



17 March 2007

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## 1 Background

Most of the countries in the Horn of Africa Region are affected by severe **Acute Watery Diarrhoea (AWD)** outbreaks. Djibouti, Kenya, Somalia, Tanzania, and Uganda have reported outbreaks to World Health Organization (WHO) with high numbers of cases and unnecessary high case fatality rates. In 1998, Somalia reported in April/May 6,724 cases including 248 related deaths (Case Fatality Rate or CFR 3.68%). Almost all the countries in the region host refugees or have internally displaced populations. The risk of cholera outbreaks among these very vulnerable populations is often very high due to the poor sanitary conditions and overcrowding prevailing in such temporary settlements.

Cholera is an acute diarrhoea illness caused by infection of the intestine with the bacterium *Vibrio cholerae*. Two serogroups, O1 and O139, are responsible for causing extensive epidemics and multi-country outbreaks of disease. Infection by O1 or O139 serogroups of *V. cholerae* can have a range of clinical presentations, from an asymptomatic infection to mild illness involving only diarrhoea, to acute enteric infection and severe illness characterized by profuse watery stools, nausea, vomiting, leg cramps, severe dehydration, and shock. Left untreated, death may occur within a few hours. The case-fatality ratio in severe untreated cases may exceed 50%; with proper treatment, the ratio is less than 1%. Laboratory diagnosis is based upon isolation of *V. cholerae* O1 or O139 serogroup from stool or vomitus, or demonstration of a significant rise in titer of antitoxic or vibriocidal antibodies in patient serum.

**This update describes the development, current status, and response activities implemented by the humanitarian community of the latest AWD outbreak in Somalia. The update follows the structure as proposed in the WHO guidelines for cholera outbreak response<sup>1</sup>.**

<sup>1</sup> Urgent WHO Interregional Meeting on Cholera, Horn of Africa, Nairobi, 18 and 19 December 1997. WHO Emerging and other Communicable Diseases, Surveillance and Control. <http://www.who.int/emc>

## 2 Overall results and outcome

Between 1 January and 10 March 2007, a total of **5602** cases of clinically diagnosed **Acute Watery Diarrhoea** including 251 related-deaths (**CFR 4.48**) were reported from Central and South Somalia. AWD cases were reported from 6 regions (Hiiraan, Lower Shabelle, Banadir, Middle Shabelle, Godo, and Lower Juba) with an estimated population of 2,495,395; the overall attack rate (**AR**) was **0.22%**. The distribution of AWD cases is shown in figure 1.

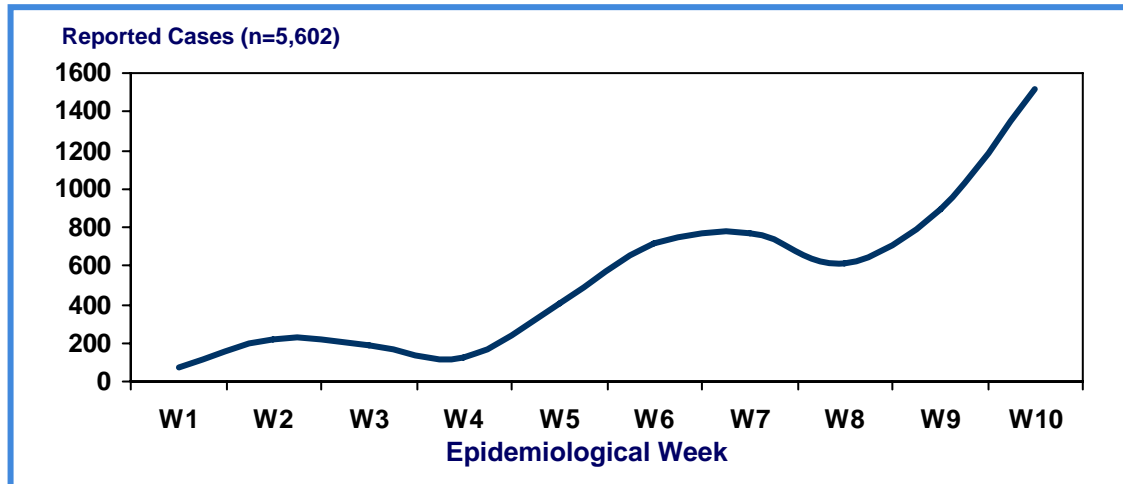


Figure 1: Distribution of AWD cases, Central and South Somalia, 01 January -10 March 2007

The first report of an increase in AWD cases was received from Hiiraan region in the first epidemiological week of 2007. After reaching the peak in week 7, cases started to decrease until the end of week 9, when no more cases were reported from Hiiraan. In the beginning of epidemiological week 5, Middle Shabelle and Lower Juba regions reported a similar increase in AWD cases. The number of cases in Middle Shabelle reached the peak in epidemiological weeks 6 and 7. No more cases were reported in the last two epidemiological weeks. In Lower Juba, cases were reported from week 5 and markedly decreased from the beginning of week 9. In Lower Shabelle region, cases were reported in week 6 with marked increase in the epidemiological week 10. Banadir Region reported cases starting from week 8 and showed a similar increase. The distribution of AWD cases by region is shown in figure 2.

