



22 March 2007

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## 1 Background

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, Gedo, and Lower Juba) with an estimated population of 2,495,395; the overall attack rate (**AR**) was **0.22%**<sup>1</sup>.

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. In the beginning of epidemiological week 5, Middle Shabelle and Lower Juba regions reported a similar increase in AWD cases.

In Lower Juba, cases were reported starting 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.

**This update describes the development, 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>2</sup>.**

<sup>1</sup> The AWD update 17 March, 2007, [http://www.emro.who.int/somalia/pdf/AWD\\_Update\\_Somalia\\_17Mar07.pdf](http://www.emro.who.int/somalia/pdf/AWD_Update_Somalia_17Mar07.pdf)

<sup>2</sup> Urgent WHO Interregional Meeting on Cholera, Horn of Africa, Nairobi, 18-19 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 17 March 2007, a total of **7976** cases of clinically diagnosed **Acute Watery Diarrhoea** including 341 related-deaths (**CFR 4.28**) were reported from Central and South Somalia. AWD cases were reported from 8 regions (Hiiraan, Lower Shabelle, Banadir, Middle Shabelle, Gedo, Bay, Galgudud and Lower Juba) with an estimated population of 3,553,301; the overall attack rate (**AR**) is **0.22%**. The trend showed increase in the number of reported cases compared with the previous epidemiological weeks. In comparison with the previous week, cases increased by 15% (2391 and 1507 respectively). The distribution of AWD cases is shown in figure 1.

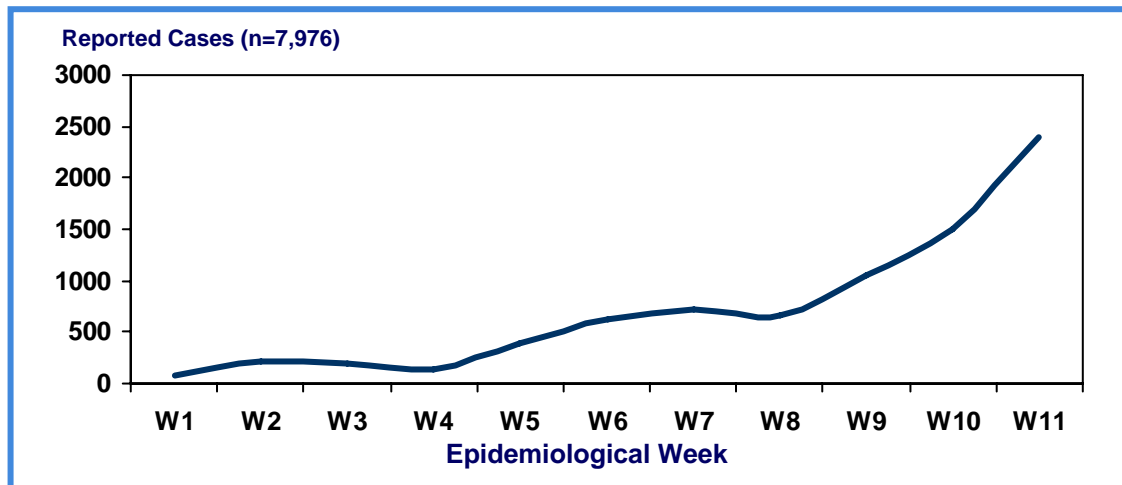


Figure 1: Distribution of AWD cases, Central and South Somalia, 01 January -17 March 2007

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. 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. In Lower Juba, cases started to be detected starting from week 5 and markedly decreased in week 9. In Lower Shabelle region, cases were reported in week 6 with marked increase in the epidemiological week 10, but a slight decrease was observed in the epidemiologic week 11 (723 and 691 respectively). Banadir Region reported cases starting from week 8 and showed 23% increase compared to the previous week (2336 and 1009 respectively). Bay and Galgudud regions (not included in the graph) started to report cases in the epidemiological week 11. The distribution of AWD cases by region is shown in figure 2.

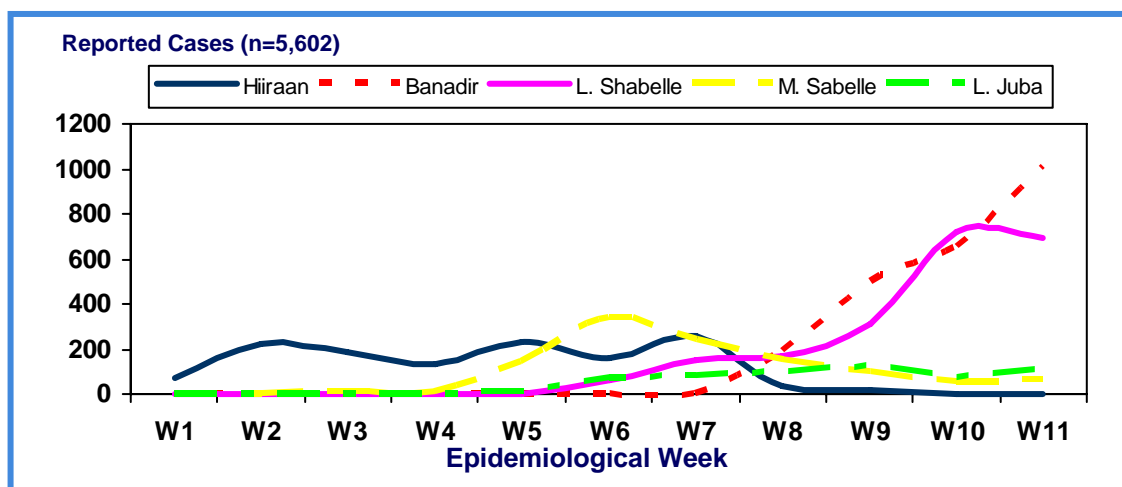


Figure 2: Distribution of AWD cases by region, Central and South Somalia, 1 January -17 March 2007

Overall, the highest Attack Rate (AR) was observed in Middle Shabelle region **0.49%** (1086/218,027), followed by Banadir and Lower Shabelle regions (0.49% and 0.15% respectively). The Attack Rate per 100 population is shown in figure 3

