International Journal of Infectious Diseases 68 (2018) 39–43

Contents lists available at ScienceDirect

International Journal of Infectious Diseases

journal homepage: www.elsevier.com/locate/ijid

Perspective

Medical and health risks associated with communicable diseases of Rohingya refugees in Bangladesh 2017

Emily Y.Y. Chan[a,b,c,*], Cheuk Pong Chiu[a], Gloria K.W. Chan[a]

[a] Collaborating Centre for Oxford University and CUHK for Disaster and Medical Humanitarian Response (CCOUC), Faculty of Medicine, The Chinese University of Hong Kong, Shatin, Hong Kong SAR, China
[b] Nuffield Department of Medicine, University of Oxford, Oxford, UK
[c] FXB Center for Health and Human Rights, Harvard School of Public Health, Harvard University, Boston, MA, USA

ARTICLE INFO

Article history:
Received 5 December 2017
Accepted 3 January 2018
Corresponding Editor: Eskild Petersen, Aarhus, Denmark.

Keywords:
Rohingya
Refugee
Displaced camp
Bangladesh
Health emergency and disaster risk management (H-EDRM)

ABSTRACT

Complex emergencies remain major threats to human well-being in the 21st century. More than 300 000 Rohingya people from Myanmar, one of the most forgotten minorities globally, have fled to neighboring countries over the past decades. In the recent crisis, the sudden influx of Rohingya people over a 3-month period almost tripled the accumulated displaced population in Bangladesh. Using the Rohingya people in Bangladesh as a case context, this perspective article synthesizes evidence in the published literature regarding the possible key health risks associated with the five main health and survival supporting domains, namely water and sanitation, food and nutrition, shelter and non-food items, access to health services, and information, for the displaced living in camp settlements in Asia.

Introduction

Complex emergencies remain a major threat to human well-being in the 21st century. More than 300 000 Rohingya people from Myanmar, one of the most forgotten minorities globally (International Organization for Migration, 2017a), have fled to neighboring countries, mainly Bangladesh, over the past decades (United Nations High Commissioner for Refugees, 2017; International Committee of the Red Cross, 2017; Beyrer & Kamarulzaman, 2017; White, 2017). Using the Rohingya people in Bangladesh as a case context, this perspective article synthesizes evidence in the published literature regarding the possible key health risks associated with the five main health and survival supporting domains, namely water and sanitation, food and nutrition, shelter and non-food items, access to health services, and information, for the displaced living in refugee camp settlements in Asia.

The case: Rohingya people in Bangladesh 2017

The Rohingya people have long been marginalized (Mahmood et al., 2017). Maungdaw in Rakhine State of Myanmar has been the epicenter of violence, and in August 2017, due to an escalation of the violence, an estimated 624 000 people fled from Rakhine State to Bangladesh (International Organization for Migration, 2017b). Some of these asylum seekers crossed the border by land, while others crossed the Naf River, a natural border between the two countries, and landed at Shah Porir Dwip, the southern tip of Bangladesh. Poorly equipped, overcrowded boats often capsized, and the fleeing population mostly arrived in Bangladesh at night or in the early morning after sailing the 3–4-km perilous journey across the Naf River at high tide (International Organization for Migration, 2017c). Those asylum seekers who managed to reach the shore were met by the Bangladeshi army, who coordinated their settlement and the provision of small quantities of food, water, and non-food items (such as buckets, water containers, shelter material, and sometimes even cash). Some were offered medical consultations and drug prescriptions, which were provided by health teams at the military and local hospitals.

Most of these refugees were relocated to Cox's Bazar in southeastern Bangladesh. Two registered refugee camps (United Nations High Commissioner for Refugees (UNHCR): Kutupalong and Nayapara) and two makeshift settlements existed at Cox's Bazar before the refugee surge in August 2017. The influx of refugees after August 25, 2017 stretched the capacity of the existing camps and makeshift settlements, and additional spontaneous settlements were established in Hakimpara, Jamtoli, and Unchiprang (International Organization for Migration, 2017b). The survival of these

* Corresponding author at: CCOUC, Faculty of Medicine, The Chinese University of Hong Kong, Rm. 308, JC School of Public Health and Primary Care, Prince of Wales Hospital, Shatin, Hong Kong SAR, China.
E-mail address: emily.chan@cuhk.edu.hk (E.Y.Y. Chan).

https://doi.org/10.1016/j.ijid.2018.01.001

people depends on the already overstretched aid agencies and their resources (Milton et al., 2017).

