ministry of Health and agencies like WHO and UNICEF who have already carried out one campaign and have launched the second one covering about 150,000 children aged 6 months to 15 years.
- Reproductive health services based on emerging needs has covered the safe deliveries of over 200 pregnant women who were assisted by 35 specially deputed midwives by UNFPA. Government of Bangladesh has meanwhile stepped up its birth control campaign and has been distributing contraceptives and providing other reproductive health services to the affected population across the makeshift sites.
- Improving water and sanitation facilities has been ongoing since the time the influx of Rohingyas began. From constructing nearly 250 makeshift toilets to making efforts to halt open defecation to providing drinking water (3.5 litre per person per day) through mobile trucks and installing tubewells this major concern is being addressed. Water samples are also being tested.
- Early warning and surveillance system developed by WHO and DGHS has been currently put on trial and will be fully operationalised by end September. All partners have been asked to report daily data from medical teams to Control Room at Civil Surgeon Office. WHO will be
compiling data for disease surveillance. Completeness of reporting will be closely monitored and shared.

**Qualitative risk assessment on communicable and infectious disease scenario**

In the setting of a complex emergency, with a sudden influx of hundreds of thousands of people in a brief period, health needs are bound to be varied and complex. These health needs will necessarily evolve as the crisis evolves. While it will be difficult to assign an order of priority, the current risk assessment has been limited to communicable and infectious diseases, as these are most emergent health threats that the affected populations are presently facing. Subsequent versions of the Public Health Situation Analysis and Interventions will include other priority issues namely, non-communicable diseases, mental health, reproductive and sexual health, infant and child health, environmental health and impact of technological hazards.

This qualitative risk assessment based on the available evidence has been done to prioritize and guide public health actions in affected communities covering conditions that include acute febrile illness with rash, measles, dengue & chikungunya, scrub typhus, acute respiratory infection, influenza, acute diarrheal diseases including cholera and dysentery, acute jaundice syndrome, hepatitis E, leptospirosis, skin disease scabies, acute encephalitis syndrome (AES) and malaria, tuberculosis, HIV/AIDS. This situation analysis aims to provide some direction to government departments, donors and other agencies who are in the process of mounting a more focused intervention plan.
1. Background and risk factors

1.1 Country information

Understanding how the two bordering countries of Myanmar and Bangladesh are placed geographically will help contextualize the current crisis involving affected people. Myanmar, a country in Southeast Asia, borders the Andaman Sea and Bay of Bengal in the south. It is bordered in the north and northeast by China, in east by Laos and Thailand, in west by Bangladesh and the Indian states of Nagaland, Manipur and Mizoram. The country covers an area of 676 578 sqkm of which Rakhine state situated on the western coast has an area of 36 762 sqkm.

Formerly East Pakistan, Bangladesh came into being only in 1971, when the two parts of Pakistan split after a bitter war which drew in neighbouring India. Bangladesh was under military rule for 15 years and although democracy was restored in 1990. It is one of the world’s most densely populated countries, with its people living into a delta of rivers that empties into the Bay of Bengal. Poverty remains widespread, even though the country has in recent years reduced population growth and improved health and education.

Table 1: Demographic data

<table>
<thead>
<tr>
<th>Demographic data</th>
<th>Bangladesh</th>
<th>Myanmar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population</td>
<td>164 856 278</td>
<td>548 364 83</td>
</tr>
<tr>
<td>population density of people per sqkm</td>
<td>1 115.62</td>
<td>-</td>
</tr>
<tr>
<td>Fertility rate</td>
<td>2.4 children born per woman</td>
<td>-</td>
</tr>
<tr>
<td>Crude birth rate</td>
<td>18.775 births/thousand</td>
<td>17.092 births/thousand</td>
</tr>
<tr>
<td>Crude death rate</td>
<td>5.265 deaths/thousand</td>
<td>8.333 deaths/thousand</td>
</tr>
<tr>
<td>Crude net migration rate</td>
<td>-1.948 people/thousand</td>
<td>-0.182 people/thousand</td>
</tr>
<tr>
<td>Life expectancy (both sexes)</td>
<td>72.709 years</td>
<td>66.445 years</td>
</tr>
</tbody>
</table>

1.1.1 Health system dynamics

**Bangladesh**

The health system in Bangladesh is pluralistic with government, private sector and NGOs playing key roles. While government is responsible for policy and regulating functions of public, private and NGO providers through legislation and regulation, the public health system is highly centralized with Ministry of Health & Family Welfare (MoHFW) managing primary and tertiary care through the Health Service Division and the Medical Education and Family Welfare Division (1). The NGO sector covers the preventive and basic care aspects and also enters into strategic health service partnerships contributing in improving immunization and control of communicable diseases. The private sector works largely through medical colleges, hospitals, clinics, pharmacies and untrained healers. In urban areas, primary health care is the responsibility of the Ministry of Local Government, Rural Development and Cooperatives (MOLGRDC) through city corporations and municipalities in partnerships with NGOs.

The Health, Nutrition and Population Sector Programme (2017-22), that forms the core of health sector activities, is sanctioned a budget of USD12 billion with government financing 84% of the same (2). The government has revised its essential service package including non-communicable diseases to be implemented at district and sub-district levels. While public health budgets have increased over the last few years, government health spending has reduced.

**Health infrastructure and service delivery network:** The country has an organised health service infrastructure however it is characterized by shortage of skilled resources, inappropriate skill-sets and inequitable distribution of trained manpower. In spite of a widespread health services arrangements, there are gaps in service delivery readiness at block and district levels. Only 7% facilities at district and upazila (sub-district) level have the capacity to provide normal delivery services; 42% can deliver antenatal care and 23% child curative care (3).

Bangladesh however is the first low income country to develop a domestic pharma industry. The Essential Drug Co Ltd was set up by the government to supply bulk of public sector medicines facilities (>80%) for medicines (4). However, the public sector is unable to meet the growing demand for medicine by those visiting the public facilities. It is common to see, stock-out of medicines in public facilities which are linked to leakage and wastage, making the target of achieving access to medicines difficult.

**Health facilities and profile of population living in Cox’s Bazaar, Sadar**

Cox’s Bazar has a modest health infrastructure with no designated trauma care facilities. The water and sanitation profile of the area is reportedly satisfactory with 96% houses having access to safe drinking water and 82% to sanitary latrines(5). With one 250 bedded district hospital, 7 upazila health complexes (312 beds) and 12 union sub centers, the existing health facilities also includes 22 private...
clinics, 12 NGO clinics and one 10 bedded hospital. In the rural areas, there is only one rural dispensary and 174 community health clinics. There are virtually no ambulances, jeeps, buses, microbuses or pick ups attached to these facilities potentially limiting mobility and outreach (5).

Vacancies of staff reported is not a big problem. Out of the 73 posts for physicians at the USC/UHFWC/RD level, 64 are filled up; at the UHC level 71 are filled out of 112 vacancies and at the DH/GH level 43 posts are filled out of a total of 62 posts (6). The district hospital attended to 214 514 OPD visits in 2016. Patients admitted were mostly cases of pneumonia followed by bronchopneumonia, septicaemia, birth asphyxia and bacterial sepsis. Most common disease of the 30+ population were asthma, bronchopneumonia, septicaemia, cardiogenic shock and encephalitis. In the case of maternal deaths, it was postpartum haemorrhage, puerperal sepsis, eclampsia and antepartum haemorrhage. Overall, in 2016, as many as 989 major and 15 666 minor surgeries were performed (6).

**Myanmar**

After the country transitioned to a civilian government in 2011 and an acceleration in some of its democratic processes, problems and challenges continue to grip the country. Information is limited with respect to health programme, policy and infrastructure. The Ministry of Health and Sports (MOHS) is the major player in its health sector. It acts both as a governing agency and provider of comprehensive health care. However, over the years as the political and administrative situation changed different players were assigned different roles. While the MOHS is organized into three departments, it is also supported by NGOs, CBOs and iNGOs. The Department of Public Health is mainly responsible for primary health care and basic health services, nutrition promotion, sanitation, maternal and child health amongst others. In line with the national health policy, NGOs like Red Cross and Myanmar Maternal and Child Welfare Association have the responsibility to contribute to service provision of health care delivery. The country’s expenditure on health is among the lowest in the world. Under the military regime, health system spending ranged between 0.5% to 3% of its GDP (7).

**Health infrastructure and service delivery network:** According to the Department of Medical Service report, 2015, the country has 193 private hospitals, 201 private specialist clinics, 3911 private general clinics and 776 private dental clinics. There are many charitable hospitals that are accessed by the poor in addition to private non profit clinics run by CBOs and faith based organizations. Some of them run ambulatory services. Public hospitals are categorized into general hospitals that usually have 2 000 beds, specialist and teaching hospitals have 200-500 beds, region/district/state hospitals have 200-500 beds, township hospitals have 25-100 beds and sub-township and station hospitals 16-25 beds (6). Located in western Myanmar, Rakhine is bordered by Chin State to the north and by Magway, Bago and Ayeyarwaddy Regions to the east. Rakhine state is flanked almost entirely by the Bay of Bengal on its west. It is one of the least developed areas of Myanmar and is second only to Chin State in terms of the proportion of the population living below the poverty line. The State fares poorly on most social development indicators and is characterized by high malnutrition, generally low enrolment and completion in primary education, and poor access to clean water and sanitation. It is also prone to natural hazards such as storms and floods. (93) In the final report of the Advisory Commission on Rakhine State, it is recognized that while all communities suffer from inadequate medical services, health access for Muslim communities is particularly low. (94) The Rohingya population who have fled to Bangladesh since 25 August 2017 are mostly believed to have originated from the northern townships of Maungdaw, Buthidaung, and Rathedaung in Rakhine State.
1.1.2 Rohingya population and their status in Myanmar and Bangladesh

More than 200,000 Rohingya population already lived in Bangladesh (mainly in Cox Bazar district) before August 2017. Approximately 33,000 of these Rohingya population are registered as refugees in Bangladesh. The first major influx of Rohingya population to Bangladesh happened in 1978 following a major military operation in Myanmar. Similar military operations resulted in more exodus in the early nineties (which was also followed by a major repatriation in the mid-nineties). Violence of 2012 in Rakhine resulted in more displacement on both sides. Current estimate of Rohingya population in Bangladesh is estimated to be above 700,000 including newly arrived 486,000. They are living in extremely challenging conditions in Bangladesh, mainly in pre-existing refugee camps, new spontaneous settlements and host communities.