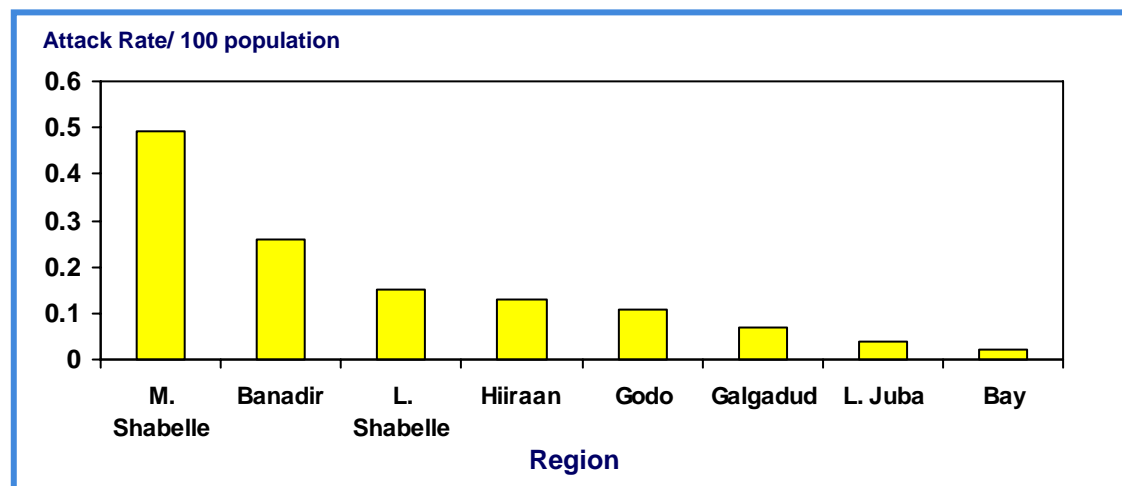


Figure 3: Distribution of AWD cases, deaths and CFR by region, Central and South Somalia, 1 January -17 March 2007

During the same reporting period, 29% (2336/6976) of cases were reported from Banadir (CFR 1.71%), 26% (2101) from Lower Shabelle (CFR 8.00%), 17% (1355) from Hiraan (CFR 2.95%), 14% (1086) from Middle Shabelle (1.84%), followed by 7% (561) from Lower Juba (CFR 7.31%), and 3% (235) from Galgadud (CFR 9.00%). Although Bay and Gedo reported 2% (180) and 1% (112), of the total cases, the CFR in both regions was high (7.78% and 8.04% respectively). The distribution of AWD cases, deaths, and CFR by region is shown in figure 4.

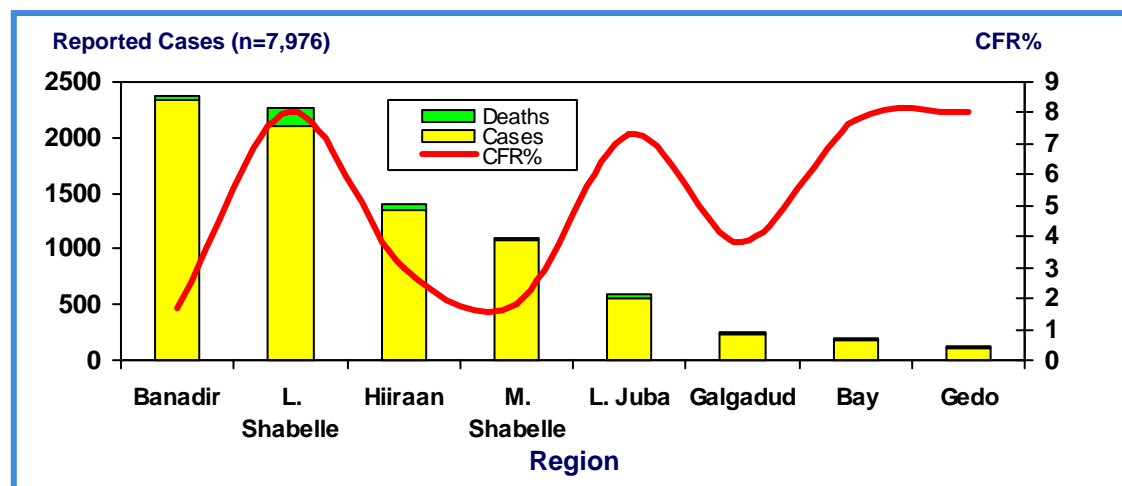


Figure 4: Distribution of AWD cases, deaths and CFR by region, Central and South Somalia, 1 January -17 March 2007

In the following table, an overview of number of reported cases, deaths, Attack Rate (AT), and Case Fatality Rate (CFR) 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 – 17 March, 2007**

Region	District	Estimated Population	Cases	AR per 100	Deaths	CFR%	Comments
Hiiraan	Bulo Burte	89,120	355	0.40	26	7.32	<i>Data up to 10 March 2007</i>
	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>0.48</b>	<b>40</b>	<b>3.00</b>	
Lower Shabelle	Merka	192,939	813	0.42	54	6.64	
	Afgoy	192,939	813	0.42	54	6.64	
	Qoryoley	135,012	318	0.24	25	7.86	
	K/Warey	134,205	299	0.22	39	13.04	
	Sablale	55,445	377	0.68	25	6.63	
	Brave	43,055	77	0.18	7	9.09	
	Awdegle	57,652	99	0.17	4	4.04	
<b>TOTAL</b>		<b>695,008</b>	<b>2101</b>	<b>0.30</b>	<b>168</b>	<b>8.00</b>	
Lower Juba	Kismayo	166,667	510	0.31	28	5.49	
	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>561</b>	<b>0.19</b>	<b>41</b>	<b>7.31</b>	
Banadir	Mogadishu	901,183	2366	0.26	40	1.69	Lab. confirmation (24) <i>V. Cholera Inaba</i>
<b>TOTAL</b>		<b>901,183</b>	<b>2366</b>	<b>0.26</b>	<b>41</b>	<b>1.73</b>	
Middle Shabelle	Jowhar	218,027	1086	0.49	20	1.84	All samples negative for <i>V. Cholera</i> .
<b>TOTAL</b>		<b>218,027</b>	<b>1086</b>	<b>0.49</b>	<b>20</b>	<b>1.84</b>	
Gedo	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
Bay	Baidoa	726,849	180	0.02	14	7.78	Data from 8-14 March, 2007
<b>TOTAL</b>		<b>726,849</b>	<b>180</b>	<b>0.02</b>	<b>14</b>	<b>7.78</b>	
Galgudud	Galaheri	330,057	235	0.07	9	3.83	Data from 17 march, 2007
<b>TOTAL</b>		<b>330,057</b>	<b>235</b>	<b>0.07</b>	<b>9</b>	<b>3.83</b>	
<b>GRAND TOTAL</b>		<b>3,553,301</b>	<b>7976</b>	<b>0.22</b>	<b>341</b>	<b>4.28</b>	

### 3 Results and outcome per region

#### 3.1 Lower Juba region

Between 30 December 2006 and 17 March 2007, total of **561 Acute Watery Diarrhoea (AWD)** cases including 41 related deaths (**CFR 7.31**) were reported from the region. Kismayo district reported 91% (510/561) of the cases, while the remaining 9% (51) were reported from Jamame (**CFR 25.49%**). Stool samples (n=21) were collected from Jamame and 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.

