West African Ebola Outbreak

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Abstract

Graphical summary of recent data concerning the ongoing outbreak of Ebola virus disease in west Africa.

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1 Ebola Outbreak Data Tables

This document consists of public data published by the World Health Organization (WHO) visualized in a variety of charts. It is hoped that this alternate way of looking at the data may prove useful. The current intent is to update this site on a weekly basis. Typically, each Wednesday data is formally released for the prior epidemiological week. The WHO considers the epidemiological week to run from Monday through Sunday.

We intend to maintain this document until the ongoing west African epidemic of Ebola virus disease (EVD) is brought under control.

The tables found in this section contain the data from which the subsequent charts are generated. Table contents are organized according to the current WHO protocol which segregates statistics of countries with widespread transmission of Ebola (Table 1) from statistics of countries with more localized transmission of the disease (Table 2 and Table 3). Each table's totals only reflect the countries residing in the table.

As of 11-Jan–15, 21,296 cases of EVD and 8,429 deaths are associated with the outbreak.

The primary data are published by the World Health Organization under the nomenclature disease outbreak news, situation reports, and situation summaries. Operationally, early data are contained in the publications labeled "disease outbreak news" and more recent data are contained in publications labeled "situation reports" and "situation summaries". The disease outbreak news reports appear to be topical and intermittent. Early data concerning the outbreak were of this nature. The first situation report was published 29-Aug–14. The situation reports are more systematic and document the status of the global outbreak and the WHO's response to it. Situation reports were originally distributed as PDF files. More recently, they are published as both web pages and PDF files. Situation summaries, the latest communication device, first published on 14-Nov–14. They provide data tables with no analysis. Currently, the weekly data release is accompanied by a situation report and a situation summary. Interim or midweekly data releases are limited to a situation summaries.

The dates referenced in these tables are the cutoff dates associated with the data in a report, not the date the document was published. The cutoff dates for all countries in a report are not always consistent. Often data from Liberia lags that of other countries. Be that as it may, we use the primary date for each data snapshot as specified by the WHO.

2 Overall Scope of the Outbreak

The charts presented in this section aggregate incidence data from countries Liberia, Sierra Leone, and Guinea during the current west African Ebola outbreak. They provide an indication of the overall impact of the disease.

Table 1: Ebola Outbreak in Countries With Widespread Transmission

Date	Liberia		Sierra Leone		Guinea		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
1-Aug-14	468	255	646	273	485	358	1,603	887
4-Aug-14	516	282	691	286	495	363	1,711	932
6-Aug-14	554	294	717	298	495	367	1,779	961
9-Aug-14	599	323	730	315	506	373	1,848	1,013
11-Aug-14	670	355	783	334	510	377	1,975	1,069
13-Aug-14	786	413	810	348	519	380	2,127	1,145
16-Aug-14	846	481	848	365	543	394	2,252	1,244
18-Aug-14	972	576	907	374	579	396	2,473	1,350
20-Aug-14	1,082	624	910	392	607	406	2,615	1,427
26-Aug-14	1,378	694	1,026	422	648	430	3,069	1,552
31-Aug-14	1,698	871	1,216	476	771	494	3,706	1,848
5-Sep-14	1,871	1,089	1,261	491	812	517	3,967	2,105
6-Sep-14	2,046	1,224	1,361	509	862	555	4,293	2,296
7-Sep-14	2,081	1,137	1,424	524	861	557	4,390	2,226
13-Sep-14	2,407	1,296	1,620	562	936	595	4,985	2,461
14-Sep-14	2,710	1,459	1,673	562	942	601	5,347	2,630
21-Sep-14	3,280	1,677	1,940	597	1,022	635	6,242	2,909
23-Sep-14	3,458	1,830	2,021	605	1,074	648	6,553	3,083
28-Sep-14	3,696	1,998	2,304	622	1,157	710	7,157	3,330
1-Oct-14	3,834	2,069	2,437	623	1,199	739	7,470	3,431
5-Oct-14	3,924	2,210	2,789	879	1,298	768	8,011	3,857
8-Oct-14	4,076	2,316	2,950	930	1,350	778	8,376	4,024
12-Oct-14	4,249	2,458	3,252	1,183	1,472	843	8,973	4,484
14-Oct-14	4,262	2,484	3,410	1,200	1,519	862	9,191	4,546
19-Oct-14	4,665	2,705	3,706	1,259	1,540	904	9,911	4,868
22-Oct-14	4,744	2,737	3,951	1,287	1,553	926	10,248	4,950
26-Oct-14	6,535	2,413	5,235	1,500	1,906	997	13,676	4,910
2-Nov-14	6,525	2,697	4,759	1,070	1,731	1,041	13,015	4,808
4-Nov-14	6,619	2,766	4,862	1,130	1,760	1,054	13,241	4,950
9-Nov-14	6,822	2,836	5,368	1,169	1,878	1,142	14,068	5,147
11-Nov-14	6,878	2,812	5,586	1,187	1,919	1,166	14,383	5,165
16-Nov-14	7,069	2,964	6,073	1,250	1,971	1,192	15,113	5,406
23-Nov-14	7,168	3,016	6,599	1,398	2,134	1,260	15,901	5,674
30-Nov-14	7,635	3,145	7,312	1,583	2,164	1,327	17,111	6,055
7-Dec-14	7,719	3,177	7,897	1,768	2,292	1,428	17,908	6,373
14-Dec-14	7,797	3,290	8,356	2,085	2,416	1,525	18,569	6,900
21-Dec-14	7,862	3,384	9,004	2,582	2,597	1,607	19,463	7,573
28-Dec-14	8,018	3,423	9,446	2,758	2,707	1,709	20,171	7,890
4-Jan-15	8,157	3,496	9,780	2,943	2,775	1,781	20,712	8,220
11-Jan-15	8,157	3,496	9,780	2,943	2,775	1,781	20,712	8,220

Table 2: Ebola Outbreak in Countries with Localized Transmission [1]

Date	Mali		United Kingdom	
	Cases	Deaths	Cases	Deaths
16-Oct-14	0	0	0	0
24-Oct-14	1	1	0	0
14-Nov-14	4	3	0	0
16-Nov-14	6	5	0	0
23-Nov-14	8	6	0	0
30-Nov-14	8	6	0	0
7-Dec-14	8	6	0	0
29-Dec-14	8	6	1	0
4-Jan-15	8	6	1	0
11-Jan-15	8	6	1	0

[1] As of 11-Jan-15, there have been 8 cases of EVD in the country with active localized transmission of Ebola. Six deaths have resulted.

