



Cholera in Zimbabwe: Epidemiological Bulletin Number 12 Week 9 (22-28 February 2009)

Foreword

This is the 12th epidemiological bulletin to be issued since the onset of a countrywide Zimbabwe cholera epidemic first reported in August, 2008. Bulletins are to be published weekly to coincide with the end of an epidemiological week (Sunday to Saturday). Daily cumulative caseload updates are posted on the OCHA website <http://ochaonline.un.org/Default.aspx?alias=ochaonline.un.org/zimbabwe>

The bulletin provides a weekly overview of the epidemic in Zimbabwe, including province by province data, to inform and improve the continuing public health response. It also provides guidance to agencies on issues relating to data collection, analysis and interpretation, and suggests operational strategies on the basis of epidemiological patterns so far.

The WHO Team welcomes feedback and data provided by individual agencies. Given the scope of this epidemic, errors and omissions are inevitable: we will be grateful for any information that helps to rectify these.

Please send any comments and feedback to the Cholera Control and Command Centre
Email: Cholera_Taskforce@zw.afro.who.int.

Toll free number for alert by district and province is **08089001** or **08089002** or **08089000**
Mobile number for alerts is **0912 104 257**

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1. Outbreak summary

Since August 2008, 56 districts (out of 62) have experienced cases at one point in time. At the end of week 9 (28 February 2009), the total number of cases reported since the start has reached 85,149 with 3,936 deaths, leading to a global crude case fatality ratio (CFR) of 4.6%.

From 22-28 February 2009, a total of 4,095 suspected cholera cases have been reported to the World Health Organization (WHO) through the Ministry of Health and Child Welfare's (MoHCW) surveillance Department. This weekly count represents an average of 585 new suspected cases reported per day and a 25% decrease in caseload as compared to the prior week (5,471 cases during week 8 after adjustment).

A total of 135 deaths have been reported (average 19/day) representing a 42% decrease in the deaths count as compared to the prior week (235 deaths during week 8).

The weekly case-fatality ratio (CFR)¹, based on reported deaths and cases decreased from 4.3% last week to 3.3 %: The institutional CFR improved, decreasing from 1.7% to 1.4%. The proportion of community deaths continues to be high with 58.5% this week.

A total of 448 Cholera Treatment Centers (CTC) and Cholera Treatments Unit (CTU) have been reported to have been established at one point in time, of which 329 are believed to be active as of 28 February 2009.

Although still low, the frequency of daily reporting has improved over the past two weeks. Zero reporting is now occurring more frequently. The timeliness of weekly reporting has also improved.

In conclusion, this week has seen a confirmation of the declining trend of new cholera cases reported at the national level. However, two provinces, Mashonaland East and Midlands, have reportedly faced an increasing caseload during week 9 as compared to week 8. There is a need to remain alert as heavy rains have restarted. An increasing case load is likely to reoccur at the local and district level.

Continuous efforts are required to decrease the institutional case fatality ratio (i-CFR) in Mashonaland East and Central. Elsewhere, efforts are required to keep the i-CFR as close as possible to 1%.

The proportion of community death is still appalling in Midlands, Mashonaland East and Manicaland.

¹ the proportion of cases that die of the disease during the time period (here the week)

2. National Overview

2.1. Cases and deaths

Suspected cholera cases continue to be reported from all 10 provinces. A total of 56 districts were affected so far (90% of 62 districts affected). Outbreaks are localized by province.

From 15-21 February 2009 (week 7)

- 4,095 new suspected cholera cases were reported representing a 25% decrease compared to week 8 (total caseload during week 8: 5,471, after adjustment of reports from Mont Darwin. (Figure 1, 2 and Map 1)
- 135 new deaths were reported representing a 42 % decrease (235 deaths week 8 after adjustment) (Map 2).
- The most affected provinces in terms of weekly caseload were Mashonaland Central (828), Midlands (762) and Masvingo (729).
- The overall number of reported cases from Harare province was higher than during week 8. However, batch reporting during week 9 including some back reports from week 8 in Chitungwiza and given the low level of reporting from Chitungwiza this week again, the overall caseload in Harare province during week 9 cannot be compared with prior weeks, based on the data received (Figure 2).

Figure 1

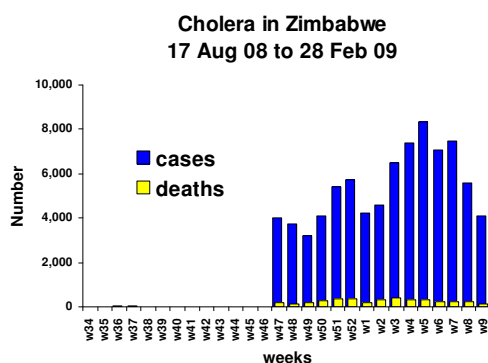
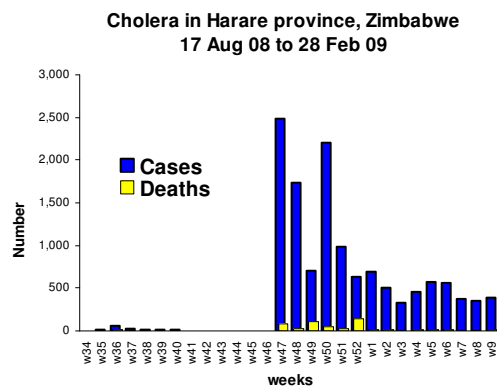
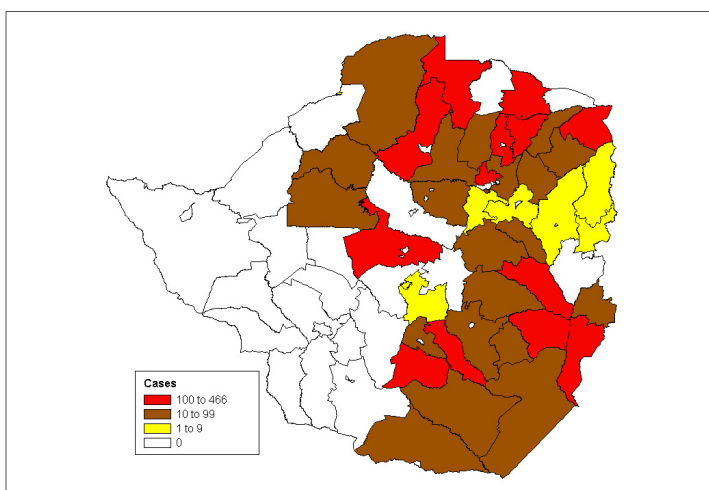