Lower Juba	
Capital	Kismayo
Est. pop.	385,790
Districts	1. Kismayo capital 2. Afmadoow 3. Badhaadhe 4. Jamame

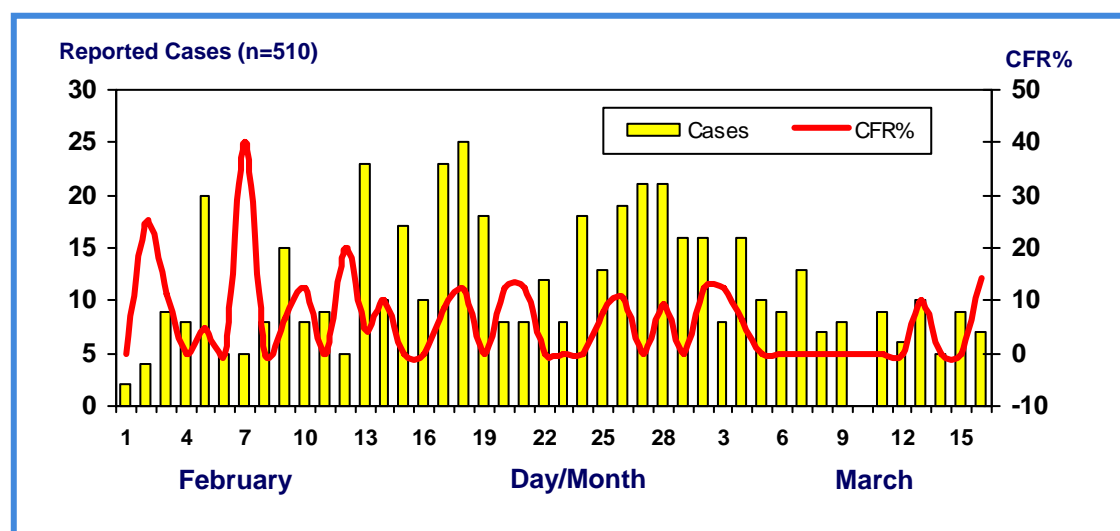


Figure 5: Daily distribution of AWD cases and CFR, Kismayo, Lower Juba region, Somalia, 30 December 2006 - 17 March 2007

The age distribution of reported AWD cases shows that 70% (353/510) of all cases are less than or equal to 5 years. The daily distribution of AWD cases by age group is shown in figure 6.

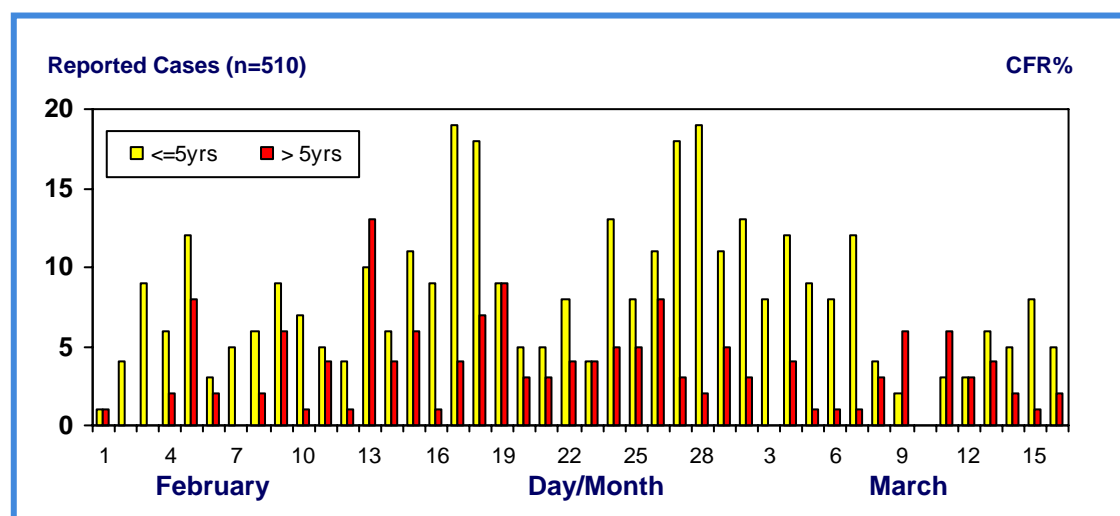


Figure 6: Distribution of AWD cases by age groups, Kismayo, Lower Juba region, Somalia, 30 December 2006 - 17 March 2007

### 3.2 Hiiraan region<sup>3</sup>

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

Hiiraan		
Capital	Beletweyne	
Est. pop.	329,811	
Districts	1. Beletweyne 2. Buuloburde 3. Jalalaqsi 4. Matabaan 5. Raahaale	6. Mahaas 7. Halgan 8. Mogokori 9. Buurweyn 10. Buqaqable

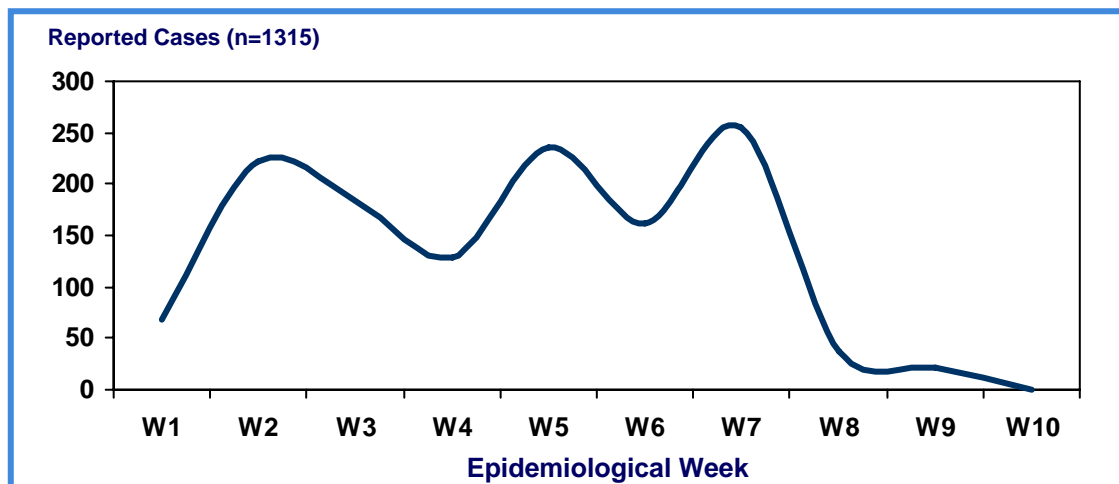


Figure 7: Distribution of AWD cases, Hiiraan region, Somalia, 30 December 2006 -10 March 2007

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.