The charts consist of weekly snapshots of data from Table 1. Weeks are considered to begin on Monday and end on Sunday, which matches the WHO's definition of an epidemiological week. Weekly summaries start with the week ending Sunday 3-Aug-14 (epidemiological week 31). The granularity of data available from the World Health Organization precludes the theoretical implementation of this algorithm (i.e. WHO data is not always published on Sundays). Therefore, the algorithm is implemented in practice by displaying the final data released during each epidemiological week. This procedure will skew the linearity of the time axes slightly.

Data from Table 2 and Table 3 (countries with localized or inactive transmission – Nigeria, Senegal, the United States, the United Kingdom, Spain, and Mali) are not included in these charts. Currently, their disease counts are dwarfed by the incidence of the disease in countries with widespread transmission. Should the situation change the charts will be updated accordingly.

The primary curve in Figure 1 describes the cumulative history of all confirmed, probable, and suspected cases of Ebola west African countries with widespread transmissionduring the current outbreak. The circles represent data points from Table 1 (eighth column). The smooth curve is a polynomial trend fitted to the cumulative case data.

The primary curve in Figure 2 describes the cumulative history of all confirmed, probable, and suspected deaths from EVD in west Africa during the current outbreak. The
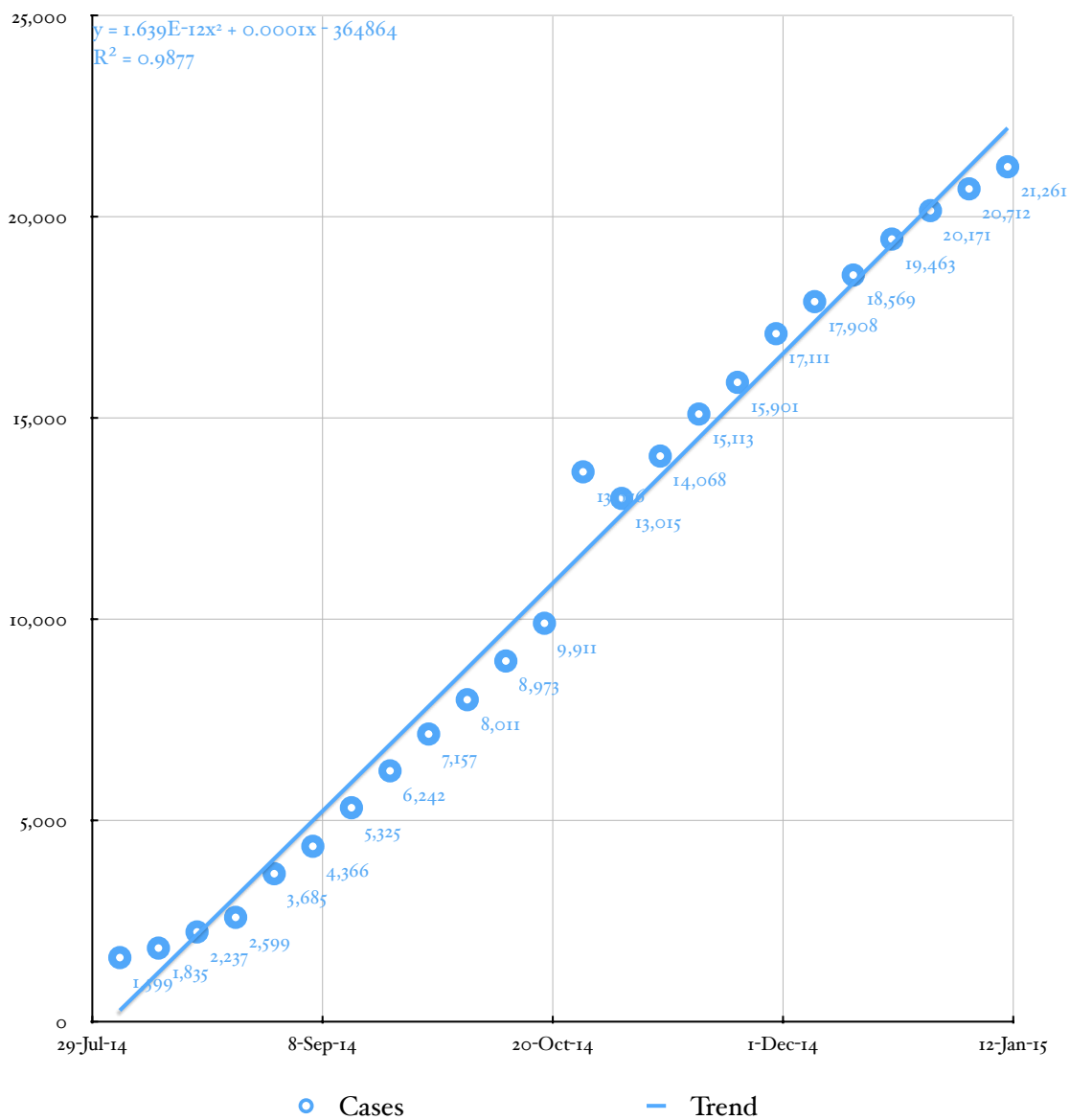
Figure 1: Cumulative Case Trend

