Translation Facilitates Comprehension of Health-Related Crisis Information: Kenya as an example

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ABSTRACT

This paper examines the relationship between translation and comprehension when communicating health-related information during a crisis. It tests comprehension levels among a population of rural and urban Kenyans of health-related crisis communication presented to them in an English source text and a Kiswahili target text. These data were gathered in Kenya in collaboration with a non-profit organisation, Translators without Borders, and the overarching aim of the project was to assess empirically the potential impact of translation on comprehension of health-crisis content.

Findings indicate that English is not a suitable medium for the transfer of important health-related information among the cohort of participants in this study, despite English being an official language of Kenya. In contrast, Kiswahili, also an official language, seems to function well. As a result, a need for translation into Kiswahili in this context has been empirically shown. It was further found that written modes of communication are not necessarily the most appropriate modes for the dissemination of health-related crisis information among this cohort. This presents interesting challenges for governments, crisis response agencies, and translators alike, and these challenges are discussed.

KEYWORDS

Health-Related crisis communication, translation, comprehension, Kenya, Translators without Borders.

1. Introduction

This paper touches on translation, comprehension and communication of health-related information in crisis settings. The overarching aim of the research project was to assess empirically the potential impact of translation on comprehension of health-crisis content. To carry out this assessment, we collaborated with a non-profit organisation, Translators without Borders, and tested comprehension levels among a population of rural and urban Kenyans of information related to the 2014 outbreak of Ebola hemorrhagic fever that was presented to them in an English source text and a Kiswahili target text.

This paper is structured as follows. We first outline why translation is necessary in crises in general and in health-related crises specifically. We take some time to tease out the concept and role of translation in crisis communication. As Kenya is used as the location for the empirical testing of comprehension of translated and non-translated information on Ebola, in order to provide an example of how translation might facilitate greater comprehension, we also touch on the multilingual contours of that country. The design and purpose of the research is then outlined in detail.

This is followed by a presentation and summary of the results of our test, and the paper closes with a discussion of the implications of our findings.

2. Translation and Health-Related Communication

Effective communication during a crisis is strategically important (Seeger 2006; Fischer 2008; World Health Organisation 2012). Insufficient linguistic or cultural competence limits access to and comprehension of important crisis-related information (Nsiah-Kumi 2008). It can also lead to a misunderstanding of risk and to poor response decisions (Santos-Hernández and Morrow 2013). A pivotal work, *Disaster Relief 2.0*, published by Harvard Humanitarian Initiative (2011), using the Haiti Earthquake example, identifies lack of translation as a perennial hidden issue in disaster and crisis response. Furthermore, the International Federation of Red Cross and Red Crescent Societies (2014) recognises the importance of translation to crisis-related communication. Given the varied nature of crises, which can range from floods, to volcanoes, to epidemics, to large-scale industrial accidents to name but a few examples, the type of information requiring translation might be general (e.g. where the nearest shelter is located), or specialised (e.g. understanding information about Becquerel and radioactivity). Translation may be carried out by professional translators and/or interpreters or by untrained volunteers and the information to be translated might be produced prior to any crisis (pre-onset for building resilience), during the crisis, and after the main event.

Research on translation and its role in crisis communication is relatively limited at present (Federici 2016). A small body of work in translation studies researches crowdsourced translation and machine translation efforts in crisis settings and argues that translation beneficially facilitates communication between affected populations and responders (Lewis 2010; Munro 2010; Lewis, Munro, and Vogel 2011; Munro 2013). Other research examines how best to disseminate translated communication during a crisis and suggests that delivery of translated messages through alternative channels, such as community or faith-based centres, can be beneficial, especially for communicating with older adults, children, pregnant women, those with physical or mental disabilities, or other particularly vulnerable groups (Nsiah-Kumi 2008; Fu *et al.* 2010; Pfefferbaum *et al.* 2012; Yip *et al.* 2013).

