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Rapid behavioral assessment of barriers and opportunities to improve vaccination coverage among displaced Rohingyas in Bangladesh, January 2018

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Abstract

Background: In November 2017, the World Health Organization received initial reports of suspected diphtheria cases in camps established for displaced Rohingyas in Cox's Bazar district, Bangladesh. By January 11, 2018, over 4,000 suspected cases of diphtheria and 30 deaths were reported. The Bangladesh government and partners implemented a diphtheria vaccination campaign in December 2017. Outbreak response staff reported anecdotal evidence of vaccine hesitancy. Our assessment aimed to understand vaccination barriers and opportunities to enhance vaccine demand among displaced Rohingyas in Bangladesh.

Methods: In January 2018, we conducted a qualitative assessment consisting of nine focus group discussions and 15 key informant interviews with displaced Rohingyas in three camps. Participants included mothers and fathers with under five-year-old children, community

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Contributorship

In addition to contributing to the preparation of the manuscript, all co-authors contributed one or more aspects of the study design, data collection, supervision of field staff, data analysis, and interpretation of results. All co-authors reviewed and approved the final version of the manuscript.

Declaration of interest statement

We have none to report.

Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the U.S. Centers for Disease Control and Prevention, UNICEF, World Health Organization, or Communicating with Communities.

Disclosures

None to report.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.vaccine.2018.12.042.

volunteers, majhis (camp leaders), Islamic religious leaders, traditional and spiritual healers, and teachers. We recruited participants using purposive sampling, and analyzed the data thematically.

Results: Across focus groups and in-depth interviews, trusted information sources cited by participants included religious leaders, elders, village doctors, pharmacists, majhis, and mothers trained by non-governmental organizations to educate caregivers. Treatment of diphtheria and measles was usually sought from multiple sources including traditional and spiritual healers, village doctors, pharmacies, and health clinics. Major barriers to vaccination included: various beliefs about vaccination causing people to become Christian; concerns about multiple vaccines being received on the same day; worries about vaccination side effects; and, lack of sensitivity to cultural gender norms at the vaccination sites.

Conclusion: Although vaccination was understood as an important intervention to prevent childhood diseases, participants reported numerous barriers to vaccination. Strengthening vaccine demand and acceptance among displaced Rohingyas can be enhanced by improving vaccination delivery practices and engaging trusted leaders to address religious and cultural barriers using community-based channels.

Keywords

Rohingya; Diphtheria; Vaccine; Barriers; Hesitancy; Demand

1. Background

More than 600,000 displaced Myanmar residents, mostly Rohingya Muslims, moved from Myanmar's Rakhine State to camps and settlements in neighboring Bangladesh between August 2017 and January 2018 [1]. The sudden influx of displaced Rohingyas into Bangladesh posed numerous humanitarian challenges and health risks [2]. In November 2017, a medical team from Médecins Sans Frontières diagnosed the first suspected case of diphtheria in a Rohingya camp in Kutupalong, Cox's Bazar district, Bangladesh [3]. By January 2018, the World Health Organization (WHO) had received reports of more than 4,000 suspected cases of diphtheria and 30 diphtheria-related deaths [4]. About two-thirds of suspected cases were children under the age of 15 years [3]. Vaccination coverage among the Rohingya population prior to settling in Bangladesh remained largely unknown; however, WHO estimated that coverage was low. In fact, a diphtheria outbreak is usually an indication of low overall vaccination coverage in a population [3].

Diphtheria is a bacterial infection primarily transmitted from person-to-person through respiratory droplets from coughing and sneezing. Transmission also occurs through physical contact with skin lesions of an infected person or surfaces of objects containing the bacteria [5]. Signs and symptoms of diphtheria include fever, sore throat, and swollen neck glands. The bacteria produces a toxin that causes a psuedomembrane, a thick covering of dead tissue in the back of the throat, making it difficult to breathe and swallow. Heart failure, respiratory failure, nerve damage, and paralysis can also occur [5]. Diphtheria is treated with antibiotics and antitoxin. Case fatality can be as high as 50% [5]. WHO recommends a 3-dose primary vaccination series with diphtheria toxoid-containing vaccine, followed by 3 booster doses [6].