$y = 1.639E\text{-}12x^2 + 0.0001x - 364864$
$R^2 = 0.9877$

Table 3: Ebola Outbreak in Countries Considered Inactive by the WHO [1]

Date	Nigeria		Senegal		Spain		United States	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
1-Aug-14	4	1	0	0	0	0	0	0
4-Aug-14	9	1	0	0	0	0	0	0
6-Aug-14	13	2	0	0	0	0	0	0
9-Aug-14	13	2	0	0	0	0	0	0
11-Aug-14	12	3	0	0	0	0	0	0
13-Aug-14	12	4	0	0	0	0	0	0
16-Aug-14	15	4	0	0	0	0	0	0
18-Aug-14	15	4	0	0	0	0	0	0
20-Aug-14	16	5	0	0	0	0	0	0
26-Aug-14	17	6	0	0	0	0	0	0
31-Aug-14	21	7	0	0	0	0	0	0
5-Sep-14	22	8	1	0	0	0	0	0
7-Sep-14	21	8	3	0	0	0	0	0
14-Sep-14	21	8	1	0	0	0	0	0
21-Sep-14	20	8	1	0	0	0	0	0
28-Sep-14	20	8	1	0	0	0	0	0
5-Oct-14	20	8	1	0	1	0	1	0
12-Oct-14	20	8	1	0	1	0	2	1
19-Oct-14	20	8	1	0	1	0	3	1
26-Oct-14	20	8	1	0	1	0	4	1
2-Nov-14	20	8	1	0	1	0	4	1

[1] As of 11-Jan-15, there have been 26 cases of EVD in the four countries with inactive localized transmission of Ebola. Nine deaths have resulted.

circles represent data points from Table 1 (ninth column). The smooth curve is a polynomial trend fitted to the cumulative death data.

Figure 3 displays the curves from Figure 1 and Figure 2 on a single chart with a common Y axis.

The blue curve in Figure 4 describes the weekly incidence of new cases of Ebola in Liberia, Sierra Leone, and Guinea. The weekly incidence of EVD is computed by subtracting the total number of cases at week $n-1$ from the number of cases at week n.

The green curve in Figure 4 is the number deaths reported from EVD in west Africa during each week of the current outbreak. The weekly deaths attributed to EVD are computed by subtracting the total number of deaths at week $n-1$ from the number of deaths at week n.
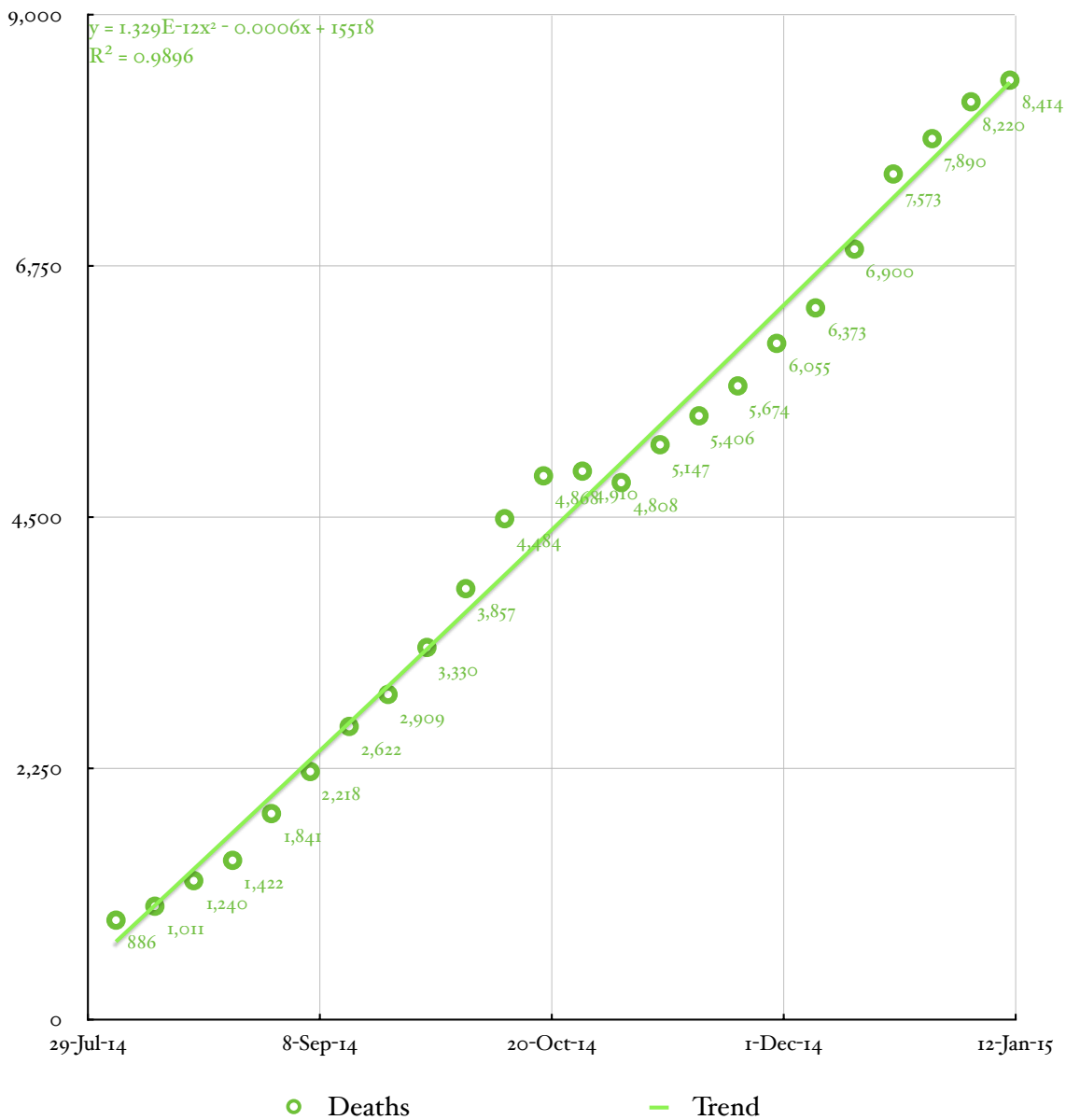
Figure 2: Cumulative Death Trend

