The data in this document are drawn from the Early Warning and Response System (EWARS), daily data received from the Ministry of Health and Family Welfare, and information gathered by WHO from health service providers in Forcibly Displaced Myanmar National (FDMN) settlements and health care facilities in Cox’s Bazar. Although the information is incomplete, it represents a first attempt to give health agencies in the field a reasonably accurate picture of morbidity and mortality in the refugee population. We thank all partners who are contributing to the EWARS.

The EWARS itself and the reports generated therefrom remain a work in progress. We welcome all comments and feedback to help us improve both the system and our joint understanding of the prevailing epidemiological situation, the ultimate aim being to prevent the spread of diseases and thereby help ensure better health outcomes for the population affected by this crisis.

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1. Population under Surveillance and Reporting Units

During epidemiological week 44 (29 October–4 November 2017), there was a 2% increase in the population\(^1\) under surveillance compared to the previous epidemiological week (807,461 and 806,100 respectively). A total of 280 daily EWARS forms were received on time during epidemiological week 44.

Kutupalong registered camp populations decreased by 27% due to a new headcount and the reallocation of FDMNs to other settlements. Kutupalong makeshift camp population was increased by 1% while the remaining camp populations remained stable.

EWARS reports were received from different departments (admission, emergency, surgery, paediatrics, gynaecology and internal medicine) in Sadar hospital in Cox’s Bazar, and Teknaf and Ukhia Health Complexes (population of 100,400). The population of these settlements fluctuates daily due to movements between camps and new arrivals.

For the reasons stated above, it was difficult to estimate the actual catchment population covered by the medical mobile teams working in camps and settlement areas. During the week of 29 October–4 November 2017, the number of daily reports per camp/settlement in Cox’s Bazar decreased by 1% compared with the previous week (from 284 to 280 reports). Table 1 below shows the population per camp and the daily number of EWARS reporting forms submitted for each one.

**Table 1: Number of EWARS reports by camp/settlement, Cox’s Bazar, Bangladesh, 29 October –4 November 2017.**

<table>
<thead>
<tr>
<th>Camp/Settlement</th>
<th>W43 Population</th>
<th>W44 Population</th>
<th>Week 44/Reports/Days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>29/10</td>
<td>30/10</td>
<td>31/10</td>
</tr>
<tr>
<td>Makeshift Settlements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kutupalong Expansion(^2)</td>
<td>426,600</td>
<td>431,000</td>
<td>11</td>
</tr>
<tr>
<td>Kutupalong Registered camp</td>
<td>32,600</td>
<td>25,743</td>
<td>4</td>
</tr>
<tr>
<td>Leda Makeshift</td>
<td>22,800</td>
<td>23,247</td>
<td>2</td>
</tr>
<tr>
<td>Nayapara Registered camp</td>
<td>34,600</td>
<td>34,557</td>
<td>1</td>
</tr>
<tr>
<td>Shamlapur</td>
<td>22,400</td>
<td>24,768</td>
<td>1</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td><strong>539,000</strong></td>
<td><strong>539,315</strong></td>
<td><strong>19</strong></td>
</tr>
<tr>
<td>New Spontaneous Settlements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hakimpara</td>
<td>55,000</td>
<td>54,898</td>
<td>2</td>
</tr>
<tr>
<td>Thangkhali</td>
<td>28,200</td>
<td>28,531</td>
<td>3</td>
</tr>
<tr>
<td>Unchiprang</td>
<td>30,100</td>
<td>30,324</td>
<td>2</td>
</tr>
<tr>
<td>Jamtoli</td>
<td>32,000</td>
<td>32,765</td>
<td>4</td>
</tr>
<tr>
<td>Moynarghona</td>
<td>21,400</td>
<td>21,460</td>
<td>2</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td><strong>166,700</strong></td>
<td><strong>167,978</strong></td>
<td><strong>13</strong></td>
</tr>
<tr>
<td>MoHWF</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cox’s Bazar, Teknaf and Ukhia</td>
<td><strong>100,400</strong></td>
<td><strong>100,348</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>Mobile Teams</strong></td>
<td>NA</td>
<td>NA</td>
<td>1</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td><strong>100,400</strong></td>
<td><strong>100,348</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>806,100</strong></td>
<td><strong>807,641</strong></td>
<td><strong>37</strong></td>
</tr>
</tbody>
</table>