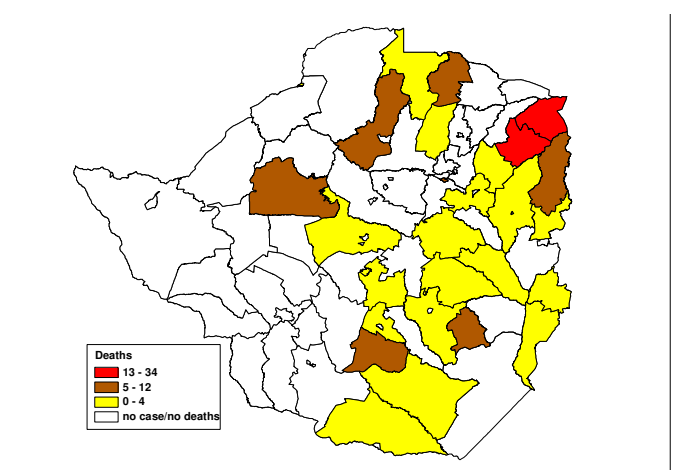
Figure 2



Map 1: New cases by district, week 9



Map 2: New deaths by district, week 9



2.2. Mortality

2.2.1. Differential deaths count

Community deaths are defined here as deaths suspected from cholera which occur outside of health facilities. The number of community deaths can reflect how well the population is being covered by the CTC/CTUs. However, interpretation of this figure must be made with caution since verbal autopsies are rarely done to confirm cause of death: some community deaths may not be caused by cholera. Reports of community deaths are not available from all provinces.

This week, the percentage of community deaths decreased from 61% (143/234) to 58.5% (79/135) (table 1).

Table 1. Proportion of deaths outside cholera treatment centers, week 22-28 February 2009

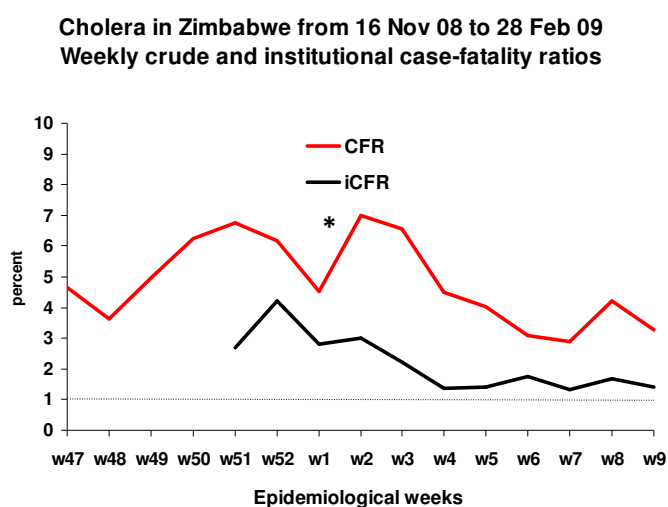
Province	Number of deaths	Number of community deaths	Proportion of community death (%)
Harare city	4	1	25
Chitungwiza	10	0	0
Bulawayo	0	0	-
Mashonaland Central	16	0	0
Mashonaland East	57	47	82
Mashonaland West	13	8	62
Manicaland	12	11	92
Masvingo	12	4	33
Matebeleland North	0	0	-
Matebeleland South	0	0	-
Midlands	11	8	73
Total	135	79	59

*for Harare, deaths outside CTC are irregularly/not reported

2.2.2. Case fatality ratios (CFR)

The institutional Case Fatality Ratio² dropped from 1.7% to 1.4 % and the crude CFR from 4.3 to 3.3% (fig.3)

Figure 3



* Probable under reporting of cases and deaths during week 1 (28 Dec08-3Jan 09) during the holiday period

² iCFR: estimation of the institutional CFR is based on the assumption that deaths which are not reported as being community deaths occurred at institution level (proxy meant for monitoring of case-management efforts at institutional level).

This week, at the provincial level, the crude CFR, was still above 5% in Chitungwiza (19.1%) and Mashonaland East (12.1%). A total of 11 districts had a crude CFR>5% (map 3).

The institutional CFR was above 1% in Mashonaland East (2.4%), Mashonaland Central (1.9%) Mashonaland West (1.2%) and in Masvingo (1.1%).

2.3. Cholera treatment centres (CTC and CTU)

To respond to the outbreak, a total of 448 Cholera Treatment Centres (CTC/CTU) have at one point been set up around the country, including 329 structures thought to be operating as of 28 February 2009 (Map 3, Table 2 and 3).

Map 3. Location of all the cholera treatment centers (CTC and CTU) as of 28 February 2009

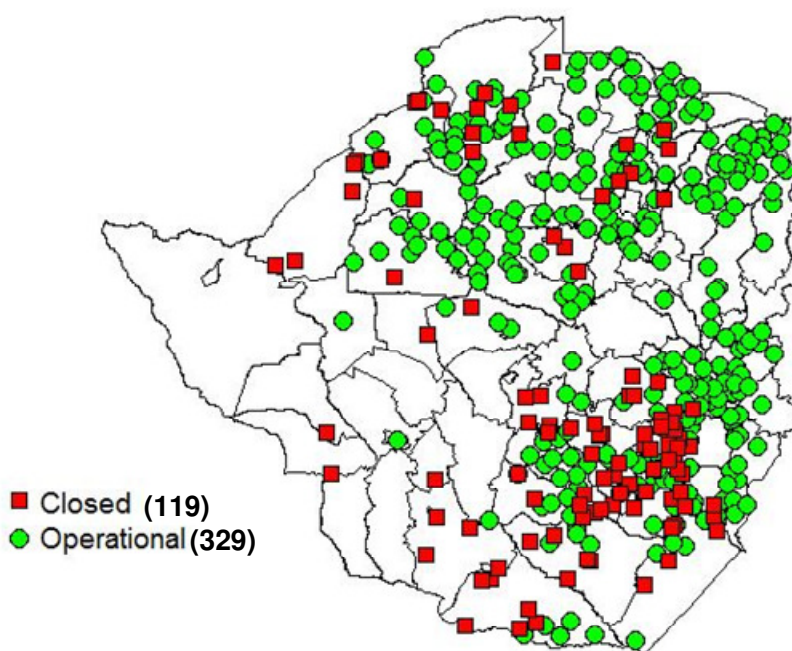


Table 2. Number of CTC/CTU by province and status since the start of the epidemic as of 28 February 2009

PROVINCE	Total opened since start	CTC/CTU closed as of 28 Feb 2009	CTC/CTU operational as of 28 Feb 2009
Bulawayo	1	0	1
Harare	3	0	3
Manicaland	65	0	65
Mashonaland Central	54	11	43
Mashonaland East	40	0	40
Mashonaland West	93	15	78
Masvingo	125	65	60
Matabeleland North	7	7	0
Matabeleland South	18	12	6
Midlands	42	9	33
Total	448	119	329