There are also several studies which discuss the ways in which key stakeholders – especially medical teams – can improve their interactions with translators and interpreters during crises (Freeth 1993; Bolton and Weiss 2001; Powell and Pagliara-Miller 2012; Businaro 2012). A portion of the crisis communication literature focuses specifically on issues of public health. Such research tends to be framed in the form of best practice guidelines for practitioners. These guidelines – based mainly on the swine and avian flu outbreaks of recent years – assert that the public

will find public health information more understandable and effective if it is delivered by family doctors and schools (Henrich and Holmes 2011), or through conventional communication sources, such as television, newspapers, and websites (Kelley, Tharian and Shoaf 2011), and generally from a source that is trusted (Longstaff and Yang 2008; Holmes *et al.* 2009). Recent studies have also shown highly significant connections between poor communication in medical contexts and loss of life as well as financial losses (e.g. Thorne, Bultz and Baile 2005; Von Fragstein *et al.* 2008; Slade 2011; Taran 2011).

In sum, existing research shows support for the argument that translation is important to effective health-related communication in a crisis setting. Multiple perspectives can be taken on the concept of translation, however, and the next section clarifies the view taken on translation in this research.

2.1. A Broad Perspective on Translation

Translation can be carried out in an exclusively written mode by a lone translator who constructs meaning using mostly words. However, adopting a broader perspective on translation than this is useful for our purposes. In a large-scale crisis, communication is complex and urgent, meaning is constructed through a fast-changing collage of modes, languages, and cultures, and there is often a lack of trained translators and interpreters who are available to work. Cadwell's work on translation needs in the 2011 Great East Japan Earthquake demonstrates this (Cadwell 2015). We consider a broader perspective on translation modality, cultural transfer, interaction between translators, and translation activism to be particularly relevant to this paper.

A growing body of research on interpreting in conflict and crisis settings exists (e.g., Apter 2001; Edwards 2002; Moser-Mercer and Bali 2007; Salama-Carr 2007; Takeda 2010; Footitt and Kelly 2012a, 2012b; Moser-Mercer, Kherbiche and Class 2014). These works examine an oral mode of transfer. This paper, however, centres on translation and focuses more on written transfer. Nonetheless, concepts such as sight-translation or translation dictation imply that translation can exist in a middle ground between written and oral modes (Carl *et al.* 2016). Furthermore, the well-established domain of audiovisual translation reminds us that words, images, icons, and sounds can be used to create meaning and that this can lead to a variety of linguistic and semiotic transfers in translation (Chaume 2013; Kaindl 2013).

Not just linguistic and semiotic concerns but also cultural concerns have been considered aspects of translation since the cultural turn in translation studies which began with Bassnett and Lefevere (1990). It is argued by many researchers that cultural or social values influence the way that people process information in a crisis (e.g., Muhren, Van Den

Eede and Van De Walle 2009; Low, Varughese and Pang 2011; Harro-Loit, Vihalemm and Ugur 2012; Oliveira 2013; Cornia, Dressel and Pfeil 2016); thus, cultural and social meanings need to be considered when adopting a perspective on translation in this research.

Technology, too, should be considered because of the way in which it has impacted on how translators work. Computer-assisted translation and post-editing of machine translation are now common (O'Brien *et al.* 2014). Moreover, while co-translation has been a feature of translation since ancient times (Liang and Mingwu 2015), information sharing, interaction, dialogue, and collaboration facilitated by technology are characteristic of much contemporary translation (Pym 2011). Labels for these processes such as community translation, crowdsourcing, and collaborative translation are now in use (O'Hagan 2011).