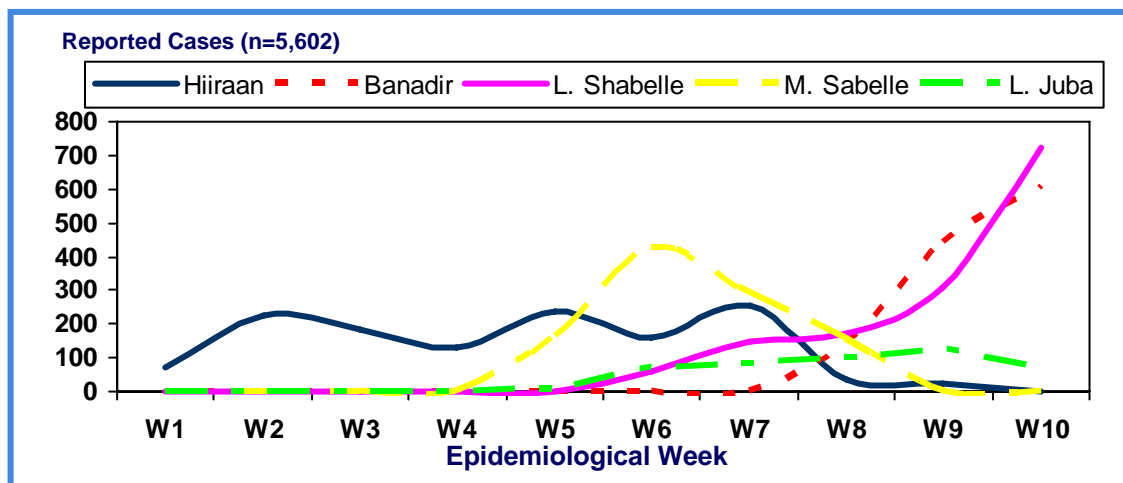


Figure 2: Distribution of AWD cases by region, Central and South Somalia, 1 January -10 March 2007

During the reporting period, 25% (1410/5602) of all cases were reported from Lower Shabelle (AR 0.20%, CFR 8.82%), 24% (1335) from Hiiraan (AR 0.48%, CFR 2.64%), 22% (1205) from Banadir (AR 0.13%, CFR 1.70%), 18% (1034) from Middle Shabelle (AR 0.47%, CFR 1.06%), followed by 9% (506) from Lower Juba (AR 0.17%, CFR 7.71%) and 2% from Godo (AR 0.11%, CFR 8.30%). The distribution of AWD cases, deaths, and CFR by region is shown in figure 3.

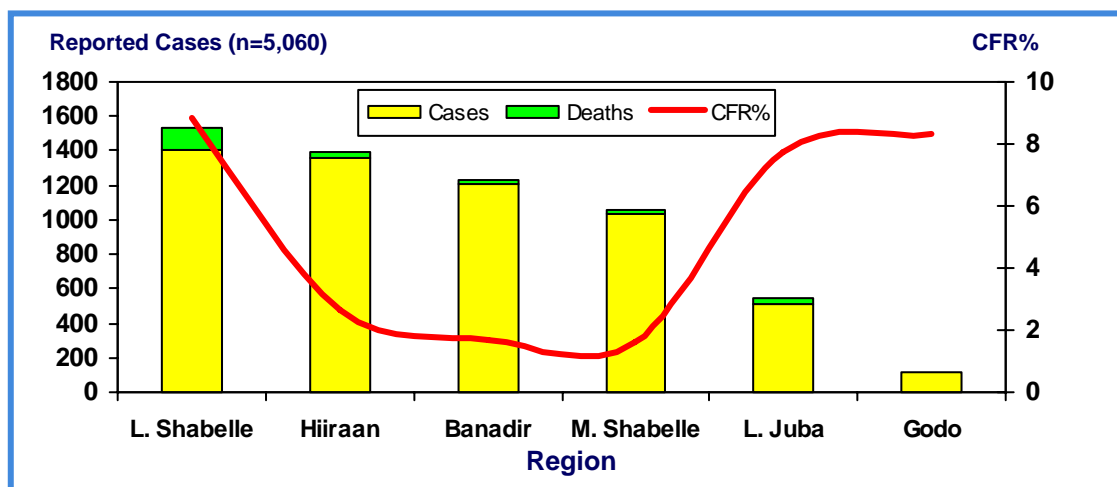


Figure 3: Distribution of AWD cases, deaths and CFR by region, Central and South Somalia, 1 January -10 March 2007

Overall, data on AWD age group was collected in 99% (5531/5602) of the cases (71 cases were missing age classification). Fifty-five percent (3057/5531) of all reported AWD cases were less than or equal to 5 years old. The distribution of AWD by age groups is shown in figure 4.

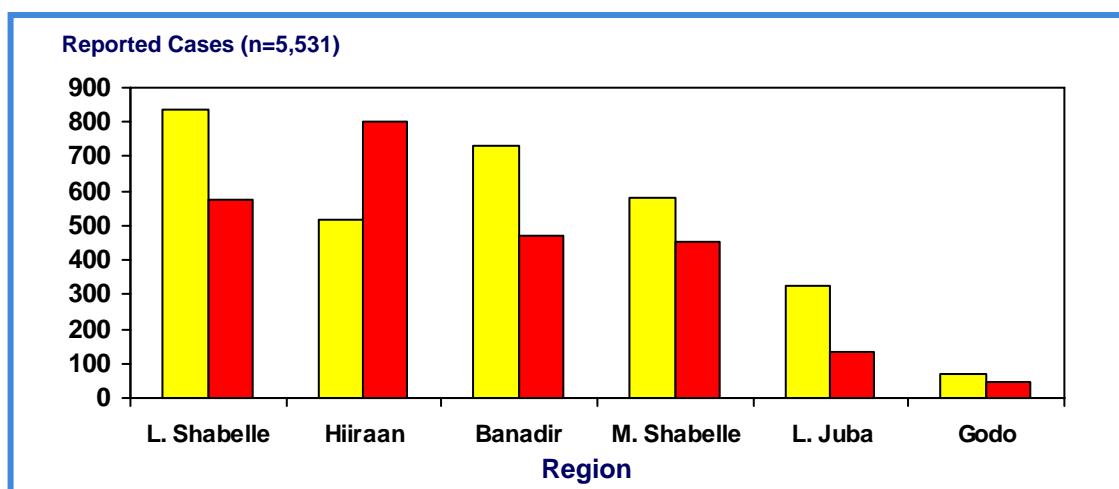


Figure 4: Distribution of AWD cases, Banadir region, Somalia, 30 December 2006 -10 March 2007