Table 3. Number of CTC/CTU reported to be active per province, and average patients treated week 9

Area / Province	New reported cases during week 7			Operative CTC	Average cases treated per CTC	
	Total	Community Death	Treated in CTC*		for all Week 9	by day of week 9
Harare city	338	1	337	2	168.5	24
Chitungwiza	52	0	52	1	52	7.4
Bulawayo	0	0	0	1	0	0
Manicaland	456	11	445	65	7	1
Mashonaland Central	828	0	828	43	19	2.7
Mashonaland East	471	47	424	40	11	1.6
Mashonaland West	423	8	415	78	5	0.7
Masvingo	729	4	725	60	12	1.7
Matabeleland North	0	0	0	0	-	-
Matabeleland South	36	0	36	6	6	0.9
Midlands	762	8	754	33	23	3.3
Total	4,095	79	4,016	329	12	1.7

* Cases treated in CTC = All cases - cases resulting in community deaths

2.4. Surveillance findings by province

2.4.1. Attack rates

From 22-28 February 2009 the **most affected provinces** in terms of weekly attack rates in cases per 100,000 inhabitants were: Mashonaland Central (AR:78), Masvingo (AR:52) and Midlands (52). (Table 4).

Table 4. Cholera cases reported week 7 and since August 2008 and attack rate (AR) per 100,000 inhabitants by provinces, Zimbabwe, as of 28 February 2009*

Provinces	Affected Population ^(a)	Number of cases		AR per 100,000	
		22-28 Feb 09	Cumulative	Weekly	Cumulative
Harare ^(b)	1,891,700	390	15,746	21	832
Bulawayo ^(c)	718,278	0	439	0	61
Manicaland	1,665,451	456	11,834	27	711
Mashonaland Central	1,056,665	828	8,845	78	837
Mashonaland East	1,317,855	471	5,984	36	454
Mashonaland West	1,300,012	423	18,581	33	1,429
Masvingo	1,401,672	729	10,710	52	764
Matabeleland North	351,260	0	1,113	0	317
Matabeleland South	331,096	36	5,231	11	1,580
Midlands	1,464,537	762	6,666	52	455

(a) Cumulating population of affected district only; (b) Includes Harare city and Chitungwiza

(c) The cumulative case count for Bulawayo was down sized week 9 compared to week 8.

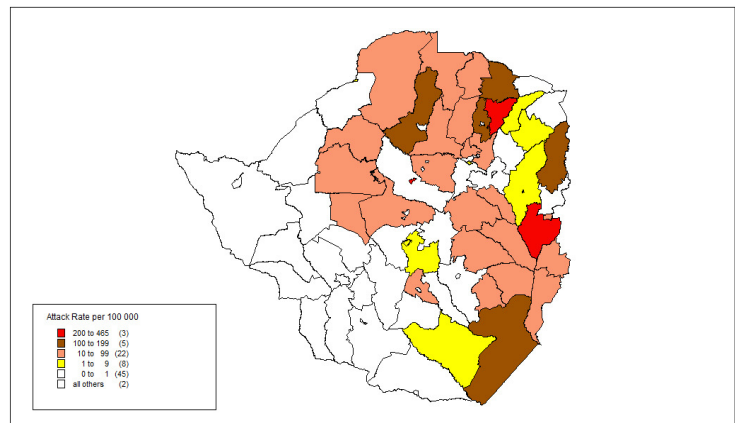
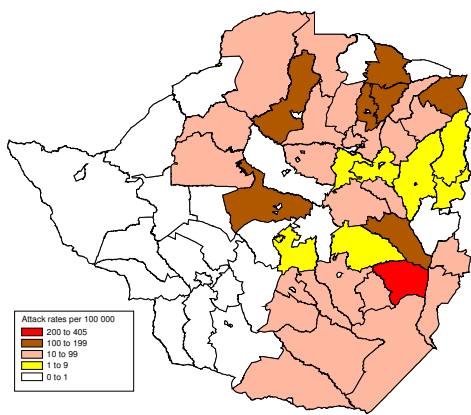
At district level, 8 districts had a weekly attack rate above 100/100,000 inh (map 4). They were

- Masvingo province: Bikita (280)
- Midlands province: Kwekwe (141)
- Mashonaland Central province: Bindura (153), Mont Darwin (143), Shamva (147)
- Mashonaland East province: Mudzi (110)
- Mashonaland West province: Makonde (118)
- Manicaland province: Buhera (109)

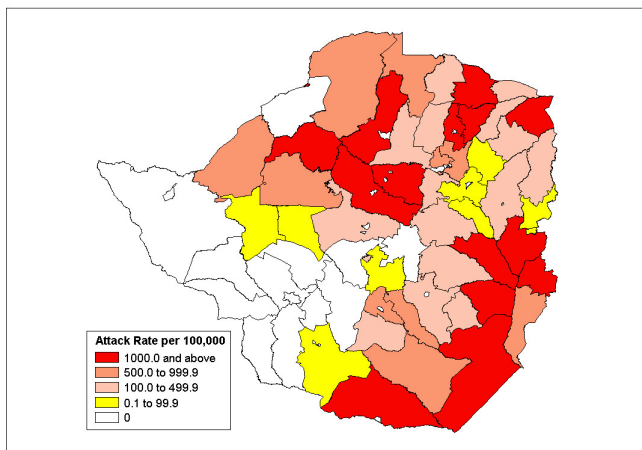
Map 4. Weekly attack rates (cases/100,000)

Week 9

Week 8



Cumulative attack rates



2.4.2. Data validity and epidemic dynamic

Timeliness and completeness

During week 8, as during other weeks, the percentage of missing daily reports decreased from 51 to 41% (168/413) (Table 5).

Table 5: Number and percentage of missing daily reports by province, during w8 and w9

Provinces / districts	Expected*	Missing Week 08		Missing Week 09	
	(N)	(N)	%	(N)	%
Chitungwiza	7	6	86	6	86
Harare City	14	0	0	0	0
Bulawayo	7	1	14	2	29
Mashonaland Central	56	29	52	27	48
Mashonaland East	70	47	67	35	50
Mashonaland West	56	22	39	27	48
Manicaland	56	37	66	37	66
Matabeleland North	21	17	81	9	43
Matabeleland South	21	1	5	0	0
Masvingo	49	34	69	16	33
Midlands	56	15	27	9	16
TOTAL	413	209	51	168	41

* expected reports from districts / areas which have notified suspected cholera cases since Aug 08

As of 28 February 2009, 83% out of 59 reporting units have sent their last daily report within the past 48 hours (Table 6) compared to 75% last week. In provinces facing the highest caseload, this percentage was above 80%: Mashonaland Central (88%), Midlands (100%) and Masvingo (100%).

