Supplementary Appendix

This appendix has been provided by the authors to give readers additional information about their work.

Supplement to: WHO Ebola Response Team. Ebola virus disease among children in West Africa. N Engl J Med 2015; 372:1274-7. DOI: 10.1056/NEJMc1415318

Supplementary Appendix

Ebola Virus Disease among children in West Africa

WHO Ebola Response Team*

WHO Ebola Response Team*

The authors (members of the WHO Ebola Response Team who contributed to this article, in alphabetic order) are as follows:

Joy Agum, M.Ph., Archchun Ariyarajah, M.Sc., Isobel M Blake, Ph.D., Anne Cori, Ph.D., Christl A Donnelly, Sc.D., Ilaria Dorigatti, Ph.D., Christopher Dye, D.Phil., Tim Eckmanns, M.D., Neil M Ferguson, D.Phil., Robert A Fowler, MD CM, MS(Epi), Christophe Fraser, Ph.D., Tini Garske, Ph.D., Wes Hinsley, Ph.D., Thibaut Jombart, Ph.D., Harriet L Mills, Ph.D., Srinivas Murthy, MD CM, Gemma Nedjati-Gilani, Ph.D., Pierre Nouvellet, Ph.D., Louise Pelletier, M.D., Steven Riley, D.Phil., Dirk Schumacher, M.Sc., Anita Shah, M.Sc., Maria D Van Kerkhove, Ph.D.

The authors' affiliations are as follows: World Health Organization (WHO), Geneva (J.A., A.A., C.D., T.E., L.P., D.S., A.S.); Department of Medicine and Department of Critical Care Medicine, Sunnybrook Hospital, Interdepartmental Division of Critical Care Medicine, University of Toronto (R.A.F.); Department of Pediatrics, University of British Columbia (S.M.); The Medical Research Council Centre for Outbreak Analysis and Modelling, WHO Collaborating Centre for Infectious Disease Modelling, Department of Infectious Disease Epidemiology, Imperial College London, United Kingdom (I.M.B., A.C., C.A.D., I.D., N.M.F., C.F., T.G., W.H., T.J., H.L.M., G.N.-G., P.N., S.R., M.D.V.K.); Robert Koch Institute, Department for Infectious Disease Epidemiology, Berlin, Germany (T.E., D.S.).

Corresponding authors:

Dr Christl Donnelly c.donnelly@imperial.ac.uk, Dr Christopher Dye dyec@who.int, and Dr Neil Ferguson neil.ferguson@imperial.ac.uk

Supported by the Medical Research Council, the Bill and Melinda Gates Foundation, the Models of Infectious Disease Agent Study of the National Institute of General Medical Sciences (National Institutes of Health), the Health Protection Research Units of the National Institute for Health Research, European Union PREDEMICS consortium, Wellcome Trust, and Fogarty International Center.

Contents

Data Sources and Cleaning

Details of the collection of Ebola Virus Disease (EVD) data have been described previously[1,2]. In summary, data on confirmed, probable or suspected EVD cases were collected using standardized viral hemorrhagic fever (VHF) data collection forms. Cases were identified through clinical care at treatment facilities or via contact tracing in Guinea, Liberia, Nigeria and Sierra Leone. The analyses reported here are restricted to data from the three most heavily affected countries: Guinea, Liberia and Sierra Leone.

These analyses reported here used the VHF patient databases from 5 January 2015, 12 December 2014 and 5 January 2015 for Guinea, Liberia and Sierra Leone, respectively. Case definitions have previously been provided by WHO[3].

Cleaning of the data has been described in the supplementary appendix of our earlier papers analysing the EVD epidemic in West Africa[1,2].

Incidence by Age

Age-stratified incidence, overall and by country

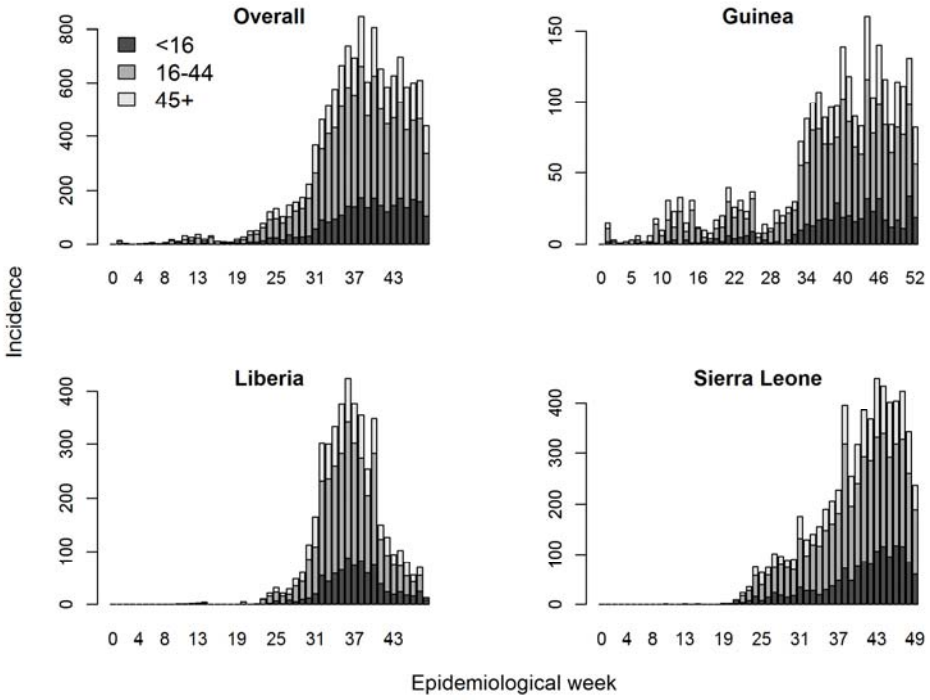

Figure S1. The Age-Stratified Incidence of Confirmed and Probable EVD Cases, Overall and by Country. The first day of week 1 for the x-axis is Monday 30 December 2013, week 20 started on Monday 12 May 2014 and week 40 started on Monday 29 September 2014.

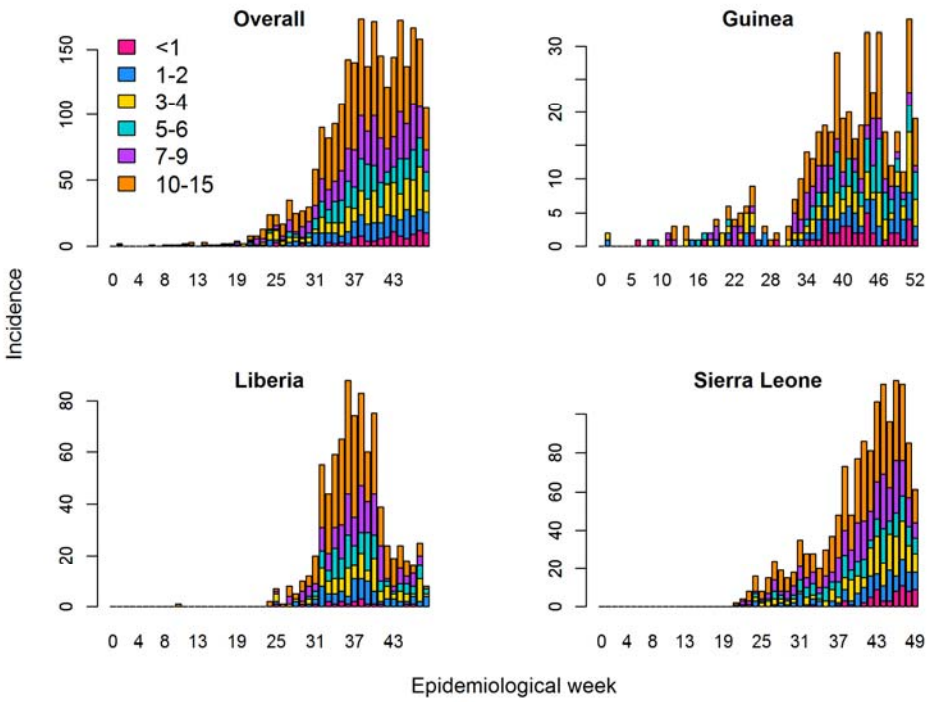

Figure S2. The Age-Stratified Incidence of Confirmed and Probable (CP) EVD Cases among Children, Overall and by Country. The first day of week 1 for the x-axis is Monday 30 December 2013, week 20 started on Monday 12 May 2014 and week 40 started on Monday 29 September 2014.