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2. Kutupalong-Balukhali expansion settlement includes the estimated population residing in the existing Kutupalong and Balukhali makeshift settlements, and their surrounding expansion zones.
The total number of consultations reported throughout EWARS decreased by 9% compared to the previous week (68,906 vs 75,544). The weekly trend of reporting units participating in the EWARS and the number of consultations is shown in Figure 1.

![Reporting Units and Number of Consultations](image)

*Figure 1: Number of EWARS reports by camp/settlement, Cox’s Bazar, Bangladesh, 25 August–4 November 2017*

2. **Proportion of Primary Causes of Cases and Deaths**

During the period 25 August–4 November 2017, a total of 245,389 consultations were reported through EWARS. Of these, 53% (129,218/245,389) were events under surveillance. Acute respiratory infections (ARIs) accounted for 29% (37,769), followed by fevers of unexplained origin (28%, 36,085), acute watery diarrhoea (21%, 27,087), skin diseases (9%, 11,518), injuries (3%, 3,418), eye infections (2%, 2,539) and malaria (2%, 2,957). The remaining 6% were due to other causes including bloody diarrhoea and malnutrition.

For the under-5 age group, a total of 50,290 events under surveillance were reported through EWARS, constituting 39% of the events under surveillance. A total of 34% (17,105) of these cases were attributed to ARIs, while (27%, 12,871) were due to fevers of unexplained origin and (23%, 1,1325) were due to acute watery diarrhoea.

For the over-5 age group, a total number of 78,928 events under surveillance were reported through EWARS, constituting 61% of the events under surveillance. A total of 29% (23,214) of these cases were attributed to fevers of unexplained origin, while 26% (20,664) were due to ARIs and 20% (15,762) were due to acute watery diarrhoea. The proportion of primary causes of reported cases for both age groups is shown in figure 2.
During the same period, there were 143 reported deaths. Of this number, 34% (49) were due to ARIs, followed by INJ (11%, 15), NDs (9%, 13), AWD (7%, 10), Cardiovascular Disease (4%, 6), Severe Malnutrition (3%, 5), and UNK (11%, 15). The remaining 21% (30) were due to other causes.

There were 59 reported deaths in the under-5 age group, representing 41% of total deaths. Of this number, 36% (21) were ARI-related, followed by NDs (22%, 13), AWD (10%, 6), SMN (9%, 5), INJ (6%, 4), MEN (3%, 2) and UNK (5%, 3). The remaining 9% (5) were due to other causes.

There were 84 reported deaths in the under-5 age group, representing 59% of total deaths. Of this number, 33% (28) were ARI-related, followed by INJ (13%, 11), Cardiovascular Disease (7%, 6), AWD (5%, 4) and UNK (12%, 10). The remaining 30% (25) were due to other causes. The daily and weekly distribution of reported deaths is shown in figures 3 and 4.
Figure 3: Daily distribution of reported deaths, Cox’s Bazar, Bangladesh, 25 August–4 November 2017.

Figure 4: Weekly distribution of reported deaths, Cox’s Bazar, Bangladesh, 25 August–4 November 2017.
3. Acute Respiratory Infection

Between 25 August and 4 November 2017 (epidemiological weeks 34-44), a total of 37,769 ARI cases were reported. Of this number, 45% (17,105/37,769) were in the under-5 age group. There were 49 ARI related deaths (CFR 0.13%). The weekly distribution of ARI cases is shown in Figure 5.

![Figure 5: Weekly distribution of reported ARI cases by age groups, Cox’s Bazar, Bangladesh, 25 August–4 November 2017.](image1)

Ukhia reported 84% (31,660/37,769) of total ARI cases followed by Teknaf and Cox’s Bazar with 16% (6,018) and 1% (91) respectively. The weekly distribution of ARI cases by upazila is shown in Figure 6.