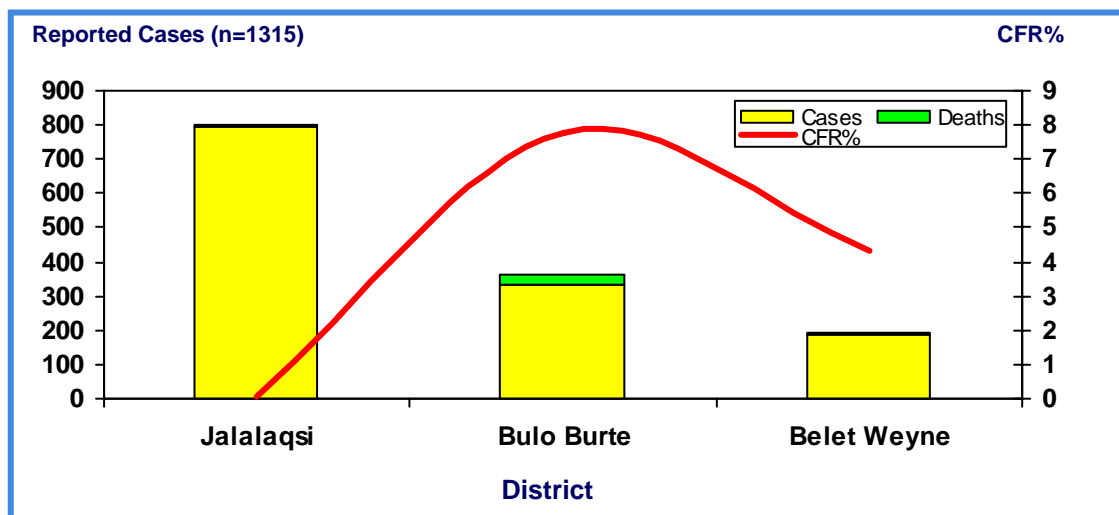


Figure 8: Distribution of AWD cases, deaths and CFR by district, Hiiraan region, Somalia, 30 December 2006 -10 March 2007

In general, the situation in Hiiraan is improving with marked decrease of the reported cases and deaths observed in the two epidemiological weeks (9-10).

<sup>3</sup> Data from 1<sup>st</sup> of January to 10<sup>th</sup> of March

### 3.3 Banadir region

Between 30 December 2006, and 17 March 2007 a total of **2366 AWD** cases including 40 related deaths (CFR 1.69) were reported through the MOH and participating NGOs. Data collected from 4 hospitals (Hayat, Arafat, Habeb, and Banadir). In the current week (epidemiological week 11) a total of 1009 AWD cases were reported including 16 deaths (CFR 1.56), showing an increase in the number

Banadir	
Capital	Mogadishu
Est. pop.	901,183.
Districts	1. Xamar Weyne 2. Hodan, 3. Wardhiigleey, 4. Boondheere, 5. Xamar Jabjab, 6. Waaberi, 7. Wadajir, 8. Kaaraan, 9. Yaaqshiid, 10. Shibis, 11. Cabdulcasiis, 12. Hawl Wadaag, 13. Shangaani, 14. Heliwaa, 15. Dharkenley 16. Dayniile

of cases compared with the previous epidemiological week (1009 and 659 respectively). The CFR remained the same. The weekly distribution of cases is shown in figure 9.

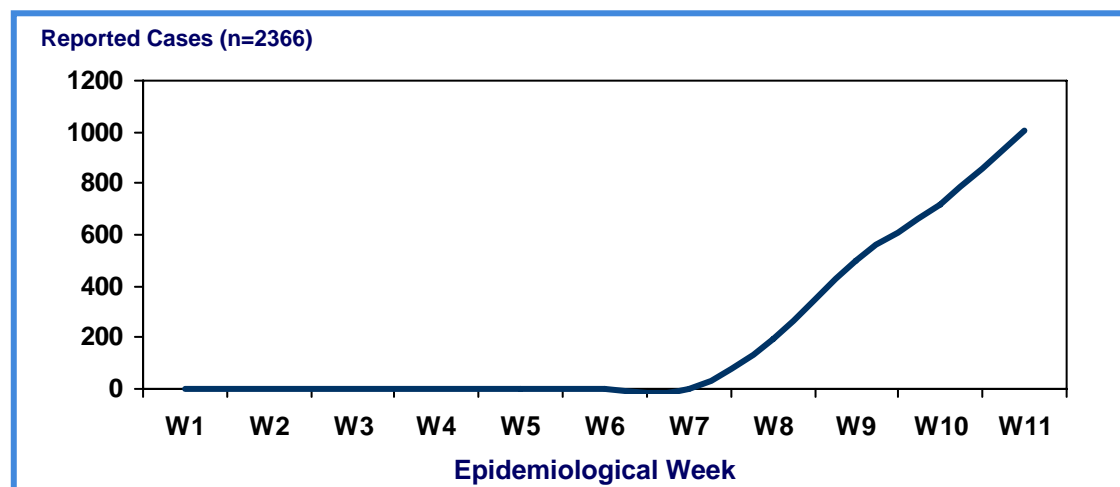


Figure 9: Distribution of AWD cases, Banadir region, Somalia, 30 December 2006 -17 March 2007

The age distribution of the reported AWD cases shows that 60% (1412/2366) were less than or equal to 5 years old. The weekly distribution of cases is shown in figure 10.

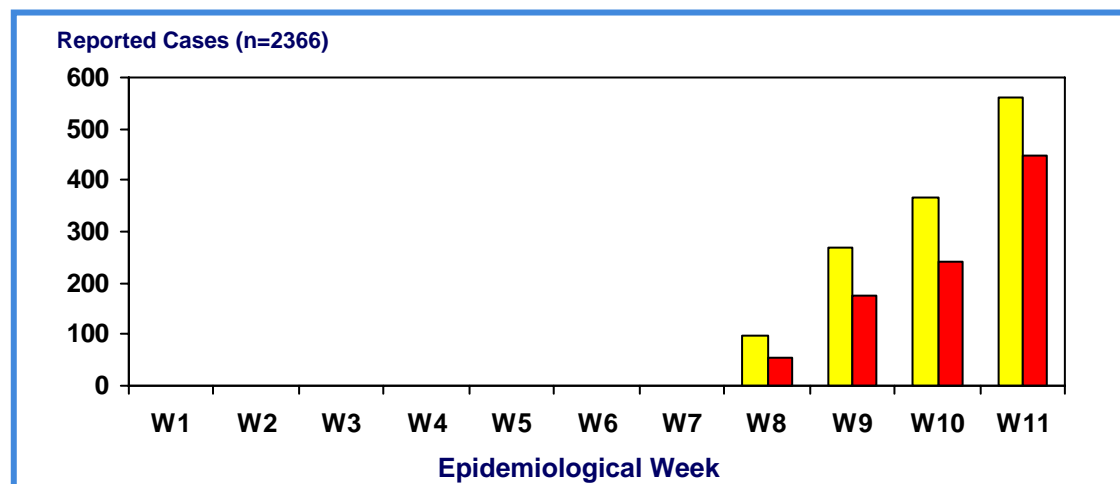


Figure 10: Distribution of AWD cases, Banadir region, Somalia, 30 December 2006 -17 March 2007

During the reporting week, 1009 AWD cases were reported from Banadir region: of them 50% (506/1009) from Banadir hospital, 22% (225) from Hayat hospital, followed by 16% (157) from Arafat hospital and 12% (121) from Habib hospital.