$y = 1.329E^{-12}x^2 - 0.0006x + 15518$
$R^2 = 0.9896$

Deaths data points: 886, 1,011, 1,240, 1,422, 1,841, 2,218, 2,622, 2,909, 3,330, 3,857, 4,484, 4,500, 4,868, 4,910, 4,808, 5,147, 5,406, 5,674, 6,055, 6,373, 6,900, 7,573, 7,890, 8,220, 8,414

Legend: ○ Deaths   — Trend

Figure 3: Weekly Cumulative Event Trends

$y = 0.5995x^2 + 938.85x - 653.54$
$R^2 = 0.9877$
$y = 0.486x^2 + 322.63x + 370.32$
$R^2 = 0.9896$

Cases   — Case Trend   Deaths   — Death Trend
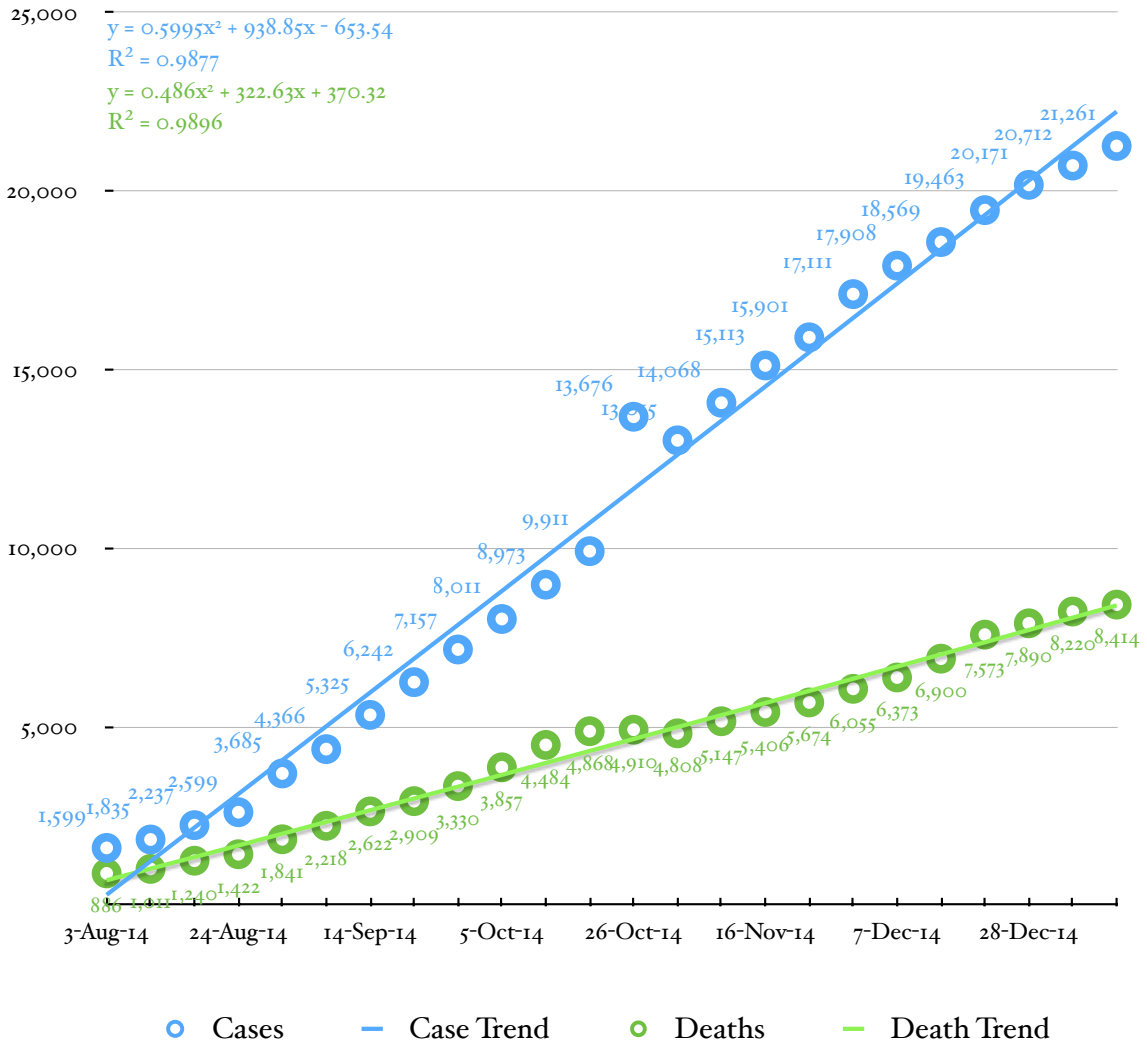
Figure 4: Weekly New Event Trends