![Figure 6: Weekly distribution of reported ARI cases by upazila, Cox’s Bazar, Bangladesh, 25 August–4 November 2017.](image2)
The highest ARI Attack Rate (AR) was reported from Moynarghna with **129/1,000** population followed by Jamtoli settlement (**AR 122/1,000**) and Kutupalong Registered camp (**AR 84/1,000**). The ARI attack rate per 1,000 population in selected camps is shown in figure 7.

![Reported ARI Cases in selected FDMNs Settlements](image)

*Figure 7: ARI attack rate per 1,000 population in selected camps, Cox’s Bazar, Bangladesh, 8 October–4 November 2017.*

In the last 4 epidemiological weeks (41-44), the AR of ARI cases decreased in Jamtoli, Moynarghna and Kutupalong Registered camp, but increased in Leda and Nayapara camps. The ARI attack rate per 1,000 population in selected camps is shown in figure 8.

![Attack Rate of Reported ARI Cases in selected FDMNs Settlements](image)

*Figure 8: Weekly ARI attack rate per 1,000 population in selected camps, Cox’s Bazar, Bangladesh, 8 October–4 November 2017.*
4. Acute Watery Diarrhoea

Between 25 August and 4 November 2017 (epidemiological weeks 34-44), a total of 27,087 AWD cases were reported including 10 related deaths (CFR 0.04%). A total of 42% (11,325) were in the under-5 age group. The weekly distribution of AWD cases by age group is shown in figure 9.

Ukhia reported 87% (223,529/27,087) of all AWD cases, followed by Teknaf and Cox’s Bazar with 12% and 1% respectively. The weekly distribution of AWD cases by upazila is shown in Figure 10.
The highest AR for AWD was reported from Moynarghna with 91/1,000 people followed by Thangkhali (AR 64/1,000) and Kutupalong Registered camp (AR 84/1,000). The AWD AR per 1,000 population in selected camps is shown in figure 11.

In the last 4 epidemiological weeks (41-44), the AR of AWD cases decreased in Moynarghna, Thankkhali, Jamtoli, and Unchprang but increased in Kutupalong Registered camp. The AWD AR per 1,000 population in selected camps is shown in figure 12.
4.1 Drinking Water Testing Results

Between 18 September and 1 November 2017, a total of 1,018 water samples were collected by WHO and Department of Public Health Engineering (DPHE) teams from different water sources in refugee settlements. The sample collection is part of the ongoing water quality surveillance programme.

Using membrane filtration testing techniques, 17% (98/580) of the samples were found negative for *E. Coli* as per the Bangladesh Standard and WHO guideline value (0 cfu/100ml). The remaining 83% (482/580) tested positive for faecal contamination (*E. Coli*).

A total of 36% (368) of the positive samples were very highly contaminated (>100 cfu/100ml) and 22% (229) were highly contaminated (>50 and <100 cfu/100ml). Intermediate contamination (<50 cfu/100ml) was found in 27% (279) of the samples. The *E. Coli* water testing results by camp/settlement are shown in Figure 13.

Out of all contaminated samples, 70% (619/876) were collected from water stored at household level, 29% (254) were collected from tube-wells, and the remaining 1% (3) was collected from different sources including streams (Chhora), tankers and water bladders. The highest level of contamination was observed in Unchiprang (100%, 3), followed by Kutupalong (89%, 427).

Based on the results of the assessment of the quality of water in refugee settlements and camps, WHO, in collaboration with the DPHE, has launched a water quality surveillance programme. WHO and DPHE
teams first inspect water sources and household storage containers to obtain an idea of the quality of water at its source as well as information on household hygiene practices. Water samples are then collected for testing. WHO has supported the establishment of a water-quality testing laboratory in the DPHE office in Sadar, and has trained 12 sample collectors on how to (1) inspect water sources and household storage containers and (2) collect water samples for testing. Monitoring and evaluation procedures put in place by WHO and the DPHE include random re-testing of positive samples.