The perspective taken on translation in this paper also pertains to ethical issues. Evidence has been put forward for an activist turn in translation studies (Wolf 2012). Judging the rightness or wrongness of activist translation in terms of traditional ethical concerns, such as confidentiality, professionalism, or neutrality, may be ineffective. In fact, researchers who are involved in this turn dismantle any idea of translator neutrality and argue for the agency and power of translators to make interventions based on their political beliefs or convictions; these interventions can end up changing the world (Tymoczko 2000; Baker 2013). The political beliefs and convictions involved can be categorised along two dimensions: engagement and resistance (Tymoczko 2014). In particular, translators have been shown to engage with anticapitalist, humanitarian, and philanthropic projects and to use postcolonialist and gender perspectives to resist dominant discourses (Arrojo 1994; Simon 1996; Calzada Pérez 2007; Baker 2010; Doerr 2012). It is further argued that interventions by activist translators are especially characterised by their ad-hoc, innovative, and voluntary character (Susam-Saraeva and Pérez-González 2012; Olohan 2013; Tymoczko 2014). Some translators working in crisis situations may consider themselves to be activists, and the solutions provided by crisis translators have been shown to be typically ad-hoc, innovative, and voluntary (Cadwell 2015). Furthermore, while all activist translators should be concerned with judging the rightness or wrongness of their interventions, ethical questions may be particularly relevant to those working in crises, as such settings tend to present great ethical complexity and moral ambiguity.

2.2. Multilingualism in Kenya

This paper explores the translation and communication of health-related information in a particular context – the outbreak of Ebola hemorrhagic fever which began in Guinea in March 2014, which centred on several countries in West Africa (especially Guinea, Sierra Leone, and Liberia), but which affected countries throughout the world, including Nigeria,

Senegal, Spain, and the USA (UNOCHA 2014). Some aspects of the linguistic setting in Kenya are relevant to this paper.

Multilingualism is a complex, frequently-observed phenomenon in sub-Saharan Africa, and an ability to communicate in more than one language is the norm (Noske 2016). Kiswahili and English are the two official languages of Kenya, and the country has over 60 indigenous languages in daily use (Kioko 2013). More precisely, the Languages of Kenya Bill, 2015, proposes that English is the "official language" and that Kiswahili is to be promoted as the "national language" (Commission for the Implementation of the Constitution 2015). One of the objectives of this bill is to "promote the equitable treatment of Kiswahili and English as the official languages of Kenya" (2015: 3), while also protecting the diversity of "community languages." Multiple communities make use of these linguistic resources, thus, it is more constructive to think in terms of a speaker's expertise, community affiliation or linguistic inheritance in a Kenyan context than in terms of the speaker's mother tongue or native speaker status (Thompson 2013). Furthermore, it should not be taken for granted that speakers will be fully confident reading the languages they speak (Noske 2016). To illustrate this point, it has been shown in one study of Kenyan school children that fluent reading does not necessarily correlate with comprehension; while these children could read English fluently, their comprehension was significantly higher in Kiswahili or in one of the community languages used by them (Piper, Schroeder and Trudell 2016).

To sum up, our review of the literature has shown that translation can be important to crisis communication, that the multimodal, cultural, collaborative, and activist view of translation adopted in this research is supported by other scholars, and that examining translation in Kenya requires an understanding of language use and reading comprehension specific to that context.

3. Design and Purpose of the Research

As established above, the role and impact of translation in contributing to comprehension of crisis communication is under-researched and barely acknowledged. The objectives of this research were therefore to address this gap to some extent. The research was carried out in collaboration with a non-profit organisation whose primary objective is to provide important translated information to communities who are not normally beneficiaries of such information – Translators without Borders. There were two specific objectives:

1. Measure the comprehensibility of English health-related information posters vs. translated Kiswahili posters among urban and rural recipients in Kenya.

2. Gauge beneficiaries' preferences for the mode of delivery of such content and the language of delivery.

The overarching aim was to assess empirically the potential impact translation can have on comprehension of health crisis content.

Kenya was selected because Translators without Borders (TWB) has a Training Centre there and an already-established relationship with a network of community health workers. Kiswahili and English were selected because, although Kenya has a highly multi-lingual make-up, Kiswahili and English are the two statutory national languages (Ethnologue 2015). Both are spoken as *lingua franca* and English is spoken in commerce, government and in educational settings, though the various ethnic groups typically speak their own indigenous community languages, which can be referred to as mother tongues or tribal languages. It should be noted, too, that while English is a medium of instruction in the Kenyan school system (Kioko and Muthwii 2001) and while it is the most widely used language on Kenyan television (Ojwang 2011), a standard, native-speaker variety of English is not the norm in actual language behaviour. Firstly, English tends to be spoken more by highly-educated, high-income members of society than by the general population (Schmied 2006). Secondly, when English is used by the general population, it is used as just one of an array of linguistic resources, leading to cross-fertilisation and code switching between English and these community languages (Kioko and Muthwii 2001).

