Contextual data

Key question 2: Should bodies of patients deceased from Ebola or Marburg disease be disinfected versus not disinfected prior to handling/moving into a body bag?

- We did not find any studies addressing this question.

Revised Question: What is the risk of EVD acquisition/exposure from handling dead bodies compared to health workers providing care to patients (people who are alive)?

- We found limited data relevant to this question.

We collected the contextual data on the broad question of handling dead bodies because there is no simple answer to key question 2.

Summary

Contextual data pertaining to key answer 2 are displayed in the table below; key findings are summarized below.

What is already known?

- Reduce transmission from exposure to dead bodies (e.g., contact with corpses, touching of bodies at funerals) through safe burial practices have been successful. [1]
- Safe funeral practices and fast hospitalization contributed to the containment of Ebola epidemics. [2]
- Some social/cultural issues, community perceptions and experiences related to burial practices are conducive to Ebola transmission. [3]

What this rapid review found?

- No data to support disinfection before moving the body to a body bag.
- Very limited data and virtually no operational details regarding safe handling of dead bodies with respect to Ebola and Marburg transmission.
- High degree of variation in transmission sources and high transmission risk around the time of death, before and after. [2]
- Reduced funeral attendance and faster hospitalization independently influenced local transmission intensity. [2]
- Health workers were half as likely to have touched a body at a funeral compared with non-health workers. [4]
- The higher prevalence of Ebola infection in contact persons who participated in burial rituals emphasizes the importance of safe and dignified burials during Ebola outbreaks and the need to systematically interview contact persons regarding participation in burial rituals. [5]
- Transmissions within community decreased to substantially low rates once isolation into community care centers was implemented. Transmission during funerals contributed a little after the safe dignified burials were put in place. [6]
- Public health messages promoted by community and religious leaders may have influenced safe burial behaviors during the Ebola outbreak in Sierra Leone. [7]
- Nearly all respondents (3049; 86%) intended to avoid touching or washing the corpse of a family member, regardless of exposure to religious leaders' messages (adjusted odds ratio: 0.89; 95% CI: 0.53–1.48). [7]

- Barriers include fears about how bodies are handled, lack of ability to view or participate in the burial at the cemetery, and the potential for quarantine and stigma when a family member requests collection of a body or following a burial. Facilitating factors for community acceptance may include community participation in digging the grave, as well as the possibility of participating on local burial teams, following appropriate training. [8]
- Safe burial using plastic bags, lack of burial clothes, and the absence of women in the burial team were described as showing a lack of honor for the deceased. Burials were described as being more compliant to control measures when practices such as community prayer were permitted. [9]
- Unsafe dead body management, including direct contact with biological liquids by multiple people close to the deceased. Safer approaches include informing the head of the health area, using chlorinated water during funeral baths, wearing household gloves when touching the dead body, and reducing the number of people in contact with the body. When community leaders, religious leaders, community members, and community health workers' supervisors were asked which unsafe practice was the most difficult to give up, dead body management and greetings with hands were the most frequently mentioned. [3]

Suggested implications of the available evidence

- Disinfection of dead bodies may be justifiable given the transmission risk associated with handling the bodies.
- The context of using disinfection of dead bodies as an intervention for reducing the transmission risk of Ebola and Marburg infection is complex. Understanding this context requires more data through qualitative and quantitative research methods, especially how to position this intervention within the continuum of IPC control in hospitals, operation of burial teams and safe burial practices.