Age distribution of EVD cases, overall and by country

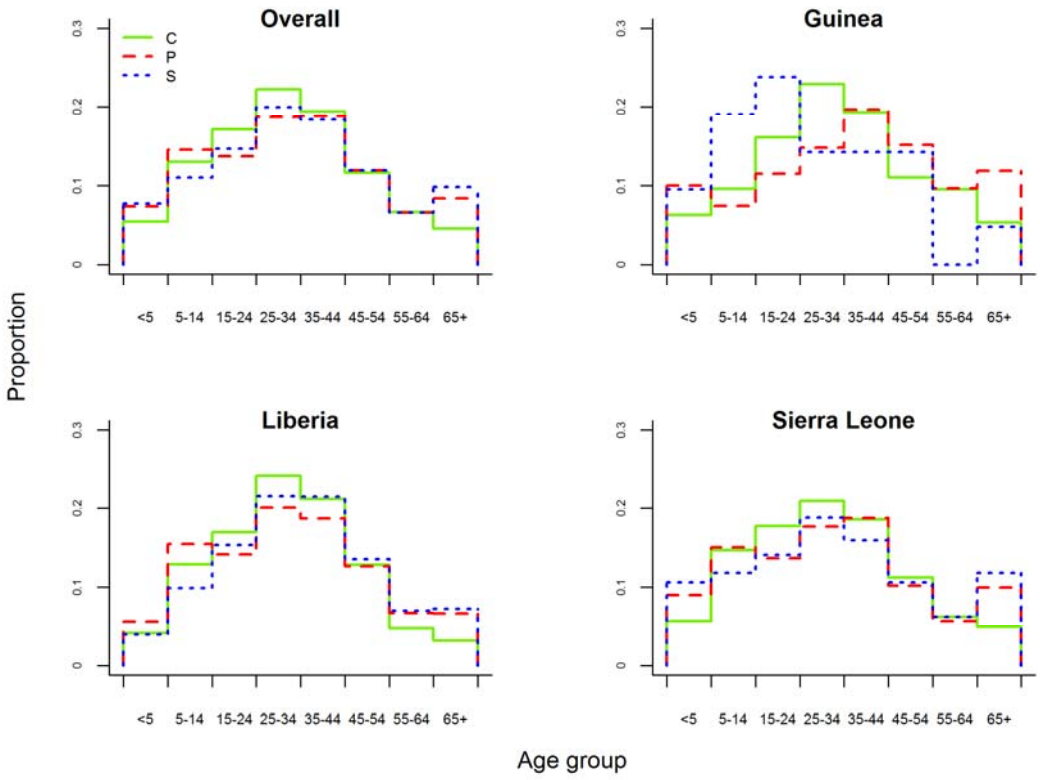

Figure S3. The Age Distribution of Confirmed (C), Probable (P) and Suspected (S) EVD Cases, Overall and by Country.

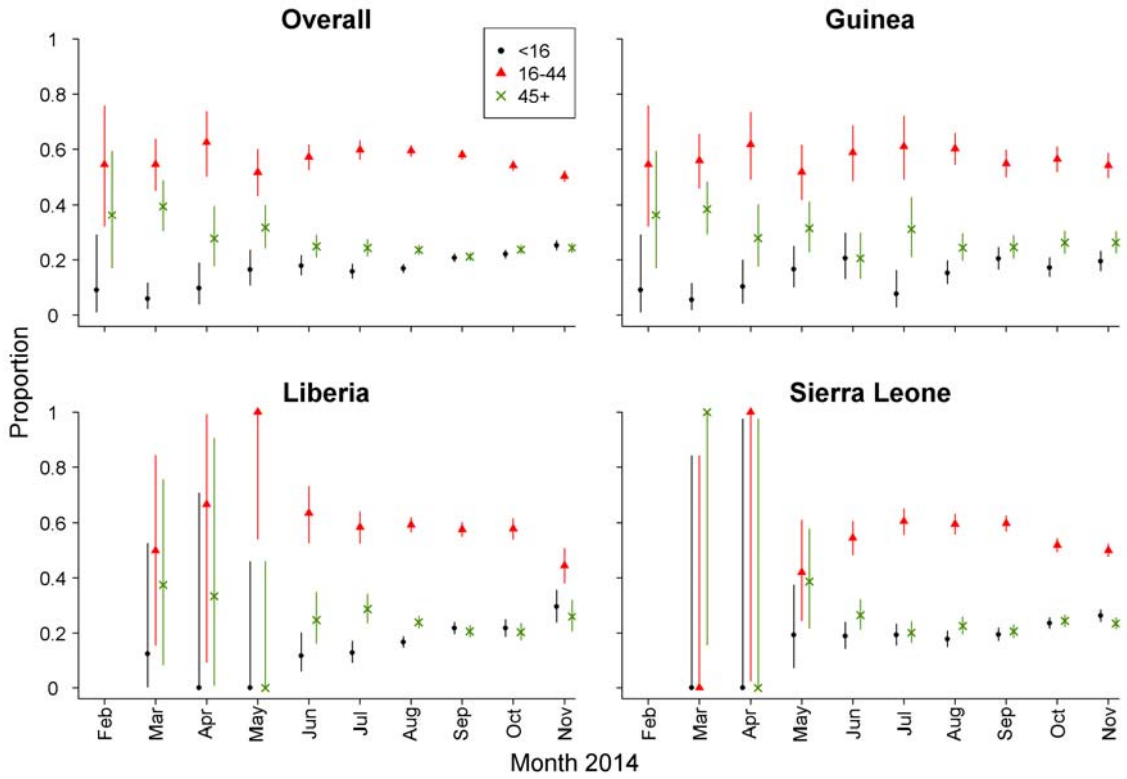

Figure S4. Proportion of Confirmed and Probable EVD Cases in Each Age Group by Month, Overall and by Country. Proportions are shown with 95% confidence intervals (bars).

Delay Distributions

Many of the delays investigated in this analysis refer to delays within the clinical history of a single case. Due to the large number of cases observed to date for these delays it is possible to estimate distributions for the delays stratified into small age bands.

However, the serial interval, symptom onset to onward transmission delay and incubation period are special cases as to estimate these delays we need information on two cases, the infector and the infectee, which are linked through contact tracing. The serial interval is defined as the delay from symptom onset in the infector to symptom onset in the infectee. If the date of contact between infector and infectee is known, this can be further sub-divided into the delay from symptom onset to onward transmission in the infector and the incubation period (i.e., the delay from infection to symptom onset) in the infectee. The potential dates of contact are specified by the infectee, so for many infectees we have data to estimate the incubation period; however, estimating the serial interval or the interval from symptom onset to onward transmission relies on identification of the infector in the database resulting in much smaller sample sizes. Due to the small numbers for these delays we were not able to estimate country-specific distribution in fine age categories, but aggregated the data into three age classes only, and only estimated overall distributions rather than stratified by country.

Figures S5 to S11 and Tables S1 to S7 show the means and standard deviations of the distributions fitted to the observed delays, stratified by age and country.

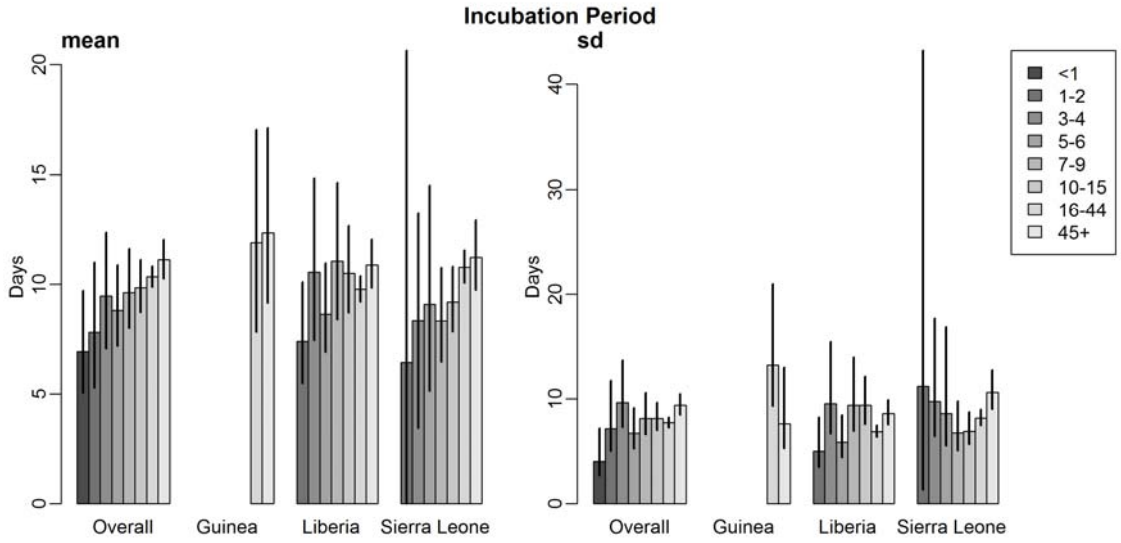

Figure S5. The Mean (left) and Standard Deviation (sd, right) of the Distribution Fitted to the Incubation Periods among Confirmed and Probable EVD Cases by Age Group (in Years), Overall and by Country. The estimated means and standard deviations are presented with 95% confidence intervals.