The highest CFR was reported from Banadir hospital. In the same period, 16 related deaths were reported: 64% (10/16) from Banadir hospital, and 34% (6) from Arafat hospital. No deaths were reported from Hayat and Habib hospitals. The distribution of AWD cases, deaths, and CFR by reporting hospital is shown in figure 11.

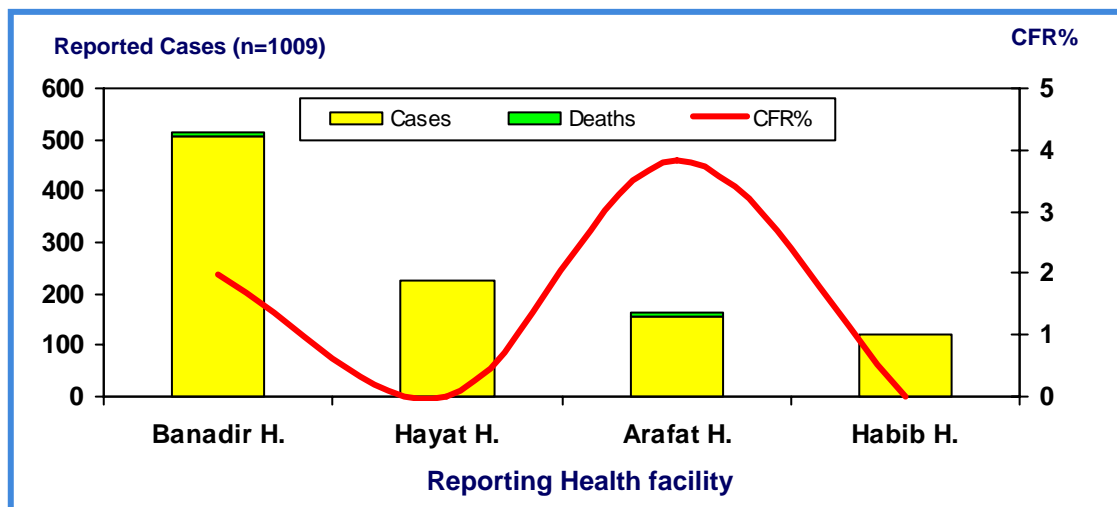


Figure 11: Distribution of AWD cases, deaths and CFR, Banadir region, Somalia, 30 December 2006 - 17 March 2007

### 3.4 Lower Shabelle region

Between 30 December 2006 and 17 March 2007, a total of **2101 AWD** cases including 158 related deaths (CFR 7.5) were reported through the MOH and the NGOs working in the field. Both AWD cases and CFR decreased compared to the previous epidemiological week 10 (cases from 723 to 961 and CFR from 8.9% to 7.5% in the epidemiological weeks 10 and 11 respectively). The CFR decreased mainly due to early detection of the cases, improved case management, and the availability of drugs and supplies. WHO sent one complete cholera kit and UNICEF provided ORS and chlorine. The weekly distribution of cases is shown in figure 12.

Lower Shabelle	
Capital	Merka
Est. pop.	850,651
Districts	1. Afgoi 2. Barawe 3. Janale 4. Kurtunwarey 5. Merka 6. Qoriyoley 7. Sablale 8. Walaweyn

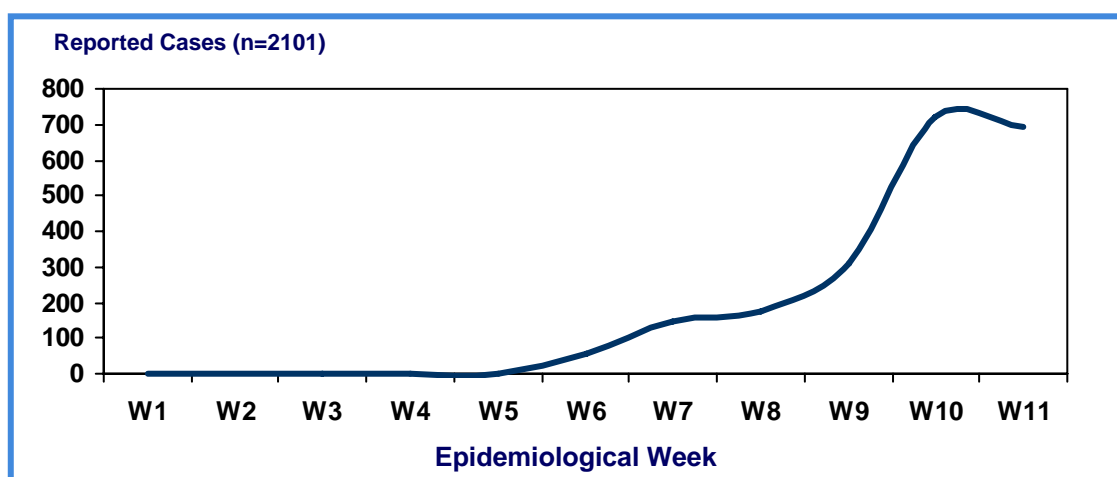


Figure 12: Distribution of AWD cases, Lower Shabelle region, Somalia, 30 December 2006 - 17 March 2007

The age distribution of the reported AWD cases shows that 59% (838/1410) were less than or equal to 5 years. The weekly distribution of by age groups is shown in figure 13 on the next page.