Table: Contextual data

Ref.	Year	Study methods	Findings relevant to the extraction of contextual data	Data type	Contextual data
[1]	2015	Analyzed data related to epidemiology and risk factors of EVD cases from Sierra Leone	Among persons with confirmed cases, 47.9% reported having had contact with someone with suspected EVD or any sick person, and 25.5% reported having attended a funeral, of whom 66.2% reported touching the body. Almost half of patients with EVD in Sierra Leone reported physical contact with a person ill with EVD or a dead body.	Context	In past Ebola virus outbreaks, strict measures to identify and isolate cases quickly, trace their contacts, and reduce transmission from exposure to symptomatic persons and to dead bodies through safe burial practices have been successful. The exposures reported in this outbreak—contact with suspected cases by healthcare workers and family members, including contact with corpses and touching of bodies at funerals—are consistent with those reported in other outbreaks.
				Context	Approximately half of the cases in the VHF data had no known exposure recorded. This may reflect the stigma associated with an EVD diagnosis
				Context	Without the availability of vaccines or definitive treatment, application of standard public health control measures is essential to slow and stop the epidemic.These include comprehensive contact tracing, followed by daily monitoring of contacts for symptoms, with prompt transport to a treatment center where suspected cases can be cared for safely, and safe burials, all performed thoroughly and effectively.
[2]	2016	Observational study of Ebola transmission using data from confirmed and probable EVD cases in 3 countries in West Africa	The principal limitation of our analysis is limited data quality (especially dates, and possible misclassifications). The proportion of cases reporting a funeral exposure decreased over time. We found a positive correlation (r = 0.35, p<0.001) between this proportion in a given district for a given month and the within-district transmission intensity, quantified by the estimated reproduction number (R). We also found a negative correlation (r =−0.37, p<0.001) between R and the district proportion of hospitalized cases admitted within 4 days of symptom onset. **These two proportions were not correlated, suggesting that reduced funeral attendance and faster hospitalization independently influenced local transmission intensity.**	Context	Safe funeral practices and fast hospitalisation contributed to the containment of this Ebola epidemic. 25% of cases who reported any exposure in the current outbreak reported exposures at funerals. Most cases (89%) reporting a funeral exposure also reported one or more non-funeral exposures. For funeral exposures, cases were asked whether they had touched the corpse. Of those giving a response, 65% reported having touched the corpse, with this proportion being greatest for Guinea (71%) and least for Liberia (61%).
			We were able to identify 14% of potential source contacts as cases in the case line-list. Linking cases to the contacts who potentially infected them provided information on the transmission network. **This revealed a high degree of heterogeneity in inferred transmissions,** with only 20% of cases accounting for at least 73% of new infections, a phenomenon often called super-spreading.	Context	We find high to extreme variability in the offspring distribution. The estimated coefficient of variation for the offspring distribution ranges from 1.6 to 5.6. This implies that 5% of cases accounted for at least 30% of all new infections and that 20% of cases accounted for at least 73% of new infections, a phenomenon termed super-spreading [26]. Super-spreading was found to affect both non-funeral and funeral transmissions equally.
			Multivariable regression models allowed us to identify predictors of being named as a potential source contact. **These were similar for funeral and non-funeral contacts: severe symptoms, death, non-hospitalization, older age, and travelling prior to symptom onset. Non-funeral exposures were strongly peaked around the death of the contact.**	Context	Transmission events from non-funeral exposures were estimated to be strongly peaked on the day of and the day after the death of the contact. In all, 44% of non-funeral exposures to potential source contacts who died were estimated to occur on or after the date of death of the

contact. Furthermore, individuals who died were more likely to be named as non-funeral contacts.