New Cases   Deaths
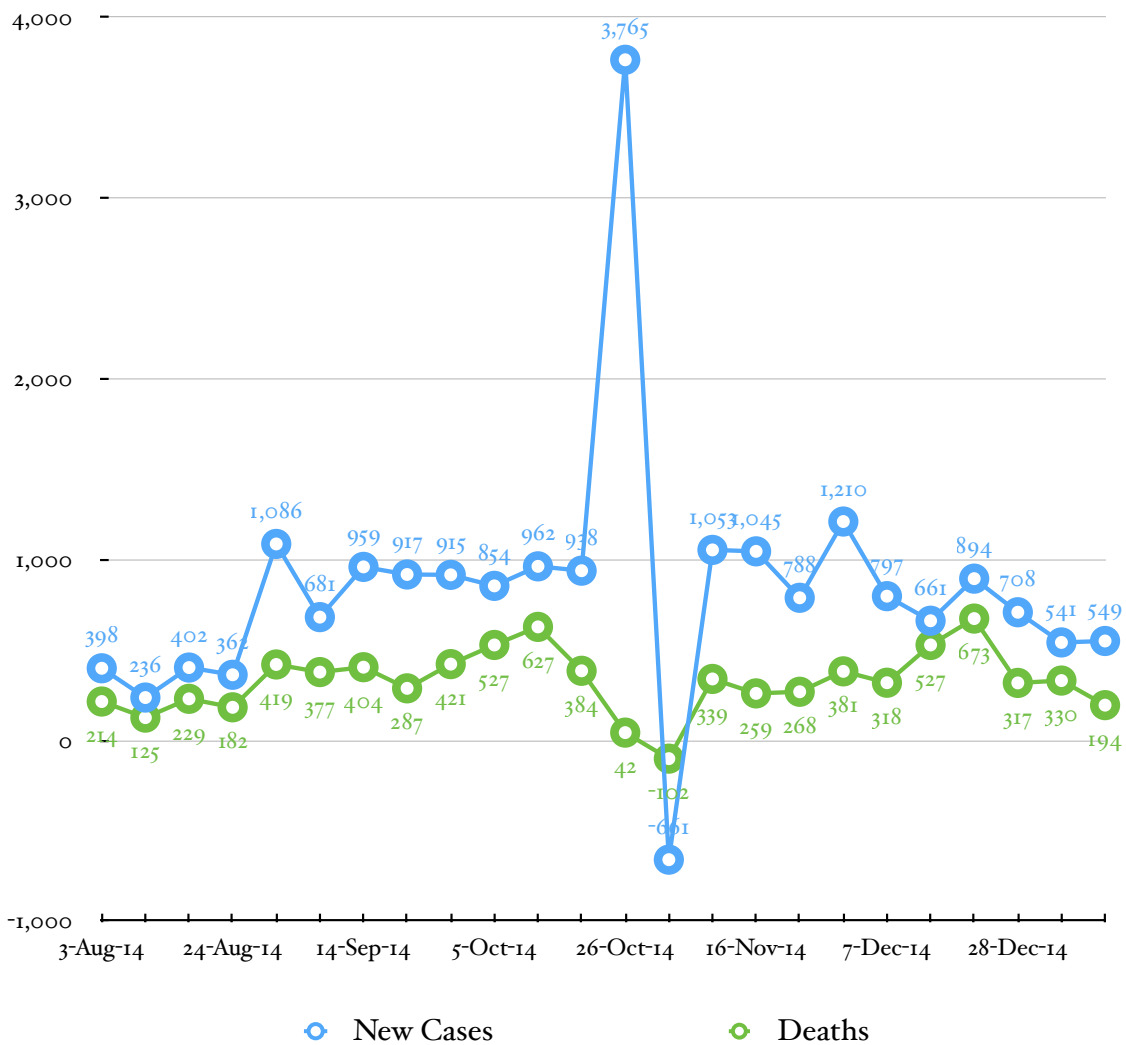
Figure 5: Cumulative Case Percentage by Country as of 11-Jan-15
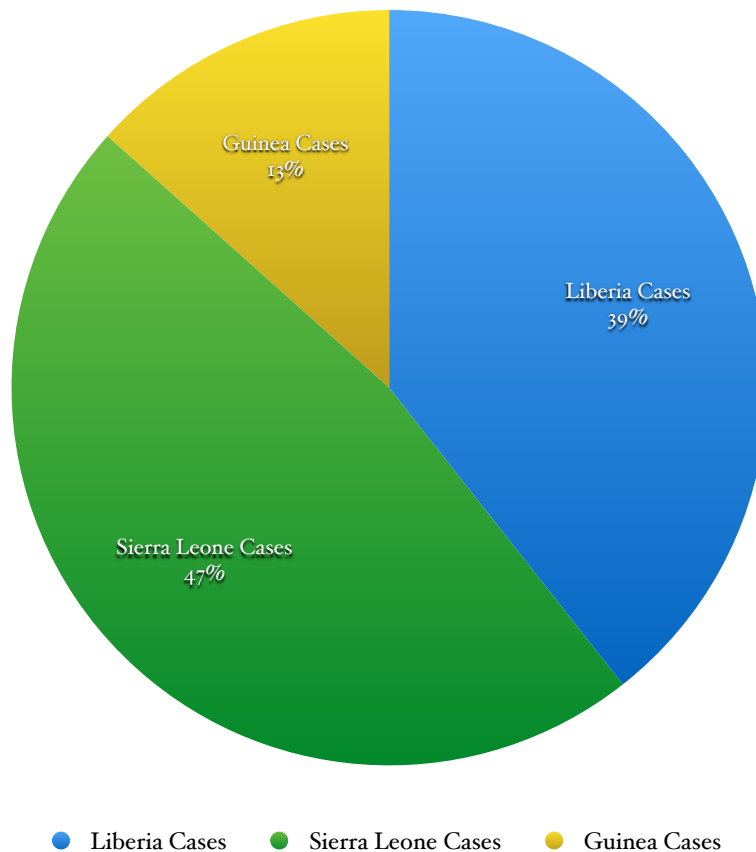
3 Scope of the Outbreak by Country

Figure 5 provides a current summary of the impact of the Ebola outbreak on the most effected countries of west Africa. It represents the distribution of cumulative case counts among these countries. Countries with localized or inactive transmission of the disease (Nigeria, Senegal, the United States, the United Kingdom, Spain, and Mali) are omitted from the charts in this section. Should conditions deteriorate in any of these countries, the charts will be revised to reflect the situation.

Subsequent charts presented in this section segregate historical data concerning the west African Ebola outbreak on a country by country basis. They present a glimpse of the impact of the disease on the most effected countries in the region.