Medical and health risks associated with the context

In emergency and crisis settings, water and sanitation, food and nutrition, shelter and non-food items, access to health services, and information are the five crucial domains securing the health and survival of the affected population (Chan, 2017).

Water and sanitation

Although clean drinking water points are available in the makeshift settlements (e.g., United Nations Children's Fund), the international water accessibility standard of "water availability within 500 meters from households" (The Sphere Project, 2011) has often not been achievable. Refugees have had to drill holes for underground water and some have collected water directly from the river; this water is of questionable quality for basic hygiene (White, 2017) (Figure 1). Water safety has been compromised, as people have bathed, washed, and practiced open defecation in the drinking water sources (Physicians for Human Rights, 2010) (Figure 2). Recent water testing in the settlements showed that 92% of the water was contaminated with *Escherichia coli* and that 48% was highly contaminated (>100 CFU/100 ml) (World Health Organization, 2017a). In 2015, acute watery diarrhea (AWD) was found to account for 7–9% of morbidity in the refugee camps (Milton et al., 2017), and the prevalence of AWD was reported to be around 22% of consultations. An overall upward trend of reported cases was observed during the first 3 months of the crisis.

Water-borne disease outbreaks such as cholera, bloody diarrhea, typhoid, and hepatitis E have been a major concern in the camps. As cholera is considered the greatest health risk (White, 2017), the United Nations Children's Fund (UNICEF)/World Health Organization (WHO) launched the world's second largest oral cholera vaccination campaign in October 2017, and 900 000 doses were prepared for a vaccination campaign in Ukhiya and Teknaf, two sub-districts of Cox's Bazar in Bangladesh. As the first round of the campaign, 650 000 doses were targeted at those aged 1 year or older. Children between 1 and 5 years of age could opt to receive an additional dose during the second round of the campaign for enhanced protection (United Nations Children's Fund, 2017a,b). However, although a single dose of oral cholera vaccine has been proven to be efficacious in children older than 5 years and in adults (Qadri et al., 2016), the gaps in refugee registration, fluidity of the refugee population, and problems in vaccination record management have continued to affect the effectiveness of this campaign (Centers for Disease Control and Prevention, 2017a).

Highly contagious fecal oral diseases such as hepatitis A and E infections are also common. In refugee camps where settlers are predominantly young and there are pregnant women, hepatitis E infection is a significant concern. Although the case fatality rate for hepatitis E in the general population is about 1% (Emerson and Purcell, 2003), the death rate from hepatitis E infection in pregnant women can increase to 20–25% if the infection occurs in the third trimester (World Health Organization, 2017b). Hepatitis E infection outbreaks have occurred in the region; for example, Nepal reported 7000 cases in an outbreak occurring in 2014 (Shrestha et al., 2015). In the displaced camp setting, hepatitis E infection has been reported in Ethiopia (2014/2015) and South Sudan (2012/2013) (Centers for Disease Control and Prevention, 2015; Centers for Disease Control and Prevention, 2016). Although hepatitis E infection has not yet been reported in the Rohingya camps, an increasing trend in reported cases of acute jaundice syndrome (AJS) has appeared in certain specific settlements (World Health Organization, 2017a).

Food security and nutrition

Food security and chronic nutrition stress will put the population at high risk of communicable disease. In Maungdaw, Myanmar, global acute malnutrition (GAM) was reported to be 24.9% and severe acute malnutrition (SAM) to be 4.7% in 2013 (Rakhine Commission of Inquiry, 2013). In the two registered UNHCR camps, GAM was reported to be 13% and stunting to be 52–57% in children aged 6–59 months in 2015 (Milton et al., 2017). Furthermore, a report from November 2017 stated that an estimated 240 000 children are in need of nutritional support (International Organization for Migration, 2017d). Children with SAM complications require hospitalization, but the current medical and health facilities may have limited capacity to manage

Figure 1. A refugee making a well for underground water.

Figure 2. A group of children playing and bathing in a river that is heavily contaminated. People were also collecting water directly from the river for daily use.