				Context	Similar predictors were found for individuals being named as funeral contacts: more severely affected cases (fever versus no fever, OR = 1.81 [95% CI: 1.08, 3.18]; respiratory versus no respiratory symptoms, OR = 1.65 [95% CI: 1.09, 2.54]), adults (≥16 versus <16 years old, OR = 2.44 [95% CI: 1.47, 4.36]), cases not hospitalized (versus hospitalized in an ETU, OR = 5.56 [95% CI: 2.94, 11.11]), those who reported travelling before they became ill (versus not travelling, OR = 2.47 [95% CI: 1.50, 3.90]), confirmed cases (versus suspected cases, OR = 1.98 [95% CI: 1.28, 3.11]), probable cases (versus suspected cases, OR = 2.03 [95% CI: 1.21, 3.42]), and those who were reported as Ebola cases after death (versus before death, OR = 1.64 [95% CI: 1.12, 2.40]).
				Health equity	Sex did not appear as an important predictor of exposure risk in any of the analyses that we performed.
				Context	Our analysis confirms that exposure to Ebola cases at funerals is an important amplifier of Ebola transmission, in line with a study focused in Sierra Leone
[4]	2015	Analyzed data from Sierra Leone National VHF Database and related sources	Although not statistically significant, HWs were half as likely to have touched a body at a funeral compared with non-HWs.	Context	Although not statistically significant, HWs were half as likely to have touched a body at a funeral compared with non-HWs.
[5]	2019	Observational study of prevalence of infection among asymptomatic and paucisymptomatic contact persons exposed to Ebola virus in Guinea	Seropositivity increased with participation in burial rituals (adjusted odds ratio [aOR] 2·30, 95% CI 1·21–4·17; p=0·0079) and exposure to blood or vomit (aOR 2·15, 1·23–3·91; p=0·0090). This study provides a new assessment of the prevalence of Ebola virus infection among contact persons according to exposure, provides evidence for the occurrence of paucisymptomatic cases, and reinforces the importance of closely monitoring at-risk contact persons.	Implementation	The higher prevalence of Ebola virus infection in contact persons who participated in burial rituals emphasizes the importance of safe and dignified burials during Ebola outbreaks and the need to systematically interview contact persons regarding participation in burial rituals.
				Implementation	Ebola virus infection occurred in 3–17% of the contact persons, **depending on the presence of symptoms among contact persons and exposure to burial rituals**.
[6]	2017	Study of transmission chain using data from Sierra Leone	All 142 confirmed and probable EVD cases registered were fully resolved in the transmission chain. 72.5% of all the EVD cases in the district were exposed in the community, 26.1% exposed during funerals, and 1.4% exposed in the health facility setting. Health-care workers contributed little to the EVD outbreak. 71.1% of EVD transmission occurred among family members.	Health equity	Female EVD cases generated more secondary cases than their male counterparts did (P = 0.03).

There was evidence that hospitalization reduced but did not eliminate onward exposures. We found that Ebola treatment units were better than other health care facilities at preventing exposure from hospitalized and deceased individuals.

				Context	The findings of the study show that most transmissions took place in the community and between family members. **However, these transmissions within community decreased to substantially low rates once isolation into the CCC was implemented. Transmission during funerals contributed a little after the safe dignified burials were put in place.** Although transmission due to exposure at the health facility had a minor role to the spread of the outbreak in the district, the full implementation of IPC measures at the health facilities further reduced the chances of transmission.
[7]	2021	Study the potential impact of engaging religious leaders in promoting safe burial practices	Of the respondents, 3148 (89%) had been exposed to faith-based messages from religious leaders on safe Ebola burials and 369 (10%) were unexposed. Exposure to religious leaders' messages was associated with a nearly twofold increase in the intention to accept safe alternatives to traditional burials and the intention to wait ≥ 2 days for burial teams (adjusted odds ratio, aOR: 1.69; 95% confidence interval, CI: 1.23–2.31 and aOR: 1.84; 95% CI: 1.38–2.44, respectively). Exposure to messages from religious leaders was also associated with avoidance of traditional burials and of contact with suspected Ebola patients (aOR: 1.46; 95% CI: 1.14–1.89 and aOR: 1.65; 95% CI: 1.27–2.13, respectively).	Implementation	Public health messages promoted by religious leaders may have influenced safe burial behaviours during the Ebola outbreak in Sierra Leone. Engagement of religious leaders in risk communication should be prioritized during health emergencies in similar settings.
				Implementation	Nearly all respondents (3049; 86%) intended to avoid touching or washing the corpse of a family member, regardless of exposure to religious leaders' messages (aOR: 0.89; 95% CI: 0.53–1.48).
[8]	2017	Facilitators and Barriers to Community Acceptance of Safe, Dignified Medical Burials in the Context of an Ebola Epidemic, Sierra Leone	In addition to concerns about breaking cultural traditions, barriers to safe burial acceptance included concerns by family members about being able to view the burial, perceptions that bodies were improperly handled, and fear that stigma may occur if a family member receives a safe, dignified medical burial. Participants suggested that providing opportunities for community members to participate in safe and dignified burials would improve community acceptance.	Implementation	Barriers include fears about how bodies are handled, lack of ability to view or participate in the burial at the cemetery, and the potential for quarantine and stigma when a family member requests collection of a body or following a burial. Facilitating factors for community acceptance may include community participation in digging the grave, as well as the possibility of participating on local burial teams (following appropriate training).
[10]	2021	Socio-cultural and anthropological implications of safe and dignified burial in DR Congo	Death, burial, funeral rites, and mourning beliefs and traditions can have a direct impact on Ebola transmission and influence trust between communities and responders.	Implementation	In the context of EVD in North Kivu, two-way dialogue and community consultations ensured community members understand the need for Safe Dignified Burial (SDB) and to raise awareness about the use of locally appropriate SDB. Rumors about the care of the deceased and the intentions of the burial teams were also reduced thanks to a well-managed and open process.