Table S1: The Distribution Fitted to the Incubation Periods (in days) for Confirmed and Probable EVD Cases, Overall and By Country. The estimated means and standard deviations (sd) are presented with 95% confidence intervals.

Age Group		Overall	Guinea	Liberia	Sierra Leone
<1	mean	6.9 (5.1, 9.7; n=14)	--	--	--
	sd	4.0 (2.7, 7.2)	--	--	--
1-2	mean	7.8 (5.3, 11.0; n=31)	--	7.4 (5.5, 10.1; n=21)	6.4 (0.0, 20.6; n=10)
	sd	7.2 (5.0, 11.7)	--	5.0 (3.5, 8.2)	11.2 (1.3, 43.2)
3-4	mean	9.5 (7.1, 12.4; n=61)	--	10.6 (7.4, 14.8; n=31)	8.3 (3.5, 13.2; n=28)
	sd	9.6 (7.3, 13.7)	--	9.5 (6.7, 15.5)	9.8 (6.4, 17.7)
5-6	mean	8.8 (7.2, 10.9; n=55)	--	8.7 (6.9, 11.0; n=35)	9.1 (5.1, 14.5; n=19)
	sd	6.7 (5.2, 9.1)	--	5.8 (4.4, 8.4)	8.6 (5.5, 16.8)
7-9	mean	9.6 (8.0, 11.6; n=83)	--	11.1 (8.4, 14.6; n=40)	8.3 (6.5, 10.8; n=43)
	sd	8.1 (6.5, 10.6)	--	9.4 (6.9, 14.0)	6.7 (5.0, 9.8)
10-15	mean	9.8 (8.7, 11.1; n=184)	--	10.5 (8.7, 12.7; n=94)	9.2 (7.8, 10.8; n=88)
	sd	8.1 (7.0, 9.6)	--	9.4 (7.6, 12.1)	6.9 (5.7, 8.7)
16-44	mean	10.3 (9.9, 10.8; n=1040)	11.9 (7.8, 17.0; n=41)	9.8 (9.2, 10.4; n=522)	10.8 (10.1, 11.6; n=477)
	sd	7.7 (7.3, 8.2)	13.2 (9.3, 21.0)	6.9 (6.3, 7.5)	8.2 (7.5, 9.0)
45+	mean	11.1 (10.3, 12.0; n=441)	12.3 (9.2, 17.1; n=17)	10.9 (9.8, 12.0; n=241)	11.2 (9.8, 12.9; n=183)
	sd	9.4 (8.5, 10.5)	7.6 (5.2, 13.0)	8.6 (7.6, 9.9)	10.6 (9.0, 12.7)

n= sample size; -- not calculated because sample size <10.

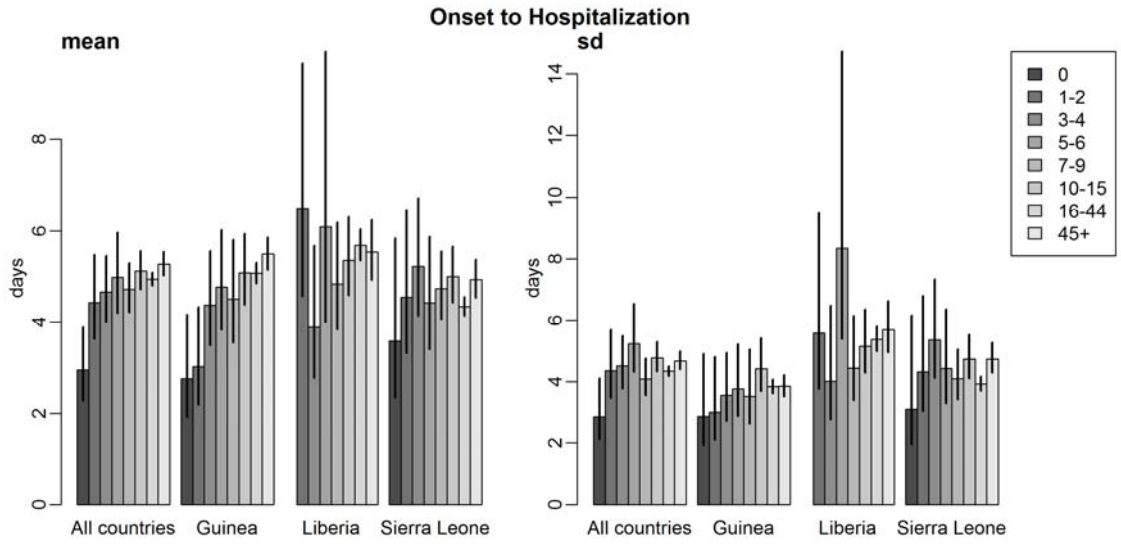

Figure S6. The Mean (left) and Standard Deviation (sd, right) of the Distribution Fitted to the Delays from Symptom Onset to Hospitalization among Confirmed and Probable EVD Cases by Age Group (in Years), Overall and by Country. The estimated means and standard deviations are presented with 95% confidence intervals.

Table S2: The Distribution Fitted to the Delays from Symptom Onset to Hospitalization (in days) for Confirmed and Probable EVD Cases, Overall and By Country. The estimated means and standard deviations (sd) are presented with 95% confidence intervals.

Age Group		Overall	Guinea	Liberia	Sierra Leone
<1	mean	2.9 (2.3, 3.9; n=53)	2.8 (1.9, 4.2; n=30)	--	3.6 (2.3, 5.8; n=16)
	sd	2.9 (2.1, 4.1)	2.9 (1.9, 4.9)	--	3.1 (1.9, 6.2)
1-2	mean	4.4 (3.6, 5.5; n=90)	3.0 (2.2, 4.3; n=35)	6.5 (4.6, 9.7; n=22)	4.5 (3.3, 6.5; n=33)
	sd	4.4 (3.5, 5.7)	3.0 (2.1, 4.8)	5.6 (3.8, 9.5)	4.3 (3.0, 6.8)
3-4	mean	4.7 (4.0, 5.5; n=154)	4.4 (3.5, 5.6; n=49)	3.9 (2.8, 5.7; n=34)	5.2 (4.1, 6.7; n=71)
	sd	4.5 (3.8, 5.5)	3.6 (2.7, 4.9)	4.0 (2.8, 6.5)	5.4 (4.1, 7.3)
5-6	mean	5.0 (4.2, 6.0; n=140)	4.8 (3.8, 6.0; n=49)	6.1 (4.0, 9.9; n=37)	4.4 (3.4, 5.9; n=54)
	sd	5.2 (4.3, 6.5)	3.8 (2.9, 5.2)	8.3 (5.4, 14.7)	4.4 (3.3, 6.4)
7-9	mean	4.7 (4.2, 5.3; n=222)	4.5 (3.6, 5.8; n=41)	4.8 (3.8, 6.2; n=59)	4.7 (4.1, 5.5; n=122)
	sd	4.1 (3.6, 4.8)	3.5 (2.6, 5.1)	4.4 (3.4, 6.1)	4.1 (3.4, 5.0)
10-15	mean	5.1 (4.7, 5.6; n=502)	5.1 (4.4, 5.9; n=127)	5.4 (4.6, 6.3; n=142)	5.0 (4.4, 5.7; n=233)
	sd	4.8 (4.3, 5.3)	4.4 (3.7, 5.4)	5.2 (4.3, 6.3)	4.7 (4.1, 5.5)
16-44	mean	4.9 (4.8, 5.1; n=3439)	5.1 (4.8, 5.3; n=1101)	5.7 (5.3, 6.0; n=947)	4.3 (4.1, 4.6; n=1391)
	sd	4.3 (4.2, 4.5)	3.8 (3.6, 4.1)	5.4 (5.0, 5.8)	3.9 (3.7, 4.2)
45+	mean	5.3 (5.0, 5.5; n=1242)	5.5 (5.1, 5.9; n=455)	5.5 (4.9, 6.2; n=288)	4.9 (4.5, 5.4; n=499)
	sd	4.7 (4.4, 5.0)	3.8 (3.5, 4.2)	5.7 (5.0, 6.6)	4.7 (4.3, 5.3)

n= sample size; -- not calculated because sample size <10.