1.1.3 Scope of the current assessment

In Rakhine State, Kachin and Shan States in Myanmar and Cox’s Bazar in Bangladesh, this assessment of public health risks focuses on two distinct population groups, each with differing factors influencing risk of illness:

- Refugees in Cox Bazar, estimated to be approximately 480,000 (9)
- Rohingya in Myanmar estimated to be close to 500,000

For both groups at risk, the immediate health priorities include provision of emergency medical and surgical care to the injured, food, shelter, adequate water and sanitation resources, and access to health care and basic medicines for communicable and non-communicable diseases.

1.2 Crisis impact

Bangladesh has for decades faced influx of Rohingya fleeing persecution in Myanmar. The country was already home to 200,000 Rohingya before the start of the episodes of violence between the Myanmar Army and Arakan Rohingya Salvation Army (ARSA) once again erupted on 25 August 2017. These violent surprise attacks against 30 border police and military posts in Buthidaung, Rathedaung and Maungtaw townships in northern Rakhine State claimed security forces, government service personnel and innocent people, leaving many injured. The result of this reactive military operation led to three significant developments:

1. Initiating largest movement to date of the Rohingya minority group into neighbouring Bangladesh (6) seeking shelter in Cox’s Bazar (border between Rakhine State and Cox’s Bazar is located in 92°11’30”E 21°14’3”N). According to estimates majority of Rohingya population has arrived from adjoining townships of Rakhine state of Myanmar, namely, Maungdaw, Buthidaung and Rathedaung.

Estimating risk

<table>
<thead>
<tr>
<th>INFORM measures</th>
<th>Myanmar’s risk of humanitarian crisis and disaster at 6.7/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard and exposure, as well as lack of coping capacity, and vulnerability are at 7.5/10, 6/10 and 6/10 respectively</td>
<td></td>
</tr>
<tr>
<td>Bangladesh risk of humanitarian crisis and disaster is measured as 5.8, hazard and exposure is at 7.5, vulnerability at 4.7 lack of coping capacity at 5.5</td>
<td></td>
</tr>
</tbody>
</table>
2. Registering large level of internal displacement from northern Rakhine to temporary shelters/camp around Sittwe city.
3. Inspite of the primary conflict-affected area being Rakhine state, tensions continue in Kachin and Shan with IDPs in Rakhine having limited access to services and being confined to camps.

As of September 24, 2017, based on field reports of agencies working in the area:

- Over 480 000 Rohingya have fled Rakhine state and crossed the border into Bangladesh seeking shelter in Cox’s Bazar (9)
- Approximately 26 747 people have been internally displaced from northern Rakhine seeking temporary shelters around Sittwe city in Myanmar

A site development task force has been established with Ministry of Health, Government of Bangladesh working closely with donor and multilateral agencies, NGOs and iNGOs.. The Inter Sector Coordination Group (ISCG) has been assigned the task of coordinating all the work on the sites and is operating as a one stop information hub for all the agencies working on the crisis. Agencies include WHO, MSF, IOM, UNHCR, UNFPA, UNICEF, ACF, HI, IFRC, ICRC, BRAC, MUKTI AND ICDDR,B.

According to IOM briefing on 26 September 2017, the main bulk of Rohingya population (both old and new arrivals) is now concentrated in 10-11 locations (Figure 1 & 2). The two predominant sites are Kutupalong and Balukhali which are now like one large site with an approximate population of 400 000. Smaller sites that have about 15 000 to 60 000 Rohingya population include Mainnerghona, Burma para, Tasnimarkhola, Hakimpara and Jamtoli. A third site has been allocated by the government on a 2 000 acre areas which will have a new settlement between Kutupalong Makeshift Settlement and Balukali Makeshift Settlement, to the West of the main road.
Figure 1: Locations and size of pre-existing and newly arrived Rohingya population, Cox Bazar
(Source: Situation report: Rohingya refugee crisis, Cox bazar, 27 September 2017. Inter Sector Coordination Group)
1.3 Current health situation

Violence in Rakhine State which began on 25 August 2017 has driven an estimated 486,000 vulnerable people across the border into Cox’s Bazar, Bangladesh (9). The speed and scale of the influx has resulted in a critical humanitarian emergency. These people have entered Bangladesh with very few possessions using majority of their savings on transportation and construction of a shelter, often out of no more than bamboo and thin plastic. Their dependence on humanitarian assistance for food, medicines, shelter and other life-saving needs is immense and only likely to grow. Basic services that were available prior to the influx are also under severe strain due to the massive increase in the population in the area. In some of the sites that have spontaneously emerged, there is virtually no access to water and sanitation facilities, raising the risks of an outbreak of disease. Reports coming in the initial weeks of the crisis pointed towards a sanitation crisis in the absence of latrines, water and proper living spaces. Shanties, tented structures and tarpaulin covered tenements were seen everywhere with maximum demand being for shelter materials. Since 25 August, 30,000 households, 150,000 people have been provided emergency shelter kits in the Kutupulong, Balukhali, Shamlapur and Leda makeshift settlements in addition to Roikhong/Unchiprang.

Population movements within Cox’s Bazar have remained highly fluid, with increasing concentration in Ukhia, where the Government has allocated 2,000 acres for a new camp to accommodate the swelling numbers. People have begun arriving at the new, proposed site before infrastructure and services can be established. Crucially there is limited access to the site and no roads through this site; this is preventing the development of infrastructure including water and sanitation facilities. There is currently no reliable estimate of the number of people who have settled in the Kutupalong Extension.

### New Arrivals reported by location, Pre-existing UMNs and Total UMNs

<table>
<thead>
<tr>
<th>Location</th>
<th>Population prior to Aug Influx</th>
<th>Total Influx (individual)</th>
<th>Total Population (combined)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Makshif Settlement / Refugee Camps</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balukhali MS</td>
<td>26,016</td>
<td>24,626</td>
<td>44,642</td>
</tr>
<tr>
<td>Kutupalong MS</td>
<td>79,479</td>
<td>97,277</td>
<td>176,755</td>
</tr>
<tr>
<td>Kutupalong RC</td>
<td>13,901</td>
<td>No data</td>
<td>13,901</td>
</tr>
<tr>
<td>Leda MS</td>
<td>14,240</td>
<td>7,017</td>
<td>21,257</td>
</tr>
<tr>
<td>Nayapara RC</td>
<td>15,230</td>
<td>No data</td>
<td>15,230</td>
</tr>
<tr>
<td>Shamlapur</td>
<td>6,433</td>
<td>19,543</td>
<td>27,976</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>155,289</td>
<td>148,463</td>
<td>303,752</td>
</tr>
<tr>
<td><strong>New Spontaneous Settlements</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Hakimpara</td>
<td>51,037</td>
<td>51,037</td>
<td>51,037</td>
</tr>
<tr>
<td>Khairighona</td>
<td>70,000</td>
<td>70,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Buthia para / Tasnimashobra</td>
<td>27,534</td>
<td>27,534</td>
<td>27,534</td>
</tr>
<tr>
<td>Roikhong / Unchiprang</td>
<td>28,221</td>
<td>28,221</td>
<td>28,221</td>
</tr>
<tr>
<td>Rubber garden / Ratcinseigan</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Jambori / Thangkhali</td>
<td>24,152</td>
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</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>198,944</td>
<td>198,944</td>
<td>198,944</td>
</tr>
<tr>
<td><strong>Host Community</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cox’s Bazar Sadar</td>
<td>12,485</td>
<td>2,805</td>
<td>15,290</td>
</tr>
<tr>
<td>Ramu</td>
<td>1,600</td>
<td>1,395</td>
<td>2,995</td>
</tr>
<tr>
<td>Teknaf</td>
<td>39,687</td>
<td>37,928</td>
<td>71,607</td>
</tr>
<tr>
<td>Ukha</td>
<td>8,452</td>
<td>46,296</td>
<td>54,748</td>
</tr>
<tr>
<td><strong>TOTAL UMNs</strong></td>
<td>211,623</td>
<td>436,823</td>
<td>647,346</td>
</tr>
</tbody>
</table>

(Source: Situation report: Rohingya refugee crisis, Cox bazar, 24 September 2017. Inter Sector Coordination Group)
Challenges exist not just for Rohingyas who have come into Bangladesh (Cox’s Bazar) from Myanmar and Rohingyas currently in Myanmar but also the already existing Rohingya community in Bangladesh who have been suffering malnutrition and disease much before this crisis as also the local Bangladeshi population. With most Rohingya being stateless, the conflict remains far from resolved, forcing agencies working in the field to anticipate more complex conditions relating to sexual abuse, trafficking, pregnant women delivering babies in extremely unhygienic conditions, malnutrition, water-borne and vector-borne diseases, amongst others.
2. Priority health concerns

2.1 Access to health services

In the weeks following 25 August, it became clear that a large medical and humanitarian crisis was looming over what is seen as the largest influx of Rohingyas into Bangladesh. Many arrivals had serious medical needs, such as violence-related injuries, severely infected wounds and advanced obstetric complications. Majority were being forced to stay in existing makeshift settlements or UNHCR-registered camps that were extremely congested and fragile. Due to lack of potable water, people were collecting water from paddy fields, puddles and hand-dug shallow wells which were often contaminated with excreta, leading to high incidence of diarrhea creating a public health scare about an infectious disease outbreak (10).

Vaccination levels in Myanmar’s Northern Rakhine State are very low, and people are at risk of measles and other diseases for new arrivals (11). With limited access to basic health care and referral services of newly arrived population and scaled-up interventions by UN agencies, the situation remains critical as it is unclear as to when the response will meet the Rohingyas’ basic public health needs. Existing health personnel are more than overwhelmed as they attempt to cope with increased demand for health services.

Photo credits: WHO Country Office, Bangladesh

2.1.1 Health system impact
The existing healthcare delivery system may have difficulty to deal with the situation, be it disease surveillance and health information management or providing services that includes SRH, GVB and MHPSS case management for healthcare posts and mobile clinics, including primary and secondary health care, trauma care and rehabilitation, reproductive, maternal, neonatal and child health, SGBV treatment and support services and mental health and psychosocial support. According to the ICSG situation report of 24 September, current health needs of the vulnerable population were estimated (9). The sheer number of new arrivals had put massive pressure on all health services and the cramped living conditions presented significant public health risks.