Table 6: Number days from last daily report to 28 February 2009

Reporting Province And districts		reporting on last day of week		1 to 2 days Since last report		3 to 6 days since last report		≥ 7 days since last report	
Name	N	N	%	N	%	N	%	N	%
Chitungwiza	1	0	0	0	0	1	100	0	0
Harare City	2	2	100	0	0	0	0	0	0
Bulawayo	1	1	100	0	0	0	0	0	0
Mashonaland Central	8	4	50	3	38	1	13	0	0
Mashonaland East	10	2	20	8	80	0	0	0	0
Mashonaland West	8	4	50	3	38	0	0	1	13
Manicaland	8	0	0	1	13	7	88	0	0
Matabele North	3	3	100	0	0	0	0	0	0
Matabele South	3	3	100	0	0	0	0	0	0
Masvingo	7	4	57	3	43	0	0	0	0
Midlands	8	7	88	1	12	0	0	0	0
Total	59	30	51	19	32	9	15	1	2

Trends Districts where the trend is to increase are found in map 6 and table 7

Trend in incidence of cholera cases in week 9 compared to week 8

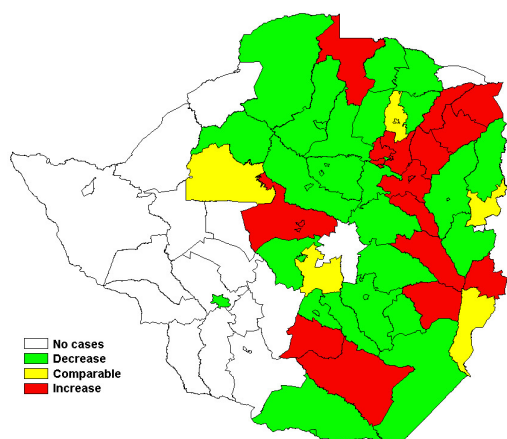


Table 7: Comparative number of cases in selected districts where an increase was observed week 9 compared to week 8

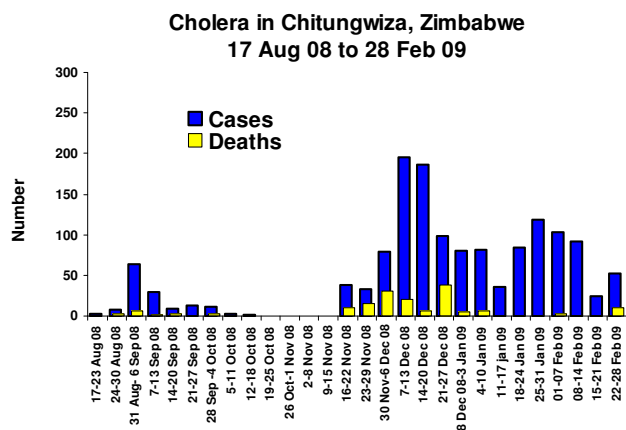
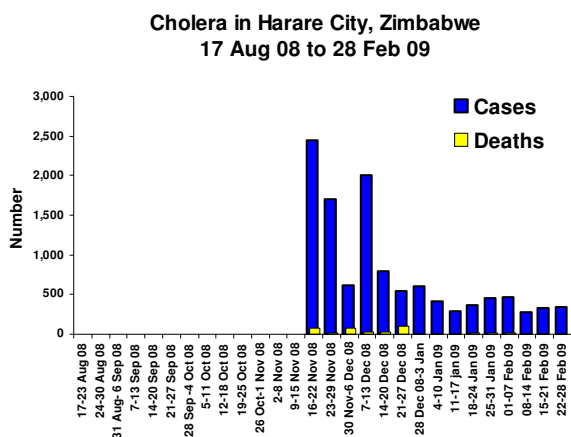
Province	District	W 9	w8	Batch reporting w9
Harare	Chitungwiza	52	24	X
	Harare city	329	323	
Mash Central	Bindura	243	231	
	Guruve	103	94	
Mash East	Goromonzi	98	52	
	Hweda	16	11	
	Marondera	5	3	
	Mudzi	149	0	
	Murehwa	19	0	
	Mutoko	72	5	
Manicaland	UMP	77	8	
	Buhera	254	192	X
	Chimanimani	77	39	X
Masvingo	Mutasa	1	0	
	Bikita	468	135	
	Mwenezi	18	11	
Midlands	Kwekwe	426	49	X
	Mberengwa	113	0	

Batch reporting overlapping with week 8 occur for Chitungwiza, Midlands (Kwekwe), Manicaland (Buhera, Chimanimani and Chipinge) challenging trend interpretation. However, globally, there has been a decrease in the count of cases and the number of deaths reported at the national level. The trend was to the increase in Midlands and Mashonaland East provinces, but the size of the increase in caseload in Midlands needs to be re-assess (figure 4).

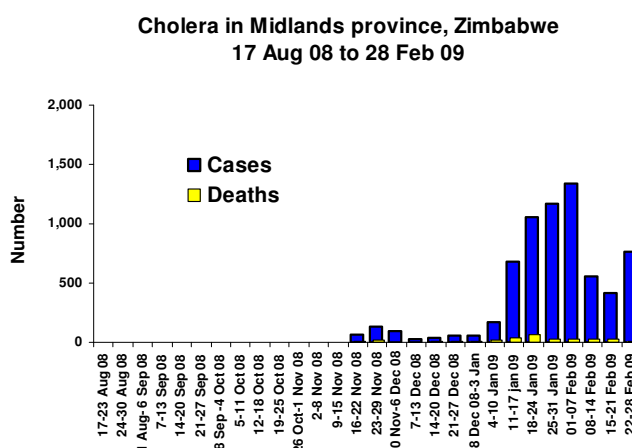
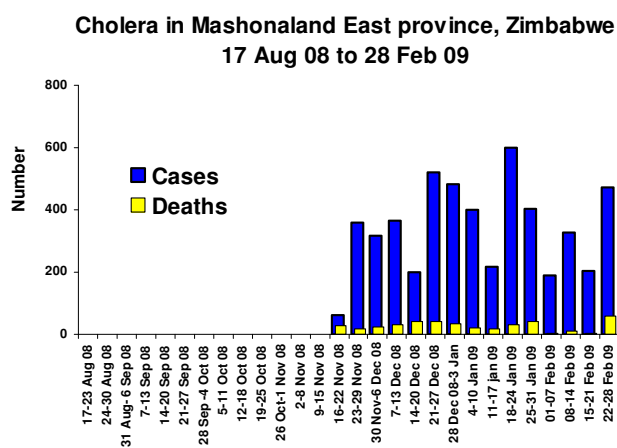
The caseload in Harare province seems again to be on the increase, but is difficult to quantify based on the data received, since under reporting at least from Chitungwiza challenges data interpretations.