These charts are organized into two groups: charts that examine the cumulative impact of the disease and and charts that examine the weekly incidence of new cases of EVD.

Figure 6: Weekly Cumulative Cases of Ebola by Country
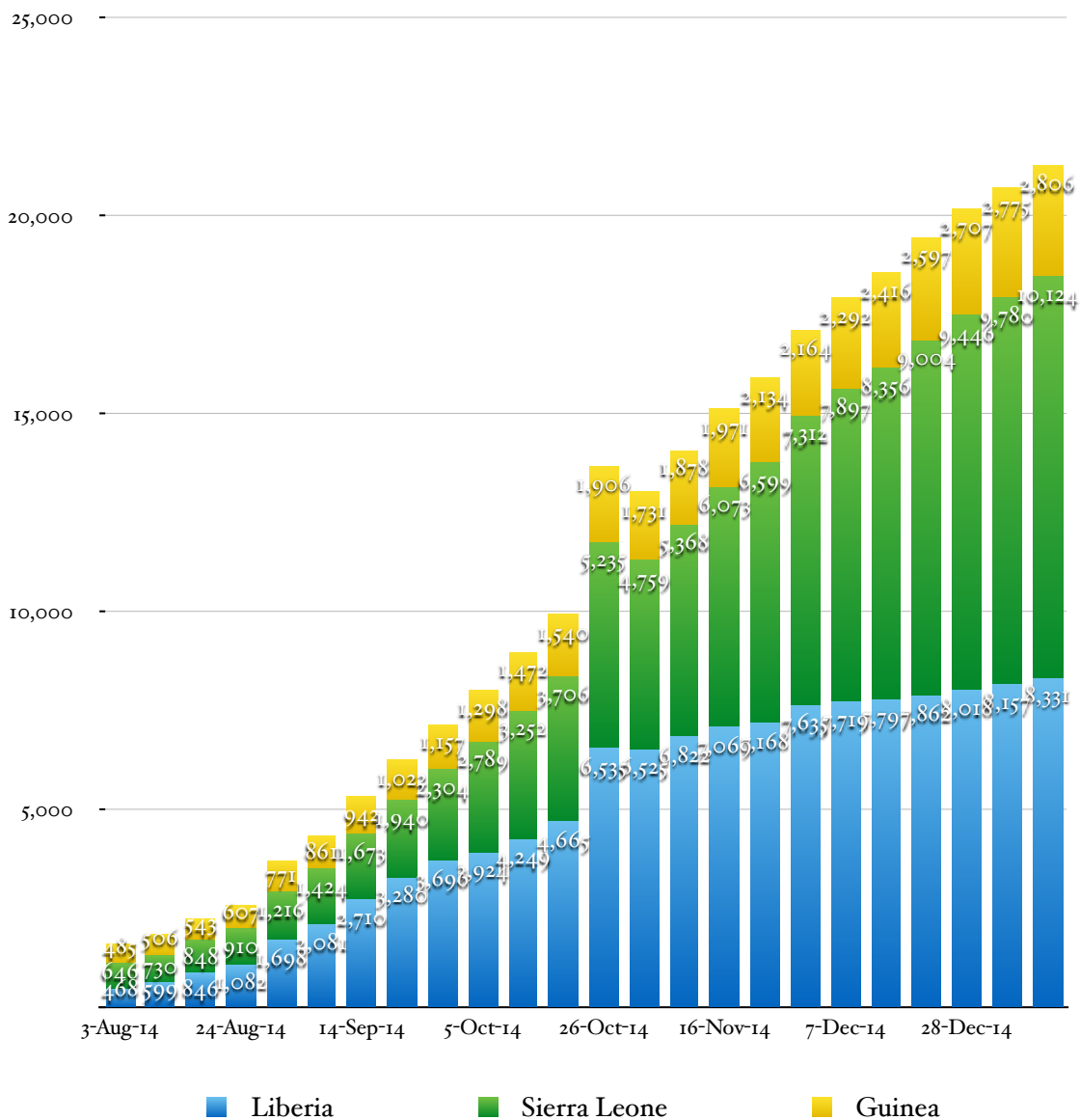
3.1   Weekly Cumulative Cases By Country

The stacked bar chart in Figure 6 describes the history of the ongoing Ebola outbreak in the most effected west African countries. The bars represent cumulative case counts presented at weekly intervals. All confirmed, probable, and suspected cases of EVD are included.