In the following table, an overview of all cases and deaths, Attack Rate, Case Fatality Rate of the current Acute Watery Diarrhoea outbreak in Somalia is given per district.

Table1: Distribution of reported Acute Watery Diarrhoea cases and deaths (AWD) by district

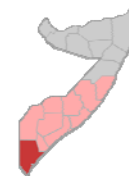
## Central and South Somalia, 1 January – 10 March, 2007

Region	District	Estimated Population	Cases	AR per 100	Deaths	CFR%	Comments
Hiiraan	Bulo Burte	89,120	355	0.40	26	7.32	
	Jalaalqsi	46,724	795	1.70	6	0.75	
	Belet Weyne	144,345	185	0.13	8	4.32	
<b>TOTAL</b>		<b>280,189</b>	<b>1335</b>	<b>0.47</b>	<b>40</b>	<b>2.64</b>	
Lower Shabelle	Merka	192,939	575	0.30	39	6.78	
	Afgoy	135,012	204	0.15	21	10.29	
	Qoryoley	134,205	225	0.17	7	3.11	
	Kattunwery	55,445	190	0.34	10	5.26	
	Sablale	43,055	54	0.13	3	5.56	
	Brave	57,652	55	0.10	12	21.82	
	Awdegle	76,700	107	0.14	33	30.84	
<b>TOTAL</b>		<b>695,008</b>	<b>1410</b>	<b>0.20</b>	<b>125</b>	<b>8.87</b>	
Lower Juba	Kismayo	166,667	455	0.27	26	5.71	
	Jamame	129,149	51	0.04	13	25.49	Lab. confirmation (10) <i>V. Cholera Ogawa</i>
<b>TOTAL</b>		<b>295,816</b>	<b>506</b>	<b>0.17</b>	<b>39</b>	<b>7.71</b>	
Banadir	Mogadishu	901,183	1,205	0.13	21	1.74	Lab. confirmation (9) <i>V. Cholera Inaba</i>
<b>TOTAL</b>		<b>901,183</b>	<b>1,205</b>	<b>0.13</b>	<b>21</b>	<b>1.74</b>	
Middle Shabelle	Jowhar	218,027	1034	0.47	17	1.64	All samples negative for <i>V. Cholera</i> .
<b>TOTAL</b>		<b>218,027</b>	<b>1034</b>	<b>0.47</b>	<b>17</b>	<b>1.64</b>	Updated up to the 2 <sup>nd</sup> of March, 2007
Godo	Bardera	106,172	112	0.11	9	8.03	
<b>TOTAL</b>		<b>106,172</b>	<b>112</b>	<b>0.11</b>	<b>9</b>	<b>8.03</b>	Data from 9-11 March, 2007
<b>GRAND TOTAL</b>		<b>2,495,395</b>	<b>5,602</b>	<b>0.22</b>	<b>251</b>	<b>4.48</b>	

### 3 Results and outcome per region

#### 3.1 Lower Juba region

**Lower Juba** is an administrative region in the traditional region of Jubaland in southern Somalia. Its capital is Kismayo. It is bordered by Kenya, the Somali regions of Godo, Middle Juba, and the Indian Ocean. The region consists of four districts: Kismayo (the capital), Afmadoow, Badhaadhe, and Jamame. The total population of the region is estimated at 385,790.



Between 30 December 2006, and 10 March 2007, total of 506 Acute Watery Diarrhoea (AWD) cases including 39 related deaths (CFR 7.15) were reported from the region. Kismayo district reported 90% (455/506) of the cases, while the remaining 10% (51) were reported from Jamame (CFR 25.49%). Stool samples (n=21) were collected from Jamame and of them 10 samples were confirmed as *V. Cholera* in Nairobi laboratory. The daily distribution of Kismayo AWD cases and daily CFR is shown in figure 5.

