Asymptomatic infection and family contact patterns in households of Ebola Virus Disease survivors, Sierra Leone 2015

Data Creators

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Data Description

The data set contains information on 937 people (living and dead) who were resident in the households of people who survived Ebola Virus Disease (EVD) in the Kerry Town Ebola Treatment Centre in Western Area Province, Sierra Leone, during the 2014-2016 epidemic. It includes individual and household characteristics, information on exposure levels, symptoms experienced by individuals during the period when the household was affected by EVD, outcomes, possible routes of transmission, and ELISA results from antibody testing for Ebola IgG in oral fluid. Survivor households were chosen because they were more easily contactable through the Save the Children survivors outreach programme: 123 of 152 survivors and their households were interviewed.

Details are available in the following published papers:

Bower H, Smout E, Bangura MS, Kamara O, Turay C, Johnson S, et al. Deaths, late deaths, and role of infecting dose in Ebola virus disease in Sierra Leone: retrospective cohort study. *BMJ*. May 17 2016;353

Bower H, Johnson S, Bangura MS, Kamara AJ, Kamara O, Mansaray SH, et al. Exposure-Specific and Age-Specific Attack Rates for Ebola Virus Disease in Ebola-Affected Households, Sierra Leone. *Emerg Infect Dis*. 2016 Aug 15;22(8)

Bower H, Johnson S, Bangura MS, Kamara AJ, Kamara O, Mansaray SH, et al. Effects of Mother's Illness and Breastfeeding on Risk of Ebola Virus Disease in a Cohort of Very Young Children. *PLoS Negl Trop Dis*. 2016;10(4):e0004622

Data Collection Methods

The study used qualitative interview methods to obtain quantitative data. All survivors discharged from Kerry Town Ebola Treatment Centre (ETC), Sierra Leone between November 2014 and March 2015 and living in the Western Area (or their parents/guardians) were contacted by the study team during July-August 2015 and invited to bring all household members who were present at the time Ebola was affecting their household to an interview. Households were defined as people eating from the same 'pot' at the time Ebola was in the household, regardless of the time they had spent in the household, and including people who joined the household during the Ebola period.

Each household was interviewed separately. Individual written informed consent was requested from all members, with parents/guardians providing consent for those under 18 years. At the interview we first drew up an inventory of all household members, noting their age, sex, and whether or not they had had or had died of Ebola virus disease. A member of the study team then demonstrated the oral swab and self-administered oral swabs were collected from all consenting participants (with parents helping young children). These were stored at -20◦C for later testing for Ebola IgG in the Immunology and Applied Biotechnology Research Laboratory of University of Makeni, Sierra Leone, in January 2016. As a group, household members were then asked to describe what had happened in the household in their own words. For each person reported by the family as having had Ebola we asked about symptoms while at home, who had helped them while they were ill, shared a bed or had other contact with them, and who had contact with their body if they died. Adults spoke for young children and corroborated information from older children. In this way, using probing questions, we assigned a maximum exposure for each household

member using predefined levels, which we had developed based on the literature and discussion with staff from the Ebola Treatment Centre. (see Additional Information section below for detail of exposure measurement).

We also asked about exposures outside the home and classified them on the same scale. For those not reported to have had Ebola we asked about symptoms at the time others in the household had Ebola. EVD cases were defined as laboratory-confirmed survivors and deaths from Kerry Town or other ETCs, and all those whom the family reported as having died of Ebola. Deaths for which the family was unsure of the cause, and, for some analyses, symptomatic individuals who were not tested or diagnosed with Ebola at the time, were classified as probable EVD if they fitted the Sierra Leone case definition of probable cases. The most likely primary or co-primary cases were identified for each household, and order of illness among other cases recorded if mentioned. To avoid overburdening participants, we did not collect time sequences or dates. We also did not directly ask family members who they thought transmitted to whom to avoid stimulating blame or ill-feeling among already traumatised families.

All interviews were done in the participants' language by multi-lingual study teams, and key outcomes were recorded in English on household inventory and individual forms. During the interview, one team member was the focal point, maintaining eye contact with the participants and guiding the discussion. A minimum of two other study team members listened and made notes, asking questions only if an issue was overlooked. This avoided multiple conversations taking place at the same time as well as 'tick-box' questioning. Study members were trained extensively so as not to need to use a paper interview guide to avoid loss of connection with the family group. Immediately after the family departed, the team sat together to discuss the story to make sure all elements were understood and data, including each person's maximum level of exposure, were finalised.