SAM complications. In addition, untreated parasitic intestinal infections might worsen the nutritional status, as severe and prolonged diarrhea may further induce malnutrition and contribute to the vicious cycle of poor nutritional outcomes across all age groups. Data from the Inter Sector Coordination Group (ISCG) have shown that the rate of SAM in the refugees could be as high as 7.5% (International Organization for Migration, 2017b).

The quantity and quality of food are not guaranteed, even with the daily distribution of food. A 2013 report on nutrient deficiencies in the Rohingya people in Rakhine State, showed that 30% of children under 5 years of age were in need of micronutrient supplementation (Office for the Coordination of Humanitarian Affairs, 2013). In 2015, anemia was found to be prevalent in children (43–49%) and women of reproductive age (13%) (Milton et al., 2017). In addition, although no specific report has highlighted food poisoning and safety issues in camps, diarrhea patterns associated with food-borne/fecal–oral diseases should be closely monitored.

Environment, shelter, and non-food items

Overcrowding, indoor cooking practices, and suboptimal shelters constructed with air-impermeable plastic sheets all contribute to fire and injury risks, poor indoor air quality, and the proliferation of infectious diseases such as acute respiratory infections, measles, and tuberculosis within the camps. Acute respiratory infection has remained the primary cause of death for the camp population living in Cox's Bazar (28%) and for children under 5 years of age (38%) (World Health Organization, 2017a). Chronic communicable diseases such as tuberculosis should be of concern, as Myanmar, from where the recent refugees have come, was ranked as one of the top 30 countries for tuberculosis in 2016 (World Health Organization, 2017c). A lack of resources, technical capacity gaps in implementation (e.g., contact tracing), and non-completion of the 6–9 months directly observed therapy (DOTS) in this mobile population remain key dilemmas when offering TB management for the refugee population in suboptimal camps or unorganized residential settings.

Chittagong and Cox's Bazar in Bangladesh, where most of the refugee settlements are currently located, are prone to natural disasters. The makeshift nature of the settlements, compounded by poor water and sanitation infrastructure, has rendered the camp settlers extremely vulnerable to the impacts of the monsoon and flooding. Proactive disaster preparedness and mitigation measures to reduce the population and environmental vulnerability are urgently needed before the annual rainy and monsoon season: in this area, over 80% of the annual rainfall falls during April to October (Bangladesh Water Development Board, 2014).

In addition, even before the rainy and flooding seasons, poor water drainage, improper management of non-food items (such as buckets), and the undulating surface of the plastic sheets of shelters and bamboo poles may encourage the accumulation of stagnant water, which may provide an ideal breeding site for disease vectors such as flies and mosquitoes. Reports have already indicated fever of unknown origin (FUO) to be the most commonly reported reason for consultations in various clinics (World Health Organization, 2017a). Given that the settlements are in areas prone to malaria and Japanese encephalitis (Centers for Disease Control and Prevention, 2017b), a protracted stay in these camp locations will expose the population to the risk of vector-borne disease if environmental measures and awareness are not highlighted. The distribution of mosquito nets and other measures for mosquito control (community education regarding the regular clearing of stagnant water) should also be attempted before the next rainy season.

Moreover, refugees generally lack essential non-food items to protect and maintain their health and dignity (e.g., female hygiene packs, etc.). Most refugees in the Bangladesh camps do not possess any footwear. Not only does being barefoot predispose the person to foot injury and trauma in this precarious settlement environment, but the risks of contracting contagious tinea and parasitic intestinal infections such as hookworm and whipworm (Chan, 2017) are high. Such infections may worsen any pre-existing malnutrition, increase the anemia risk, and complicate wound healing.

Health care

Continuous efforts are required to maintain childhood immunization for vaccine-preventable diseases (Rakhine Commission of Inquiry, 2013). Recent field reports have indicated measles and suspected diphtheria cases in the camp area (World Health Organization, 2017a). In particular, one death from measles and 412 suspected measles cases were reported in November 2017, with 82% of cases occurring in children under 5 years of age. With the support of UNICEF and the WHO, the Ministry of Health and Family Welfare of Bangladesh launched a measles and rubella vaccination campaign in September/October 2017 (United Nations Children's Fund, 2017a,b). Nearly 55% of children under 15 years of age ($n = 186\,929$) have been vaccinated (International Organization for Migration, 2017b), but to achieve the >95% coverage required for herd immunity, the vaccination campaign must be continued and expanded. The constant population movement and lack of official registration increase the complexity of the field vaccination operations. Reports on the Rohingya people in Malaysia have shown that despite the host government's intention to vaccinate the refugees, the vaccination rate in children under 5 years of age in the refugee community is lower than that in the host community (Mahmood et al., 2017).