- sufficient primary health care coverage needs to be urgently established in all new settlements and in the rapidly expanding in existing settlements
- limited disease surveillance and early warning systems were seen, particularly given the lack of WASH facilities in new settlements, crowded living conditions and consequent risk of outbreaks
- as many as 199,000 people needed support to meet their food requirements
- existing facilities were reporting 150-200% increase in patients, overwhelming current capacity and resources and requiring additional support to manage increased caseload
- inadequate referral systems were contributing to patients not receiving appropriate care
- high levels of stress and serious protection concerns were being reported with insufficient MHPSS services
- 24,000 pregnant and lactating mothers were in need of maternal health care support
- limited disease surveillance and early warning systems
- low rates of immunization amongst new arrivals pointed towards their being at risk of several vaccine preventable disease. As people began to visit health facilities, suspected cases were recorded. Three suspected measles cases were reported within a month of the arrivals.
- insufficient WASH facilities across existing sites and near absence in new settlements were further aggravated due to the rains and water logging creating high risk for diarrhoeal and other disease outbreaks.
- rates of SAM and MAM were found to be above emergency threshold levels and both clinical and community based nutrition interventions woefully inadequate
- agencies and health workers reported high numbers of acute respiratory infections (ARI), lower respiratory tract infections (LRTI), diarrheal and skin diseases

The emerging ground scenario as presented above, combined with the daily reports of the agencies and ICSG’s situation report of 24 September, helped identify urgent health needs of the Rohingya population (9). These included:

- increasing primary care coverage in all new settlements and in the rapidly expanding in existing settlements
- providing support to existing health systems which are currently severely overstretched and catering to secondary health care needs and needs of the host population
- conducting well planned immunization drives and campaigns for vaccine preventable diseases and establishing full EPI programming for Rohingya children
- providing midwife support to pregnant women helping them deliver in safe and hygienic settings and ensuring they got adequate maternal health care support; also reproductive health services and SGBV support are priority areas, given high proportion of women in newly arrived influx
- referral systems to and from health facilities to be strengthened including support for transport, treatment and discharge
• establishing early warning and surveillance systems and adhering to given high likelihood of a communicable disease outbreak
• stepping up outbreak preparedness, including establishment of response capacity given current conditions within new and existing settlements
• Scaling up services related to mental health and psychosocial support

Based on these health needs, priority interventions were identified and introduced. With arrivals of the Rohingyas reducing in numbers as of 27 September and air loads of supplies, relief and shelter materials being received, a more streamlined and systematic health response is being developed. Some of the priority interventions that were implemented and initiated in the first month since the crisis are summarized below.

Photo credits: WHO Country Office, Bangladesh

Priority interventions

Health planning at the new locations (Health Sector Coordination Meeting, 20 September 2017) is being undertaken with government and partners to ensure that health risks of men, women, children and the elderly in the settlements are minimized and precautions are taken to diffuse build up of any disease outbreak. Some of the urgent next steps that are being strengthened include:

Allocation of a new site: The government has allocated 2 000 acres for a new settlement between Kutupalong Makeshift Settlement and Balukali Makeshift Settlement, to the west of the main road, the site is undulating and previously largely uninhabited with no existing services. It is estimated that of the total land area, only approximately 30% of the site is usable. There are concerns regarding the site size, lack of preparedness, access, suitability and density if all new arrivals are located there. It is estimated it will take up to two months to provide basic emergency shelter coverage and WASH service provision. However, people are already on the site and more are moving each day.
Establishing health posts: Multiservice health posts within the new settlements are being set up especially in areas where people are newly settling not where existing services are. Initially these were temporary in the form of mobile teams and tented clinics and were reached by foot as there is no road access into the site. But gradually these are being made into permanent facilities as access improves and the situation stabilizes.

Immunization and nutrition: Support provided to Ministry of Health and Family Welfare plan to carry out mass measles, rubella and polio immunization campaign to protect 150,000 children aged 6 months to 15 years. Complimentary nutritional services are being provided at select posts by UNICEF.

Reproductive health: Over 200 deliveries were assisted by 35 specially deputed midwives by UNFPA; GoB has stepped up distribution of reproductive health services and launching a special birth control campaign.

Water and sanitation: 56% water points from tubewells were reported to be contaminated at medium level of risk (within 1-10 cfu/100ml). 3 water samples from household containers were contaminated medium and high risk level (11-100 cfu/100ml). One surface water source sample, used by the migrants for the first few days was contaminated at very high level of risk (>100 cfu/100ml). More than 248 emergency latrines installed and mobile toilets under construction. Efforts are being made to give 3.5 litre water per person per day through mobile trucks carrying drinking water and new tubewells are being installed.

Surveillance: Early warning and surveillance system developed by WHO and DGHS has been currently put on trial and will be fully operationalised by 25 September. MOH has indicated that one health post will aim to cover 20,000 population and will include space and services for outpatient services, RMNCAH+ including family planning, nutrition, family planning, MHPSS, SGBV and disability support services.

Data Management and Reporting: While EWARS, set up by WHO, is now active, all partners have been asked to report daily data from medical teams to the Control Room at the Civil Surgeon Office. WHO will be compiling data for disease surveillance. Completeness of reporting will be closely monitored and shared. This is a very critical part of the rehabilitation and response system for it will feed into the planning of interventions related to the emerging health situation and strengthening coordination mechanisms with the GoB.

In the coming days, the current parameters of the humanitarian response plan (that will be updated by 28 September) will guide future efforts for a population coverage of 1.2 million, comprising of 200,000 existing population, 400,000 newly arrived, 300,000 possibly more arrivals, and 300,000 host communities. It will cover a six-month period from October 2017 to March 2018. The plan features:

- establishing new health posts (integrated OPD, RMNCAH+, nutrition, SGBV, MHPSS)
- increasing capacity of existing facilities (including government facilities and district hospital)
- strengthening referral systems (bi-directional)
- EWARS, outbreak preparedness and response
- SRH/RMNCAH+, SGBV, MHPSS
- specific needs for the health posts
Communicable and infectious diseases

Common communicable diseases syndromes (and infectious diseases) encountered in complex emergencies, with crowded populations and poor hygiene and sanitary conditions that are relevant to the Bangladesh/Myanmar crisis have been identified below. A qualitative risk assessment based on the available evidence has been done to prioritize and guide public health actions in affected communities.

**Acute febrile illness with rash**

**Measles**

Measles is a highly contagious infection which spreads easily through the coughs and sneezes of those infected. Nine out of ten people who are not immune and share living space with an infected person will catch it (12). Testing for the virus in suspected cases is important for public health efforts. Immunization is the only and most effective preventive measure against acquiring measles. The live attenuated measles vaccine induces an immune response that is similar to naturally acquired immunity and can be boosted by challenge from wild or vaccine virus (12).

Measles is endemic at both side of the borders. In Bangladesh and Myanmar, the case fatality ratio for measles has been reported in the range of 4-8%. Measles is the fifth leading cause of death among children under five years of age in Bangladesh. Annually, an estimated 20,000 children die from measles in the country which has a population of around 146 million (13).

In recent times in Cox Bazaar area of Bangladesh, measles outbreaks have been reported in 2016 and continued in 2017. First round of campaign for measles was conducted in December 2016 for the two Upazilas (Ukhiya and Teknaf) of Cox’s Bazar which reported high number of measles cases, particularly among the migrants from Myanmar (14).

Myanmar made efforts towards the goal of mortality reduction due to measles by routine measles first dose immunization and the provision of second opportunity in supplementary immunization activities (SIA) implemented in 2002-2004 and in 2007 nationwide. In spite of the immunization efforts against measles, outbreaks continued to occur almost once every three to four years due to accumulation of susceptible population (Figure) (15).
After the 25 August 2017 crisis, a vaccination campaign against measles, rubella and polio combined with Vitamin A distribution is underway to immunize 150,000 Rohingya children below the age of 15 years in 12 refugee settlements close to the border with Myanmar (16). However due to continuous rain fall, flooding and military crises, the coverage is still not fully achieved.

**Dengue & Chikungunya**

Dengue is a mosquito-borne viral infection causing a severe flu-like illness and, sometimes causing a potentially lethal complication called severe dengue. Up to 50-100 million infections are estimated to occur annually in over 100 endemic countries, putting almost half of the world’s population at risk. Dengue flourishes in urban poor areas, suburbs and the countryside but also affects more affluent neighborhoods in tropical and subtropical countries (17). In the ideal situation, case-fatality rate of Dengue Haemorrhagic Fever (DHF) should be lower than 1%, but it can be as high as 20% in the absence of prompt diagnosis and proper treatment (18). Dengue prevention and control depends on effective vector control measures. Dengue is caused by *Aedes aegypti* mosquito (17).

Chikungunya is transmitted by same vector responsible for transmission of dengue. Serious complications are not common, but in older people, the disease can contribute to the cause of death. Often symptoms in infected individuals are mild and the infection may go unrecognized, or be misdiagnosed in areas where dengue occurs. The disease mostly occurs in Africa, Asia and the Indian subcontinent (WHO) (19).

The risk of dengue/chikungunya transmission in refugee populations in affected areas may be increased because they typically have fewer resources available to treat, control and prevent the
disease, and a higher population people are living in temporary shelters and/or overcrowded conditions, particularly where fresh water is stored in unprotected water containers and rainfall collects in other artificial containers, allowing mosquitoes vectors to proliferate. Refugee camps face additional risk due to the large numbers of people originating from a number of different localities; aggregating these groups can expose these displace populations to diseases to which they have no previous immunity, and enhance the spread of opportunistic diseases who take advantage of this large-scale movement of people to hitch a ride into new areas.

Both Bangladesh and Myanmar (and their respective refugee areas) are endemic for dengue and chikungunya. Most of the dengue cases in Bangladesh are reported during June and October as intermittent rains and high temperature and humidity during the months create the ideal breeding conditions for *Aedes*. Specifically in Chittagong, a high prevalence of 45% dengue positive cases has been reported among suspected patients (20). No major chikungunya outbreak has been reported since 2008 in Bangladesh but recently, Institute of Epidemiology, Disease Control and Research and other sources have reported chikungunya outbreaks in the Dhaka city (21). Evidence also points towards limited availability of diagnostics at health facilities. Similarly, a very limited vector surveillance for *Aedes* has been reported (22).