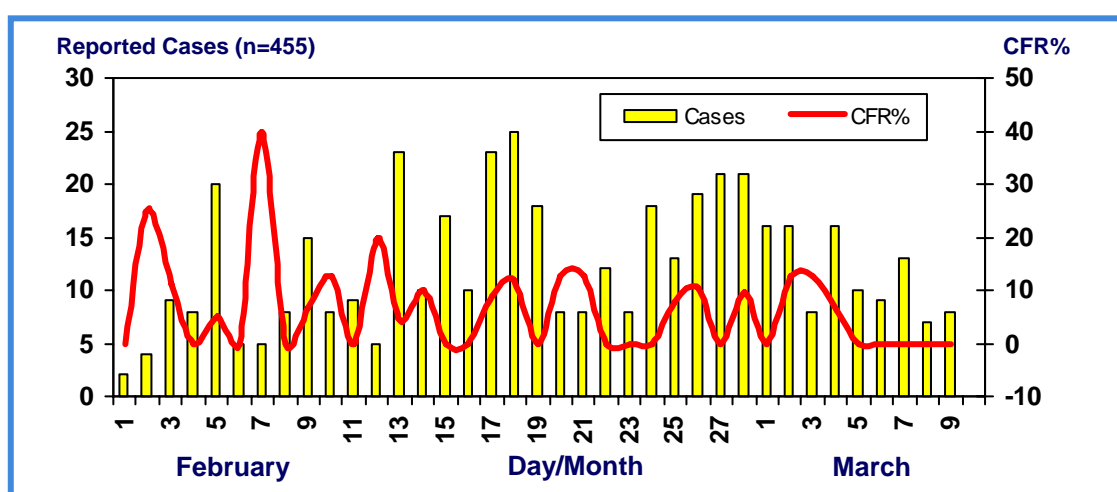


Figure 5: Daily distribution of AWD cases and CFR, Kismayo, Lower Juba region, Somalia, 30 December 2006 -10 March 2007

The age distribution of reported AWD cases showed that 71% (323/455) of all cases less than or equal to 5 years. The daily distribution of AWD cases by age group is shown in figure 6.

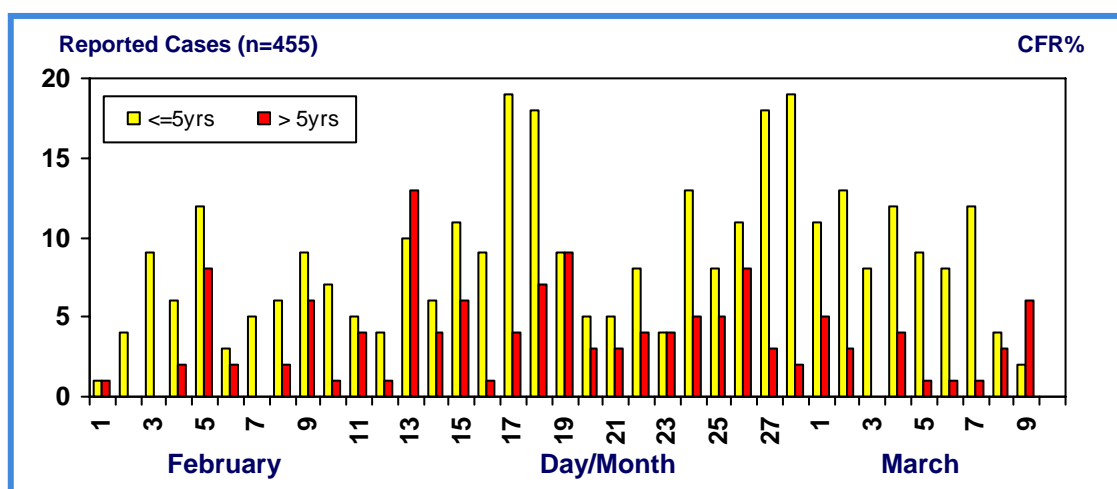
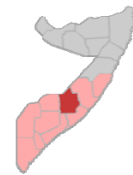


Figure 6: Distribution of AWD cases by age groups, Kismayo, Lower Juba region, Somalia, 30 December 2006 -10 March 2007

### 3.2 Hiiraan region

**Hiiraan** is an administrative region in Somalia, the capital is Beletweyne. It is bordered by Ethiopia and the Somali regions of Galguduud, Middle Shabelle, Lower Shabelle, Bay and Bakool. The Region consists of 10 districts named: Beletweyne, Buuloburde, Jalalaqsi, Matabaan, Raahaale, Mahaas, Halgan, Mogokori, Buurweyn, and Buqaqable. The total population of Hiiraan region is estimated at 329,811.



Between 30 December 2006, and 10 March 2007, total of 1315 Acute Watery Diarrhoea (AWD) cases including 21 related deaths (CFR 3.0) were reported by the MOH and NGOs working in the field. AWD age distribution showed 61% (801/1,315) were more than 5 years old. The weekly distribution of cases is shown in figure 7.

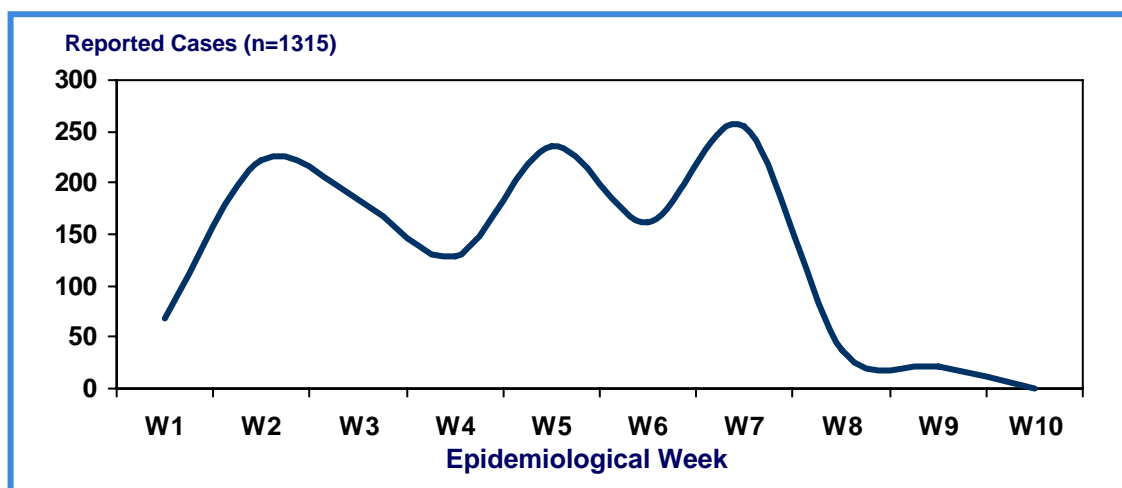


Figure 7: Distribution of AWD cases, Hiiraan region, Somalia, 30 December 2006 -10 March 2007