The aim was to survey 200 participants from the general population giving some participants an information poster about Ebola in English and some a translated version of the poster in Kiswahili (see Appendix 1 for both versions of the poster). Basic knowledge regarding Ebola was tested in advance of presentation of the posters by asking four questions (see Results section). Comprehension of the poster content was then tested after each participant read the poster through an expanded list of 12 questions (see Appendix 2). The aim was to get an even distribution of urban and rural dwellers in Kenya, of gender, and of numbers who read English/Kiswahili versions of the poster. The focus on urban vs. rural dwellers was driven by the claim that there are increasing inequalities within Africa between urban and rural populations (Noske 2016).

Research ethics approval was granted by the university Research Ethics Committee. Community Health Workers (CHWs) were recruited by Translators without Borders (TWB) and were trained in the objectives and administration of the survey. The CHWs used their weekly meetings with the community to introduce the survey and to announce that they would be calling door-to-door with the survey. They emphasised that participation was completely voluntary. To fulfill research ethics obligations, they first read a 'plain language statement' to the participant and then the 'informed consent form,' which the participant was

subsequently asked to sign. The plain language statement, informed consent form, survey questions and information poster were translated into Kiswahili by TWB. The reason for translating the research instruments (plain language statement, informed consent form, and all survey questions) into Kiswahili and conducting the survey in Kiswahili was that we wanted to avoid any possible confusion regarding the research project. It was our supposition that, despite English being a *lingua franca* in Kenya, there would potentially be comprehension issues with information delivered in English. This was, in fact, the basic motivation for the research project, and the data gathered below on language competence confirmed the validity of this supposition. Once surveys were returned to TWB, the data were uploaded to an online survey tool for analysis.

4. Results: demographics and language competences and preferences

In this section, the profile of survey participants is presented according to the categories of abode (rural or urban), gender, age, and language preferences.

As shown in Figure 1, there were 95 participants from a rural area and 102 from an urban area. Figure 2 demonstrates that there was an almost equal division between male (99) and female (98) respondents.