In response to the outbreak in Cox's Bazaar, a diphtheria vaccination campaign was implemented by the Bangladesh government and partners during December 12–31, 2017. Round one of the campaign reached about 150,000 children ages 6 weeks to 6 years with diphtheria-tetanus-pertussis-hepatitis *B-Haemophilus influenzae* type b vaccine (pentavalent), bivalent oral polio vaccine, and pneumococcal conjugate vaccine [3,4,7]. Another 166,000 children ages 7–14 years received tetanus-diphtheria vaccine. Round two of the campaign occurred during January 27–February 10, 2018 and round three occurred during March 10–25, 2018 [4]. In the first round of the campaign, administrative coverage was estimated to be 81% compared to 93% and 90% for the second and third rounds, respectively, among children 6 weeks to 6 years old [8]. Community mobilizers, mostly from non-governmental organizations (NGOs), helped to identify eligible children and bring them to fixed campaign sites. Diphtheria campaign messages were disseminated through megaphones, local and community radio broadcasts, and door-to-door outreach.

Vaccine hesitancy [9–13] is defined by WHO's Strategic Advisory Group of Experts on Immunization as "delay in acceptance or refusal of vaccines despite available vaccination services" [12]. Vaccine hesitant individuals range from those who might passively accept all vaccines despite having some vaccination concerns to those who delay or refuse some or all vaccines due to reasons that may be context-specific and vary across persons, place, time, and vaccines [14]. Vaccine hesitancy was anecdotally reported among the Rohingya population during round one of the diphtheria campaign. The nature, extent, and drivers of the reported hesitancy were unknown. Following round one of the diphtheria campaign, we aimed to better understand the vaccination barriers among displaced Rohingyas in Bangladesh to develop strategies for strengthening confidence and trust in immunization. We wanted to obtain a contextualized understanding of vaccine hesitancy and explore community structures to identify influential Rohingya leaders for future engagement to improve vaccination uptake.

2. Materials and methods

2.1. Study design, sampling, and recruitment

In January 2018, we conducted a qualitative assessment consisting of focus group discussions (FGDs) and key informant interviews (KIIs) to examine vaccination barriers and opportunities in 3 camps in Ukhia sub-district, Bangladesh: Balukhali, Hakim-para, and Kutupalong (Table 1). These communities were selected because they experienced high numbers of suspected diphtheria cases and reported instances of vaccine hesitancy during the diphtheria campaign. We purposefully selected participants who were mothers or fathers with children under five years, community volunteers, camp leaders or religious leaders. Data collection teams first identified several eligible participants from various sub-blocks in the respective camps, and later asked them to refer the teams to other eligible participants. This process, along with door-to-door recruitment, continued until the quota of participants was obtained in each location.

Nine FGDs were conducted with mothers with children under five years of age (n = 3), fathers with children under five years of age (n = 3), community volunteers (n = 1), *majhis* - camp leaders (n = 1), and *imams* – religious leaders (n = 1). Each FGD had 10 participants.

Fifteen KIIs with additional participants were conducted among mothers of children under five years of age (n = 3), imams (n = 3), majhi's (n = 3), traditional and spiritual healers (n = 3), and teachers (n = 3) in order to separately follow-up on themes that emerged from the FGDs. Participants in the KIIs were different from FGDs.

2.2. Instrumentation

An interdisciplinary team developed the FGD guide (Supplementary Material) and KII guide (Supplementary Material). The guides covered the following primary domains: perceptions of diphtheria and measles, trusted information sources, experiences from vaccination campaigns, vaccination barriers, and other community needs and priorities. We developed the guides in English and subsequently translated them to Bangla. Because Rohingya is an oral language, we carried out standardized oral translations of the Bangla version into Rohingya language during the training of data collectors, who were all native Chittagonian speakers. Chittagonian dialect of Bangla is similar to Rohingya language [15]. At the time of our assessment, communication between service providers and displaced Rohingyas was mostly done in the local Chittagonian dialect without using translators. Our data collectors practiced administering questions and probes under the supervision of a communication consultant fluent in Bangla and Chittagonian dialect and conversant in Rohingya language.