During the reporting period, 61% (795/1315) of all cases were reported from Jalalaqsi, 25% (335) from Buloburte, followed by 14% (185) from Beletweyne district. The highest CFR was reported from Buloburte 7.76% (26/335), followed by Beletweyne 4.32% (8/185) then Jalalaqsi at 0.08% (6/975). The distribution of AWD cases, deaths, and CFR by district is shown in figure 8.

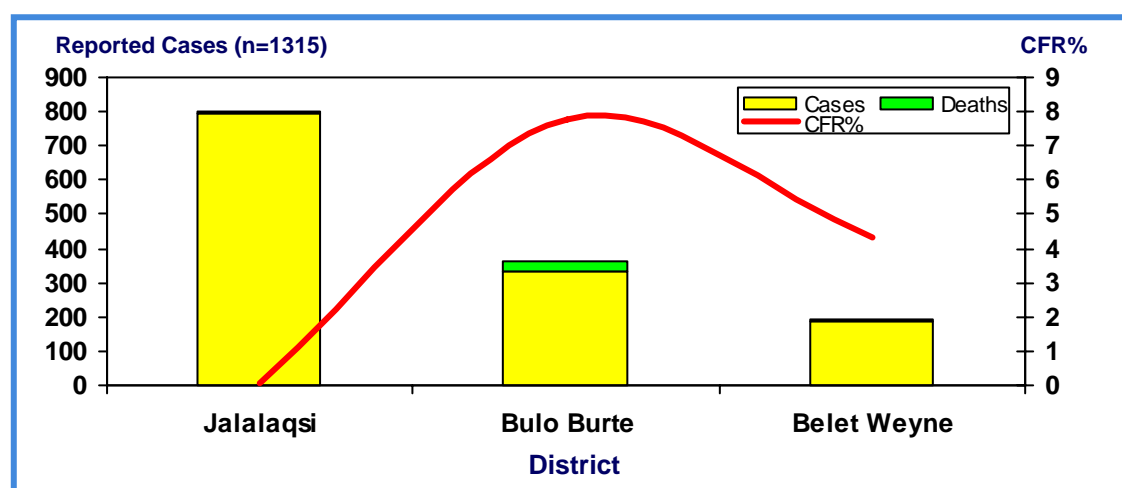
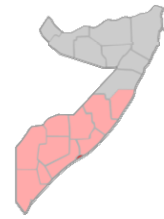


Figure 8: Distribution of AWD cases, deaths and CFR by district, Hiiraan region, Somalia, 30 December 2006 -10 March 2007

In general, the situation in Hiiraan is improving with marked decrease of the reported cases and deaths observed in the last two epidemiological weeks.

### 3.3 Banadir region

**Banadir** (referring to the northern ports of Barawa and Mogadishu) is a region in southern Somalia. The regional capital is Mogadishu, though the region itself is coextensive with the city and is much smaller than the historical region of Banadir. It is bordered by the Somali regions of Middle Shabelle and Lower Shabelle and the Indian Ocean. The region includes 16 districts named; Xamar Weyne, Hodan, Wardhiigleey, Boondheere, Xamar Jabjab, Waaberi, Wadajir, Kaaraan, Yaaqshiid, Shibis, Cabdulcasiis, Hawl Wadaag, Shangaani, Heliwaa, Dharkenley and Dayniile. The total population of Banadir region is estimated at 901,183.



Between 30 December 2006, and 10 March 2007 (epidemiological weeks 1-10), a total of 1205 Acute Watery Diarrhoea (**AWD**) cases including 21 related deaths (CFR 1.70) were reported through the MOH and participating NGOs working in the field (Hayat and Banadir Hospitals). The first cases were reported in the epidemiological week 8 and the trend shows a marked increase in the last two successive epidemiological weeks. The weekly distribution of cases is shown in figure 9.

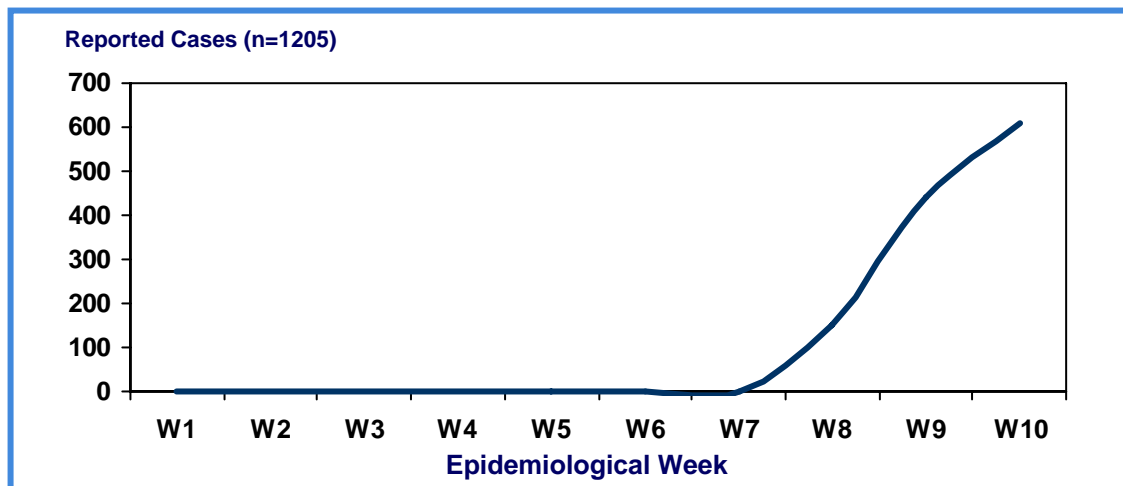


Figure 9: Distribution of AWD cases, Banadir region, Somalia, 30 December 2006 -10 March 2007