In Myanmar dengue fever (DF)/dengue haemorrhagic fever (DHF) is one of the leading causes of morbidity and mortality among children under the age of 10 years, with approximately 85% of cases occurring in this age group (23). Recently, Myanmar recorded 14 919 cases and 81 deaths of dengue infection from 1 Jan to 22 Jul 2017. Most of the deaths were from Ayeyarwady Region, followed by Yangon and Bago Regions. In Rakhine State, about 1 800 people were infected, and 18 died from the infection. High occurrence was observed in Minbya, Sittwe and Toungup Townships (24). Evidence from past post disaster response indicates vulnerability to dengue transmission in makeshift settlements.

**Scrub typhus**

Scrub typhus, also known as bush typhus, is a disease caused by a bacteria called *Orientia tsutsugamushi*. Scrub typhus is spread to people through bites of infected chiggers (larval mites). The most common symptoms of scrub typhus include fever, headache, body aches, and sometimes rash. Most cases of scrub typhus occur in rural areas of Southeast Asia, Indonesia, China, Japan, India, and northern Australia. No vaccine is available to prevent scrub typhus (25). To reduce risk of getting scrub typhus, avoiding contact with infected chiggers is the major preventive measure. When traveling to areas where scrub typhus is common, avoid areas with lots of vegetation and brush where chiggers may be found. Scrub typhus can be treated with antibiotics (tetracycline and doxycycline) (25).

Scrub typhus infections are under-diagnosed causes of febrile illness across the tropics, and it is not known how common they are in Bangladesh and Myanmar. A seroepidemiologic survey across six major teaching hospitals in Bangladesh by using an IgM enzyme-linked immnosorbent assay reported recent exposure i.e. 287 of 1 209, 23.7% seropositive for *Orientia tsutsugamushi*. Patients were also recruited during June–August 2010 at Chittagong district, the major area of settlement of Myanmar refugee since 25 August 2017. Farming as an occupation was reported as significantly associated with *Orientia tsutsugamushi* infection (26).

Considering the influx of nearly half a million people from Myanmar, majority people with low socio-economic conditions, adopting preventive majors for scrub typhus is not an option. Majority of the
people are living in a single room with over 10 people living in single household. Given the presence of mites in the region and vulnerable population, scrub typhus is a threat.

**Acute respiratory infection**

**Acute respiratory infections.** ARIs include any infection of the upper or lower respiratory tracts. A major concern is acute lower respiratory tract infection (ALRI) (pneumonia, bronchiolitis and bronchitis) in children under five. Low birth weight, malnourished and non-breastfed children and those living in overcrowded conditions are at higher risk of acquiring pneumonia (27). Infants of less than six months of age, who are not breastfed, have an increased risk of dying from pneumonia that is five times higher than in infants who are exclusively breastfed for the first six months. Early detection and case management of pneumonia and other common illnesses, guided by the Integrated Management of Childhood Illness (IMCI), prevents avoidable morbidity and mortality in children under five years of age (27).

ARI is a serious problem in both the Bangladesh and Myanmar. In Bangladesh, ARI/pneumonia is a leading cause of under-five morbidity and mortality. Most of the pneumonia deaths occur under two years of age and accounts for 77.5% of deaths in the first year of life. Children of 2-6 months of age were found to have 2.6 times higher chance of death due to pneumonia (28). The proportions of pneumonia deaths of children under two years are mostly in winter and spring (64.3%), the peak season of RSV bronchiolitis (28).

According to UNICEF Myanmar report, morbidity and mortality among children due to severe respiratory infections, particularly pneumonia, continues to be high at 21 per cent of under-five deaths and 27.6 per cent of deaths among children aged between one month and five years. Care is sought for suspected pneumonia in around 66 per cent of cases, but it is not clear what proportion received appropriate treatment (29). Both are reflective of poor health care access/delivery and quality of care.

**Influenza**

The influenza / acute respiratory illness season in Bangladesh follows the Southern Hemisphere season pattern, following the start of monsoon, with the peak incidence falling in June or July and declining thereafter. Myanmar has a similar season to Bangladesh. The subtypes of influenza A and the lineages of influenza B are similar to those found in other Southern Hemisphere pattern countries (30).

Bangladesh has some limited data on other viruses causing influenza-like illness. In a recent study of hospitalized children under five using nasal swabs:

- Of 165 infected cases, 43.5% (n = 87) cases had a single viral pathogens. In symptomatic cases, human rhinovirus was detected as the predominant virus (31.5%), followed by RSV (31%), HMPV (13%), HBoV (11%), HPIV-3 (10.5%), and adenovirus (7%) (31).
Acute diarrheal diseases including cholera and dysentery

Cholera

Cholera is caused by the bacterium, Vibrio cholerae serogroup O1 or O139. This bacterium can survive in water for a very long time, probably indefinitely, even without human infections. The cholera patient’s stool contains large numbers of bacteria that can then spread through contaminated water or through unclean hands onto food (32).

Whether a person is infected depends on how many bacteria they consume as well as level of immunity from previous exposure. The number of susceptible people decrease as the population becomes immune. Malnutrition can make cholera more severe as the body’s immunity is already weakened. Each of these factors contributes to the severity of the outbreak.

Treatment of severe cases is not complicated and is always successful if given properly. However, effective treatment must be provided quickly and efficiently. Without treatment, the case fatality rate (CFR) for severe cholera patients is about 50% (33).

There are currently two WHO-prequalified Oral Cholera Vaccines (OCV): Dukoral® and Shanchol. Results of clinical trials with Dukoral® show 85-90% protection at 6 months in all age groups, and 62% at 1 year in adults, after two doses. The clinical efficacy diminishes to 18% 3 years after vaccination. The Dukoral® vaccine was also shown to cross-protect against enterotoxigenic E coli (ETEC) in several studies. Efficacy of OCV is less in children under 5 years. Vaccinating 50% of the population could control cholera transmission in endemic regions (i.e. where there is a high level of natural immunity). Where natural immunity is lower, a larger proportion of the population would need to be immunized. Mass immunization of e.g. 70% of a population should be achievable, but for maximal protection against V. cholerae, two doses of OCV must be given two weeks apart (for Shanchol® – the stockpiled OCV) (34).
According to WHO, Use of OCV is highly recommended if there frequently has been cholera in the area and one or more of the following factors occur (ref):

a) A sudden deterioration of the water / sanitation,

b) Civil unrest,

c) Major change in the climate (e.g. drought or flood),

d) Sudden movement of large numbers of people, especially if there is no organized camp where improved water can be provided.

WHO recognizes that cholera is endemic in Bangladesh. Burden of disease modelling estimated that the country bears ~110,000 cases with ~4,500 deaths each year (Ali M 2015). ALL seven divisions and about all 64 districts of Bangladesh report epidemics of severe acute watery diarrhoea (MoHFW Source). Sentinel surveillance data gathered over several years by the International Centre for Diarrheal Disease and Research (icddr,b) showed that about 20% of diarrheal patients admitted to the icddr,b hospitals, in Mirpur and Mohakhali, are infected with Vibrio cholerae. National data of such a rate does not exist. In Bangladesh, showed the highest resistance to trimethoprim-sulfamethoxazole (100% in Mirpur) and lowest resistance to ciprofloxacin (0% in Dhaka, Matlab and Mirpur) and azithromycin (30% in Dhaka to 7% in Mirzapur). Multidrug resistance (≥ 3 antibiotics) for Shigella were: Mirzapur (50%); Dhaka (36%); Matlab (23%) and Mirpur (37%); and for V. cholerae it was 26%, 37%, 49% and 23% respectively.

Assessing the exposure to cholera among refugees, one must look into the potential circulation of the Vibrio in Northern Rakhine, Myanmar. In general Myanmar is considered endemic to cholera; however, three epidemics have only been documented between 2003 – 2013 including two located in in Yangon and Mandalay. In Myanmar much Rohingya population have settled in temporary settlements in Rakhine State. Internally-displaced-person camps of Rohingyas in Northern Rakhine have regularly reported cases of severe acute watery diarrhea for the past 5 years; unfortunately, no testing was performed to confirm presence of V cholerae (WHO unpublished data).

In Myanmar much Rohingya population have settled in temporary settlements in Rakhine State. The State fares poorly on most social development indicators and is characterized by high malnutrition, generally low enrolment and completion in primary education, and poor access to clean water and sanitation. According to the latest assessment, more than half (52%) of the total Rakhine state’s population has no access to the improved sanitation facility. Also, around 45% of the population has not access to or is not using improved water supply facility according to the SDG standards (11). As result, it is possible that MMR refugees have been exposed to Vibrio while living in Northern Rakhine; however, the presence of Vibrio and the extent of its transmission have not been documented among the Rohingya population and Northern Rakhine.

No boiling of water was observed in the population, as there is limited access to firewood and other sources of fuel. Based on field assessments conducted in the newly established settlements and makeshift camps, the water and sanitation conditions are way below any acceptable minimum standard. Sanitation facilities range between is 1 latrine per 1,000 people to 1 latrine for 5,000 people. Open defecation is a widespread practice, coupled with rainfall this poses a very serious public health threat. Likewise there is a severe shortage of clean drinking water, estimated at 0.5-1 liter per person, per day.

Association between open defecation and cholera is well known. Open-Defecation is a common practice among displaced populations. In several settlements and camps, people are resorting to use of surface water from streams and ditches, which is highly polluted. WASH interventions appeared to
be difficult as number of influx is increasing every day and people remain scattered in many locations including road side areas. Based on the current number of Rohingya people (estimated as 425 000), it was estimated that 19 000 latrines and 4 000 hand pump tubewells are required to be installed. Since all the Rohingya will be placed in 12 camps, these WASH components will need to be installed in those 12 camps proportionate to the population. However, national authorities, as of now have only planned to install 1 200 tubewells and 1 200 latrines for all the camps, leaving a considerable unmet need. As of 16 September-26 September DPHE had completed installation of 26 tubewells and 183 latrines.

WHO emphasized the need to ensure proper collection, handling and storage of water at the point of use.

~47% of the refugee population needs to walk over 1/2 hours to have access to healthcare facilities and medicines (10).

