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PERSPECTIVES FROM THE FIELD

Field epidemiology in action: an Australian perspective of epidemic response to the Rohingya health emergencies in Cox's Bazar, Bangladesh

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Approximately one million Rohingya persons who fled waves of violence in Myanmar at different times, the latest being 25 August 2017, now live in two coastal districts in Bangladesh; Cox's Bazar and Bandarban (1). In makeshift shelters made from bamboo and tarpaulin in camps sprawling through rough terrains, the Rohingya live in conditions of overcrowding, poor sanitation, high malnutrition and, on arrival, extremely low vaccination coverage (1-3). The United Nations described the situation as the fastest growing refugee crisis and a major humanitarian emergency (4).

In November 2017, an outbreak of diphtheria that was first identified in Kutupalong mega campsite quickly spread and became a major public health threat – an emergency within an emergency. The World Health Organization's (WHO) Global Outbreak Alert and Response Network (GOARN) responded to the emergency with the deployment of a team of trained epidemiologists, vaccine specialists and technical experts (5). This report describes the experience of some of the Australian experts who served in the GOARN mission in Cox's Bazar, Bangladesh in 2018.

This mass displacement event provided an ideal setting for large-scale outbreaks of communicable diseases. The refugee camps in Cox's Bazar endure monsoonal rains as one of the wettest parts of the world, prone to landslides and flooding (Image 1). These conditions contribute to the proliferation of diseases spread via person to person, vector-borne, airborne, waterborne and zoonotic transmission. Complex emergencies such as this also pose the risk of environmental health threats, gender-based violence, decreased mental health and a rise in non-communicable diseases (6).

Image 1. Rohingya refugee camps in Cox's Bazar established on sandy hills prone to landslide and flooding (left), and immediately after the first rain in April 2018 (right). *Photos: Meru Sheel (left), Julia Maguire (right). Reproduced with permission of the photographers.*

Table 1. Epidemic prone syndromes/diseases reported through the Early Warning, Alert and Response System, 1 January 2018 – 11 November 2018

Disease/Syndrome	Total Cases
Acute respiratory infection	481,294
Unexplained fever	361,781
Acute watery diarrhoea	202,384
Other diarrhoea	96,473
Bloody diarrhoea	38,905
Suspected malaria	68,102
Acute jaundice syndrome	2,920
Suspected measles/rubella	1,541

Source: *Weekly Epidemiological Bulletins – Cox's Bazar (11).*

The identification of the first case of diphtheria was rapidly followed by one of the world's largest and protracted diphtheria outbreaks. As of mid-August 2018, the number of diphtheria cases exceeded 8,000, including 44 deaths. This outbreak marked the first major resurgence of diphtheria in the post-universal vaccine era in Bangladesh since the 1980s. By comparison, the world largest known diphtheria epidemic was recorded in the 1990s throughout the former Soviet Republics with over 140,000 cases and 4,000 deaths and the protracted outbreak in Indonesia (2011–2017) with over 3,000 cases and 110 deaths (7, 8). This diphtheria outbreak in Bangladesh was unique in that it occurred among a largely under-vaccinated refugee population living in overcrowded camps, and spilled over to the local host Bangladeshi community, which generally had a high (>90%) immunisation rate (9).

There were also other infectious disease outbreaks and health conditions that occurred concurrently with diphtheria. Table 1 provides a summary of key epidemic-prone diseases monitored using the Early Warning, Alert and Response System (EWARS), a web-based mobile application used for disease notification, outbreak detection and response in emergency situations (10).

The Australian Response MAE (ARM) network deployed three epidemiologists and three Master of Philosophy in Applied Epidemiology (MAE, Australia's FETP - Field Epidemiology Training Program) scholars to the response between January and April 2018 to support activities of the WHO's emergency operations in Cox's Bazar (2, 12). The overall objectives of the GOARN deployees were to provide technical support for capacity building and training for improved prevention and control of outbreaks, while working in collaboration with other health organisations as well as the Bangladesh Ministry of Health and Family Welfare (MoHFW).