The age distribution of the reported AWD cases showed 59% (733/1205) were less than or equal to 5 years old. The weekly distribution of cases is shown in figure 10.

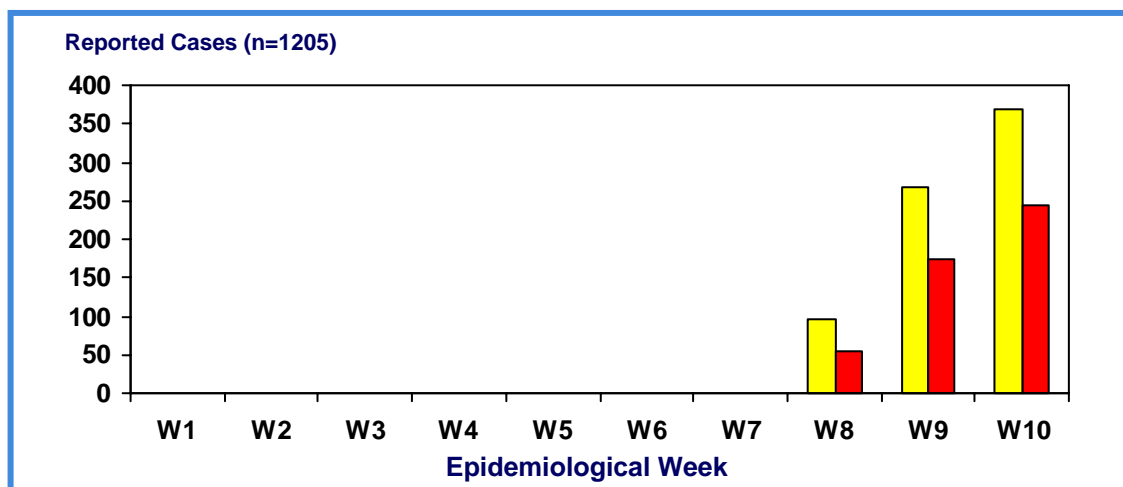
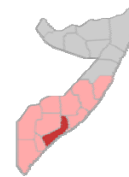


Figure 10: Distribution of AWD cases, Banadir region, Somalia, 30 December 2006 -10 March 2007

### 3.4 Lower Shabelle region

**Lower Shabelle** is an administrative region southern Somalia, the capital is Merka. Its bordered by the Somali regions of Banadir, Middle Shabelle, Hiiraan, Bay and Middle Juba and the Indian Ocean. The region consists of 8 districts named Afgoi, Barawe, Janale Kurtunwarey, Merka, Qoriyoley, Sablale, and Walaweyn. The estimated total population is 850,651 and Atter Mogadishu, this is thought to be the region with the most population in Somalia.



Between 30 December 2006, and 10 March 2007, a total of 1410 **AWD** cases including 125 related deaths (CFR 8.9) were reported through the MOH and the NGOs working in the field. The AWD cases doubled in the last 2 weeks (309 and 723) in the epidemiological weeks 9 and 10 respectively. The weekly distribution of cases is shown in figure 11.

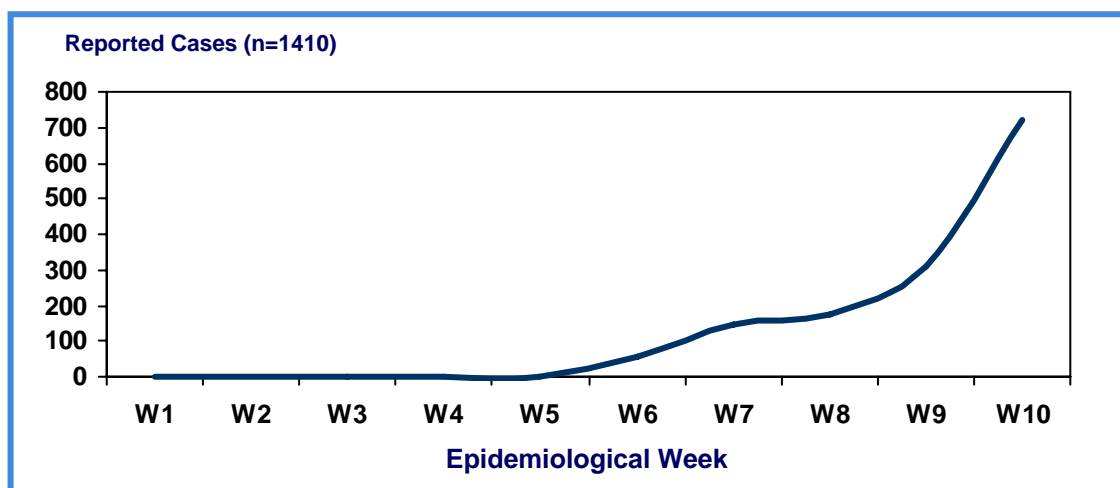


Figure 11: Distribution of AWD cases, Lower Shabelle region, Somalia, 30 December 2006 -10 March 2007

The age distribution of the reported AWD cases showed 59% (838/1410) were less than or equal to 5 years. The weekly distribution of by age groups is shown in figure 12.