Oral fluid samples were tested for Ebola virus glycoprotein IgG using an IgG Capture assay based on the EBOV Mayinga GP antigen (rGPδTM, IBT Bioservices Inc. USA cat.0501-016). Two positive controls and four negative controls were included in each plate. The cut-off for a reactive result was defined per plate as the mean optical density (OD) of the negative controls plus a fixed OD measure (0.1). Data are given as "normalised ODs", i.e. the ratio of the test OD to the cut-off, so results >1 are reactive. Tests were repeated for positive samples and some negative samples, including those with unexpected results and samples nearer the cut-off.

Data Analysis and Preparation

A database template was created in EPI-data based on the study forms and data double-entered by a trained data entry clerk and the study coordinator. After validation, quality checks and double entry corrections, data were exported to STATA and tabulated to further check inconsistencies and identify missing data. These were cross-checked with the paper records. The original variables were then used to construct others where necessary for different analyses.

Geographic regions

Western Area Province, Sierra Leone

Key dates

Data capture took place from 20 July to 27 August 2015.

Quality Controls

The interview team was trained in qualitative interviewing techniques and data-recording over a 10-day period with extensive use of role play. Team supervisors were present at each interview. Questionnaires were collected and checked each evening and queries followed-up with the interviewers the following day. Data were double-entered in EPI-Data using software data checks. Initial comparison and cleaning were done in EPI-data. Additional checks were performed after transfer to STATA 14.

Species

Human population

Privacy

Each household was interviewed privately in locations away from their home, usually in school classrooms which were vacant due to school holidays and/or closures due to the epidemic. Interviewers and data entry clerks were trained in research ethics and confidentiality. Paper records were returned daily to the study coordinator and held in a locked cabinet in a locked office

throughout. Electronic data were password-protected, access limited and anonymised using unique household and participant codes. Laboratory samples were identified only with anonymised codes. Code breaking sheets were only accessible to the study coordinator. Data analysis was performed on anonymised data.

Ethics

All participants gave individual, written, informed consent with parents or guardians giving consent for those aged under 18 years, and assent sought from children over 12 years. Participants were provided with contact details of the Principal Investigators and the Sierra Leone Ethics Committee in case of further questions. Ethical approval and permission to perform the study was granted by the Sierra Leone Ethics and Scientific Review Committee (19 May 2015). and the Ethics Committee of the London School of Hygiene & Tropical Medicine (Ref. No. 9866-2).

Keywords

Ebola Virus disease, Ebola Virus Infection, Sero-prevalence, Risk factors, Exposure, Transmission Patterns, Household and Individual Characteristics, Asymptomatic infection

Language of written material

English

Additional Information

1. Exposure measurement

The table below contains the exposure levels that we developed based on the literature and discussion with staff from the Ebola Treatment Centre. We predefined these levels so that we could record only the highest level and not probe for details for possible lower levels. Our hierarchy of exposure appears to be accurate; we found strong correlations between EVD risk and each increase in exposure level.

Classification of level of exposure to Ebola Virus Disease cases

Level 1:	Contact with the body after death / prepared the body for burial
Level 2:	Direct contact with body fluids e.g. blood, diarrhoea, vomit, urine, or a baby breastfed by an EVD-positive woman
Level 3:	Direct close contact with wet case (i.e. with diarrhoea/vomiting/ bleeding) e.g. helped dress, embraced, carried, helped care, or shared bed Or a mother who breastfed an EVD-positive child
Level 4:	Direct close contact with dry case (i.e. without wet symptoms at the time), e.g. helped dress, embraced, carried, helped care, shared bed
Level 5:	Indirect close contact with wet case, e.g. washed clothes, bed linen, slept in the same room but not the same bed
Level 6:	Indirect close contact with dry case, e.g. washed clothes, bed linen Formal/informal health workers without known contact with a case; ETC workers in PPE; Ebola Intervention workers [outside household only] Attended funeral without contact with the body [outside household only]
Level 7:	Minimal contact, eg shared meals, shared utensils, sat In the same room Children placed in observation centres [outside household only]
Level 8:	No actual contact, e.g. kept distance once person was symptomatic