The curves in Figure 7 describe the cumulative history of of the current Ebola outbreak in several west Africa countries. The circles represent data points from Table 1. The
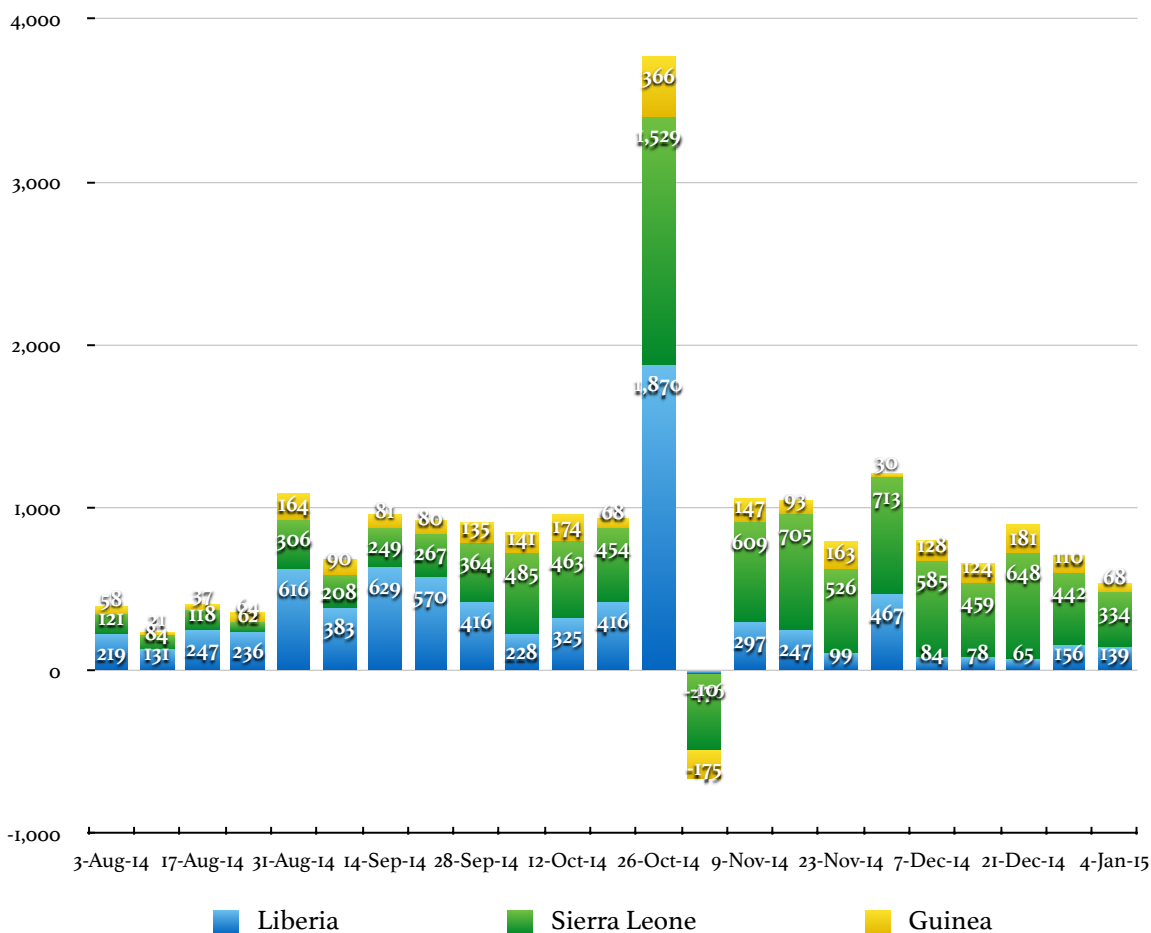
Figure 7: Weekly Cumulative Case Trends by Country
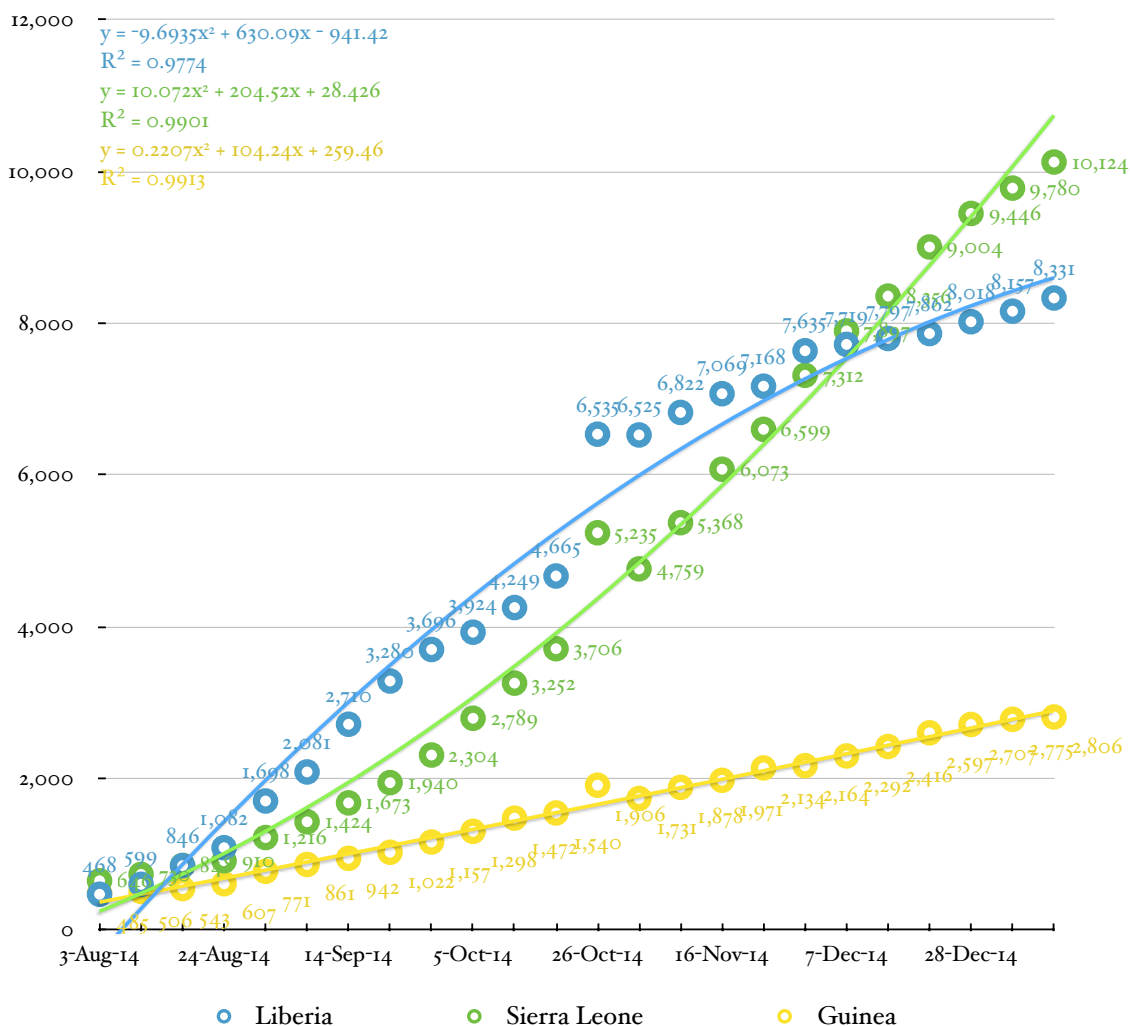
smooth curves are polynomial trends fitted to the cumulative case data. All confirmed, probable, and suspected cases of EVD are included.