Whilst ORS has been distributed to existing settlements in the past (200 000), there has not been large scale distribution to new arrivals (436 000) or those in spontaneous new settlements (200 000).

**Rotavirus**

Rotavirus is responsible for more than a third of deaths caused by diarrheal diseases in young children throughout the world. Children who get infected may have severe watery diarrhea, often with vomiting, fever, and abdominal pain. Vomiting and watery diarrhea can last from 3 to 8 days. Additional symptoms may include loss of appetite and dehydration (loss of body fluids), which can be especially dangerous for infants and young children.

Rotavirus causes between 18 and 28% of diarrhea in Bangladesh[1]. Bangladesh plans to introduce the rotavirus vaccine into its routine EPI schedule in 2018.

**Dysentery**

Dysentery is bloody diarrhoea, i.e., any diarrhoeal episode in which the loose or watery stools contain visible red blood. Dysentery is most often caused by Shigella species (bacillary dysentery) or Entamoeba histolytica (amoebic dysentery). Other causes include Campylobacter, E. coli (EHEC), and Salmonella species of bacteria. The frequency of each pathogen varies considerably in different regions of the world. For example, shigellosis is most common in Latin America while Campylobacter is the dominant bacteria in Southeast Asia. The vast majority of infections are self-limited and resolve spontaneously without treatment. However, in a minority of cases, Shigella spp and EHEC can cause a severe disease called haemolytic uremic syndrome (HUS) wherein the red blood cells block the entrance to the kidneys, leading to anemia, low platelet counts, and kidney failure. A very severe infection like this can be fatal within 24 hours. Prevention of dysentery relies primarily on good sanitation and the availability of clean drinking water.

In Bangladesh, Shigella represents from 2 to 13% of isolates identified among patients with diarrhea in Bangladesh, depending on location and age group sampled (90). Adults tend to have a lower percentage than children. Specific data on locations in the areas affected are not available. Salmonella typhi dysentery represents 11% of the non-malaria febrile illness in Chittagong (the district adjacent to Cox’s Bazar in which many of the Rohingya have arrived) in 2016. (91) No recent data on causes of
dysentery in Myanmar is available, but a study with data from 1993 found as much as 23% of the diarrhea specimens with both blood and mucus from the Infectious Diseases Hospital of Yangon were Shigella(92).

Given the challenges with WASH in the most of the current settlements, dysentery should be anticipated. As the waters recede during the dry season, the risk for dysentery will increase. Proper hand hygiene becomes increasingly difficult when water resources are scarce.

As for antibiotic resistance 28% of Shigella isolates were resistant to ciprofloxacin in Mirzapur, and 12% to mecillinam. In Dhaka, the figures for Shigella were 45% and 50%, in Matlab 35% and 15%, and in Mirpur 41% and 8% respectively. Susceptibility of Shigella to azithromycin and ceftriaxone in Dhaka was 74% and 95%, and in Mirpur 88% and 92% respectively.

**Acute jaundice syndrome**

**Hepatitis E**

Hepatitis E is a liver disease caused by infection with a virus known as hepatitis E virus (HEV). Every year, there are an estimated 20 million HEV infections worldwide, leading to an estimated 3.3 million symptomatic cases of hepatitis E and approximately 44 000 deaths (accounting for 3.3% of the mortality due to viral hepatitis) (40). The virus is transmitted via the faecal-oral route, principally via contaminated water. Hepatitis E is found worldwide, but the prevalence is highest in East and South Asia. Prevention of Hepatitis E relies primarily on good sanitation and the availability of clean drinking water. Boiling and chlorination of water will inactivate HEV. Immune globulin is not effective in preventing Hepatitis E (40).

Bangladesh is endemic for HEV. Although no recent outbreaks have been reported, a recent study estimated a baseline prevalence of antibody to hepatitis E virus (anti-HEV) of 22.5%. Seroincidence was 60.3 per 1,000 person-years during the first 12 months and 72.4 per 1,000 person-years from >12 to 18 months (during the monsoon season), peaking by age 50 years and with low rates during childhood (41). In another study, annual mortality rate from HEV in Bangladesh was estimated as 3.9 per 100,000 people. No recent outbreak has been reported from Myanmar, however, smaller outbreaks of HEV have been reported in the past (42). Recent studies have found serological evidence of infection with hepatitis in 117 (32%) among 403 subjects (213 healthy persons and 190 liver disease patients (43). Studies from other parts of the world reported rural dwelling, farming as occupation, open defecation and stream/river as a source of drinking water as risk factors for transmission of HEV (44).

**Leptospirosis**

Leptospirosis is a widespread zoonotic disease that is increasingly being recognized in urban settings within developing countries (45). Human infection results from exposure to pathogenic spirochetes of the genus Leptospira, often by skin contact with contaminated water or soil (46). In low-income urban neighborhoods, rats are important carrier mammals and excrete the organism in urine. Conditions of poor sanitation, flash flooding, and overcrowding are considered to be the most important risk factors facilitate transmission of the disease (47). The risk of acquiring leptospirosis can be greatly reduced by avoiding contact with water that is contaminated with animal urine, or eliminating contact with
potentially infected animals. Leptospirosis is treated with antibiotics, such as doxycycline or penicillin, which should be given early in the course of the disease (48).

Limited evidence on leptospirosis from Bangladesh points towards a wider presence of the disease, at least in urban areas. A recent prevalence study assessing etiologies of fever in rural and semi-urban areas of Bandarban district, an area approximately 100 KM from Cox Bazaar, revealed high proportions (44%) seropositivity for leptospirosis (49). In cases misdiagnosed as malaria; illustrates major persistent reservoir of leptospirosis. Another study in low income urban community in Bangladesh found 8.4% of febrile patients meeting the criteria for definite or probable (50). Though there is limited peer reviewed evidence related to risk factors associated with the transmission of leptospirosis, World Health Organization has suggested unusual flooding in Bangladesh causing overflowing of rodent-infested sewers that exposes inhabitants to Leptospirosis infection (51). No evidence is available from recent past from Myanmar related to burden of leptospirosis.

**Acute hemorrhagic fever**

**Dengue hemorrhagic fever**

Dengue fever is a common mosquito-borne illness in many tropical and subtropical countries. Symptoms can be mild and include fever, rash, muscle and joint pain. Dengue fever rarely causes death. However, the infection can progress into a more serious condition known as severe dengue or dengue hemorrhagic fever. Repeated exposure to the dengue virus can make it more likely that you will develop dengue hemorrhagic fever. The best way to prevent dengue fever is to protect yourself from being bitten by mosquitos. Wear clothing that covers your arms and legs. Use mosquito netting and mosquito repellent when traveling in the tropics (52).

Dengue is endemic in both Bangladesh and Myanmar. Both primary and secondary dengue infections have been implicated in severe dengue or DHF in both countries (53–55). Surveillance data from Bangladesh reveals up to 40% of dengue cases as DHF (56,57). In Myanmar, data on proportion of DHF cases in recent past is not available. However, dengue fever (DF)/dengue haemorrhagic fever (DHF) is recognized as one of the leading causes of morbidity and mortality among children under the age of 10 years, with approximately 85% of cases occurring in this age group (58).

Mortality following dengue infection is a reflection of severe dengue or DHF. However, it is also an indicator of robustness of clinical management standards and capacity to follow and enforce protocols. From a clinical outcome perspective, no official figures have been issued on the case fatality rate of dengue by government or multilateral agencies due to absence of data on annual incidence of dengue and related deaths in Bangladesh. However, one study reported CFR as 1.7% for Bangladesh which is more than double the regional average of 0.79 (59) (60). In Myanmar, however, WHO SEARO in 2009 reported a CFR of 0.75, which is slightly lower as compared to the regional average of 0.79 (59).

An outbreak of dengue fever with a substantial proportion of severe dengue cases can test any health system in peace times. Burden on existing health services and ever increasing need for secondary care in complex emergencies is likely to be further compromised, including clinical management protocols, when managing severe dengue cases. This might have decisive influence on clinical outcomes in such cases.
Crimean Congo Hemorrhagic Fever

The Crimean-Congo haemorrhagic fever (CCHF) virus causes severe viral haemorrhagic fever outbreaks. CCHF outbreaks have a case fatality rate of up to 40%. The CCHF virus is primarily transmitted to people either by tick bites or through contact with infected animal blood or tissues during and immediately after slaughter (61). The majority of cases have occurred in people involved in the livestock industry, such as agricultural workers, slaughterhouse workers and veterinarians. Human-to-human transmission can occur resulting from close contact with the blood, secretions, organs or other bodily fluids of infected persons. CCHF is endemic in Africa, the Balkans, the Middle East and Asia, in countries south of the 50th parallel north. There is no vaccine available for either people or animals. The only way to reduce infection in people is by raising awareness of the risk factors and educating people about the measures they can take to reduce exposure to the virus (61).

CCHF transmitting Hyalomma tick vector is found in Bangladesh (62). Similarly, confirmed human cases have been reported in the past, both of which along with the eco-epidemiology increase the probability of occurrence of CCHF in the country.

Myanmar shares border with Bangladesh, which reported confirmed cases of CCHF. Moreover, ticks responsible for transmission of CCHF are also known to exist in Myanmar (62), hence putting it at risk for CCHF virus. High risk of Myanmar for CCHF is also in line with recent evidence where in there are parts of the country where humans are predicted to be at potential risk for CCHF, yet where evidence is most lacking and thus where surveillance is a priority (63).

There is significant overlap of presentation, clinical scenario and lab abnormalities between the dengue and CCHF. Both Bangladesh and Myanmar are endemic for dengue and hence differential diagnoses are an issue, until late into the illness. In the absence of clinical suspicion by treating physicians, CCHF could spread undetected and soon become a public health threat including in a complex emergency setting with crowded populations. This is especially true for Myanmar where human cases of CCHF have never been reported. Recent risk assessment has also revealed limited human and vector surveillance for CCHF in Bangladesh, further adding to the risk (64).