2.3. Data collection

Data collection took place during January 13–18, 2018. By this time, 5 separate vaccination campaigns had been implemented in Ukhia sub-district (2 rounds of oral cholera vaccine, 2 rounds of measles-rubella vaccine, and 1 round of diphtheria-containing vaccine). Ten data collectors from two UNICEF-funded NGOs (BRAC and PULSE Bangladesh) conducted all FGDs and KIIs in Rohingya language. The data collectors were all from the local host communities, and had been engaged in various community-level work with the Rohingya population. They were therefore conversant in Rohingya language. All data collectors had some prior experience with qualitative data collection. Several staff from UNICEF, CDC, and WHO supervised the data collection. We decided against audio-recording interviews due to concerns that the presence of an audio-recorder might deter candid participation. In each team, an assigned note-taker took detailed notes using a structured template.

2.4. Data analysis

At the end of each FGD and KII, the team immediately debriefed to discuss and summarize key themes and observations. After data collection, all teams debriefed together under the supervision of a behavioral scientist and communication consultant. Coupled with the debriefing sessions, we analyzed the written notes thematically. We first deductively identified themes based on questions and probes in the interview and discussion guides. Additional themes were inductively identified based on emerging topics from the interviews/discussions that were not included in the guides. Themes from the KIIs and FGDs largely overlapped across groups and interviews. We have therefore combined the thematic analysis from the FGDs and KIIs in order to comprehensively capture the main results.

2.5. Ethics

All respondents provided verbal consent. The assessment was locally approved by Bangladesh's Communicating with Communities platform. It was also reviewed in accordance with the US Centers for Disease Control and Prevention (CDC) human research protection procedures and was determined to be an epidemic disease control, non-research activity.

3. Results

Our total sample comprised 105 Rohingyas, of whom 90 participated in focus groups and 15 took part in in-depth interviews. More than half of the sample (55%) was comprised of mothers and fathers of children under the age of five years. Participants were between the ages of 18 and approximately 70 years. All respondents approached for the KIIs agreed to participate. Less than 5% of those approached for the FGDs declined to participate for uncited reasons. One respondent exited a caregiver FGD after he was blamed by fellow participants for discouraging vaccination in the community. He felt uncomfortable by the situation and expressed his desire to leave, which was honored by the data collection team.

3.1. Perceptions of diphtheria and measles

Local words existed for both diphtheria (*gola-fula*) and measles (*lu-thee*). When community members suspected diphtheria, traditional treatment involved gargling with hot water followed by ingesting a chili-paste and salt mixture. Lime with honey poultice would also be applied to the neck. For suspected measles, one mother explained that:

> ". . .the child is bathed in a water mixture followed by the scrubbing of the skin and application of mud to the skin. The child is then kept indoors to avoid sunlight."

Treatment of diphtheria and measles was usually sought from a combination of sources including traditional and spiritual healers, village doctors, and pharmacies. Health clinics were used in some instances after earlier treatment options failed – such as visits to traditional healers. It remained unclear how much time was spent with traditional healers before seeking care from a clinic.

3.2. Trusted information sources

Respondents cited religious leaders as the most trusted sources of information. They used variety of local terms to describe different roles among trusted religious leaders. Imams were described as the overall guardians of Islam. *Hujurs* were described as religious leaders responsible to educate children in Qur'anic and Arabic studies. *Hafiz* were also described as a subset of religious leaders who have memorized the Qur'an and completed a full translation of the Qur'an from Arabic to Rohingya language. *Boidyas* were described as spiritual healers who usually based their healing practices in the Qur'an. However, a subset of *boidyas* were reportedly distrusted because their practices were not grounded in the Qur'an.

Other trusted community members cited were educated Rohingyas, elders, village doctors, pharmacists, *majhis*, and Model Mothers. Majhis were informal community leaders who

emerged either through their past role or position in Myanmar or were appointed by humanitarian responders (including the government) to assist with a wide range of relief, rehabilitation, and security related efforts. While *majhis* were generally respected, some participants expressed distrust in the *majhis* on health issues, partly because of their liaison role between the Bangladesh army and the Rohingya community. Model Mothers, women with children or grandchildren initially recruited by NGOs to assist with the dissemination of health information, were valued for their role as resource persons in information centers. In general, educated Rohingyas and elders were seen as knowledgeable about health.