Data in this section comprise weekly snapshots from Table 1. Weeks are considered to begin on Monday and end on Sunday, which matches the WHO's definition of an epidemiological week. Weekly summaries start with the week ending Sunday 3-Aug–14 (epidemiological week 31). The granularity of data available from the World Health Organization precludes the theoretical implementation of this algorithm (i.e. WHO data is not always published on Sundays). Therefore, the algorithm is implemented in practice by displaying the final data released during each epidemiological week. This procedure will skew the linearity of the time axes slightly.

Figure 8: Weekly New Cases of Ebola by Country

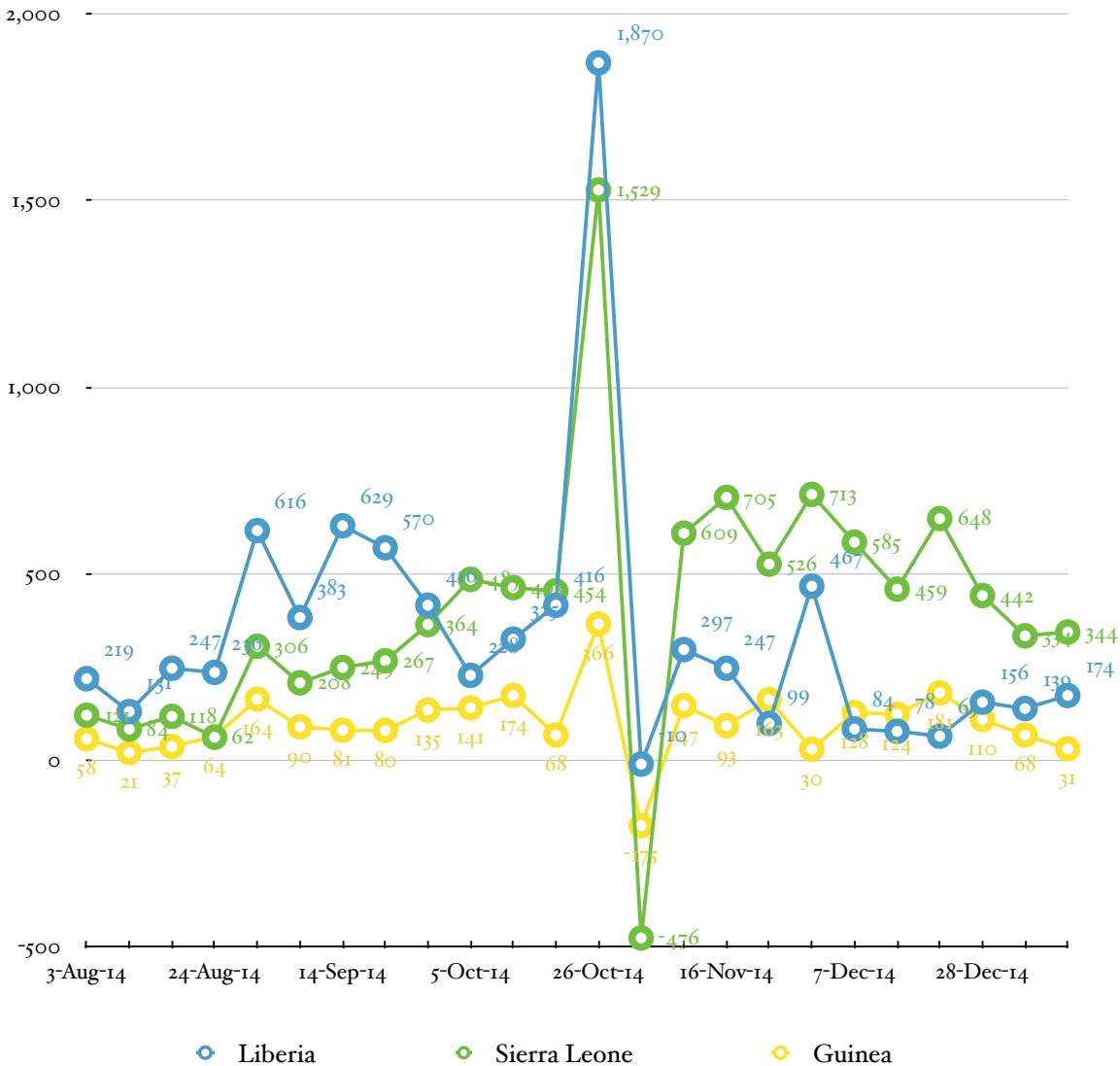## 3.2   Weekly New Cases By Country

The stacked bar chart in Figure 8 describes the history of the ongoing Ebola outbreak in the most effected west African countries. The bars represent new case counts presented at weekly intervals. All confirmed, probable, and suspected cases of EVD are included.

The curves in Figure 9 describe the weekly incidence of new cases of Ebola in several west Africa countries. The circles represent the actual incidence data. The smooth curves are polynomial trends fitted to the new case data. All confirmed, probable, and suspected cases of EVD are included.

In both charts, the weekly incidence of EVD is computed by subtracting the total number of cases at week $n-1$ from the number of cases at week n.

Data in this section comprise weekly snapshots from Table 1. Weeks are considered to begin on Monday and end on Sunday, which matches the WHO's definition of an

Figure 9: Weekly New Case Trends by Country

epidemiological week. Weekly summaries start with the week ending Sunday 3-Aug–14 (epidemiological week 31). The granularity of data available from the World Health Organization precludes the theoretical implementation of this algorithm (i.e. WHO data is not always published on Sundays). Therefore, the algorithm is implemented in practice by displaying the final data released during each epidemiological week. This procedure will skew the linearity of the time axes slightly.