Figure 4. Weekly cases and deaths count by province

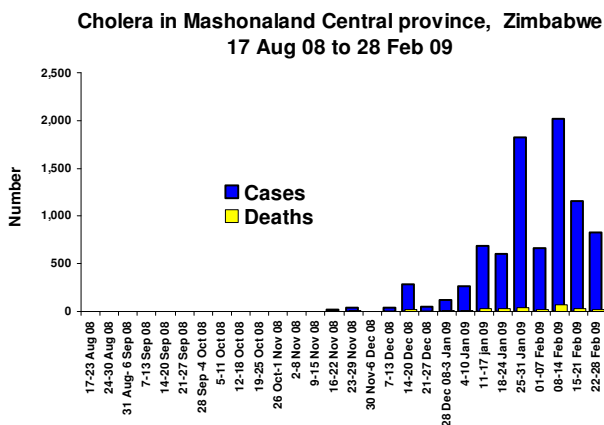
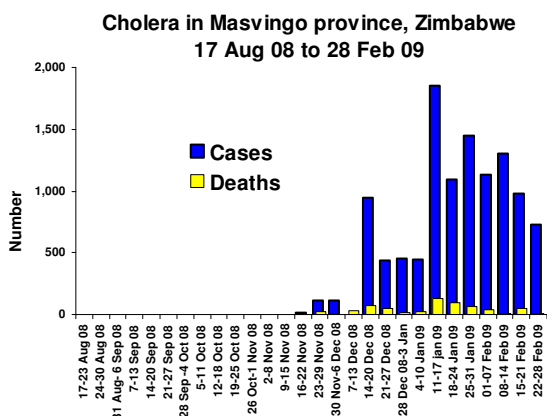
Harare province (note the difference in scales)



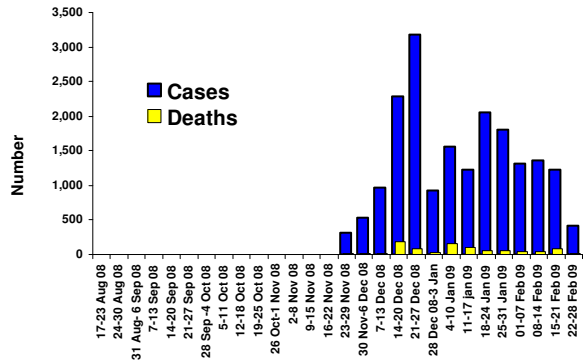
Provinces facing an increase in weekly case count (note the difference in scales)



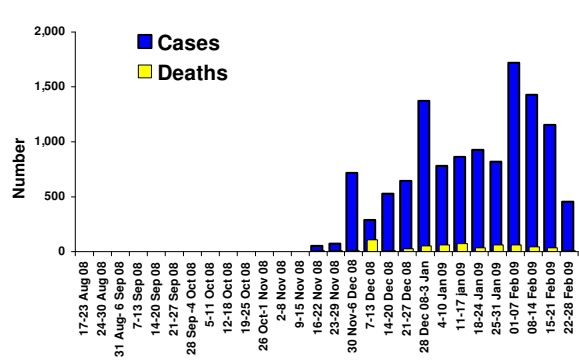
Provinces with decreasing trend (note the difference in scales)



Cholera in Mashonaland West province, Zimbabwe
17 Aug 08 to 28 Feb 09

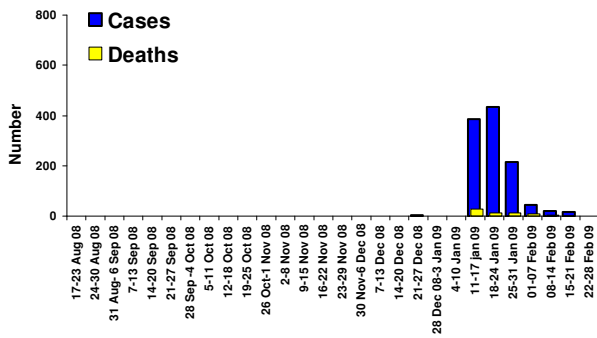


Cholera in Manicaland province, Zimbabwe
17 Aug 08 to 28 Feb 09

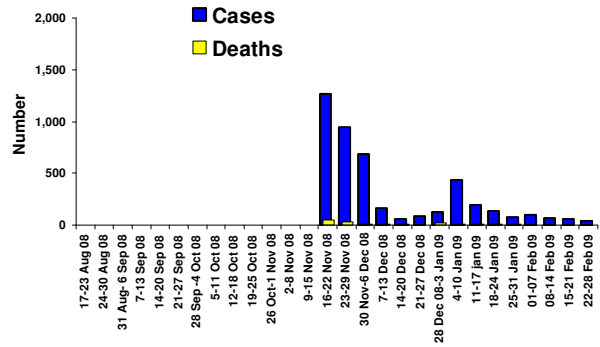


Provinces with low caseload (note the difference in scales)

Cholera in Matabeleland North province, Zimbabwe
17 Aug 08 to 28 Feb 09



Cholera in Matabeleland South province, Zimbabwe
17 Aug 08 to 28 Feb 09



Cholera in Bulawayo province, Zimbabwe
17 Aug 08 to 28 Feb 09

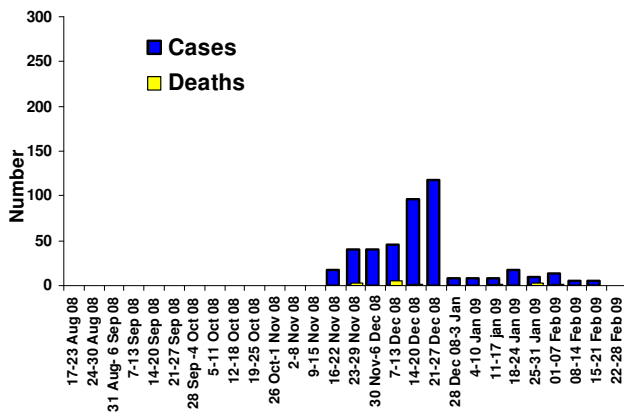


Table 8. Trends in cases and deaths by province, with comments on affected districts