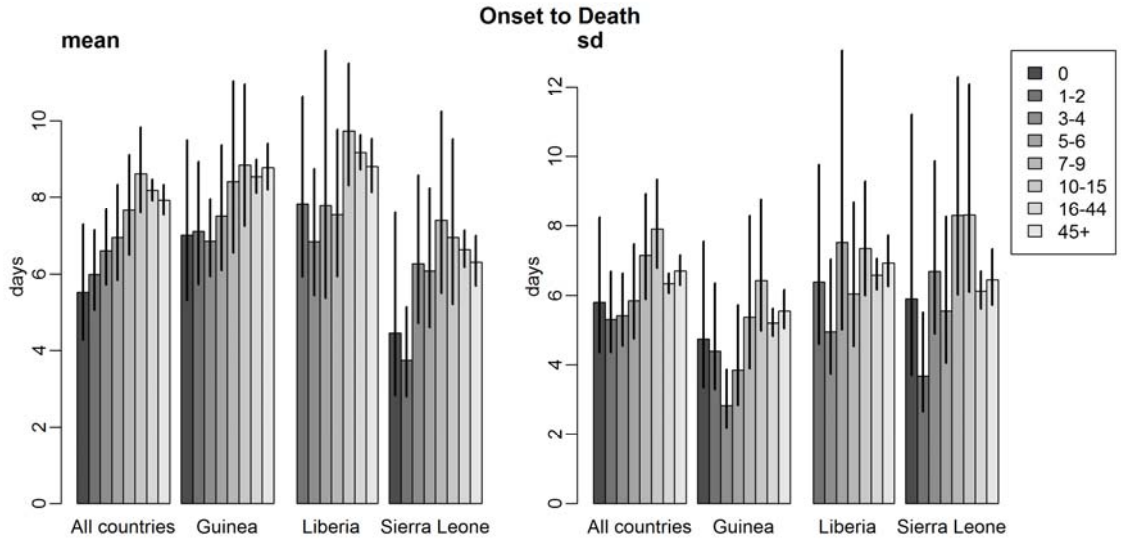

Figure S7. The Mean (left) and Standard Deviation (sd, right) of the Distribution Fitted to the Delays from Symptom Onset to Death among Confirmed and Probable EVD Cases by Age Group (in Years), Overall and by Country. The estimated means and standard deviations are presented with 95% confidence intervals.

Table S3: The Distribution Fitted to the Delays from Symptom Onset to Death (in days) for Confirmed and Probable EVD Cases, Overall and By Country. The estimated means and standard deviations (sd) are presented with 95% confidence intervals.

Age Group		Overall	Guinea	Liberia	Sierra Leone
<1	mean	5.5 (4.3, 7.3; n=62)	7.0 (5.3, 9.5; n=23)	--	4.5 (2.8, 7.6; n=30)
	sd	5.8 (4.4, 8.2)	4.7 (3.4, 7.6)	--	5.9 (3.7, 11.2)
1-2	mean	6.0 (5.1, 7.1; n=106)	7.1 (5.7, 8.9; n=32)	7.8 (5.9, 10.6; n=32)	3.7 (2.8, 5.2; n=42)
	sd	5.3 (4.4, 6.7)	4.4 (3.3, 6.3)	6.4 (4.6, 9.8)	3.7 (2.7, 5.5)
3-4	mean	6.6 (5.7, 7.7; n=122)	6.9 (5.9, 8.0; n=33)	6.8 (5.4, 8.7; n=38)	6.3 (4.7, 8.6; n=51)
	sd	5.4 (4.5, 6.6)	2.8 (2.2, 3.9)	5.0 (3.7, 7.0)	6.7 (4.9, 9.9)
5-6	mean	6.9 (5.8, 8.3; n=89)	7.5 (6.1, 9.4; n=24)	7.8 (5.4, 11.8; n=25)	6.1 (4.6, 8.2; n=40)
	sd	5.9 (4.8, 7.5)	3.9 (2.8, 5.7)	7.5 (5.0, 13.1)	5.6 (4.1, 8.3)
7-9	mean	7.7 (6.5, 9.1; n=119)	8.4 (6.5, 11.0; n=25)	7.5 (5.9, 9.8; n=42)	7.4 (5.5, 10.2; n=52)
	sd	7.1 (5.9, 8.9)	5.4 (3.9, 8.3)	6.0 (4.5, 8.7)	8.3 (6.0, 12.3)
10-15	mean	8.6 (7.6, 9.8; n=196)	8.8 (7.2, 11.0; n=49)	9.7 (8.3, 11.5; n=84)	6.9 (5.2, 9.5; n=63)
	sd	7.9 (6.8, 9.3)	6.4 (5.0, 8.8)	7.3 (6.0, 9.3)	8.3 (6.1, 12.1)
16-44	mean	8.2 (7.9, 8.5; n=2002)	8.5 (8.1, 9.0; n=543)	9.2 (8.7, 9.6; n=818)	6.6 (6.2, 7.1; n=641)
	sd	6.3 (6.1, 6.6)	5.2 (4.8, 5.6)	6.6 (6.2, 7.1)	6.1 (5.6, 6.7)
45+	mean	7.9 (7.5, 8.3; n=1094)	8.8 (8.2, 9.4; n=333)	8.8 (8.1, 9.5; n=379)	6.3 (5.7, 7.0; n=382)
	sd	6.7 (6.3, 7.2)	5.6 (5.0, 6.2)	6.9 (6.3, 7.7)	6.4 (5.7, 7.3)

n= sample size; -- not calculated because sample size <10.

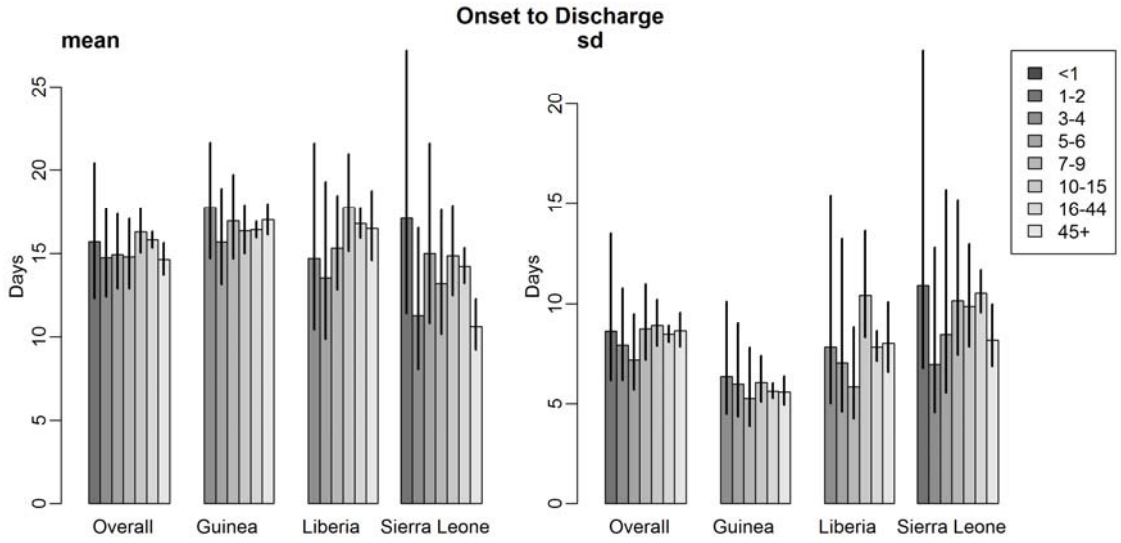

Figure S8. The Mean (left) and Standard Deviation (sd, right) of the Distribution Fitted to the Delays from Symptom Onset to Discharge among Confirmed and Probable EVD Cases by Age Group (in Years), Overall and by Country. The estimated means and standard deviations are presented with 95% confidence intervals.

Table S4: The Distribution Fitted to the Delays from Symptom Onset to Discharge (in days) for Confirmed and Probable EVD Cases, Overall and By Country. The estimated means and standard deviations (sd) are presented with 95% confidence intervals.