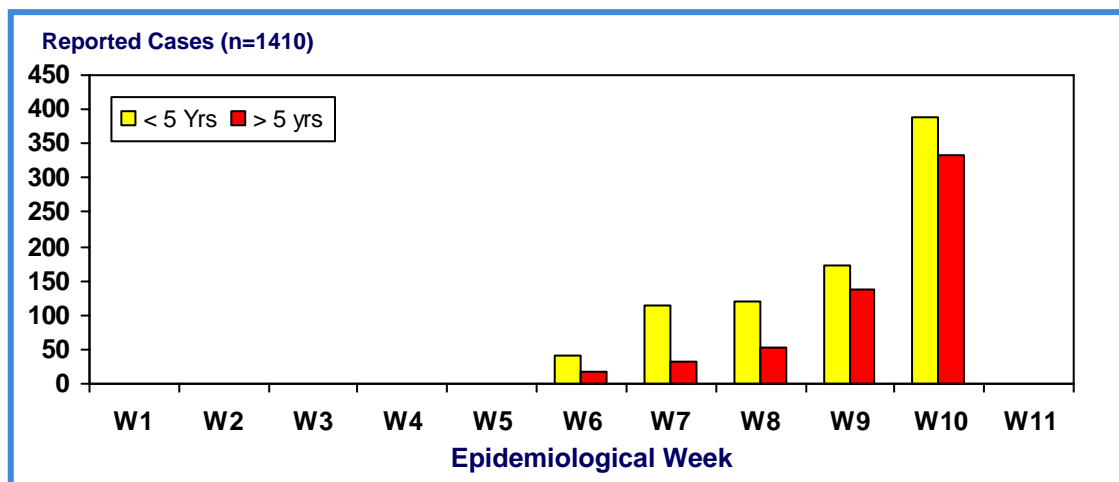


Figure 13: Distribution of AWD cases, Lower Shabelle region, Somalia, 30 December 2006 -17 March 2007

During the reporting period, 40% (813/2101) of all cases were reported from Merka (mainly due to an increased number of Internally Displaced People or IDPs coming to the area), 18% (377) from K/Warey, 15% (138) from Afgoye, 14% (299) from Qorioley, 6% (118) from Awdegle, followed by Brave and Sabale each at 5% and 4% respectively.

The highest CFR was reported from Qorioley (**13.04%**) followed by Awdegle (11.86%), while the lowest CFR was observed in K/warey. Although Sabale reported only 5% of the total cases, the **CFR was 9.09%**, mainly as this is a rural area with a continuous lack of medical services. Mobile teams have been requested to visit the location to improve case management and to decrease the CFR. The distribution of AWD cases, deaths, and CFR by reporting facility is shown in figure 14.

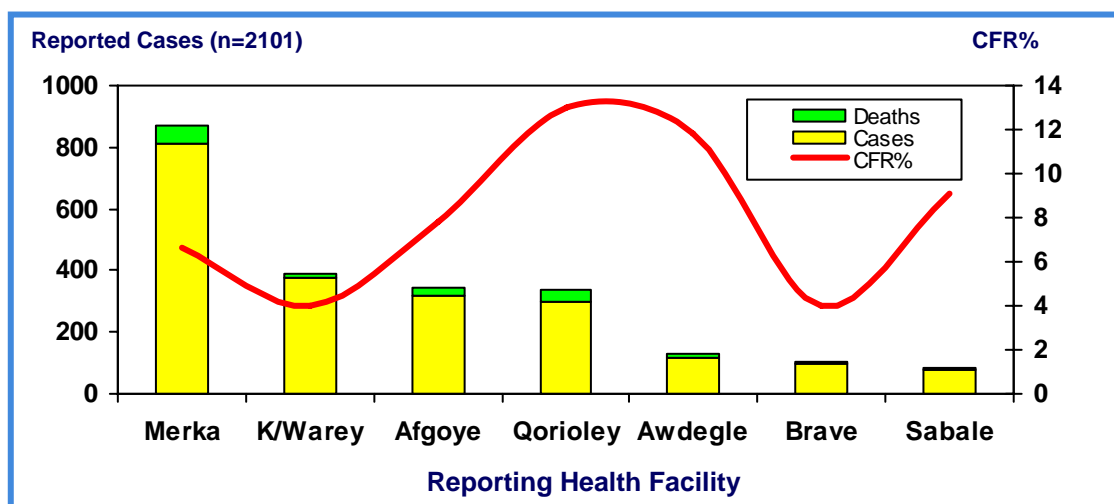
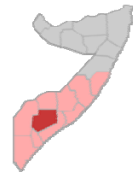


Figure 14: Distribution of AWD cases, deaths, and CFR by reporting facility, Lower Shabelle region, Somalia, 30 December 2006 -17 March 2007

### 3.5 Bay Region

**Bay** is an administrative region in **southern Somalia**. Its capital is **Baidoa**. It is bordered by the Somali regions of **Bakool**, **Lower Shabelle**, **Middle Juba**, and **Gedo**. Bay region is one of the most populated regions of Somalia (estimated population at 726,849) and consists of the following districts; **Baidoa**, **Buurhakaba**, **Diinsoor**, **Qansaxdheere** and **Berdaale**.



On 8 March 2007, hospital staff reported an increase of AWD cases. Between 8-14 March 2007, 21 patients were admitted to the hospital including one related death. During the same period, a total of 180 cases including 14 deaths (**CFR 7.78%**) were reported from 4 quarters in Baidoa.

Reports were received about sporadic cases of AWD in some villages around Baidoa. Patients were unable to reach the hospital due to transportation problems. Rumour verification is currently ongoing into additional suspected AWD cases in Dinsor district. The distribution of AWD cases and deaths by reporting health facility is shown in figure 15.

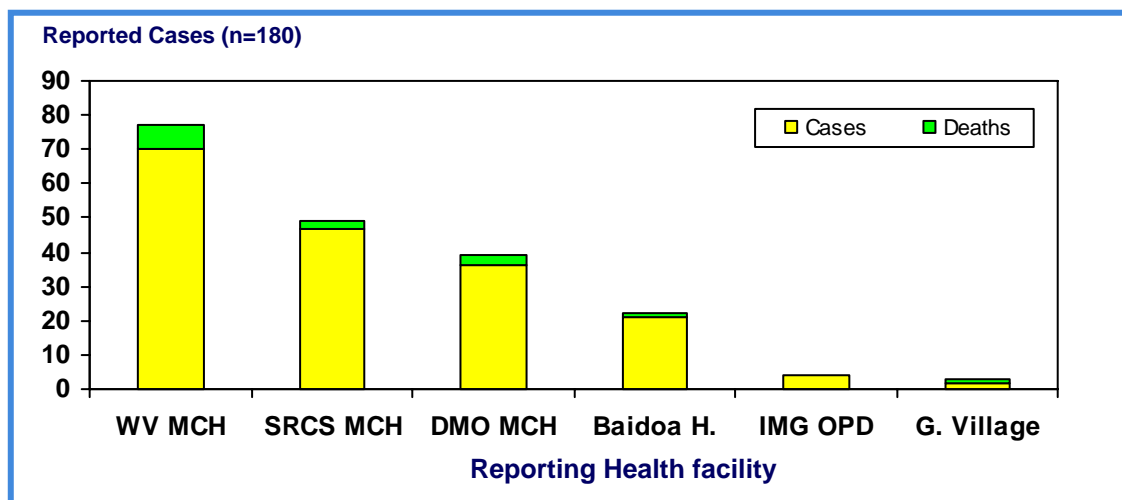
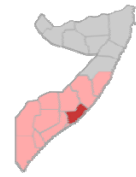


Figure 15 Distribution of AWD cases, and deaths, Bay region, Somalia, 8-14 March 2007

### 3.6 Middle Shabelle Region

**Middle Shabelle** is an administrative region in southern Somalia. As part of the former Banadir region, its capital was Mogadishu until the mid 1980s, when the town of Jowhar became the capital. It is bordered by the Somali regions of Galguduud, Hiiraan, Lower Shabelle, and Banadir and the Indian Ocean. The region consists of 6 districts named; Aadan Yabaal, Balcad, Cadale, Jowhar, Mahadaay Weyn and Warsheekh.