Province	Cases			Deaths			Higher caseload this week	Comments
	This week	Last week	Trend	This week	Last week	Trend		
Bulawayo	0	5	↓	0	0	-		
Harare (City)	4	4	-	1	1	-		
Harare (Chitungwiza)	52	24	↑	10	0	-		Batched reporting overlapping with week 8 and under reporting the rest of the week
Mashonaland Central	828	1,156	↓	16	29	↓	Bindura, Darwin, Shamwa	
Mashonaland East	471	205	↑↑	57	4	↑↑	Mudzi, Gormonzi, UMP	
Mashonaland West	423	1,233	↓↓	13	82	↓↓	Makonde, Hurungwe	
Manicaland	456	1,152	↓↓↓	11	32	↓↓	Buhera, Chipinge	Batch reporting in Buhera, Chipinge and Manicaland covering part of week 8
Matabeleland North	0	15	↓↓	0	0	-	-	
Matabeleland South	36	62	↓↓	0	0	-	Beitbridge	
Masvingo	729	977	↓↓	12	52	↓↓	Bikita, Chivi	
Midlands	762	419	↑↑	11	32	↓↓	Kweke, Mberengwa, Gowke Nortn	Batch reporting in Kwekwe covering part of week 8

↑ **Increasing** ↓ **Decreasing** – **Stable**

3. Laboratory testing

Note for reader: The below results are preliminary and may be subject to further revision as further testing is being carried out

A total of 207 specimens positive for *Vibrio cholerae* were received at the National Microbiology Reference Laboratory in Harare. The majority of them (88%) were OGAWA type (Table 9).

Table 9: Distribution by district of strains of *Vibrio cholerae* received between 18 August 2008 and 27 February 2009

Province	District	N	OGAWA	INABA
HARARE	Chitungwiza	28	28	0
	Harare City	73	62	10
Mash. Central	Bindura	12	10	2
	Shamva	6	5	1
Mash. East	Goromonzi	3	3	0
	Mudzi	5	5	0
	Seke	10	10	0
Mash. West	Chegutu	9	8	1
	Makonde	27	21	6
Masvingo	Chiredzi	17	17	0
	Masvingo	2	2	0
Mata. North	Binga	10	7	3
Mata South	Beitbridge	2	2	0
TOTAL		207	182 (88%)	24 (12%)

Sensitivity testing to antibiotics allowed to identify (table10)

- **11 strains resistant to tetracycline (9 Ogawa + 2 Inaba)**
 - 2 sensitive to Doxycyclin and Ciprofloxacin but resistant Erythromycine and Nalixid acid.
 - 9 sensitive to Cotrimoxazole and Nalixidic acid but resistant Ampicillin and Chloramphenicol
 - All proceeded from patients treated in Chinoyi (Makonde district, Mash.West)
- **26 strains of intermediate sensitivity to tetracycline (22 Ogawa+4 Inaba)**
 - all sensitive to Ciprofloxacin
 - all resistant to Chloramphenical and Cotrimoxazole
 - (21) 81% sensitive to Ampicilin
 - 2 (8%) resistant to Ampicillin and Chloramphenicol and Nalixidic a. but ciprofloxacin sensitive
 - Proceeding from patients treated in
 - Mashonaland West: Chinoyi (3) Chegutu (1)
 - Masvingo: Masvingo(2), Chiredzi (17)
 - Matabeleland South: Beitbridge (1)
 - Mashonaland East: Epworth (1)
 - Bulawayo (1)
- **10 strain resistant to Erythromycin (15% of all tested)**
 - All were sensitive to Ciprofloxacin and Doxycyclin
 - None were tested for Ampicillin, Chloramphenicol or Cotrimoxazol
 - On 10 tested for Tetracycline, 8 were sensitive+2 resistant
 - On 6 tested for Nalixidic acid, all were resistant
 - Proceeded from patient treated in Bridh, Harare (6) and from Chinoyi, Makonde district, Mashonaland.West (4).

Table 10: Sensitivity testing of strains of *Vibrio cholerae* received between 18 August 2008 and 27 February 2009

Antibiotic tested	Number of specimen tested	Sensitive		Intermediate		Resistant	
		N	%	N	%	N	%
Ampicilline	139	101	73	0	0	38	27
Chloramphenicol	165	67	41	0	0	98	59
Cotrimoxazole	139	43	31	0	0	96	69
Tetracycline	207	170	82	26	13	11	5
Doxycycline	36	36	100	0	0	0	0
Nalixidic acid	195	78	40	0	0	117	60
Ciprofloxacin	165	165	100	0	0	0	0
Erythromycin	68	58	85	0	0	10	15
Azithromycin	33	33	100	0	0	0	0

In summary

- Tetracycline sensitivity testing
 - 5% resistant to Tetracycline and 13% intermediate sensitivity were found
 - Resistant strain to Tetracycline also tested for Doxycyclin were sensitive at 94% (34/36)
 - Tetracycline resistant strain proceeded from Mashonaland West and strain
 - Intermediary sensitivity to Tetracycline found in several other provinces (table 8)
 - Strains with intermediary sensitivity to Tetracycline were not tested for Doxycyclin
- Sample size still too low to get a true picture by district

4. Activities carried out by the C4

The workshop carried out in Bindura with Environmental Health Officers (EHO) from each district of Mashonaland Central province in order to refresh knowledge on infection control in CTCs was replicated for EHO from Masvingo and Midlands. It will be carried out this week in Manicaland and next week in Mashonaland West and East.

5. Discussion

5.1. Interpretation

Although under-reporting, late and batch reporting was still occurring this week, data completeness has improved compared to last week. The declining trend is continuing, except for two provinces, Mashonaland East and Midlands, where a new increase has been observed. The situation in Harare Province remains unclear due to persisting under reporting from Chitungwiza district.

Continuous efforts are required to decrease the institutional case fatality ratio (i-CFR) in Mashonaland East and Central. Elsewhere, continuous efforts are also required to keep the i-CFR as close as possible to 1%.

The proportion of community death is still appalling in Midlands, Mashonaland East and Manicaland.

Heavy rains have restarted and there is a need to remain alert since an increasing case load is likely reoccur at the local and district level.

With regard to sensitivity to antibiotics, results suggest that cyclines are still efficient in most provinces of the country and the national protocol for treatment of severe cases with Doxycycline (adults) or Erythromycin (children) is still applicable in most areas. Further sensitivity testing is needed throughout country to get a clearer picture of the sensitivity pattern. There is also a need to further document the sensitivity pattern in Mashonaland West, where most resistant strains were identified. Finally, systematic specimen testing for their sensitivity to Doxycyclin and Erythromycin is recommended.

5.2. Provinces needing special attention this week

- **Under or late reporting:** Chitungwiza and Manicaland
- **Increasing trend:** Chitungwiza, Midlands, Mashonaland East.
- **Higher case load:** Chitungwiza, Midlands, Mashonaland Central, Masvingo
- **Case fatality ratios :**
 - High CFR in Chitungwiza and Mashonaland East
 - High i-CFR in Mashonaland East and Central.
 - Higher percentage in community deaths in Midlands, Mashonaland East and Manicaland.