Age Group		Overall	Guinea	Liberia	Sierra Leone
<1	mean	--	--	--	--
	sd	--	--	--	--
1-2	mean	15.7 (12.3, 20.4; n=20)	--	--	17.1 (11.4, 27.2; n=10)
	sd	8.6 (6.2, 13.5)	--	--	10.9 (6.8, 22.7)
3-4	mean	14.7 (12.4, 17.6; n=38)	17.7 (14.7, 21.6; n=15)	14.7 (10.5, 21.6; n=10)	11.3 (8.1, 16.5; n=13)
	sd	7.9 (6.2, 10.8)	6.4 (4.5, 10.1)	7.8 (5.0, 15.4)	7.0 (4.6, 12.8)
5-6	mean	14.9 (12.9, 17.4; n=42)	15.7 (13.2, 18.9; n=19)	13.5 (9.9, 19.3; n=11)	15.0 (10.8, 21.6; n=12)
	sd	7.2 (5.7, 9.5)	6.0 (4.4, 9.0)	7.0 (4.6, 13.2)	8.5 (5.5, 15.7)
7-9	mean	14.8 (12.9, 17.1; n=70)	16.9 (14.7, 19.7; n=19)	15.3 (12.9, 18.4; n=19)	13.2 (10.2, 17.6; n=32)
	sd	8.7 (7.2, 11.0)	5.3 (3.9, 7.8)	5.8 (4.3, 8.8)	10.2 (7.4, 15.2)
10-15	mean	16.3 (15.0, 17.7; n=177)	16.4 (15.0, 17.9; n=70)	17.7 (15.1, 21.0; n=52)	14.9 (12.5, 17.9; n=55)
	sd	8.9 (7.9, 10.2)	6.1 (5.1, 7.4)	10.4 (8.3, 13.6)	9.9 (7.8, 13.0)
16-44	mean	15.8 (15.3, 16.3; n=1192)	16.4 (16.0, 16.9; n=517)	16.8 (15.9, 17.7; n=291)	14.2 (13.2, 15.3; n=384)
	sd	8.5 (8.1, 8.9)	5.6 (5.3, 6.0)	7.8 (7.1, 8.6)	10.5 (9.6, 11.7)
45+	mean	14.6 (13.7, 15.6; n=319)	17.0 (16.1, 18.0; n=145)	16.5 (14.6, 18.7; n=60)	10.6 (9.2, 12.3; n=114)
	sd	8.6 (7.9, 9.6)	5.6 (4.9, 6.4)	8.0 (6.6, 10.1)	8.2 (6.9, 10.0)

n= sample size; -- not calculated because sample size <10.

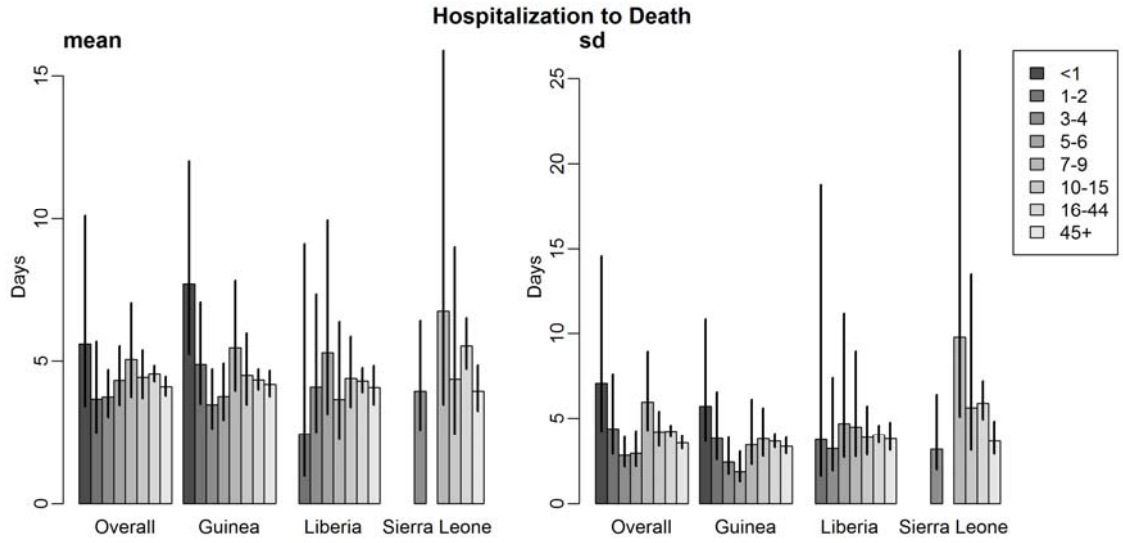

Figure S9. The Mean (left) and Standard Deviation (sd, right) of the Distribution Fitted to the Delays from Hospitalization to Death among Confirmed and Probable EVD Cases by Age Group (in Years), Overall and by Country. The estimated means and standard deviations are presented with 95% confidence intervals.

Table S5: The Distribution Fitted to the Delays from Hospitalization to Death (in days) for Confirmed and Probable EVD Cases, Overall and By Country. The estimated means and standard deviations (sd) are presented with 95% confidence intervals.

Age Group		Overall	Guinea	Liberia	Sierra Leone
<1	mean	5.6 (3.4, 10.1; n=23)	7.7 (5.2, 12.0; n=14)	--	--
	sd	7.1 (4.3, 14.6)	5.7 (3.7, 10.9)	--	--
1-2	mean	3.7 (2.5, 5.7; n=35)	4.9 (3.5, 7.1; n=21)	2.4 (1.0, 9.1; n=10)	--
	sd	4.4 (2.9, 7.6)	3.8 (2.6, 6.6)	3.8 (1.6, 18.8)	--
3-4	mean	3.7 (3.0, 4.7; n=48)	3.5 (2.6, 4.7; n=24)	4.1 (2.5, 7.4; n=10)	3.9 (2.6, 6.4; n=14)
	sd	2.8 (2.2, 3.9)	2.4 (1.7, 3.9)	3.2 (1.9, 7.4)	3.2 (2.0, 6.4)
5-6	mean	4.3 (3.4, 5.5; n=34)	3.7 (2.9, 4.9; n=16)	5.3 (3.1, 9.9; n=11)	--
	sd	2.9 (2.2, 4.3)	1.9 (1.3, 3.1)	4.7 (2.7, 11.2)	--
7-9	mean	5.0 (3.7, 7.1; n=55)	5.5 (4.0, 7.8; n=15)	3.6 (2.3, 6.4; n=24)	6.8 (3.5, 15.9; n=16)
	sd	6.0 (4.3, 8.9)	3.5 (2.3, 6.1)	4.5 (2.8, 9.0)	9.8 (5.1, 26.7)
10-15	mean	4.4 (3.7, 5.4; n=98)	4.5 (3.5, 6.0; n=39)	4.4 (3.4, 5.9; n=42)	4.4 (2.4, 9.0; n=17)
	sd	4.2 (3.4, 5.4)	3.8 (2.8, 5.6)	3.9 (2.9, 5.7)	5.6 (3.1, 13.5)
16-44	mean	4.5 (4.3, 4.8; n=898)	4.3 (4.0, 4.7; n=386)	4.3 (3.9, 4.8; n=343)	5.5 (4.7, 6.5; n=169)
	sd	4.2 (3.9, 4.6)	3.7 (3.3, 4.1)	4.0 (3.6, 4.6)	5.9 (4.9, 7.2)
45+	mean	4.1 (3.8, 4.5; n=421)	4.2 (3.8, 4.7; n=216)	4.1 (3.5, 4.8; n=121)	3.9 (3.2, 4.9; n=84)
	sd	3.6 (3.2, 4.0)	3.4 (2.9, 3.9)	3.8 (3.1, 4.8)	3.7 (2.9, 4.8)

n= sample size; -- not calculated because sample size <10.

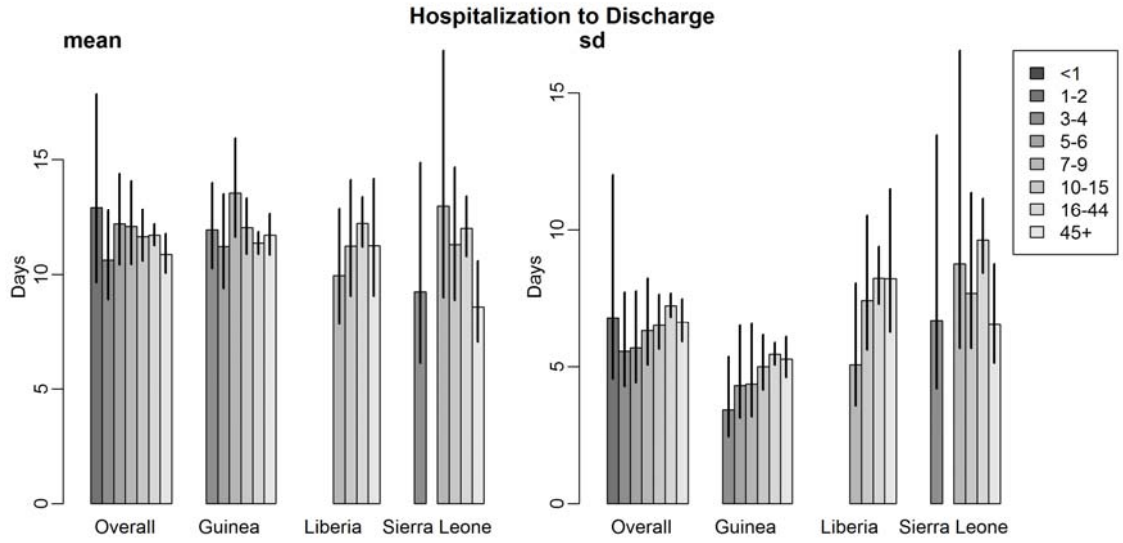

Figure S10. The Mean (left) and Standard Deviation (sd, right) of the Distribution Fitted to the Delays from Hospitalization to Discharge among Confirmed and Probable EVD Cases by Age Group (in Years), Overall and by Country. The estimated means and standard deviations are presented with 95% confidence intervals.