The WHO supported MoHFW in conducting activities to contain the diphtheria outbreak and prevent additional outbreaks. These activities included the provision of technical and logistical support for capacity building and training, strengthening disease surveillance, supplying essential medical supplies and laboratory materials, and adapting preparedness and response activities on disaster management to the local context. The GOARN team supported the WHO's mass immunisation campaigns for diphtheria, tetanus, measles, rubella, and cholera, and launched the Extended Program on Immunization through outreach clinics within the camps.

The main contributions of the Australian GOARN team included: 1) supporting the establishment and monitoring of the EWARS for diphtheria and diseases listed in Table 1. GOARN deployees conducted in-field risk assessments and supported health partners in the use of EWARS; 2) coordinating contact tracing within the camps and the host community; 3) coordinating the establishment of local laboratory capacity for diphtheria and selected epidemic-prone diseases; and 4) providing infection prevention and control assessment, training and support with a focus on anticipated potential health needs (13).

Image 2. Field hospital in Rohingya refugee camp; external (left) and internal (right). *Photos: Noore Alam. Reproduced with permission of the photographer.*

Providing large-scale health support in crisis conditions predictably involved challenges due to lack of resources, poor infrastructure and limited capacity for patient follow-up in the refugee camps. Timely identification of patients and their contacts was a challenge due to poorly or unmarked dwellings leaving high likelihood of miscounting. The WHO-GOARN team established a strong network of partner agencies that acted as focal points for treatment, contact tracing and referrals for diphtheria and other outbreaks, and facilitated daily sharing of information between agencies.

The local host community has historically relied on basic health services that are considered substandard compared to urban Bangladesh (14, 15). The host community had limited availability of public health laboratory services prior to this crisis, however this situation has improved with the establishment of the new laboratory in Cox's Bazar by a collaboration between the WHO case management team and the Institute of Epidemiology, Disease Control and Research (IEDCR). There was a rapid expansion and strengthening of primary health services and, as of April 2018, there were more than 200 health facilities across the Rohingya camps (Image 2). There are sensitive and complex political aspects of humanitarian assistance that must be navigated by all organisations involved.

As expected, language was an obstacle in effective health service delivery. Chittagonian, spoken in the Chittagong region and by local staff, is the primary dialect of the Cox's Bazar population, while other regions of Bangladesh primarily speak Bengali (Bangla), and the Rohingya speak the Rohingya language. The WHO office in Cox's Bazar operates in English, which promotes a chain of communication from English to Bengali or Chittagonian to Rohingya. The use of translators and local personnel aided communication, especially since Chittagonian is not dissimilar to Rohingya. Language barriers coupled with cultural differences made it difficult to communicate with affected populations and highlighted the role of building capacity by identifying and training bilingual local staff.

Our participation in this emergency response demonstrated a strong partnership between several players: volunteers, front-line healthcare workers, epidemiologists, laboratory specialists, immunisation experts, operations and logistics managers and high-level policy makers. The experience for the Australian FETP trainees was a first glimpse of field epidemiology in a complex humanitarian emergency and acutely demonstrated the barriers and challenges for success in communicable disease prevention in a crisis. The impact and efficiency of the response in Cox's Bazar will improve over time with increased training of local staff, collaborative efforts of health organisations and the establishment of a greater number of health facilities, including vital services such as laboratories. While some may suggest that emergency response is like "blowing out the fire", a strong response based on underlying principles of capacity development and preparedness can lead to long term gains in outbreak response capacity. This is particularly critical in a crisis that is expected to continue for many years.

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Competing interests

The authors have no competing interests to declare.