Acknowledgements

We are very grateful to MoHCW District Medical Officer, Provincial surveillance officers, especially Provincial Medical Director and Environmental Health Officer, and MoHCW's department of surveillance, who have helped to gather and transmit the bulk of the information presented here.

Likewise, we acknowledge agencies, including members of the Health and WASH clusters, who have kindly shared their data with our team.

MoHCW has recognized and thanked the efforts made by NGOs assisting in the response and providing support to MoHCW cholera treatment centres (MoHCW – 16/12/2008).

This document would not have been possible without the contributions of the WHO data management team, who are part of the C4 Cholera Command and Control Center.

6. Appendix 1: Case definition

The cholera control guidelines for Zimbabwe state that the definition of suspected cholera cases is "in an area where there is a cholera epidemic, a patient aged 2 years or more develops acute watery diarrhoea, with or without vomiting". A confirmed cholera case is "when *Vibrio cholerae* is isolated from any patient with diarrhoea". This is adapted/modelled after the WHO case definition for cholera.

Including all ages in the case definition somewhat reduces specificity (i.e. more non-cholera childhood diarrhoea cases are included), but essentially does not impede meaningful interpretation of trends. However, teams should monitor any shift in the age distribution of cases, which might indicate a changing proportion of non-cholera cases among patients seen.

7. Appendix 2: Cholera in Zimbabwe: Suspected cases, deaths, AR, CFR week 6 to 8, 2009

Province	District	Total Population	w7				W8				W9			
			08.02.2009 - 14.02.2009				15-21 Feb 09				15-21 Feb 09			
			Cases	Deaths	AR/100,000	CFR(%)	Cases	Deaths	AR/100,000	CFR(%)	Cases	Deaths	AR/100,000	CFR(%)
Harare	Chitungwiza	343,147	92	0	27	0.0	24	0	7	0.0	52	10	15	19.2
	Harare	1,548,553	280	1	18	0.4	323	4	21	1.2	338	4	22	1.2
	Total	1,891,700	372	1	20	0.3	347	4	18	1.2	390	14	21	3.6
Bulawayo	Bulawayo urban	718,278	5	0	1	0.0	5	0	1	0.0	0	0	0	#DIV/0!
Mashonaland Central	Bindura	150,981	154	5	102	3.2	243	6	161	2.5	231	4	153	1.7
	Centenary	114,407	8	0	7	0.0	34	3	30	8.8	0	10	0	#DIV/0!
	Guruve	196,699	382	22	194	5.8	94	3	48	3.2	103	0	52	0.0
	Mazowe	206,919	12	0	6	0.0	88	1	43	1.1	38	0	18	0.0
	Mt Darwin	212,291	884	30	416	3.4	452	6	213	1.3	303	1	143	0.3
	Rushinga	71,320	93	6	130	6.5	0	0	0	-	0	0	0	-
	Shamva	104,048	483	9	464	1.9	245	10	235	4.1	153	1	147	0.7
Total	1,056,666	2,016	72	191	3.6	1,156	29	109	2.5	828	16	78	1.9	
Mashonaland East	Chikomba	127,646	31	0	24	0.0	107	0	84	0.0	26	0	20	0.0
	Goromonzi	188,890	95	0	50	0.0	52	0	28	0.0	98	2	52	2.0
	Hwedza	75,025	4	0	5	0.0	11	0	15	0.0	16	2	21	12.5
	Marondera	164,193	3	1	2	33.3	3	0	2	0.0	5	0	3	0.0
	Mudzi	136,059	126	2	93	1.6	0	0	0	-	149	14	110	-
	Murehwa	172,144	0	0	0	-	0	0	0	-	19	0	11	-
	Mutoko	140,405	24	5	17	20.8	5	0	4	-	72	34	51	-
	Seke	202,739	45	0	22	0.0	19	1	9	5.3	9	1	4	11.1
	UMP	110,755	0	1	0	-	8	3	7	37.5	77	4	70	5.2
	Total	1,317,855	328	9	25	2.7	205	4	16	2.0	471	57	36	12.1
Mashonaland West	Chegut	239,009	164	3	69	1.8	107	3	45	2.8	79	3	33	3.8
	Hurungwe	329,584	337	15	102	4.5	237	13	72	5.5	87	3	26	3.4
	Kadoma	250,766	372	8	148	2.2	534	16	213	3.0	0	0	0	#DIV/0!
	Kariba Mahombekombe	25,285	1	0	4	0.0	2	0	8	0.0	2	0	8	0.0
	Kariba Rural	37,126	30	3	81	10.0	1	2	3	0.0	0	0	0	0.0
	Makonde	183,898	204	7	111	3.4	268	36	146	13.4	217	5	118	2.3
	Zvimba	234,344	246	4	105	1.6	84	12	36	14.3	38	2	16	5.3
Total	1,300,012	1,354	40	104	3.0	1,233	82	95	6.7	423	13	33	3.1	
Manicaland	Buhera	233,598	370	12	158	3.2	192	0	82	0.0	254	0	109	0.0
	Chimanimani	122,390	63	0	51	0.0	39	0	32	0.0	77	0	63	0.0
	Chipingwe	301,251	526	4	175	0.8	115	4	38	3.5	113	0	38	0.0
	Makoni	289,803	25	1	9	4.0	24	4	8	16.7	8	0	3	0.0
	Mutare	236,064	205	3	87	1.5	625	11	265	1.8	0	0	0	#DIV/0!
	Mutare City	180,953	46	3	25	6.5	26	0	14	0.0	0	0	0	#DIV/0!
	Mutasa	176,898	18	3	10	16.7	0	1	0	-	1	0	1	-
	Nyanga	124,494	176	23	141	13.1	131	12	105	9.2	3	12	2	400.0
Total	1,665,451	1,429	49	86	3.4	1,152	32	69	2.8	456	12	27	2.6	
Matebeleland North	Binga	127,391	11	2	9	18.2	0	0	0	-	0	0	0	-
	Lupane	104,738	0	0	0	-	0	0	0	-	0	0	0	-
	Nkayi	119,131	9	3	8	33.3	15	0	13	0.0	0	0	0	#DIV/0!
	Total	351,260	20	5	6	25.0	15	0	4	0.0	0	0	0	#DIV/0!
Matebeleland South	Beitbridge	110,105	55	1	50	1.8	55	0	50	0.0	36	0	33	0.0
	Gwanda	138,020	0	0	0	-	0	0	0	-	0	0	0	-
	Plumtree	82,971	15	1	18	6.7	7	0	8	0.0	0	0	0	#DIV/0!
	Total	331,096	70	2	21	2.9	62	0	19	0.0	36	0	11	0.0
Masvingo	Bikita	166,595	315	1	189	0.3	135	7	81	5.2	466	1	280	0.2
	Chiredzi	248,417	700	0	282	0.0	466	33	188	7.1	33	4	13	12.1
	Chivi	165,215	121	3	73	2.5	164	2	99	1.2	111	1	67	0.9
	Gutu	210,750	123	1	58	0.8	21	3	10	14.3	12	0	6	0.0
	Masvingo	280,196	12	1	4	8.3	97	4	35	4.1	29	0	10	0.0
	Mwenezi	134,004	35	5	26	14.3	11	0	8	0.0	18	0	13	0.0
	Zaka	196,495	0	0	0	-	83	3	42	3.6	60	6	31	10.0
Total	1,401,672	1,306	11	93	0.8	977	52	70	5.3	729	12	52	1.6	
Midlands	Chirumhanzu	74,764	2	0	3	0.0	5	0	7	0.0	0	0	0	#DIV/0!
	Gokwe North	227,546	62	6	27	9.7	199	27	87	13.6	99	1	44	1.0
	Gokwe South	311,684	171	4	55	2.3	72	3	23	4.2	72	5	23	6.9
	Gweru City (Mkoba)	149,468	17	0	11	0.0	5	0	3	0.0	3	0	2	0.0
	Kwekwe	303,094	59	2	19	3.4	49	2	16	4.1	426	0	141	0.0
	Mberengwa	194,682	14	5	7	35.7	0	0	0	-	113	5	58	-
	Shurugwi	93,828	1	0	1	0.0	2	0	2	0.0	2	0	2	0.0
	Zvishavane	109,471	232	11	212	4.7	87	0	79	0.0	47	0	43	0.0
Total	1,464,537	558	28	38	5.0	419	32	29	7.6	762	11	52	1.4	
GD TOTAL	11,498,526	7,458	217	65	2.9	5,571	235	48	4.2	4,095	135	36	3.3	