Table S6: The Distribution Fitted to the Delays from Hospitalization to Discharge (in days) for Confirmed and Probable EVD Cases, Overall and By Country. The estimated means and standard deviations (sd) are presented with 95% confidence intervals.

Age Group		Overall	Guinea	Liberia	Sierra Leone
<1	mean	--	--	--	--
	sd	--	--	--	--
1-2	mean	12.9 (9.7, 17.8; n=13)	--	--	--
	sd	6.8 (4.6, 12.0)	--	--	--
3-4	mean	10.6 (8.9, 12.8; n=34)	11.9 (10.3, 14.0; n=15)	--	9.2 (6.1, 14.9; n=12)
	sd	5.6 (4.3, 7.7)	3.4 (2.4, 5.4)	--	6.7 (4.2, 13.5)
5-6	mean	12.2 (10.4, 14.4; n=34)	11.2 (9.4, 13.5; n=19)	--	--
	sd	5.7 (4.4, 7.8)	4.3 (3.1, 6.5)	--	--
7-9	mean	12.1 (10.4, 14.1; n=49)	13.6 (11.6, 15.9; n=18)	9.9 (7.8, 12.9; n=18)	13.0 (9.0, 19.8; n=13)
	sd	6.3 (5.1, 8.2)	4.4 (3.2, 6.6)	5.1 (3.6, 8.1)	8.8 (5.7, 16.5)
10-15	mean	11.6 (10.6, 12.8; n=132)	12.0 (10.9, 13.3; n=66)	11.2 (9.1, 14.1; n=36)	11.3 (8.9, 14.7; n=30)
	sd	6.5 (5.6, 7.6)	5.0 (4.2, 6.2)	7.4 (5.6, 10.5)	7.7 (5.7, 11.4)
16-44	mean	11.7 (11.3, 12.2; n=921)	11.4 (10.9, 11.9; n=488)	12.2 (11.2, 13.4; n=223)	12.0 (10.8, 13.4; n=210)
	sd	7.2 (6.8, 7.7)	5.4 (5.1, 5.9)	8.2 (7.3, 9.4)	9.6 (8.4, 11.2)
45+	mean	10.9 (10.1, 11.8; n=235)	11.7 (10.9, 12.6; n=136)	11.2 (9.1, 14.2; n=43)	8.6 (7.1, 10.6; n=56)
	sd	6.6 (5.9, 7.5)	5.3 (4.6, 6.1)	8.2 (6.3, 11.5)	6.5 (5.1, 8.8)

n= sample size; -- not calculated because sample size <10.

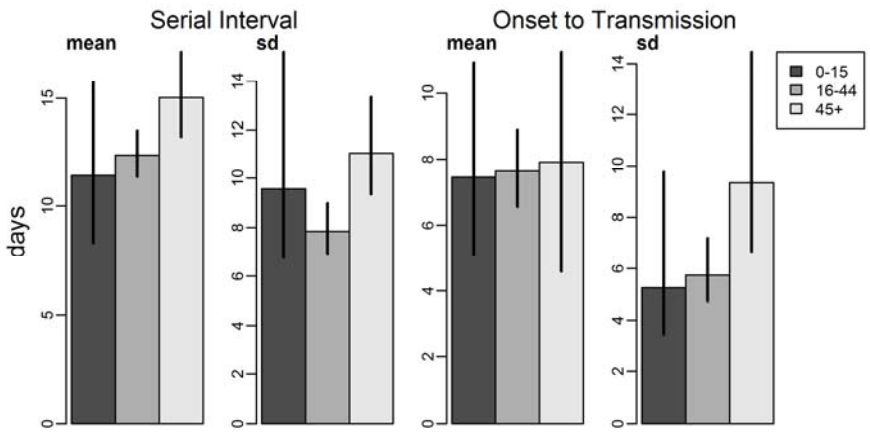

Figure S11. The Mean (left) and Standard Deviation (sd, 2nd from left) of the Distribution Fitted to the Serial Interval and Mean (3rd from left) and Standard Deviation (sd, right) of the Distribution Fitted to the Delays from Onset to Onward Transmission among Confirmed and Probable EVD Cases by Age Group (in Years). The estimated means and standard deviations are presented with 95% confidence intervals.

It is clear that there is no trend with age in the mean delay from symptom onset to onward transmission (Figure S11, Table S7). Thus, we would only expect the mean serial interval, which is the sum of the delay from symptom onset to onward transmission and the incubation period (infection to symptom onset) in the secondary case, to vary with age if young individuals transmit more frequently to young individuals (shown to have shorter incubation periods, Table S1). Although a trend in this direction was found, it was non-significant (Fisher's exact p=0.17) and did not appear sufficiently strong to have generated the trend seen in the mean serial interval with age. Thus, the age dependence in the serial interval warrants further investigation as sample sizes increase.

Table S7: The Distributions Fitted to the Serial Intervals and Delays from Symptom Onset to Onward Transmission (in days) for Confirmed and Probable EVD Cases by age group. The estimated means and standard deviations (sd) are presented with 95% confidence intervals.

Age Group		Serial Interval	Symptom Onset to Onward Transmission
<16	mean	11.4 (8.3, 15.7; n=30)	7.4 (5.1, 11.0; n=18)
	sd	9.6 (6.8, 15.2)	5.2 (3.5, 9.7)
16-44	mean	12.4 (11.3, 13.5; n=205)	7.6 (6.5, 8.9; n=126)
	sd	7.8 (6.9, 9.0)	5.7 (4.7, 7.2)
45+	mean	15.0 (13.2, 17.2; n=124)	7.9 (4.6, 11.3; n=66)
	sd	11.0 (9.3, 13.3)	9.3 (6.7, 14.5)

n= sample size

Signs and Symptoms by Age Group

Table S8. Signs and Symptoms of Confirmed and Probable EVD Cases from Guinea, Liberia and Sierra Leone by Age Group (in years).

	Age Group (years)						
	<16		16-44		45+		p-value†
	n	%	n	%	N	%	
Gender	688/1371	50.2%	2056/4154	49.5%	917/1767	51.9%	0.243
General Symptoms							
Fever	923/1021	90.4%	2638/3036	86.9%	1020/1252	81.5%	<0.001
Fatigue	756/962	78.6%	2438/2978	81.9%	972/1236	78.6%	0.010
Loss of appetite	663/908	73.0%	2134/2785	76.6%	822/1155	71.2%	0.001
Vomiting	567/913	62.1%	1908/2804	68.0%	653/1148	56.9%	<0.001
Diarrhea	547/906	60.4%	1804/2768	65.2%	685/1160	59.1%	<0.001
Headache	512/869	58.9%	1703/2670	63.8%	670/1120	59.8%	0.010
Abdominal Pain	393/842	46.7%	1479/2578	57.4%	537/1065	50.4%	<0.001
Muscle Pain	313/819	38.2%	1426/2602	54.8%	599/1106	54.2%	<0.001
Joint Pain	270/781	34.6%	1376/2520	54.6%	580/1061	54.7%	<0.001
Chest Pain	187/650	28.8%	940/2091	45.0%	362/852	42.5%	<0.001
Cough	204/661	30.9%	593/2004	29.6%	259/839	30.9%	0.735
Difficulty Breathing	143/723	19.8%	598/2165	27.6%	257/917	28.0%	<0.001
Difficulty Swallowing	133/679	19.6%	597/2043	29.2%	216/873	24.7%	<0.001
Conjunctivitis	158/719	22.0%	597/2138	27.9%	222/899	24.7%	0.004
Sore Throat	99/608	16.3%	386/1839	21.0%	153/784	19.5%	0.036
Confused	56/560	10.0%	221/1774	12.5%	87/718	12.1%	0.290
Hiccups	50/741	6.7%	332/2298	14.4%	136/955	14.2%	<0.001
Jaundice	64/571	11.2%	248/1809	13.7%	93/726	12.8%	0.294
Eye Pain	34/559	6.1%	153/1751	8.7%	40/704	5.7%	0.013
Rash	39/632	6.2%	110/1925	5.7%	39/798	4.9%	0.527
Coma/Unconscious	28/559	5.0%	83/1759	4.7%	45/708	6.4%	0.234
Hemorrhagic Symptoms							
Unexplained bleeding	75/763	9.8%	282/2349	12.0%	107/982	10.9%	0.231
Hematemesis	8/576	1.4%	36/1828	2.0%	7/717	1.0%	0.193
Blood in Stool	20/621	3.2%	52/1932	2.7%	21/758	2.8%	0.798
Bleeding Gums	13/614	2.1%	38/1936	2.0%	11/756	1.5%	0.611
Bloody Nose	8/617	1.3%	27/1931	1.4%	7/752	0.9%	0.623
Bloody Cough	8/613	1.3%	15/1923	0.8%	6/751	0.8%	0.464
Bleeding Other	2/576	0.3%	23/1828	1.3%	11/723	1.5%	0.111
Bleeding at Injection Site	3/612	0.5%	19/1928	1.0%	14/756	1.8%	0.042
Blood in Vomit	3/573	0.5%	24/1818	1.3%	7/715	1.0%	0.263
Blood from vagina§	2/296	0.7%	27/990	2.7%	3/355	0.8%	0.018
Blood in urine	3/614	0.5%	9/1920	0.5%	4/748	0.5%	1.000