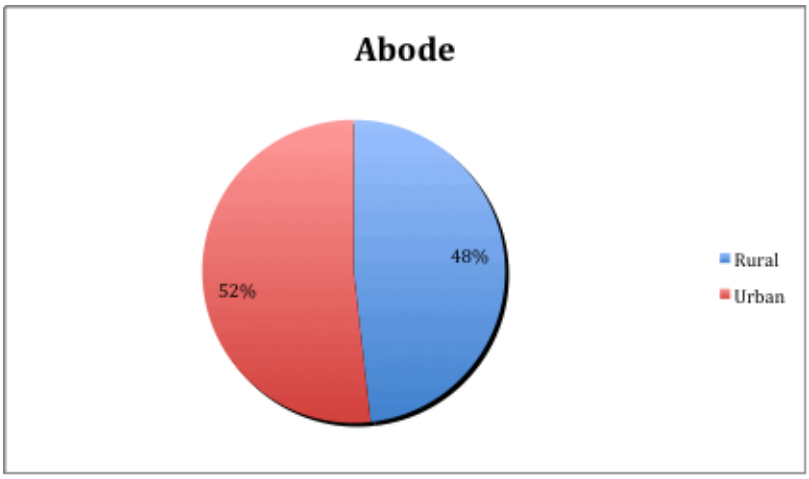

Figure 1. Rural vs. urban participants

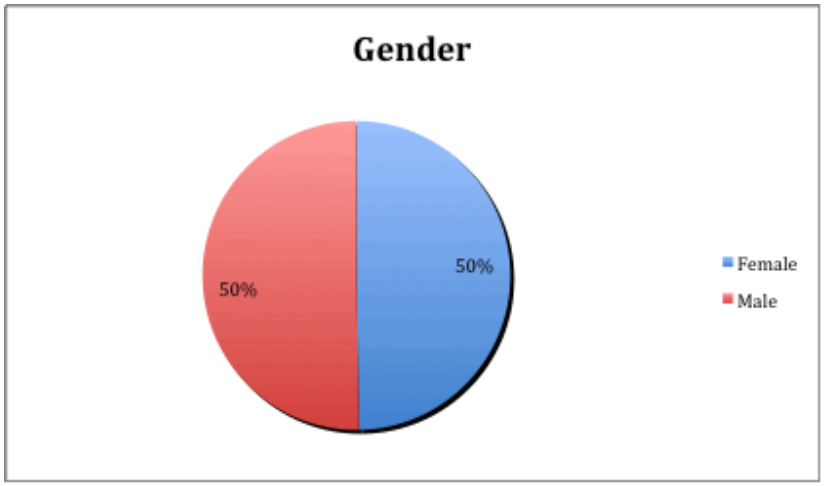

Figure 2. Gender of participants

Distribution across age categories was, however, more skewed, with 137 in the 18-44 category, 55 in the 45-64 category, and 5 in the 65+ category (see Figure 3).

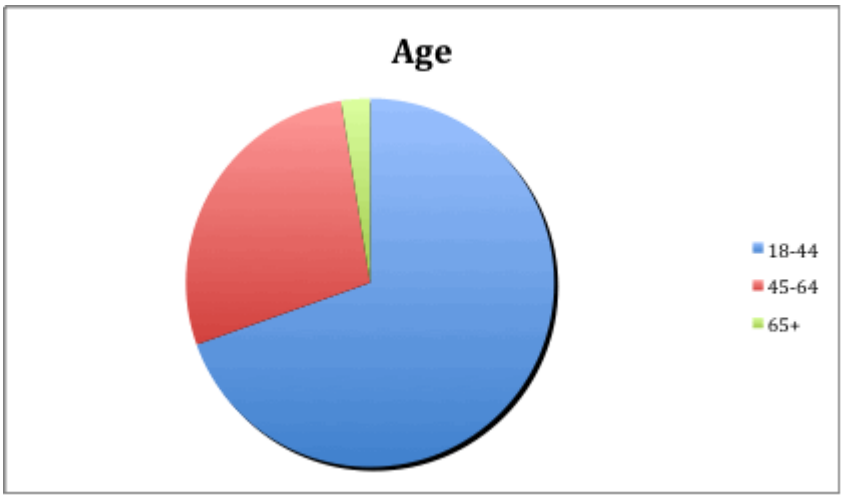

Figure 3. Age categories for participants

The sample therefore includes a balance between abode and gender, but was biased towards a younger age group.

4.1. Languages

Participants were first asked to name their 'mother tongue'. This was qualified as 'tribal language' to indicate that the question referred to one of Kenya's community languages. Table 1 shows the mother tongues listed in descending order of speakers with 24 different languages named. In the context of the results presented later, it is worth noting that Kiswahili is listed as a mother tongue by only four people. However, when asked to list their 'second-best language', 189 listed Kiswahili (with five listing English, one Nyoyaya, and two Orma). When asked for their 'third-best language,' English came out on top (see Table 2).

Language	Number
Kikuyu	22
Kamba	20
Nyoyaya	20
Orma	19
Maa	18
Luhya	17
Kisili	12
Luo	12
Pokomo	11
Samburu	6
Malakote	5
Meru	5
Taita	5
Digo	4
Kalenjin	4
Kiswahili	5
Borana	2
Kiembu	2
Nandi	1
Oromo	1
Giriama	1
Kuria	1
Mijikenda	1
Teso	1

Table 1. Mother tongue (tribal language)

2nd best language	Number
Kiswahili	189
English	5
Nyoyaya	1
Orma	2

3rd best language	Number
English	135
Kiswahili	44
Arabic	11
Somali	5
Orma	1
None	1

Table 2. Second and third-best languages

We note that the total number who selected Kiswahili as first, second or third-best language exceeds the total number of participants. The CHWs confirmed that some participants responded with 'Kiswahili' more than once, which explains why this is the case. We can only speculate here that some of the participants did not understand what was meant by first, second and third-best language.