When asked about preferred channels of receiving information about immunization, respondents cited: *masjid* (mosque) especially during *Jummah* (Friday prayers), household visits, blocklevel community meetings, information centers, health centers, and megaphones. Though megaphones were often deployed for health messaging, megaphones were mainly preferred as a way to remind people about vaccination dates and locations. Community-level channels were preferred for more detailed health messaging – including the use of more interactive video documentaries.

> "Publicity and engagements with imams and majhis will be good ways to get the information to the people. If the imam explains the benefits of vaccination in the light of the Qu'ran and Hadith that would be good for people to hear." – Imam

3.3. Experiences from vaccination campaigns in Cox's Bazar

Respondents shared a mix of positive and negative experiences from various past vaccination campaigns since arriving in Bangladesh. Some participants said that they had positive experience from the campaigns and felt cared for by the government of Bangladesh and humanitarian workers. Others reported that they were initially instructed by their religious leaders to refuse vaccination. For this reason, those respondents said that they felt misled by the religious leaders on the issue of vaccination. Religious leaders and fathers said they did not want their wives and daughters to be vaccinated by male vaccinators in public areas without privacy and gender sensitivity considerations.

Compared to when they first moved to Bangladesh, most participants, including religious leaders, said that they became more receptive to vaccination after several months of exposure to multiple vaccination campaigns within the camps. The underlying reasons for increasingly accepting vaccination were not straightforward. Respondents expressed that they had, in general, observed fewer swollen necks from diphtheria and skin rashes related to measles now compared to several months ago. They attributed this to the vaccination campaigns. Nonetheless, they expressed dissatisfaction with vaccinators for not providing information about the vaccines children were receiving and for not being kind or gentle with the children. Mothers particularly complained that children were often discouraged while they waited in line because of crying and pain they saw being expressed by other children during vaccination. As a result, some children, especially if they were older or unescorted, ran away before being vaccinated.

> "Vaccinators have to treat children with more care and be more patient. Don't rush. They need to take their time. They need to find ways to make the pain less for children." – Father of vaccine-eligible child

> "Seeing children get vaccinated and crying cause fear in other children so the other parents tend to leave. They need to not let other children see before it's their turn, or else they will become afraid." – Mother of vaccine-eligible child

> "When people who are unskilled and untrained vaccinate our children they don't do it properly and that causes pain for the children. If the vaccinators are trained properly, people will feel less pain. Also, if there are female vaccinators that would also be good for us." – School Teacher

3.4. Vaccination barriers

Four major vaccination barriers emerged: (i) fear of becoming a Christian because of vaccination, (ii) safety concern about receiving multiple vaccines on the same day, (iii) other vaccine safety concerns, and (iv) lack of sensitivity to cultural gender norms in the vaccination site procedures.

3.4.1. Fear of becoming a Christian—Various beliefs emerged about vaccination causing a person to become a Christian. Such beliefs were complex and varied among respondents. Participants mentioned that a mark was sometimes left at the injection site, which they often attributed to poorly trained vaccinators. This mark was perceived to be equivalent to a tattoo (forbidden in Islam), and was thought to prevent a Rohingya from going to heaven.

> "If a mark appears, once you die with that mark you cannot go to heaven. You will be treated as someone who is Christian." – Mother of vaccine eligible child

Another dimension to the fear of becoming Christian was the perception that "white" humanitarian workers were "*all Christians looking to convert Rohingyas from Islam to Christianity*." One person said that "*first they [humanitarian workers] give you food, second is vaccination, then third is converting you to a Christian*." Participants cited rumors of Rohingyas living in the camps who had been converted to Christianity. A third dimension to this belief was based on suspicions that vaccines contain mysterious substances that may be intended to convert Rohingyas to Christianity. As one respondent said, "*We know what's in the food they give us, but we don't know what's in the vaccine*."

3.4.2. Safety concern about receiving multiple vaccines—Participants did not understand the need for children to get multiple vaccines on the same day and they viewed it as a safety concern. In Myanmar, participants said that they were only given one vaccine at a time. Mothers and fathers expressed that receiving multiple vaccines during the same visit was a cause of pain and fever and that it was difficult for children to withstand the pain. Such concerns were said to wane once the reported side effect was alleviated. Although not common, a few participants further expressed that multiple injections might be a ploy to kill off the Rohingya population. According to respondents, vaccinators did not discuss the possibility of adverse events following immunization.