* Total numbers are the numbers of cases with data on the variable in question. † p-value for Fisher's exact test for each sign or symptom. ‡ Fever was defined as a body temperature above 38°C; however, in practice, health care workers at the district level often do not have a medical thermometer and simply ask whether the person's body temperature is more elevated than usual. § Percentages reflect only female cases.

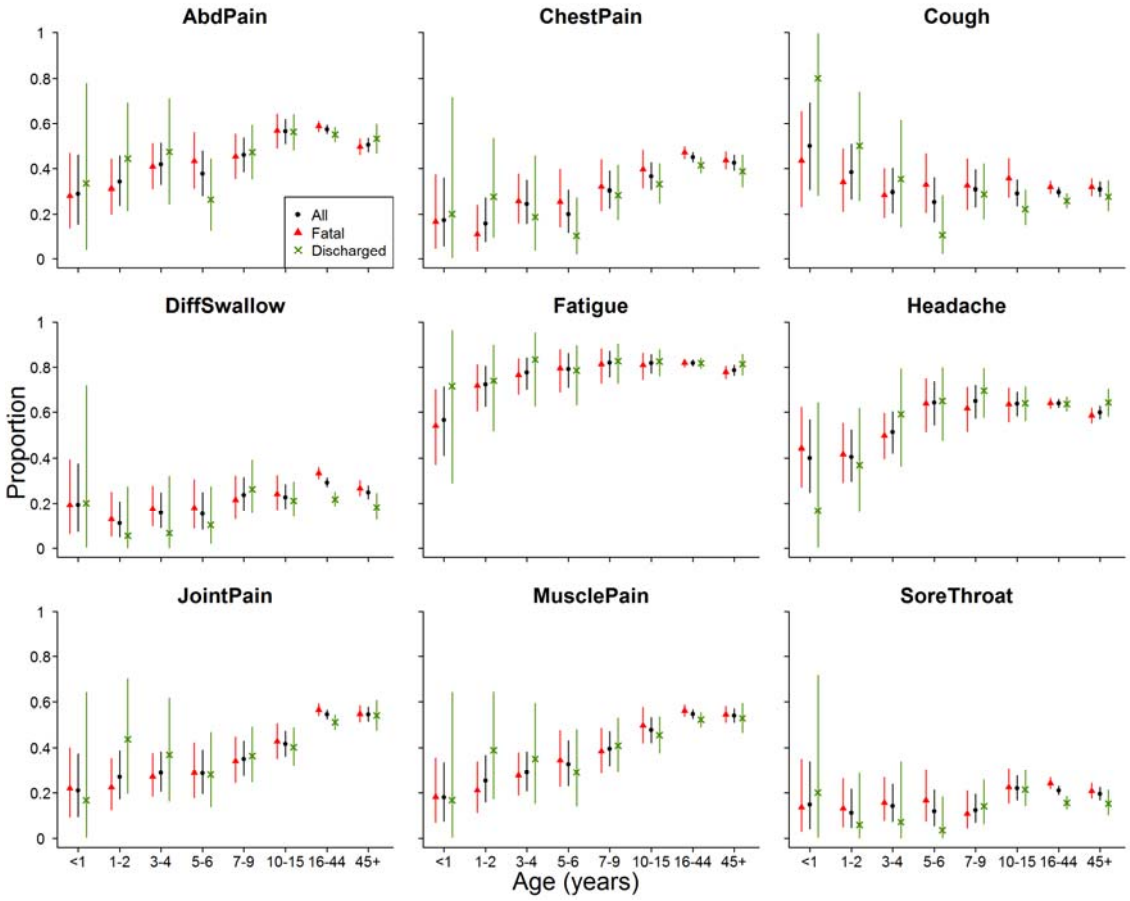

Figure S12. Common Symptoms of Cases by Age Group (in years) and Outcome. Proportions are shown with 95% confidence intervals. Fatal cases by age are plotted in red, discharged cases are shown in green.

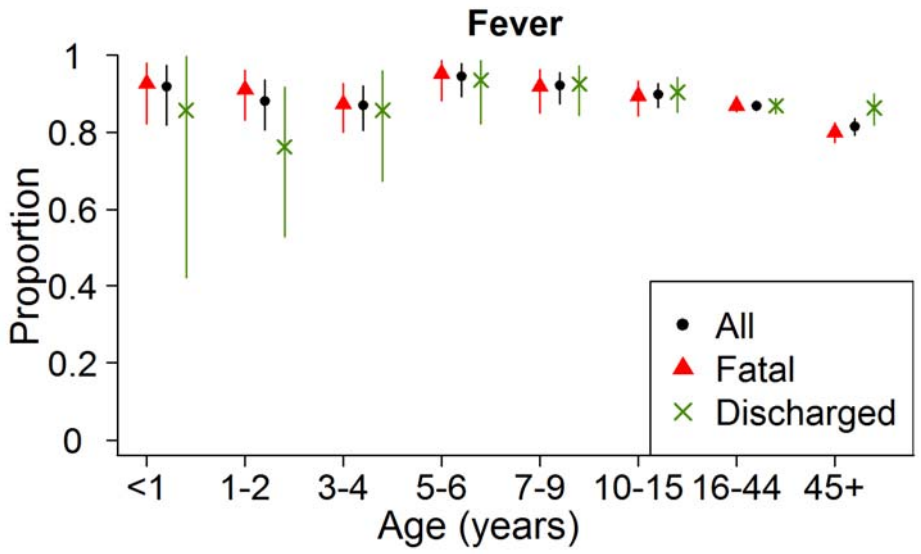

Figure S13. Proportion of Cases Reporting Fever by Age Group (in years). Proportions are shown with 95% confidence intervals. Fatal cases by age are plotted in red, discharged cases are shown in green.

Case Fatality Rate

When estimating the CFR we excluded any cases for whom the date of report was on or after the date of outcome completion recorded in the database.