Between 15 January and 17 March 2007, a total of **1086 AWD** cases including 20 related deaths (CFR 1.84) were reported from the region. All cases were reported from Jowhar district. The first cases were reported on 15 January 2007, reaching the peak on 4 February 2007 with 69 cases. No AWD related deaths were reported in the last 3 days. All stool samples (n=3) collected from the hospital tested negative for *V. Cholera* in the Nairobi laboratory. The daily distribution of Jowhar AWD cases is shown in figure 16.

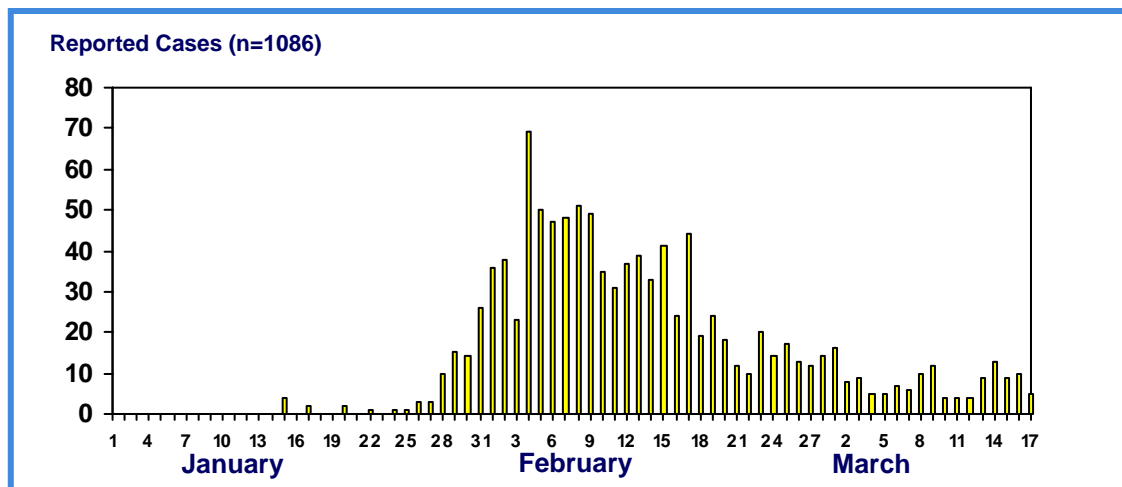


Figure 16: Daily distribution of AWD cases, Jowhar, Middle Shabelle, Somalia, 30 December 2006 -17 March 2007

In the current week, 58 AWD cases including 2 related deaths (CFR 4.45%) were reported. There was no change compared to the previous epidemiological week 10 (58 and 54 respectively). Overall, there was a sharp decrease of reported cases after the peak in the epidemiological week 6 (337 cases). The weekly distribution of reported AWD is shown in figure 17.

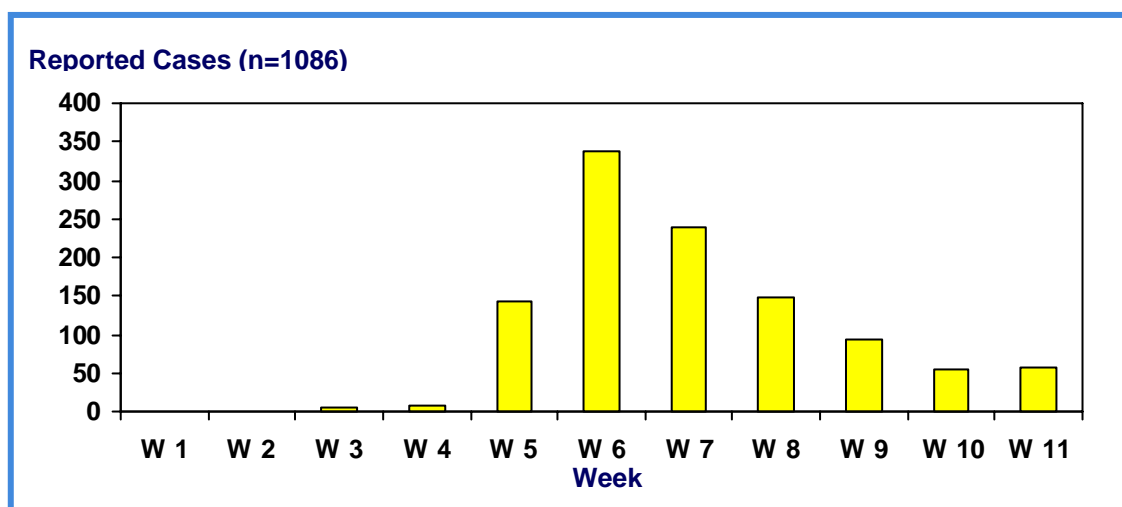
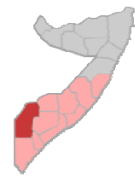


Figure 17: Weekly Distribution of AWD cases Jowhar, Middle Shabelle region, Somalia, 30 December 2006 -17 March 2007

### 3.7 Gedo region

**Gedo** is an administrative region in **southwestern Somalia**. The capital is **Garbahaarreey** it is considered the second largest region of Somalia after Bari. Gedo is bordered by Ethiopia, Kenya, the Somali regions of Bakool, Bay, Middle Juba, and Lower Juba further down east. The population exploded in the last twenty years and reaching almost one million in early 1990s. This new migration movement made Beled Hawo the second largest district in Gedo. Lugh used to be the second largest city and district, Bardera being the first. At one time Beled Hawo District became the largest city and district in the region. Gedo region consists of seven districts, namely **Baardheere**, **Buurdhuubo**, **Beledxaawo**, **Doolow**, **Ceelwaaq**, **Garbahaarreey**, and **Luuq**.



Between 9-17 March 2007 (epidemiological week 11), a total of 112 AWD cases including 9 related deaths (CFR 8.04) were reported through MOH and NGOs from Gero region.