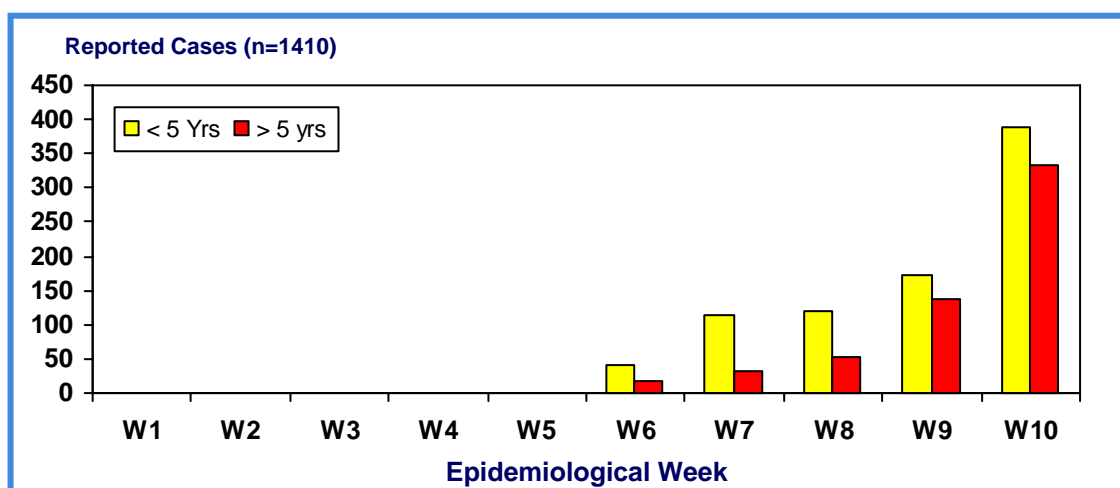


Figure 12: Distribution of AWD cases, Lower Shabelle region, Somalia, 30 December 2006 -10 March 2007

During the reporting period, 41% (575/1410) of all cases were reported from Merka (mainly due to increase number of new Internally Displaced People or IDPs coming to the area), 16% (225) from Qorioley, 14% (204) from Afgoye, 13% (190) from K/Warey, 8% (107) from Awdegle followed by Brave and Sabale each 4%. The highest CFR was reported from Awdegle (30.84%). Although Brave reported only 4% of the total cases, the CFR was 21.82% mainly because it is a rural area and the lack of medical services, so mobile teams were asked to visit the location to improve the case management in order to decrease the CFR. The distribution of AWD cases, deaths, and CFR by reporting facility is shown in figure 13.

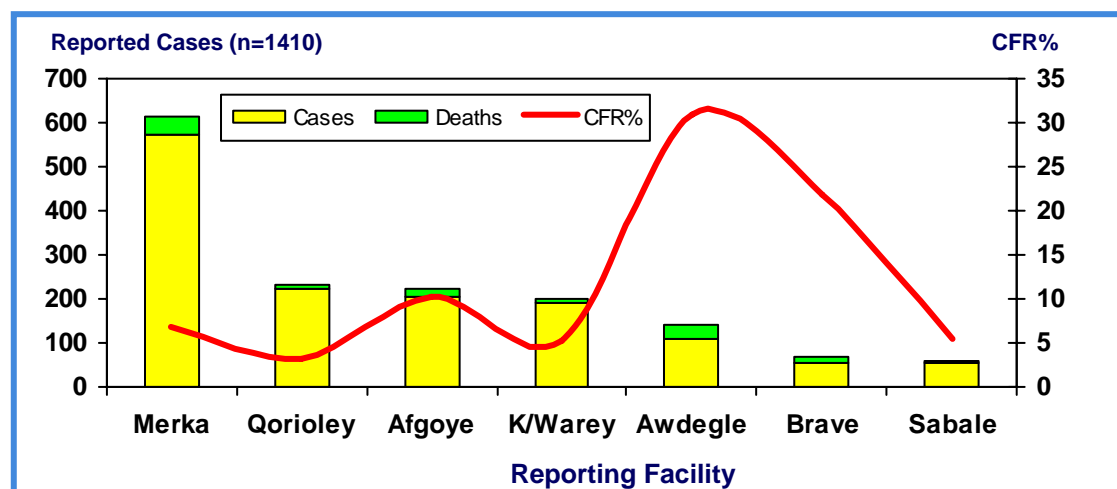


Figure 13: Distribution of AWD cases, deaths, and CFR by reporting facility, Lower Shabelle region, Somalia, 30 December 2006 - 10 March 2007

#### 4 Laboratory confirmation / drug resistance

The role of the laboratory at the beginning of an outbreak is to confirm that suspected cases are caused by *V. cholerae*. As soon as laboratory confirmation is established, further testing of large numbers of samples is not beneficial and only puts unnecessary stress on laboratories (WHO/EMC/DIS/97). During the epidemic, the role of the laboratory is to monitor the sensitivity of the *Vibrio* against recommended antibiotics.