Gynecological and obstetric care needs

A report published in 2017 stated that one in seven Rohingya women in Northern Rakhine State had undergone at least one unskilled abortion under unhygienic conditions (Mahmood et al., 2017). Thus, the female asylum seekers may present with various gynecological and obstetrics needs. Although data on sexual and gender-based violence are not available, reports from other displaced camp contexts (Krause, 2015; Iyakaremye & Mukagatare, 2016) have highlighted that gynecological and obstetric services and the treatment and management of sexually transmitted diseases (STD) and HIV/AIDs are essential to address the needs of populations living in camp settlements.

Information needs

The lack of proper documentation of the Rohingya people in their country of origin has rendered the arrangement of re-settlement challenging (Mahmood et al., 2017). To reduce health risks and other medical emergency and disaster vulnerabilities, the medical response community could provide immunization cards for children and a basic medical history summary to those who have sought treatment during their stay in the temporary settlements. Not only would these documents facilitate future medical consultations, but they might also serve as valuable proof of identity.

Conclusions

The situation of the Rohingya people in Bangladesh once again reminds the medical community of the importance of health emergency disaster risk management (H-EDRM) (Chan & Murray, 2017) in camp settings. Perpetual violence and context instability have left the Rohingya population in a dire situation, and global collaboration is urgently needed to reinforce and facilitate negotiations between Myanmar and Bangladesh in order to improve the fate and well-being of the Rohingya refugees. Ultimately, it is not only about respecting life and preserving dignity, but also to ensure the survival of this forgotten population.

Conflict of interest

None.

Funding

None.

Authorship

EC was responsible for the conception and design of the study. CC was responsible for the acquisition of data and interpretation of the data. EC, CC and GC drafted the article. EC, CC, and GC revised the paper critically for important intellectual content. EC approved the final version for submission.

References

Bangladesh Water Development Board. Annual Flood Report 2014; 2014 http://www.ffwc.gov.bd/index.php/reports/annual-flood-reports. [Accessed 27 November 2017].

Beyrer C, Kamarulzaman A. Ethnic cleansing in Myanmar: the Rohingya crisis and human rights. Lancet 2017;390:1570–3.

Chan EYY. Public health humanitarian response to natural disasters. Routledge; 2017.

Chan EYY, Murray V. What are the health research needs for the Sendai Framework?. Lancet 2017;390(October):e35–6.

Centers for Disease Control and Prevention. Cholera — Vibrio cholerae infection: Vaccines; 2017a. https://www.cdc.gov/cholera/vaccines.html. [Accessed 27 November 2017].

Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Report: Hepatitis E outbreak among refugees from South Sudan-Gambella, Ethiopia, April 2014-January 2015; 2015. https://www.cdc.gov/mmwr/pdf/wk/mm6419.pdf. [Accessed 27 November 2017].

Centers for Disease Control and Prevention. Morbidity and Mortality Weekly Report: Investigation of hepatitis E outbreak among refugees-Upper Nile, South Sudan, 2012-2013; 2016. https://www.cdc.gov/mmwr/pdf/wk/mm6229.pdf. [Accessed 28 November 2017].

Centers for Disease Control and Prevention. Health Information for Travelers to Bangladesh: Clinical View; 2017b. https://wwwnc.cdc.gov/travel/destinations/clinician/none/bangladesh. [Accessed 27 November 2017].

Emerson S, Purcell R. Hepatitis E. Rev Med Virol 2003;13:145–54.