Chegut population including Norton population
 Goromonzi population including Ruwa population
 Guruve population including Mbire population
 Hurungwe population including Karoi and Chimundu populations
 Kwekwe population including Redcliff population
 Makondé population including Chinoyi population
 Makoni population including Rupase population
 Seke population including Epworth population

8. Appendix 3: Cholera in Zimbabwe. Suspected cases, deaths, AR, CFR 18 Aug08-21 Feb 09

			Cumulative since start			
			C	D	AR/100,000	CFR
Harare	Chitungwiza	343,147	2,457	166	716	6.8
	Harare	1,548,553	13,289	461	858	3.5
	total	1,891,700	15,746	627	832	4.0
Bulawayo	Bulawayo Urban	718,278	439	18	61	4.1
Mashonaland Central	Bindura	150,981	1,947	38	1,290	2.0
	Centenary	114,407	229	32	200	14.0
	Guruve	196,699	1,525	74	775	4.9
	Mazowe	206,919	454	12	219	2.6
	Mt Darwin	212,291	3,220	73	1,517	2.3
	Rushinga	71,320	225	18	315	8.0
	Shamva	104,048	1,245	33	1,197	2.7
total	1,056,666	8,845	280	837	3.2	
Mashonaland East	Chikomba	127,646	259	18	203	6.9
	Goromonzi	188,890	1,059	41	561	3.9
	Hwedza	75,025	62	5	83	8.1
	Marondera	164,193	138	9	84	6.5
	Mudzi	136,059	2,686	158	1,974	5.9
	Murehwa	172,144	163	23	95	14.1
	Mutoko	140,405	322	78	229	24.2
	Seke	202,739	781	35	385	4.5
	UMP	110,755	514	49	464	9.5
total	1,317,855	5,984	416	454	7.0	
Mashonaland West	Chegutu	239,009	3,963	193	1,658	4.9
	Hurungwe	329,584	2,900	127	880	4.4
	Kadoma	250,766	4,932	189	1,967	3.8
	Kariba Mahombekombe	25,285	337	21	1,333	6.2
	Kariba Rural	37,126	460	41	1,239	8.9
	Makonde	183,898	4,936	186	2,684	3.8
	Zvimba	234,344	1,053	79	449	7.5
total	1,300,012	18,581	836	1,429	4.5	
Manicaland	Buhera	233,598	3,183	84	1,363	2.6
	Chimanimani	122,390	1,314	72	1,074	5.5
	Chipinge	301,251	2,998	76	995	2.5
	Makoni	289,803	591	64	204	10.8
	Mutare	236,064	3,157	222	1,337	7.0
	Mutare City	180,953	106	5	59	4.7
	Mutasa	176,898	31	9	18	29.0
	Nyanga	124,494	454	71	365	15.6
total	1,665,451	11,834	603	711	5.1	
Matabeleland North	Binga	127,391	1,077	52	845	4.8
	Lupane	104,738	2	0	2	0.0
	Nkayi	119,131	34	9	29	26.5
	total	351,260	1,113	61	317	5.5
Matabeleland South	Beitbridge	110,105	5,127	149	4,656	2.9
	Gwanda	138,020	74	9	54	12.2
	Plumtree	82,971	30	1	36	3.3
	total	331,096	5,231	159	1,580	3.0
Masvingo	Bikita	166,595	2,504	167	1,503	6.7
	Chiredzi	248,417	4,109	146	1,654	3.6
	Chivi	165,215	1,433	134	867	9.4
	Gutu	210,750	302	14	143	4.6
	Masvingo	280,196	871	62	311	7.1
	Mwenezi	134,004	762	54	569	7.1
	Zaka	196,495	729	60	371	8.2
Total	1,401,672	10,710	637	764	5.9	
Midlands	Chirumhanzu	74,764	56	2	75	3.6
	Gokwe North	227,546	2,490	121	1,094	4.9
	Gokwe South	311,684	1,651	64	530	3.9
	Gweru City (Mkoba)	149,468	236	5	158	2.1
	Kwekwe	303,094	866	38	286	4.4
	Mberengwa	194,682	421	33	216	7.8
	Shurugwi	93,828	31	8	33	25.8
	Zvishavane	109,471	915	28	836	3.1
Total	1,464,537	6,666	299	455	4.5	
GD TOTAL		11,498,526	85,149	3,936	741	4.6

Chegutu population including Norton population
 Goromonzi population including Ruwa population
 Guruve population including Mbire population
 Hurungwe population including Karoi and Chimundu populations
 Kwekwe population including Redcliff population
 Makondé population including Chinoyi population
 Makoni population including Rupase population
 Seke population including Epworth population