3.4.3. Other vaccine safety concerns—Participants said they became worried when their children experienced vaccination side effects, such as fever, pain, swelling, and rash, and sometimes initially feared that side effects would result in death. However, they said

that they gradually gained more confidence in vaccines once observed that vaccination side effects did not cause death. No long term or serious side effects were reported.

3.4.4. Lack of sensitivity to cultural gender norms in the vaccination site procedures—During vaccination campaigns, fixed sites were set up in the camps and a yellow flag was raised above each location to indicate the site. Respondents were concerned that these vaccination sites were usually in the open with no privacy considerations for women and girls, and most vaccinators were male. Adolescent girls were reportedly not allowed to go to public vaccination sites due to the Islamic principle of *purdah*, stipulating that once girls reach puberty they should fully cover their bodies and avoid being seen by men outside of their family. For similar reasons, respondents inferred that some mothers might have been discouraged from taking their children for vaccination due to cultural norms that discourage interactions with men outside of a woman's family. Fathers and religious leaders especially recommended creating more private vaccination spaces and hiring female vaccinators. Women participants expressed that they would prefer household visits by health workers in the privacy of their homes.

> "They should separate vaccination sites for women and girls; women should vaccinate the women; women should not go in front of a man who's not part of their family." – Imam

3.5. Community perceptions of needs and priorities

Recurring themes regarding community priorities and needs were health/wellbeing, housing, and access to safe drinking water. Leading health problems reported by respondents included fever, watery diarrhea, skin problems (rashes, itching, lesions), and respiratory problems (including difficulty breathing). Measles and diphtheria were only mentioned as health problems among young children and adolescents. Respondents sometimes attributed health problems to unfavorable environmental conditions such as uncleanliness, dirt, poor sanitation and hygiene, and smoke originating from indoor cooking. Watery diarrhea was often associated with limited access to clean water. Participants suspected that the cooking oil supplied by humanitarian organizations was making people sick.

Housing and shelter was viewed as a top priority due to the lack of bedding and mats on which to sleep. Many respondents linked skin problems to sleeping on the floor. Cold climate was also cited as a contributing factor to health problems. Respondents expressed that the climate in Myanmar was warmer than in Bangladesh. Consumption of leftover food that may have gone bad was frequently mentioned as a major problem in the camps. Participants mentioned that their families would sometimes eat leftovers for up to three days. Other needs reported by the interviewees included cooking gas, education (especially Arabic schooling in *madrassas*), livelihood opportunities, and street lights to improve security at night. The lack of a private place to shower also emerged as a recurring theme – especially among women.

4. Discussion

Although our rapid behavioral assessment among displaced Rohingyas in Bangladesh in January 2018 revealed that respondents perceived vaccination as important, we identified several important barriers to uptake of vaccination services in this population that were related to both service delivery and demand. Most of these barriers can be categorized using a matrix of vaccine hesitancy determinants developed by WHO's Strategic Advisory Group of Experts on Immunization: contextual influences, individual and group influences, and vaccine- and vaccination-specific issues [16]. Contextual influences that may have contributed to vaccine hesitancy among Rohingyas included initial resistance by religious leaders to accept any vaccines, beliefs that vaccination can lead to becoming a Christian, and gender norms discouraging women and adolescent girls from attending vaccination campaigns. Individual and group influences included negative experiences during previous vaccination campaigns, knowledge gaps about vaccination benefits, and normative beliefs about the intentions of health and humanitarian workers. Suspicions that some health and humanitarian workers aimed to convert Rohingyas from Islam to Christianity negatively influenced vaccine confidence. Vaccine- and vaccination-specific issues included fear of not knowing the substances contained in any of the vaccines, receiving multiple vaccines on the same day (also felt to be linked to more adverse events), and delivery of vaccines in public spaces that lacked privacy and religious consideration for women and adolescent girls. Prior studies have described vaccine hesitancy across diverse settings and populations [17–29]. While interventions addressing vaccine hesitancy [30–43] usually require careful design to fit the local context, there is increasing evidence suggesting that interventions must address barriers at the individual, interpersonal, community, and policy levels in order to be effective [11–15].