References

1. World Health Organization. 2018. Rohingya crisis in Cox's Bazar district, Bangladesh: Health Sector Bulletin. Bulletin number 6, 24 September 2018. Available at: http://www.searo.who.int/bangladesh/healthsectorcxbbanbulletinn6.pdf. Accessed: 19 Oct 2018.
2. United Nations International Children's Fund (UNICEF). 2017. Malnutrition rates among Rohingya refugee children in Bangladesh appear to be at least double earlier estimates. Available at: https://www.unicef.org/press-releases/malnutrition-rates-among-rohingya-refugee-children-bangladesh-appear-be-least-double Accessed: 18 Oct 2018.
3. Chan EYY, Chiu CP, Chan GKW. Medical and health risks associated with communicable diseases of Rohingya refugees in Bangladesh 2017. Int J Infect Dis 2018;68:39-43. DOI: https://doi.org/10.1016/j.ijid.2018.01.001
4. United Nations High Commissioner for Refugees. 2017. Joint statement on the Rohingya refugee crisis. Available at: http://www.unhcr.org/en-au/news/press/2017/10/59e4c17e5/joint-statement-rohingya-refugee-crisis.html Accessed: 19 Oct 2018.
5. World Health Organization. 2018. Strengthening health security by implementing the International Health Regulations (2005). Global Outbreak Alert and Response Network (GOARN). Available at: http://www.who.int/ihr/alert_and_response/outbreak-network/en/ Accessed: 18 Oct 2018.
6. Toole MJ, Waldman RJ. The public health aspects of complex emergencies and refugee situations. Annual Review of Public Health. 1997. 18:1, 283–312. DOI: https://doi.org/10.1146/annurev.publhealth.18.1.283
7. Charles RV, Melinda W. Diphtheria in the Former Soviet Union: Reemergence of a Pandemic Disease. Emerging Infectious Disease journal 1998; 4(4): 539. DOI: https://doi.org/10.3201/eid0404.980404

8. Husada D, Puspitasari D, Kartina L, Setiono P, Moedjito I, Kartika B. Six-Year Surveillance of Diphtheria Outbreak in Indonesia. Open Forum Infectious Diseases 2017; 4(Suppl 1): S244-S.
9. World Health Organization and United Nations Children's Emergency Fund. Bangladesh: WHO and UNICEF estimates of national immunization coverage: 2017 revision. 2017. https://www.who.int/immunization/monitoring_surveillance/data/bgd.pdf. Accessed 19 Dec 2018.
10. Karo B, Haskew C, Khan AS, Polonsky JA, Mazhar MKA, Buddha N. World Health Organization Early Warning, Alert and Response System in the Rohingya crisis, Bangladesh, 2017–2018. Emerg Infect Dis. 2018 Nov; 24(11):2074–2076. DOI: https://doi.org/10.3201/eid2411.181237
11. Weekly Epidemiological Bulletins – Cox's Bazar W45 2018. Date of issue: 14 November 2018. Available from: https://www.humanitarianresponse.info/en/operations/bangladesh/document/mortality-and-morbidity-weekly-bulletin-mmwb-coxs-bazar.
12. Hassan S et al. The ARM Network - a model for infectious disease response capacity in the Western Pacific Region. Western Pacific Surveillance and Response Journal, 2014, 5(2). DOI: https://doi.org/10.5365/wpsar.2014.5.2.011
13. Tolosa MX, Shirin T, Yesurajan F, Housen T, Stewart A, Sangal L. Establishing Basic Public Health Laboratory Capacity in the Context of a Large-Scale Acute Refugee Crisis –Challenges and lessons learned. [Abstract] 9th Southeast Asia and Western Pacific Biregional TEPHINET Scientific Conference. Investing in Field Epidemiology Training Programs in the Era of the Sustainable Development Goals. 5-9 November 2018. Vientiane, Lao PDR. p. 143. Available from: http://tephinetbiregional.cvent.com/events/9th-southeast-asia-and-western-pacific-bi-regional-tephinet-scientific-conference/custom-115-068b0019e8704e40a6a8fb2b0da39e70.aspx
14. Khan MMH, Krämer A, Khandoker A, Prüfer-Krämer L, Islam A. Trends in sociodemographic and health-related indicators in Bangladesh, 1993–2007: will inequities persist? Bulletin of the World Health Organization 2011;89:583-593. DOI: https://doi.org/10.2471/BLT.11.087429
15. Khan MMH, Zanuzdana A, Krämer A (2013) Levels, Trends and Disparities in Public-Health-Related Indicators among Reproductive-Age Women in Bangladesh by Urban-Rural and Richest-Poorest Groups, 1993-2011. PLoS ONE 8(9): e75261. DOI: https://doi.org/10.1371/journal.pone.0075261

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