2. Variables

abpain	Abdominal pain
adults	# adult in HH
ageall	Age in yrs & months
agecat9	Age in 9 categories
agenewyears	Age(y) at time of Ebola
bleed	Any bleeding symptoms
blgum	Bleeding gums

blstool	Blood in stool
blurry	Blurry vision
child	# children in HH
confirmed	Infection confirmed by ELISA y/n
coprim	Co-primary (y/n)
dd	Diarrhoea
diedh	Location of death
extcon	External contact level
fatig	Fatigue body weakness
from1	1st possible source
from2	2nd possible source
from3	3rd possible source
frontline	frontline worker
fup	Follow-up time in days based on survivor ETC admission date
headache	Headache
hhcon	Within household contact level
hhheb	Household head during Ebola period
hhid	Household ID #
hiccups	Hiccups
ivdate	Date of interview
latrine	Latrine access
lossappeti	Loss of appetite
miscarry	Miscarriage
mjpain	Muscle/joint pain
nv	Nausea-vomiting
occup1	Occupation
oral	oral fluid sample collected
outcome	Outcomes (based on histories, before IgG results)
particid	participant ID
place	rural/urban
primary	Primary (y/n)
quaran	Whether household was quarantined or not
ratio1	1st ELISA IgG result as ratio of optical density/mean kit neg +0.1
ratio2	2nd ELISA IgG result as ratio of optical density/mean kit neg +0.1
ratio3	3rd ELISA IgG result as ratio of optical density/mean kit neg +0.1
ratio4	4th ELISA IgG result as ratio of optical density/mean kit neg +0.1
redeye	Red eyes
relat	Person's relationship to another HH member (relatto)
relatto	Person related to (ref to relat)
rooms	# of rooms in residence
sex	Participant gender
soap	Access to soap (household level)
sore	Sore throat/pain swallowing
status	Ebola status using ELISA results
water	Access to water (household level)
wetdry	Type of symptoms in the home

3. Missing data

Missing data is almost completely accounted for by persons who were absent at interview. For the 45 people who were absent at interview but still alive, basic demographics (sex, age, relationships, household characteristics) and outcome were recorded in the inventory. For 17 of the 45, information on exposure and symptoms was gleaned from the narratives of other household members. For the remaining 28 absentees information on individual exposure or symptoms is missing. Swab data is missing for 56 household members comprising 45 alive but absent, four who had died since the household had Ebola, and seven who refused. Of those who refused swabs, only two refused to continue with the interview. Six participants who did give oral swabs do not have results due to laboratory anomalies.

4. Rights and access

A data set without serological findings is available now and access may be sought via a request indicating intended use to the corresponding investigator. Access to the dataset including laboratory data will be embargoed until July 2017 to allow papers by the study team to be published.

Project Information

Project

Asymptomatic infection and family contact patterns in households of Ebola Virus Disease survivors, Sierra Leone 2015

Funder/Sponsor

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Associated Roles

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Co-investigator	Francesco	Checchi	Humanitarian Health	Save the Children, UK

File Description

Title	Filename	File type	Description
Data from study of asymptomatic infection and family contact patterns in households of Ebola Virus Disease survivors: without serological variables	sl_ebola_repos_NO_LAB_STATA.dta sl_ebola_repos_NO_LAB_CSV.csv	Stata Data File Comma Separated Values	Database of 46 variables comprising individual and household characteristics, exposure levels, symptoms, outcomes and possible sources of transmission for 937 members of the households of 123 EVD survivors from the Kerry Town Ebola Treatment Centre, Western Area Province, Sierra Leone.
Codebook for Ebola Response dataset	sl_ebola_repos_NO_LAB_Codebook.pdf	Adobe PDF/A	Codebook for Ebola Response dataset that doesn't contain serological variables
Data from study of asymptomatic infection and family contact patterns in households of Ebola Virus Disease survivors: with serological variables	sl_ebola_repos_ALL_VAR_STATA.dta sl_ebola_repos_ALL_VAR_CSV.csv	Stata Data File Comma Separated Values	Database of 53 variables comprising individual and household characteristics, exposure levels, symptoms, outcomes and possible sources of transmission, and laboratory results from ELISA antibody testing for Ebola IgG for 937 members of the households of 123 EVD survivors from the Kerry Town Ebola Treatment Centre, Western Area Province, Sierra Leone. **EMBARGOED UNTIL 30 JULY 2017 – please contact corresponding investigator before releasing embargo.**
Codebook for Ebola Response dataset with serological variables	sl_ebola_repos_ALL_VAR_Codebook.pdf	Adobe PDF/A	Codebook for Ebola Response dataset that contains serological variables
Individual questionnaire	Surviver_Household_Questionnaire.pdf	Adobe PDF/A	Forms used to create the member inventory of survivor households and perform questionnaires of each person.
Information for participants	Participant_Information_Sheet.pdf	Adobe PDF/A	Information sheet for participants
Consent form	Participant_Consent_Form.pdf	Adobe PDF/A	Participant consent form used in study
Study protocol	Study_Protocol.pdf	Adobe PDF/A	Study protocol