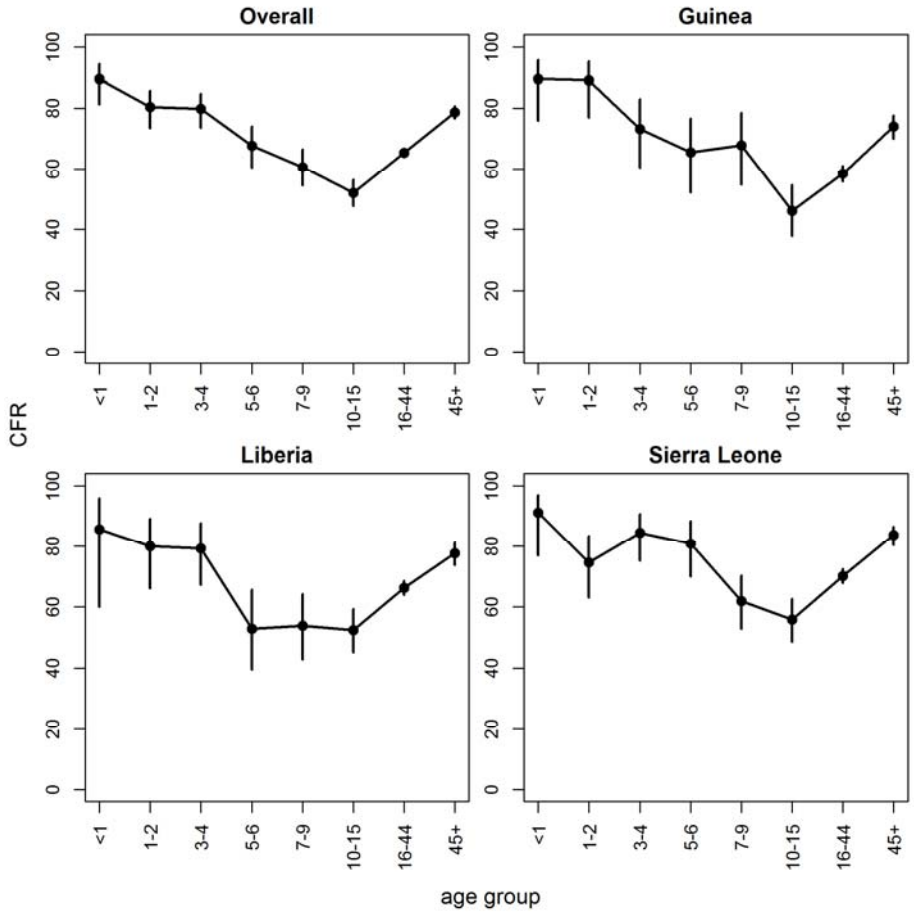

Figure S14. Case Fatality Rate (CFR) of Confirmed and Probable EVD Cases by Age Group (in Years), Overall and by Country. The estimated CFRs are presented with 95% confidence intervals.

Table S9. Case Fatality Rate of Confirmed and Probable EVD Cases with Definitive Clinical Outcome by Age Group, Overall and by Country

Age Group (years)	Overall	Guinea	Liberia	Sierra Leone
Estimate (95% CI, n)				
<1	89.5 (81.3, 94.4; n=86)	89.5 (75.9, 95.8; n=38)	85.7 (60.1, 96.0; n=14)	91.2 (77.0, 97.0; n=34)
1-2	80.4 (73.5, 85.8; n=158)	89.1 (77.0, 95.3; n=46)	80.0 (66.2, 89.1; n=45)	74.6 (63.1, 83.5; n=67)
3-4	79.8 (73.7, 84.8; n=198)	73.2 (60.4, 83.0; n=56)	79.3 (67.2, 87.7; n=58)	84.5 (75.3, 90.7; n=84)
5-6	67.6 (60.4, 74.1; n=176)	65.5 (52.3, 76.6; n=55)	52.8 (39.7, 65.6; n=53)	80.9 (70.0, 88.5; n=68)
7-9	60.6 (54.5, 66.5; n=249)	67.9 (54.8, 78.6; n=56)	53.8 (42.9, 64.3; n=80)	61.9 (52.7, 70.4; n=113)
10-15	52.1 (47.7, 56.4; n=511)	46.2 (37.8, 54.7; n=130)	52.4 (45.3, 59.3; n=191)	55.8 (48.7, 62.7; n=190)
16-44	65.4 (64.0, 66.8; n=4424)	58.4 (55.8, 61.1; n=1314)	66.3 (63.9, 68.6; n=1525)	70.2 (67.9, 72.4; n=1585)
45+	78.7 (76.6, 80.7; n=1533)	74.0 (69.9, 77.7; n=492)	77.8 (73.8, 81.2; n=481)	83.8 (80.5, 86.6; n=560)

n= sample size, 95% CI = 95% Confidence Interval

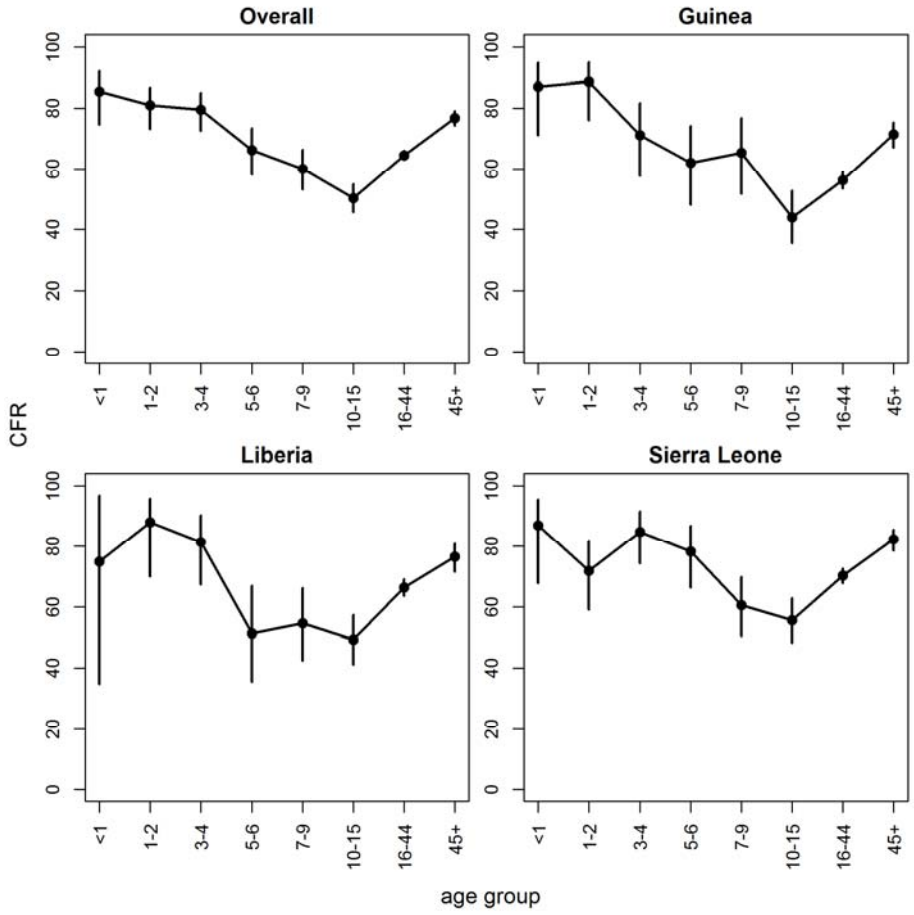

Figure S15. Case Fatality Rate (CFR) of Confirmed EVD Cases by Age Group (in Years), Overall and by Country. The estimated CFRs are presented with 95% confidence intervals.

Table S10. Case Fatality Rate of Confirmed EVD Cases with Definitive Clinical Outcome by Age Group, Overall and by Country

Age Group (years)	Overall	Guinea	Liberia	Sierra Leone
Estimate (95% CI, n)				
<1	85.5 (74.7, 92.2; n=62)	87.1 (71.1, 94.9; n=31)	75.0 (34.9, 96.8; n=8)	87.0 (67.9, 95.5; n=23)
1-2	81.0 (73.2, 86.9; n=126)	88.6 (76.0, 95.0; n=44)	88.0 (70.0, 95.8; n=25)	71.9 (59.2, 81.9; n=57)
3-4	79.5 (72.6, 85.0; n=161)	71.2 (57.7, 81.7; n=52)	81.4 (67.4, 90.3; n=43)	84.8 (74.3, 91.6; n=66)
5-6	66.2 (58.2, 73.4; n=145)	62.0 (48.2, 74.1; n=50)	51.4 (35.6, 67.0; n=35)	78.3 (66.4, 86.9; n=60)
7-9	60.0 (53.3, 66.4; n=210)	65.4 (51.8, 76.8; n=52)	54.7 (42.6, 66.3; n=64)	60.6 (50.5, 69.9; n=94)
10-15	50.3 (45.7, 55.0; n=443)	44.0 (35.6, 52.8; n=125)	49.3 (41.3, 57.4; n=144)	55.7 (48.3, 62.9; n=174)
16-44	64.6 (63.0, 66.1; n=3820)	56.3 (53.5, 59.0; n=1249)	66.5 (63.7, 69.1; n=1175)	70.3 (67.9, 72.7; n=1396)
45+	76.8 (74.4, 79.1; n=1224)	71.4 (67.1, 75.4; n=448)	76.5 (71.6, 80.8; n=324)	82.3 (78.5, 85.5; n=452)

n= sample size, 95% CI = 95% Confidence Interval

References

1. WHO Ebola Response Team. Ebola virus disease in West Africa--the first 9 months of the epidemic and forward projections. N Engl J Med 2014;371:1481-95. doi: 10.056/NEJMoa1411100. Epub 2014 Sep 23.
2. WHO Ebola Response Team. West African Ebola Epidemic after One Year — Slowing but Not Yet under Control. N Engl J Med. doi: 10.1056/NEJMc1414992 Epub 2014 Dec 24.
3. World Health Organization. Case definition recommendations for Ebola or Marburg Virus Diseases, as of 09 August 2014. Available at: http://www.who.int/csr/resources/publications/ebola/ebola-case-definition-contact-en.pdf. Last accessed 22 Jan 2015.