In the ongoing cholera outbreak in Somalia, 10 stool samples (n=21) have been confirmed by the African Medical and Research Foundation (AMREF) laboratory in Nairobi, Kenya to be *V. cholerae*, serogroup O1, serotype *Ogawa* in Jamame district, Lower Juba region in South Somalia. Another 9 samples (n=10) collected from Mogadishu, Banadir region, Central Somalia were confirmed with *V. cholerae*, serogroup O1, serotype *Inaba*.

All samples collected from Jowher district, Middle Shabelle region were found to be negative. The antibiotic sensitivity test was conducted on the positive samples and *Vibrio* was found to be resistant to Nalidixic Acid, Chloramphenicol, and Cotrimoxazole.

WHO will continue its technical support to national reference laboratories. Additional support is provided in the procurement of laboratory supplies. Difficulties in collection and transport of specimens were identified and adequately addressed by the Ministry of Health and/or NGOs working in the field. Currently, WHO is assisting in the collection and exchange of data on drug resistance from the zonal laboratories and in the dissemination of information to neighbouring countries.

WHO has already distributed Carey Blair stool transport media to 22 health personnel of Ministry of Health and NGOs working in the affected areas.

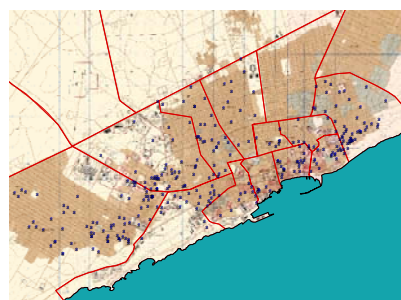


## 5 Control measures

A large number of governmental, non-governmental, and international organizations are jointly responding to the outbreak. Outbreak task forces chaired by WHO have been established at zonal and central level. The **WHO and UNICEF** along with ICRC /SRCS, MSF and other partners, are coordinating the efforts of the different agencies in the provision of safe drinking water, hygiene and sanitation, public awareness, and case management, all crucial elements in controlling the ongoing outbreak.

### Safe drinking water

The NGO Accion Contre la Faim (**ACF**) has been chlorinating 326 wells in Mogadishu (see map). Each well is chlorinated every 3 days with chlorine tablets supplied by UNICEF. ACF estimates an average of 144 users per well, totalling 46,944 people with access to safe drinking water. ACF will be opening a Cholera Treatment Centre shortly in Al-Hijra.



*Blue dots are the 326 wells in Mogadishu chlorinated by ACF*

**UNICEF** distributed 415,000 aquatabs packets, 144 chlorine drums, and around 12,000 sachets of Chlor Floc Water Maker for water chlorination and purification of drinking water, either directly to health facilities or through the different implementing partners such as the **SRSC, MSF, ACF, InterSos, and Horn Relief**.

UNICEF activities cover 400,000 people alone outside of the Somali capital.

To ensure sufficient quantity and quality of safe drinking water, 31 collapsible water tanks and 12,200 plastic jerry cans were provided for 362,000 litres of clean drinking water. Another 15 water trucks supplied 13.25 million litres of drinking water to the affected population. For chlorination purposes, 42 drums of chlorine, 279,500 aquatabs, and 214,000 sachets of Chlor Floc were provided. Several organizations rehabilitated 81 shallow wells and repaired another 18 other water sources. An additional 22 pumps were installed, of which 19 hand pumps. In addition, 1650 bacteriological H<sub>2</sub>S field-testing kits were provided for continuous monitoring of water quality in the affected areas. The NGOs responsible are **Juba Shine, Horn Relief, Himilo Foundation, Muslim Aid, Bahr-el-Ghazal Women Development Center (BWDC)**, the Somalia Red Crescent Society (**SRCS**), Relief Care (**AFREC**), , Hiran Water supply (**HWS**), Centre for Research and Dialogue (**CRD**), Society Development Initiative Organization (**SDIO**), **JCC**, Centre d'Etudes de la Famille Africaine (**CEFA**), and International Islamic Relief Organization (**IIRO**). Together they reached a total number of 423,551 beneficiaries.

### Sanitation and hygiene and hygiene promotion

To provide the population with proper sanitary conditions, 1890 concrete slabs for the construction of latrines were donated. At least 5 pit latrines were constructed. Over 1000 sanitation tools such as shovels were distributed to facilitate clean up campaigns and garbage disposal. A large number of flood prevention tools, such as sandbags, were also distributed.

A total of 64 community awareness workshops were organized, training 2020 hygiene promoters. During the workshops, over 425,000 soap bars were distributed. **UNICEF** also distributed over 300,000 soaps.

## 6 Prepositioning of essential supplies

The needs for supplies and equipment for cholera control are estimated by calculating the expected attack rate for new cases. Essential supplies for treatment of cholera cases are Ringers Lactate, Oral Rehydration Salts (ORS) and antibiotics.

WHO and UNICEF both provide special diarrhoeal kits. WHO kits consist of drugs, infusions and other essential supplies for the management of 100 severe and 400 mild to moderate cases. WHO prepositioned 8 kits, of which one is already in use. Another five are expected soon.

Each UNICEF kit contains 1250 litres of Ringer Lactate and required supplies. Three full kits were delivered to Jowhar and Middle Shabelle, and further supplies to Hiran and Mogadishu. Another 30 kits are in the process of being distributed to the most affected areas.

In addition, UNICEF delivered 15 cholera kits to partners in the field, with another 27 in the pipeline, as well as 102,000 sachets of Oral Rehydration Salts.

The United Arab Emirates (UAE) Red Crescent Society delivered 80 metric ton of emergency supplies for distribution in public hospitals of Banadir and Kaysaney.