Malaria

Malaria is a public health problem in Bangladesh. The disease is high endemic in 13 border districts facing international boundaries with the eastern states of India (Assam, Tripura and Meghalaya) and part of Myanmar. The forested and hilly terrain has the geo-physical potential for intense malaria transmission throughout the year, and increased mobility of the non-immune population in the Hill Tract Districts further adds to the risk of transmission. Chittagong District is one of the highest risk area, where some of the formal and informal settlements of Rohingya are a part. Cox’s Bazar where some of the newer settlements has a lower number of cases. The two main species of malaria – Plasmodium falciparum and P. vivax are found on both sides of the Bangladesh-Myanmar border, although Plasmodium falciparum is found more commonly (93% P falciparum, 7 % P. vivax). Reported rates of malaria in the Cox’s Bazar and Chittagong districts vary from 0.1 to 50 per 1 000 for P. falciparum and 0.1 to 10 for P. vivax, with the greater rates found within Chittagong district (65).

In Myanmar, on the other hand, between the years 2005 and 2014 there has been an 81.1 % decline in the reported annual incidence of malaria in (1 341.8 cases per 100 000 population to 253.3 cases per 100 000 population) (66). In the same period, there was a 93.5 % decline in reported annual mortality
from malaria (3.79 deaths per 100,000 population to 0.25 deaths per 100,000 population) and a 87.2% decline in the proportion of hospitalizations due to malaria (7.8 to 1.0%) (66). However, low socio-economic status, poor schooling and close proximity to water bodies and forest areas comprise important risk factors for continued transmission (67). Artemisinin-based combination therapy (ACT) is a key strategy for global malaria elimination efforts. However, the development of artemisinin-resistant malaria parasites threatens progress and continued usage of oral artemisinin monotherapies (AMT) predisposes the selection of drug resistant strains. This is particularly a problem along the Myanmar. Private healthcare facilities and drug shops and providers who prioritize consumers’ demand instead of recommended practices were more likely to stock oral AMT (68). Additionally, over the past decade, a dramatic rise in fake anti-malarial has become one of the top public health issues in Myanmar. Newton et al. found that of 104 shop-bought ‘artesunate’ samples from South Asian countries including Myanmar (Burma), 38% did not contain ART (69).
Skin disease

Scabies

Scabies is a skin infestation caused by a mite known as the *Sarcoptes scabiei*. Scabies is characterized by an itchy, red rash to form on the skin. There are approximately 130 million cases of scabies in the world at any given time (70). It’s a highly contagious condition that can easily be passed from one person to another through direct skin contact. It may also be transmitted through infested clothing or bedding. Scabies is prevented by avoiding direct skin-to-skin contact with an infected person or with items such as clothing or bedding used by an infected person. According to WHO, Scabies can spread easily under crowded conditions where close body and skin contact is common. Few studies also reported the possible linkage of scabies to a higher number of children per family and the tendency to live in single-room houses (71).

Though scabies is not routinely reported from Bangladesh but the parasite is known to be present in the country and the environment is conducive for the same. During a study conducted in Dhaka medical college in 2010 among 67 000 OPD patients, significant number of case were reported scabies affected (72). Limited evidence is available from the two countries related to scabies, however studies from other parts of the world reported young age, presence of many children in household, low SES, poor housing and sharing of clothes as major risk factors associated with scabies infection (73).

Considering the Rohingya crisis, as near to half million people migrated from the Myanmar and settled in temporary arrangements in Cox Bazaar province of Bangladesh with UN refugees camps, number of people sharing common space and proportion of people: households must be high. According to some media reports its estimated that there is only one toilet available between 180 refugees (74). These conditions give a conducive environment to the scabies causing parasite to proliferate and transmit between the people sharing the same household as well as with others sharing the same facility.

Acute encephalitis syndrome (AES)

Japanese encephalitis

Japanese encephalitis virus (JEV) is a flavivirus related to dengue, yellow fever and West Nile viruses, and is spread by mosquitoes. JEV is the main cause of AES in many countries of Asia with an estimated 68 000 clinical cases every year. JE has a case fatality rate can be as high as 30% among those with disease symptoms; 20-30% of those who survive suffer permanent neuropsychiatric sequelae. There is no cure for the disease. But safe and effective vaccines are available to prevent JE (75). In endemic areas, JE can become a serious public health problem in the conflict regions where immunization coverage is not operationally feasible (75).

Bangladesh is endemic for JE. The country has regularly reported Japanese encephalitis cases since the last decade. In 2011, a study estimated JE incidence as 2.7/100 000 population in Rajshahi (95% CI = 1.8-4.9), 1.4 in Khulna (95% CI = 0.9-4.1), and 0.6 in Chittagong (95% CI = 0.4-0.9) (76). On the other hand, data on JE in Myanmar are limited. From 2006-2015, the country reported 259 confirmed cases of JE.

Within Myanmar, JE is endemic in Rakhine State of Myanmar due to virus circulation among domestic animals through Culex mosquito; Rakhine State and Yangon Region are highest reporting regions. In
2014, an outbreak of JE occurred in Rakhine State that clearly illustrated the vulnerability of Rakhine state to JE [21 confirmed cases out of 49 JE suspected in 46 villages of nine townships, including 10 fatal cases (CFR=20.4%)] (77).

Existing evidence suggests that both Bangladesh and Myanmar suffer from poor VBD surveillance and control activities (64). In spite of high endemicity, both countries are yet to introduce a JE immunization programme in the country (78,79). In addition, in both countries and especially in areas affected in the current crisis, risk factors for JE transmission include close co-habitation of humans and animals (domestic pigs and cattle), extensive paddy cultivation, limited use of long-lasting insecticide treated net and no prior vaccination in affected people and pigs. Also, awareness about JE or knowledge related to transmission and prevention of the disease is limited in local communities.

Nipah virus disease

Nipah virus (NiV) is a member of the family Paramyxoviridae, genus Henipavirus which causes disease both in human and animals. NiV was initially isolated and identified in 1999 during an outbreak of encephalitis and respiratory illness among pig farmers and people with close contact with pigs in Malaysia and Singapore. Its name originated from Sungai Nipah, a village in the Malaysian Peninsula where pig farmers became ill with encephalitis. Clinical presentation can range from asymptomatic infection to fatal encephalitis. Those infected initially have a sudden onset of flu-like symptoms such as fever, headaches, pain in the muscles, vomiting and sore throat, followed by dizziness, drowsiness, altered consciousness (partial or complete loss of consciousness) and focal neurological signs indicating acute encephalitis. Encephalitis and seizures occur in severe cases. This progresses to coma within 24-48 hours.

Outbreaks of Nipah virus have occurred in Bangladesh, north and west of Dhaka (87). The last outbreak occurred in 2013. The Pteropus fruit bat has been identified as the primary host of the disease (88), and the major risk factor for infection is the consumption of either raw or fermented raw date palm sap (89).

Tuberculosis and HIV/AIDS

Tuberculosis

Tuberculosis is high in both countries with prevalence of 365 per 100,000 individuals in Myanmar (19th highest TB prevalence) and 225 per 100,000 individuals in Bangladesh (35th highest TB prevalence) (80). Given the decreased access to medical care within Myanmar, it can be assumed that the prevalence of TB among the Myanmar nationals is higher than the published rates. Another important challenge is Multi Drug Resistance Tuberculosis (MDR TB) - with an estimated 9,700 MDR cases per year in Bangladesh and an estimated 9,000 cases in Myanmar each year; extensively drug-resistant TB (XDR-TB) has been detected in Myanmar. MDR-TB is estimated at 1.5 to 5% of new cases (Bangladesh and Myanmar respectively) and 25 to 29% of previously treated cases (Myanmar and Bangladesh). The association between poverty and TB is well-recognized, and the highest rates of TB were found in the poorest section of the community (81). TB occurs more frequently among low-income people living in overcrowded areas and persons with little schooling (82). Poverty may result in poor nutrition which may be associated with alterations in immune function. On the other hand, poverty resulting in overcrowded living conditions, poor ventilation and poor hygiene-habits is likely to increase the risk of transmission of TB (83). Considering the crowded situation of the settlement with minimal support to
preventive and curative services related to TB, there is a reasonable expectation that TB cases will rise and so would MDR-TB among the TB cases identified.

**HIV/AIDS**

HIV rates in Bangladesh are low (84). Bangladesh’s latest round of serological surveillance (2011) showed that HIV prevalence among all key populations remained below 1 percent with the exception IDU. Although the overall prevalence of HIV was 1.2% among IDU in 2007/08, there is a concentrated epidemic among male IDU in Dhaka. The prevalence of HIV in this cluster increased from 4% in 2002 to 7% in 2007/08, which fell slightly in 2010 to 5.3% (85).

Similarly, in Myanmar, the overall HIV epidemic in Myanmar seems to be declining with HIV prevalence among adults, 15 years and older, estimated to be less than 0.6% nationally. There were an estimated 224,795 people living with HIV (PLHIV) including those aged under 15, one-third of whom were female (86). Though both the countries have lower prevalence compared to the average of the south Asian region, the current crisis and possibility of transmission of HIV among the vulnerable population is high. The victims of sexual violence in the recent turmoil in Myanmar, there may be a risk for HIV among the survivors are one such vulnerable group.
Risk characterization

The conflict in Rakhine State which began on 25 August 2017 has driven an estimated 486 000 Rohingyas across the border into Cox’s Bazar, Bangladesh. This latest influx is in addition to pre-existing population of 36 000 registered Rohingyas and 164 000 who were residing in camps/makeshift settlements prior to 25 August 2017. The speed and scale of the influx has resulted in a critical humanitarian emergency. Basic services that were available prior to the influx are under severe strain due to the massive increase in people in the area. In some of the sites that have spontaneously emerged, there is no access to water and sanitation facilities and along with cramped and crowded living conditions there is a significant risk of disease outbreaks.

There are massive unmet shelter and site management needs across all sites. Newly created spontaneous sites are not yet suitable for mass habitation, with a lack basic access and infrastructure, particularly water and sanitation facilities. The land that has been allocated for the new site is not suitable for habitation, there is no road access, and the population density in accessible areas is extremely high which poses multiple risks. Conditions across all sites have been severely affected by heavy rains. Crucially there is limited access to the site and no roads through this site. This is preventing the development of infrastructure including water and sanitation facilities.

From food and nutrition perspective, all new arrivals viz. 429 000 people are in need of emergency food assistance. Amongst the new arrivals, there are an estimated 55 770 pregnant and lactating women, children under 5, and adolescent girls that require targeted food and nutrition assistance.