International Committee of the Red Cross. Rakhine, Myanmar crisis: Lives shattered, needs urgent; 2017. https://www.icrc.org/en/document/myanmar-rakhine-crisis-lives-shattered-needs-urgent. [Accessed 27 November 2017].
International Organization for Migration. Humanitarian Response Plan September 2017/February 2018; 2017a. https://reliefweb.int/sites/reliefweb.int/files/resources/2017_HRP_Bangladesh_041017_2.pdf. [Accessed 28 November 2017].
International Organization for Migration. Situation Report: Rohingya Refugee, Crisis Cox's Bazar; 2017b. https://reliefweb.int/sites/reliefweb.int/files/resources/171126_weekly_iscg_sitrep_final.pdf. [Accessed 28 November 2017].
International Organization for Migration. Rohingya children drown fleeing Myanmar Violence: IOM; 2017c https://www.iom.int/news/rohingya-children-drown-fleeing-myanmar-violence-iom. [Accessed 29 November 2017].
International Organization for Migration. Situation Report: Rohingya Refugee, Crisis Cox's Bazar; 2017d. https://www.humanitarianresponse.info/system/files/documents/files/171119_weekly_iscg_sitrep_final.pdf. [Accessed 28 November 2017].
Iyakaremye I, Mukagatare C. Forced migration and sexual abuse: experience of Congolese adolescent girls in Kigeme refugee camp, Rwanda. Health Psychol Rep 2016;4(3):261–71.
Krause U. A continuum of violence? Linking sexual and gender-based violence conflict, flight, and encampment. Refug Surv Q 2015;34:1–9.
Mahmood SS, Wroe E, Fuller A, Leaning J. The Rohingya people of Myanmar: health, human rights, and identity. Lancet 2017;389(May):1841–50.
Milton AH, Rahman M, Hussain S, Jindal C, Choudhury S, Akter S, et al. Trapped in statelessness: Rohingya refugees in Bangladesh. Int J Environ Res Publ Health 2017;14(942):1–8.
Office for the Coordination of Humanitarian Affairs. Myanmar: humanitarian bulletin. Switzerland: United Nations Office for Coordination of Humanitarian Affairs; 2013.
Physicians for Human Rights. Stateless and Starving: Persecuted Rohingya Flee Burma and Starve in Bangledesh; 2010. http://burmacampaign.org.uk/images/uploads/Stateless-and-Starving.pdf. [Accessed 21 November 2017].
Qadri F, Wierzba TF, Ali M, Chowdhury F, Khan AI, Saha A, et al. Efficacy of a single-dose, inactivated oral cholera vaccine in Bangladesh. N Engl J Med 2016;374 (May (18)):1723–32.
Rakhine Commission of Inquiry. Final Report of Inquiry Commission on Sectarian Violence in Rakhine State; 2013. http://www.burmalibrary.org/docs15/Rakhine_Commission_Report-en-red.pdf. [Accessed 21 November 2017].
Shrestha A, Lama TK, Karki S, Sigdel DR, Rai Utsav, Rauniyar SK, et al. Hepatitis E epidemic, Biratnagar, Nepal, 2014. Emerg Infect Dis 2015;21(4):711–3.
The Sphere Project. Humanitarian charter and minimum standards in humanitarian response. Practical Action Publishing; 2011.
United Nations Children's Fund. World's second largest oral cholera vaccination campaign kicks off at Rohingya camps in Bangladesh; 2017a. http://www.unicef.org.hk/en/worlds-second-largest-oral-cholera-vaccination-campaign-kicks-off-at-rohingya-camps-in-bangladesh/. [Accessed 21 November 2017].
United Nations Children's Fund. Bangladesh steps up vaccination for new Rohingya arrivals as measles cases rise; 2017b. http://www.unicef.org.hk/en/bangladesh-steps-up-vaccination-for-new-rohingya-arrivals-as-measles-cases-rise. [Accessed 21 November 2017].
United Nations High Commissioner for Refugees. Joint Statement on the Rohingya Refugee Crisis; 2017. http://www.unhcr.org/news/press/2017/10/59e4c17e5/joint-statement-rohingya-refugee-crisis.html. [Accessed 29 November 2017].
White K. Rohingya in Bangladesh: an unfolding public health emergency. Lancet 2017;390(Oct):1947.
World Health Organization. Mortality and Morbidity Weekly Bulletin (MMWB): Cox's Bazar, Bangladesh, Volume No. 6: 19 November 2017; 2017a http://www.searo.who.int/bangladesh/mmwbvol6.pdf. [Accessed 29 November 2017].
World Health Organization. Fact sheet: Hepatitis E; 2017b. Available from: http://www.who.int/mediacentre/factsheets/fs280/en/. [Accessed 28 November 2017].
World Health Organization. Global Tuberculosis Report 2017; 2017c. http://apps.who.int/iris/bitstream/10665/259366/1/9789241565516-eng.pdf?ua=1. [Accessed 28 November 2017].