[9]	2018	Mixed-methods study in Sierra Leone about household transmission dynamics and community compliance with Ebola control measures	Burials in plastic bags, without female attendants or prayer, were perceived as dishonourable. Further reasons for low compliance were low EMC survival rates, family perceptions of a moral duty to provide care to relatives, poor communication with the EMC, and loss of livelihoods due to quarantine. Compliance with response measures increased only after the second generation, coinciding with the implementation of restrictive bylaws, return of the first survivor, reduced contact with dead bodies, and admission of patients to the EMC.	Implementation	Return of a survivor to the village and more effective implementation of control strategies coincided with increased compliance to control measures, with few subsequent cases.
				Context	Following death, the index case was buried in an unsafe manner by community members, many of whom had unprotected contact with the body. It is believed that this may have started the chain of person-to-person transmission in the village. Transmission lasted for 16 weeks, with 30 cases arising over five transmission generations: 11 cases in the 1st generation, seven in the 2nd, five in the 3rd, four in the 4th, and two in the 5th.
				Acceptability	"Initially, it [burial team] was not good but when we saw that the deaths increased, we knew it was for our own safety."
				Acceptability	"Without the burial team, the disease would have spread because touching dead bodies is bad."
				Health equity	"Men burying women is not good; women should be part of the burial team."
				Implementation	Safe burial using plastic bags, lack of burial clothes, and the absence of women in the burial team were described as showing a lack of honor for the deceased. Burials were described as being more compliant to control measures when practices such as community prayer were permitted. In addition, the burial team started to dress in PPE after arrival in the village as now recommended by WHO Guidelines [27]. Additional measures that can be implemented without compromising safe burial, such as including female members in the burial team, and safe alternatives to plastic burial bags, would further enhance community acceptance compliance, and should be included in EVD control guidelines.
[11]	2017	A survey/interview of community perceptions and experiences during periods of low but ongoing transmission of EVD in Sierra Leone	Participants perceived that as healthcare practices and facilities improved, so did community trust. Resource management remained a noted concern. Perceptions of survivors ranged from sympathy and empathy to fear and stigmatization. Barriers included persistent denial of ongoing Ebola transmission, secret burials and movement across porous borders. Facilitators included personal protective actions, consistent messaging and the inclusion of women and survivors in the response.	Context	Understanding community experiences during the devastating Ebola epidemic provides practical lessons for engaging similar communities in risk communication and social mobilization during future outbreaks and public health emergencies.
				Context	There should be targeted social mobilization and risk communication efforts particularly around safe burial practices and personal protective actions such as hand washing. There should be targeted communication with survivors

[3]	2017	Use of a community-led prevention strategy to enhance behavioral changes towards EVD prevention: a qualitative case study in Western Côte d'Ivoire	The community-led strategy was socially accepted in the villages. The people interviewed demonstrated accurate understanding of information about prevention practices. Some practices were easily adopted, while others remained difficult to implement (e.g., ensuring safe and dignified dead body management).	Implementation	The strategy was implemented in Western districts bordering Liberia, Guinea, and Mali. This study aims to analyze the community-led strategy, to document lessons learned from the experience, and to capitalize on the achievements. This research demonstrates that sensitization efforts led by well-integrated and respected community leaders can be conducive of behavior change.
				Implementation	Unsafe dead body management, including direct contact with biological liquids by multiple people close to the deceased. Alternative approaches include informing the head of the health area, using chlorinated water during funeral baths, wearing household gloves when touching the dead body, and reducing the number of people in contact with the body.
				Acceptability	When community leaders, religious leaders, community members, and community health workers' supervisors were asked which unsafe practice was the most difficult to give up, dead body management and greetings with hands were the most frequently mentioned.

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