Findings from the rapid assessment were used to revise subsequent vaccination campaign messages and improve demand promotion strategies. We suggested that engaging more diverse groups of Rohingya community leaders ahead of subsequent vaccination campaigns may help strengthen confidence in vaccines and address cultural and religious barriers. We recommended shifting away from one-time social mobilization activities towards establishing ongoing community engagement platforms comprising influential leaders. Moreover, we urged that faith-based messaging be considered in promoting vaccine demand among Rohingyas whose worldview may be largely shaped by their Islamic faith. This strategy should be designed and implemented by working closely with religious leaders to identify appropriate passages from the Qu'ran and Hadith to support vaccination messages so as to ensure that the messages resonate with Rohingyas during future vaccination campaigns. Friday prayer could also be leveraged to widely disseminate messages in mosques. New strategies should be explored to increase women's involvement in vaccination activities by engaging Model Mothers and female *hafiz*.

Regarding vaccination delivery practices at the vaccination sites, we proposed several strategies to improve the Rohingya population's accessing services and accepting vaccination. At vaccination sites, private areas should be provided for women and adolescent girls in alignment with Rohingya tradition. Vaccinator practices and attitudes need to be explored in order to design strategies to improve caregiver-vaccinator interactions. At

the time of our assessment, communication in the camps between service providers and Rohingyas was done in the local Chittagonian dialect. Having vaccinators who are able to speak Rohingya language would likely yield more effective interpersonal communication, which may strengthen trust between the vaccinators and Rohingyas in the camps.

Findings from our assessment were promptly shared with the Communicating with Communities coordination platform and partner organizations supporting the response. We learned from partners on-the-ground that our findings informed the microplanning process for subsequent vaccination campaigns including more targeted approaches for engaging community leaders and following-up with caregivers of children needing to be vaccinated who may have been missed during previous campaigns.

Our assessment is subject to several limitations. Consistent with qualitative investigations, the sample was not intended to be representative of the Rohingya population in Bangladesh. We aimed to qualitatively describe and understand the range views, experiences, and social contexts expressed by participants, and use such data to interpret the diversity of perspectives captured. Although we provided a structured format for taking detailed notes, we were unable to audio-record and transcribe all the discussions and interviews because of the urgency of the outbreak. Although facilitators were trained to encourage participants to speak candidly about their experiences, some participants' responses could have been biased by social desirability to repeat information they received during social mobilization. Finally, interpretations may have been affected by the completeness of notes and quality of translation from the language of discussion (Rohingya language) to the language of notes (Bangla) and ultimately the language of analysis (English). We ensured that communication consultants fluent or conversant in all three languages were involved in every stage of the assessment. Finally, we cannot discern how potential power imbalance between interviewers and participants may have influenced the responses we obtained.

5. Conclusions

Most respondents perceived vaccination as an important prevention strategy against childhood diseases. However, they reported vaccination barriers, which were predominantly influenced by religious beliefs, safety concerns, gaps in knowledge, past vaccination experiences, risk perceptions, and gender norms. An overarching strategy to strengthen confidence in vaccination and address sociocultural barriers should involve engaging influential Rohingya leaders in the early stages of planned community vaccination activities to ensure ownership and maximum participation. A mix of communication channels should be used to ensure optimal community engagement. Additional training of vaccinators to improve interpersonal interactions with children and communication with caregivers should be explored. More broadly, vaccination delivery in humanitarian response settings should consider and address sociocultural issues to ensure effectiveness of vaccination campaigns in alignment with the Sphere Minimum Standards in Humanitarian Response [44].

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Abbreviations:

WHO	World Health Organization
AEFI	adverse event following immunization
NGO	non-governmental organization

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Table 1

Community characteristics and distribution of focus group discussions and key informant interviews, Cox's Bazar, Bangladesh, January 2018.

Community	Rohingya population[a]	Number of focus group discussions	Number of key informant interviews
Balukhali	35,599	3	5
Hakimpara	55,158	3	5
Kutupalong	53,648	3	5
Total	144,405	9	15

[a]Population estimates based on UNHCR household-counting data as of January 27, 2018; available from: http://data2.unhcr.org/en/situations/myanmar_refugees.