WHO shares the results of its water quality tests with WASH colleagues working in the FDMN camps and settlements in Cox’s Bazar. This allows WASH partners to take appropriate measures to improve sanitary conditions and prevent the further deterioration of drinking water quality.

5. Unexplained Fever

Between 25 August and 4 November 2017 (epidemiological weeks 34-44), a total of 36,085 cases of unexplained fever were reported through EWARS. The number has been increasing since 18 October 2017. Additional investigation and data analysis are required to determine the etiology of the reported cases. However, it remains difficult to diagnose the cause of unexplained fever because there are very few diagnostic facilities in camps and not enough trained staff who can use rapid diagnostic tests. The daily trend of reported cases of unexplained fever is shown in figure 14.

![Reported UNFEV Cases in FDMNs Settlements](image-url)

*Figure 14: Unexplained Fever reported cases, Cox’s Bazar, Bangladesh, 25 August –4 November 2017.*
6. Measles Outbreak

Between 1 September and 4 November 2017, a total of 412 suspected cases of measles including one related death (CFR; 0.24%) were reported from Cox’s Bazar. A total of 85 of these cases were detected during an outbreak investigation conducted by WHO between 2-4 November 2017 in Kutupalong settlement. The mean age of the patients was 3.6 years Standard Deviation [SD 5.2] ranging from 36 days to 30 years (3.7 and 4.1 years for males and females respectively). The age distribution of reported cases is shown in figure 15.

A total of 57% (326) of patients were male. Of the total cases, 82% were in the under-5 age group. The age distribution of reported cases is shown in figure 14. A total of 85% (352) of the cases were from Ukhia, followed by 11% (46) from Teknaf and 3% (11) from the district hospital. The remaining two cases (1%) were from Ramu (2) and Kutiubdia (1). Of the total number of cases, 97% (398/412) were from the FDMNs and the remaining 3% (14) were from the host community. The distribution of cases by vaccination status and age group is shown in figures 16.

Figure 15: Reported measles cases by age group, Cox’s Bazar, Bangladesh, 1 September -4 November 2017.

Figure 16: Distribution of reported measles cases by upazila, Cox’s Bazar, Bangladesh, 1 September-28 October 2017.
Fifty-eight samples were collected for laboratory results. Of these, 64% (37) were positive for measles-specific IgM, 16% (9) were negative for measles-specific IgM, 2% (1) were positive for rubella-specific IgM, and 19% (11) are pending laboratory results. The onset dates of reported cases of measles are shown in figure 17.

![Reported Measles Cases by Vaccination Status](image)

**Figure 17:** Daily distribution of reported measles cases by age group, Cox’s Bazar, Bangladesh, 18 September-21 October 2017.

### 6.1 Enhancing routine vaccination in response to the measles outbreak

Establishing the Ministry of Health and Family Welfare’s (MOHFW) routine Expanded Programme on Immunization (EPI) in camps and settlements and setting up vaccination posts at entry points into Bangladesh are both key to combatting the transmission of measles. The MOHFW is adopting a three-pronged approach to improve overall immunization rates, in coordination with health partners. Firstly, it has identified 43 static health care facilities (34 in Ukhiya and 9 in Teknaf) and will deploy a trained vaccination team (consisting of two vaccinators and two volunteers) to each one. Beginning on 11 November, all children under 2 years old will receive two doses of MR.

Secondly, another 56 dedicated outreach vaccination teams (48 in Ukhiya and 8 in Teknaf) will visit households in all camps and settlements as part of a concerted effort to vaccinate children with MR vaccine.

Lastly, vaccination posts have been established at the main entry points into Bangladesh (Subrang, Shahporir dip, Teknaf). Since 1 November, children between 6 months and 15 years old passing through these entry points have been vaccinated against measles and rubella (MR), and children under five years of age have received oral polio vaccine (bOPV).