Finally, both Bangladesh and Myanmar and their affected regions of Cox’s Bazar and Rakhine are endemic and have high burden of different communicable diseases. Both sites have witnessed in recent times, outbreaks of measles, dengue, chikungunya and malaria. Endemic transmission of HEV and leptospirosis is also likely to be high including in affected areas/populations. While progress has been made in malaria control, Cox Bazar’s continues to be among the malaria endemic districts of Bangladesh. In addition, there is a high burden of acute respiratory diseases especially in under 5 year-old children. Weak tuberculosis control programs are reflected in a high total burden as well MDR TB rates in both countries. Poor access to improved sanitation and clean water, inadequate vaccination coverage, inadequate surveillance and vector control capacity are some of the important drivers of common communicable diseases in the two countries.

In this backdrop of high background endemicity of communicable diseases and worsening health, nutrition and environmental conditions due to the current crisis, affected populations are at high risk of local outbreaks of waterborne (cholera, hepatitis E, dysentery), foodborne (cholera, dysentery) and vector borne diseases (dengue, chikungunya, JE, malaria, scrub typhus) as well as skin diseases (scabies).

Population displacement can result in overcrowding in resettlement areas, raising the risk of transmission of certain communicable diseases that are spread from person to person through respiratory droplets such as measles, diphtheria and pertussis (vaccine-preventable diseases), and acute respiratory infections or ARI. This risk is increased with inadequate ventilation. Overcrowding can also increase the likelihood of transmission of meningitis, tuberculosis, flu, waterborne and vectorborne diseases in the weeks and months following the influx of refugees. Lack of adequate shelter for affected populations may also increase the risk of malaria and dengue due to increased exposure to vectors.
Diseases such as dengue/DHF, JE and nipah virus disease are endemic in Bangladesh and Myanmar, and can present with severe clinical manifestations requiring critical secondary care. Such cases, especially in an outbreak form, are likely to further compromise the already stretched health services in refugee areas.

A particular attention was given to cholera for which a specific WHO-led risk assessment was conducted between stakeholders. The assessment addressed the risk for a large cholera outbreak. As a result, it is very highly likely that small size clusters of cholera will occur in refugee settlements (high level of confidence). Furthermore the risk of a large outbreak is considered high among new arrivals as well; however, our level of confidence regarding for such as statement is moderate. All criteria to recommend pre-emptive vaccination campaigns for the Rohingya population are fulfilled as described above.

**Priority interventions**

Ensuring **uninterrupted and sufficient provision of safe drinking-water** is the most important preventive measure in reducing the risk of outbreaks of waterborne diseases.

- **UNHCR, WHO and SPHERE** recommend that each person be supplied with at least 15–20 litres of clean water per day.
- There are a number of water treatment methods (boiling, filtration, chlorine, coagulation, flocculation, and solar) that have demonstrated effective removal of pathogens in the laboratory and reductions in diarrhoea when used in the field. WHO has recently begun international testing of water treatment technologies according to WHO performance standards (WHO, 2012) and the latest list of tested technologies and their performance should be consulted.
- The preferred method or combination of methods depends on a number of factors including turbidity or number of suspended particles in the water, existing methods in use and accepted by the population, supply chains, and cost.
- Chlorine is often used in emergencies as it is inexpensive and in certain forms easy to transport. Several considerations should be given to chlorine including:
  - For household water treatment, the most practical forms of free chlorine are liquid sodium hypochlorite, sodium calcium hypochlorite and bleaching powder.
  - The amount of chlorine needed depends mainly on the concentration of organic matter in the water and has to be determined for each situation. Chlorine may be ineffective with water which is highly turbid, such as from rivers and/or ponds. In such cases other treatment options, such as filtration or coagulation-flocculation should be considered.
  - After 30 minutes, the residual concentration of active free chlorine in the water should be 0.5 mg/litre, which can be determined by using a simple field chlorine test kit.
  - Chlorine is ineffective against certain protozoa, most notably *cryptosporidium*, a pathogen which can cause especially serious health conditions for individuals with HIV. Greater protection of drinking-water sources would combine chlorination with other methods or select a method such as membrane filtration that would effectively protect against the range of pathogens most commonly associated with diarrhoeal diseases.
- Regular monitoring of WASH related health risks through sanitary surveys and use of rapid fecal indicator water quality tests, is an important mechanism for assessing and managing risks. A number of field kits are available for assessing water quality and efforts should be made to quantify fecal contamination, where possible.
- Key messages on food hygiene and regular handwashing with soap should be promoted to sensitize communities to the relevant health risks.
In addition, adequate sanitation facilities should be provided in the form of improved and well maintained latrines or designated, protected defecation areas. Sanitation efforts should also incorporate behaviour change approaches considering the common practice of open defecation.

All health-care waste (for example, contaminated syringes and needles) should be properly segregated and disposed of in designated containers and destroyed as appropriated. The safest and most environmentally friendly method is autoclaving, however, this requires reliable water and power. Incineration is the next preferred option, using dual chamber, high temperature equipment. If no other options are available, burning in pits or burying may be a temporary measure.

Shelter and site planning/management are other important consideration for the prevention of communicable disease. Wherever possible, shelters for the displaced or homeless must be positioned with sufficient space between them and, aimed at preventing diseases related to overcrowding or lack of ventilation, such as measles, ARI, diarrhoeal diseases, TB and vector-borne diseases.

Domestic waste should be disposed in a pit, away from shelters and protected from rodents to reduce the exposure of the population to rodents and other vectors of disease.

Shelters should be equipped with long-lasting insecticidal nets (LLIN) for each sleeping space to prevent malaria transmission. In addition, adequate sanitation facilities should be provided in the form of latrines or designated defecation areas. These should be separate sex-specific facilities designed and located with attention to security issues.

Surveillance/early warning and response system for rapid detection of cases of epidemic-prone diseases is essential to ensure rapid control. The surveillance/early warning and response system should:

- focus on the priority epidemic-prone communicable diseases most likely to occur in the disaster-affected population;
- be simple to use, uniform in style and include standard case definitions and reporting forms (for WHO case definitions, see section 5 for detection of acute watery diarrhoea, acute bloody diarrhoea, measles, acute respiratory infection, dengue, malaria, jaundice syndrome, meningitis, tetanus, unexplained fevers, any unusual/unexpected public health events, including disease clusters and unexplained disease);
- include an alert system for immediate reporting and prompt investigation of priority epidemic prone diseases such as bloody diarrhoea, measles and DHF;
- include outbreak preparedness, with development of specific outbreak response plans and adequate stockpile of supplies, as well as outbreak investigation kits and transport material for laboratory specimens;
- complement existing surveillance structures;
- be sensitive to unusual emerging and re-emerging communicable diseases of major public concern, including dengue and diphtheria; identify key laboratories for prompt diagnosis and confirmation of the main communicable disease threats, as well as protocols for transport and tracking of specimens;
- ensure data is forwarded to the local health authorities and the WHO office.

Immunization for measles/rubella is recommended for all persons 6 months to 35 years of age. The vaccine of choice is either measles-rubella containing vaccine (MR) or measles-rubella-mumps.
containing vaccine (MMR). Vaccine should be administered as soon as they enter an organized camp or settlement, regardless of previous vaccination or history of measles disease, neither of which are contraindications to receiving the vaccine. Emergency public health personnel, both national and international, should be routinely vaccinated against measles and rubella, regardless of age. Given the current situation in Bangladesh, the fact that the country is endemic for cholera and the usual time for cholera outbreaks is the start of the monsoon season (June), Oral Cholera Vaccine (OCV) to protect the population most at risk against the disease is a critical intervention. A risk assessment will help decide on where and how to use OCV should be conducted as soon as possible and should be done within the framework for vaccination in humanitarian emergencies. When the situation stabilizes, routine vaccinations offered by the national immunization programme should be made available to all infants, pregnant women and other people as part of the provision of basic emergency health-care services.

**Public Health Communication.** Information may be the most important commodity during emergencies. Information may also be the most rapid public health response ahead of the delivery of aid. In addition, the dissemination of information in a timely and transparent manner also helps generate trust and credibility in response activities and agencies providing relief. Heightened community awareness of the need for early treatment and reinforcement of proper case management are important in reducing the impact of communicable diseases.

It is important to convey to all parties that dead bodies do not represent a public health threat. When death is due to the initial impact of the event and not because of disease, dead bodies have not been associated with outbreaks. Standard infection control precautions are recommended for those managing corpses.

**The use of standard treatment protocols** in health-care facilities with agreed upon first-line drugs is crucial to ensure effective diagnosis and treatment for ARI, the main epidemic-prone diseases (including cholera, dysentery, shigellosis, typhoid, dengue and DHF, hepatitis, leptospirosis, measles, malaria, meningitis and influenza A and STIs.

- Standard Precautions aim to ensure hand hygiene and the avoidance of direct contact with blood and body fluids. Therefore essential supplies should include waterless hand antiseptics and personal protection (e.g., gloves). Additional specific (transmission-based) precautions should be determined by risk assessment. It is important that Standard Precautions should be used not only at health-care facilities, but also by health-care workers providing care in the field.
- Malaria treatment: In the emergency phase, severe falciparum malaria can be treated with artemether by the intramuscular route as an acceptable and practical alternative. However, as soon as intensive case monitoring becomes possible, artesunate by the intravenous or intramuscular route should be used as the treatment of choice, followed by intravenous quinine.
- Provision of anti-TB treatment must be ensured for TB patients who were previously receiving treatment in the affected areas.
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24. Promed-mail. PRO / MBDS > Dengue - Myanmar (13) - [Internet]. 2017 [cited 2017 Sep 27]. Available


93. Rakhine State Health Profile UNICEF and State MOH Profile, Government of Myanmar
Anncex 1  WHO recommended case definitions

**Acute diarrhoea**
Acute diarrhoea (passage of three or more loose stools in the past 24 hours)
with or without dehydration.

**Suspected cholera**
In an area where cholera is not known to be present:
• a person aged > 5 years with severe dehydration or death from acute watery diarrhoea with or without vomiting.

In an area where there is a cholera outbreak:
• a person aged > 5 years with acute watery diarrhoea with or without vomiting.

To confirm a case of cholera:
• isolation of Vibrio cholera O1 or O139 from a diarrhoeal stool sample.

**Bloody diarrhoea**
Acute diarrhoea with visible blood in the stool.

To confirm a case of epidemic bacillary dysentery:
• take a stool specimen for culture and blood for serology,
• isolation of Shigella dysenteriae type 1.