### 3.8 Galgadud Region

Galgudud is an administrative region in central Somalia. It is bordered by Ethiopia, the Somali regions of Mudug, Hiiraan and Middle Shabele, and the Indian Ocean. The capital is Dhusa Mareb and the largest city is Dhusa Mareeb. The region population is estimated at 330,057. The region consists of 8 districts, namely, Dhusa Mareb, Cadaado, Ceelbuur, Ceeldheer, Galcad, Galhareeri, Caabudwaq and Balanballe.



On 17th March 2007, SRCS reported 235 cases of Acute Watery Diarrhoea including 9 deaths (CFR 3.83). All cases were reported from Galhareri district which has no health post and the nearest health center is Elder or Dusamareb districts. The most affected areas are Dargaan village 28km north-East of Galhareeri and Galhareeri agropastoral areas of Farawein, Garwein, Caasha-muuse, Awrla' and Tuulo.

## 4 Laboratory confirmation / drug resistance

On 10 March 2007, 10 stool samples were collected from **Merka district**, Lower Shabelle. Three samples were confirmed with *V. cholerae*, serogroup O1, serotype *Inaba* and 2 samples with *V. cholerae*, serogroup O1, serotype *Hikojima*<sup>4</sup>. WHO requested the African Medical and Research Foundation (AMREF) laboratory in Nairobi to confirm the results. The mean age of confirmed cases was 5.0 years, ranging from 2-20 years. 60% (3/5) were males. The *Vibrio* was resistant to Chloramphenicol, and Cotrimoxazole, while sensitive to Erythromycin and Tetracycline.

On 13 March 2007, 10 stool samples were collected by MSF-Spain from **Banadir hospital**. All 10 samples were confirmed with *V. cholerae*, serogroup O1, serotype *Inaba*. The mean age of confirmed cases was 11.02 years ranging from 10 months-35 years. 70% (7/10) were male.

On 14 March 2007, 12 stool samples were collected by MSF-Spain from **Xayat hospital**. Five samples were confirmed with *V. cholerae*, serogroup O1, serotype *Inaba*. The mean age of confirmed cases was 8.70 years ranging from 2-40 years. 60% (3/5) were male.

In both cases, the *Vibrio* was resistant to Nalidixic acid, Chloramphenicol, and Cotrimoxazole, intermediate sensitive to Ciprofloxacin and Norfloxacin while sensitive to Tetracycline.

## 5 Outbreak Control Task Force

Weekly Outbreak Task Force (**OTF**) meetings are held in the Somalia Support Secretariat in Nairobi, chaired by WHO and attended by NGOs working in Somalia (CISS/SHSC, MERLIN, MDM, SACOD, MCA, UNOCHA, FSAU, MSF-SPAIN, IFRC, COSV, UNICEF, NARDO-RUDO, CISP, ICRC). One of the key issues discussed in the latest meeting was the criteria to open additional centres such as Cholera Treatment Centres (CTCs) or Oral Rehydration Therapy centres (ORT).

CTCs are activated as per different criteria. Some organizations find a certain number of cases attending the existing health facilities sufficient, while others apply operational criteria, which have been established by the task force in Mogadishu, based on field experience since 1994. According to these criteria, 5 confirmed samples (tested by an independent laboratory) which are not related to each other, on a daily basis, for 3 days are needed to open a CTC. Declaring a cholera outbreak as well as opening additional facilities to respond to an outbreak may have both political and economic implications.

CTCs are more adequate to respond to outbreaks in urban areas as the presence of health centres facilitates timely availability of information, and preventive measures can be taken before the peak of cases and deaths. For rural areas, the rapid deployment of mobile clinics/teams can be helpful, especially in chlorination of drinking water, provision of supplies such as ORS to mild/moderate cases and the referral of severely affected patients to bigger health centres or hospitals. MSF-Spain will open a CTC on the 24<sup>th</sup> of March, while ACF has not opened their CTC yet.

Due to roadblocks in Mogadishu, transport of supplies to the health centres has been very challenging and costly. WHO is planning to support an NGO in the establishment of a warehouse in Lower Shabelle so that supplies can be distributed more efficiently and effectively.

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<sup>4</sup> The organism responsible for causing cholera is *Vibrio cholerae* serogroup O1 of which there are 2 biotypes, Classical and El Tor. The biotypes are further split into serotypes *Inaba*, *Ogawa* and (rarely) *Hikojima*. If *Hikojima* serotype is confirmed, all 3 serotypes of *Vibrio cholerae* are present during the ongoing outbreak.

All health partners agree that an assessment of the overall situation needs to be organized to determine the magnitude of the problem and to provide objective criteria for the provision of necessary supplies.

On 15 March, a Cholera Task Force meeting was held in WHO Baidoa office with MOH and NGOs to discuss the cholera preparedness plan which was prepared in January 2007; to update the partners about the current situation; to set up data information sharing and reporting mechanisms; and to start social mobilization activities. A Cholera Treatment Centre (CTC) was opened in Baidoa hospital. The World Food Programme (WFP) has been requested to assist with food supplies for the health workers.

A team of 25 volunteers from the Somalia Red Cross Society (SRCS) distributed 700 Oral Rehydration Salts (ORS) sachets and conducted a social mobilization campaign in Isha and H/wadag (Baidoa).

World Vision (WV) organized social mobilization teams and distributed 600 ORS sachets in Derdal, in Baidoa town and rural areas around Baidoa. They have requested chlorine to purify drinking water in the shallow wells in the rural areas.

WHO provided ORS sachets and IV fluids to the Deeg-Roor Medical Organization (DMO). UNICEF has additional cholera kits and ORS in stock in Baidoa. WHO stockpiled 1 complete cholera kit for the CTC.

The current outbreak provides a large number of lessons learned for all agencies working in health in Somalia. Necessary preventive measures before the beginning of the dry season have not been taken, such as the chlorination of major wells, surveillance for early detection of AWD cases, and the establishment of a laboratory specimen referral system to collect samples from suspected cases for laboratory confirmation.



In General, Cholera remains a global threat and is one of the key indicators of social development. While the disease no longer poses a threat to countries with minimum standards of hygiene, it remains a challenge to countries where access to safe drinking water and adequate sanitation cannot be guaranteed.

The World Health Organization (WHO) reports that 20% of the world's populations don't have enough drinking water. Ensuring an adequate supply of water is often more important than the quality of water, when it comes to directly affecting people's health. Without enough water, personal hygiene is difficult and water-borne diseases are more prevalent. The frequent washing of hands with soap and water can reduce diarrheal disease transmission by one-third. Sanitation facilities are significantly worse: 40% of the world's population (2.5 billion people) don't have improved sanitation facilities.