**Acute flaccid paralysis (suspected poliomyelitis)**
Acute flaccid paralysis in a child aged < 15 years, including Guillain–Barré syndrome, or any acute paralytic illness in a person of any age in whom poliomyelitis is suspected.

**Acute Haemorrhagic Fever Syndrome**
Acute onset of fever (duration of less than 3 weeks) and any of the following:
• haemorrhagic or purpuric rash,
• vomiting with blood,
• cough with blood,
• blood in stools
• epistaxis, or
• other haemorrhagic symptoms.

**Acute Jaundice Syndrome**
Illness with acute onset of jaundice and absence of any known precipitating
Acute lower respiratory tract infections/ pneumonia
In children aged less than five years old:
- cough or difficulty breathing, and
- for infants aged 2 months to 1 year, breathing 50 or more times per minute, or
- for children aged 1 to 5 years, breathing 40 or more times per minute, and
- no chest in-drawing, no stridor, no general danger signs.
- Severe pneumonia:
  - cough or difficulty breathing and one or more of the following:
    - inability to drink or breastfeed,
    - severe vomiting,
    - convulsions, lethargy or unconsciousness, or
    - chest in-drawing or stridor in an otherwise calm child.

Acute viral hepatitis (A or E)\textsuperscript{10}
Any person with discrete onset of an acute illness with signs or symptoms consistent with acute viral hepatitis typically including fever, acute jaundice, nausea, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness and/or elevated serum aminotransferase levels (ALTs) (>2.5 times the upper limit of normal, as defined by the performing laboratory.

Malaria
Person with current fever or history of fever within the past 48 hours (with or without other symptoms such as nausea, vomiting and diarrhoea, headache, back pain, chills, muscle pain) with positive laboratory test for malaria parasites (blood film, thick or thin smear) or rapid diagnostic test).
In children
Uncomplicated malaria:
- Fever and no general danger signs such as lethargy or unconsciousness, convulsions, or inability to eat or drink. Where possible, confirm malaria with laboratory test.

Severe malaria:
- Fever and general danger signs (lethargy or unconsciousness, convulsions, or inability to eat or drink).

Measles
Fever and maculopapular rash (i.e. non-vesicular) with:
- cough and coryza (i.e. runny nose), or
• conjunctivitis (i.e. red eyes).

Any person in whom a clinical health worker suspects measles infection.

To confirm a case of measles:
• Presence of measles-specific IgM antibodies.

10 An interim recommended case definition.

Meningitis

Suspected case:
• sudden onset of fever (>38.5 °C) with stiff neck.
• in patients aged < 12 months, fever accompanied by a bulging fontanelle.
• Probable case of bacterial meningitis:
• suspected case of acute meningitis, as defined above, with turbid cerebrospinal fluid.

Probable case of meningococcal meningitis:
• suspected case of meningitis, as defined above and Gram stain showing Gram-negative diplococcus, or
• ongoing epidemic or petechial or purpurral rash.

Confirmed case of meningococcal meningitis:
• suspected or probable case, as defined above, with either positive-CSF antigen detection for Neisseria meningitidis or positive CSF culture or blood with identification of N. meningitidis.

Tetanus

Adult tetanus
Either of the following signs 3–21 days following an injury or wound:
• trismus of the facial muscles or risus sardonicus
• painful muscular contractions.

Neonatal tetanus
Any neonate with normal ability to suck and cry during the first 2 days of life who, between day 3 and day 28, cannot suck normally, or any neonate who becomes stiff or has spasms or both.

Unexplained Fever
Fever (body temperature >38.5 °C) for >48 hours and without other known aetiology.

Unexplained cluster of health events
An aggregation of cases with similar symptoms and signs of unknown cause that are closely grouped in time and/or place.
## Annex 2

### Indicators for priority emergency response activities

<table>
<thead>
<tr>
<th>Code</th>
<th>Sub-Domain</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-R.3</td>
<td>H3 Communicable diseases; H5 Non communicable diseases and mental health</td>
<td>Case Fatality Ratio (CFR) for most common diseases</td>
<td>Probability of dying as a result of a given disease. Is a result of a mixture of disease severity and quality of health care.</td>
</tr>
<tr>
<td>H-A.2a</td>
<td>H4.2 Maternal and newborn care</td>
<td>Number of functional health facility with Basic Emergency Obstetric Care (BEmOC) per 500 000 population</td>
<td>Proxy indicator for the physical availability and geographical accessibility of emergency obstetric services and their distribution across districts. An unbalance between the availability of BEmOC and CEmOC (with too few BEmOC) is often observed.</td>
</tr>
<tr>
<td>H-A.2</td>
<td>H4.2 Maternal and newborn care</td>
<td>Number of functional health facilities with Comprehensive Emergency Obstetric Care (CEmOC) per 500 000 population</td>
<td>Proxy indicator for the physical availability and geographical accessibility of emergency obstetric services and their distribution across districts in the affected areas. An unbalance between the availability of BEmOC and CEmOC (with too few BEmOC) is often observed.</td>
</tr>
<tr>
<td>H-C.5</td>
<td>H4.2 Maternal and newborn care</td>
<td>Percentage of births assisted by a skilled attendant</td>
<td>Proxy measure for the utilization rate of obstetrics services in health facilities and in communities where Village-Trained Midwives are operating. It is a measure of a health systems ability to provide adequate care for pregnant women during labour and delivery.</td>
</tr>
<tr>
<td>H-C.6</td>
<td>H4.2 Maternal and newborn care</td>
<td>Percentage of deliveries by caesarean section</td>
<td>The proportion of all deliveries by caesarean section in a geographical area is a measure of access to and use of a common obstetric interventions for a verting maternal and neonatal deaths and for preventing complications such as obstetric fistula. Of all the procedures used to treat major obstetric complications, caesarean section is one of the commonest, and reporting is relatively reliable.</td>
</tr>
<tr>
<td>H-A.6</td>
<td>H4.3 Sexual violence</td>
<td>Percentage of functional health facilities with clinical management of rape survivor services</td>
<td>Key indicator to measure the allocation of resources and the availability of services to address consequences of sexual violence.</td>
</tr>
</tbody>
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<th>Code</th>
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<tbody>
<tr>
<td>H-C.1</td>
<td>H1 General clinical services &amp; essential trauma care</td>
<td>Number of outpatient consultations per person per year (attendance rate or consultation rate)</td>
<td>Proxy indicator for accessibility and utilization of health services that may reflect the quality of services. It does not measure the coverage of this service, but the average number of visits in a defined population.</td>
</tr>
<tr>
<td>H-A.1.a</td>
<td>H1 General clinical services &amp; essential trauma care</td>
<td>Number of functional basic health units/10 000 population</td>
<td>Proxy indicator of geographical accessibility, and of equity in availability of health facilities across different administrative units.</td>
</tr>
<tr>
<td>H-A.1.b</td>
<td>H1 General clinical services &amp; essential trauma care</td>
<td>Number of functional health centres/50 000 population</td>
<td>Proxy indicator of geographical accessibility, and of equity in availability of Health Facilities across different administrative units</td>
</tr>
<tr>
<td>H-A.1.c</td>
<td>H1 General clinical services &amp; essential trauma care</td>
<td>Number of functional district-rural hospitals/250 000 population</td>
<td>Proxy indicator of geographical accessibility, and of equity in availability of Health Facilities across different administrative units.</td>
</tr>
<tr>
<td>H-A.9a</td>
<td>H1 General clinical services &amp; essential trauma care</td>
<td>Number and Percentage of non functional health facilities</td>
<td>Indicator of the consequence of the crisis on the availability of the health services</td>
</tr>
<tr>
<td>H-A.9b</td>
<td>H1 General clinical services &amp; essential trauma care</td>
<td>Number and Percentage of health facilities supported by humanitarian organisations</td>
<td>Indicator of support by health cluster partners beside MoH to the health system; in very disrupted health system can be a proxy for functional health facilities/services as non-supported health facilities have stopped functioning</td>
</tr>
<tr>
<td>H-A.5</td>
<td>H1 General clinical services &amp; essential trauma care</td>
<td>Number of inpatient beds per 10 000 population</td>
<td>Indicator for the availability of hospital beds across crisis areas and proxy indicator of equity in the allocation of resources.</td>
</tr>
<tr>
<td>H-A.7</td>
<td>H1 General clinical services &amp; essential trauma care</td>
<td>Number of health workers per 10 000 population</td>
<td>Key indicator to monitor the availability of health workers. It can serve as a proxy to monitor equity in the allocation of resources by humanitarian actors across different groups within the humanitarian case load and/or crisis affected population versus local populations.</td>
</tr>
<tr>
<td>H-A.8</td>
<td>H1 General clinical services &amp; essential trauma care</td>
<td>Number of community health workers per 10 000 population</td>
<td>Indicator monitoring the availability of human resources key to delivering community-based intervention.</td>
</tr>
<tr>
<td>H-C.2</td>
<td>H1 General clinical services &amp; essential trauma care</td>
<td>Number of consultations per clinician per day</td>
<td>Measure for the workload and proxy indicator of the quality of care.</td>
</tr>
<tr>
<td>H-A.9</td>
<td>H1 General clinical services &amp; essential trauma care; H2 Child health; H3 Communicable diseases; H4 Sexual and Reproductive Health</td>
<td>Number and percentage of functional health facilities providing selected relevant services</td>
<td>Proxy indicator for the physical availability and geographical accessibility of selected services relevant to the local context.</td>
</tr>
<tr>
<td>H-C.3</td>
<td>H5 Non communicable diseases and mental health; H6 Environmental Health</td>
<td>Coverage of measles vaccination (%)</td>
<td>Measles coverage refers to the percentage of children who have received at least one dose of measles-containing vaccine in a given year. This indicator is used for estimating the vaccine coverage of the total EPI strategy. To avoid overestimation, measles vaccination coverage is often used as a proxy since it is usually lower than DPT3 coverage.</td>
</tr>
<tr>
<td>H-C.4</td>
<td>H2 Child health</td>
<td>Coverage of DTP3 in &lt; 1 year old (%)</td>
<td>Indicators used for estimating the vaccine coverage of the total EPI strategy. To avoid overestimation, measles vaccination coverage is often used as a proxy since it is usually lower than DTP3 coverage.</td>
</tr>
</tbody>
</table>