Participants were asked to rate their understanding of written and spoken Kiswahili, followed by their understanding of written and spoken English. This was done on a 4-point Likert scale as follows:

Understanding of written Kiswahili/English
1. Very limited, I don't understand anything or just a few words
2. Limited, I usually understand about 50%
3. Good, I usually understand 80% of what I read
4. Excellent, I usually have no trouble at all understanding written texts.

Understanding of spoken Kiswahili/English
1. Very limited, I don't understand anything or just a few words
2. Limited, I usually understand about 50%
3. Good, I usually understand 80% of what I hear
4. Excellent, I usually have no trouble at all understanding what I hear.

The responses are presented in Figures 4 to 7.

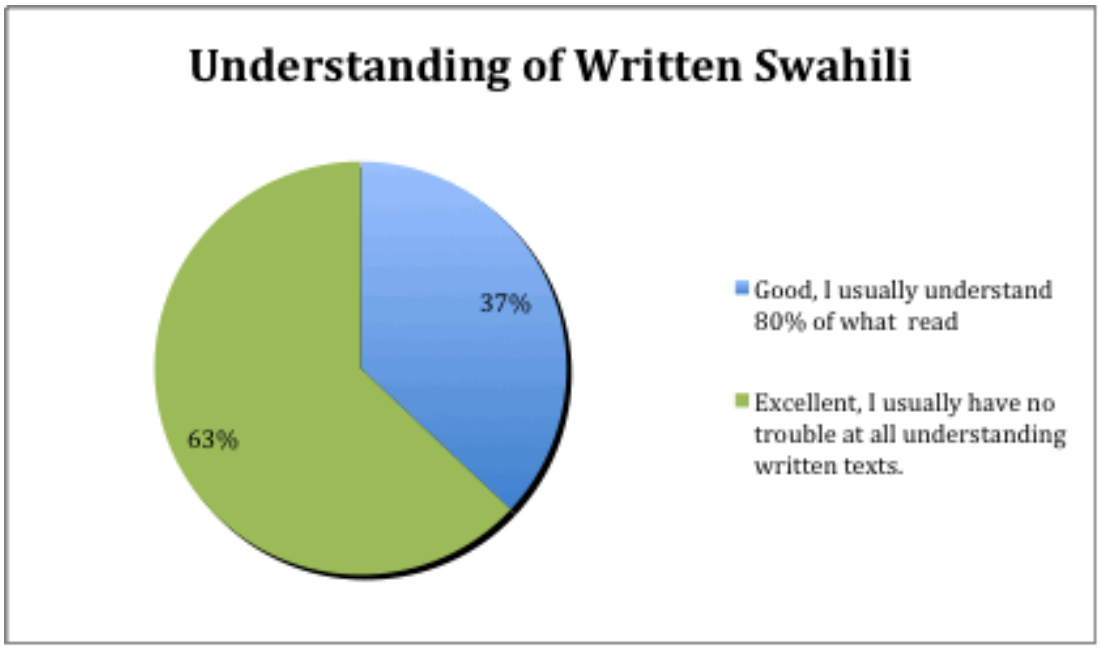

Figure 4. Understanding of written Kiswahili

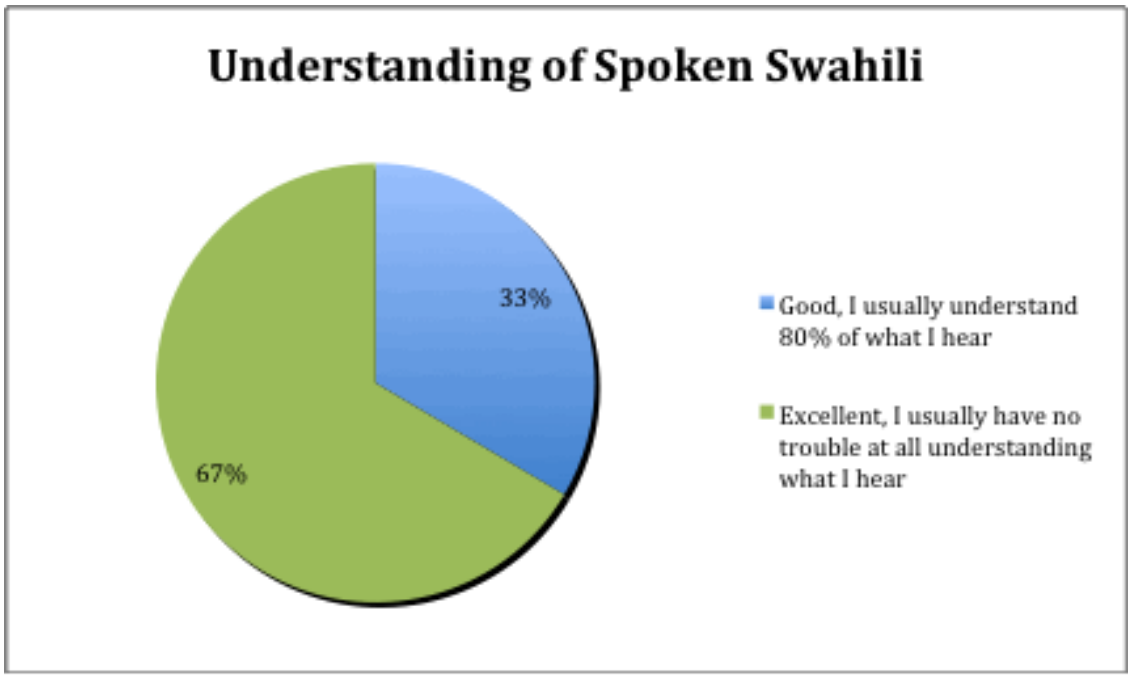

Figure 5. Understanding of spoken Kiswahili

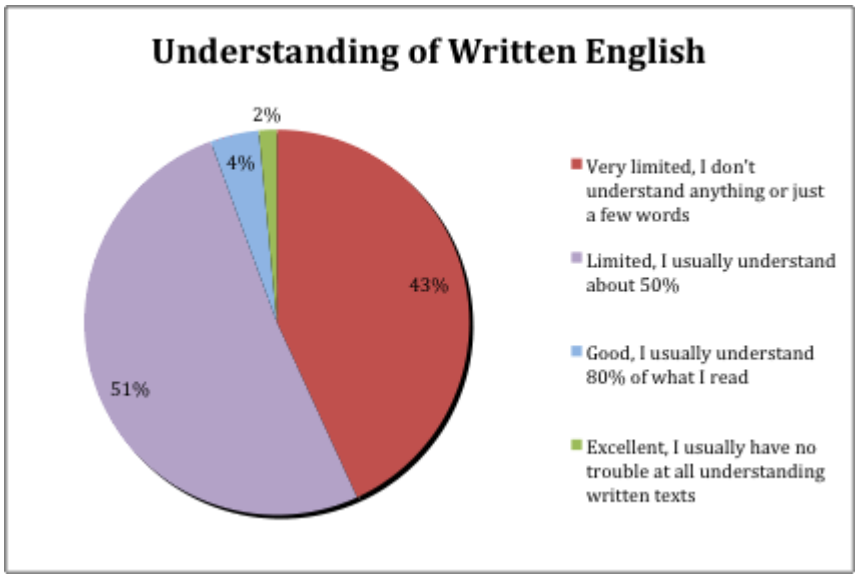

Figure 6. Understanding of written English

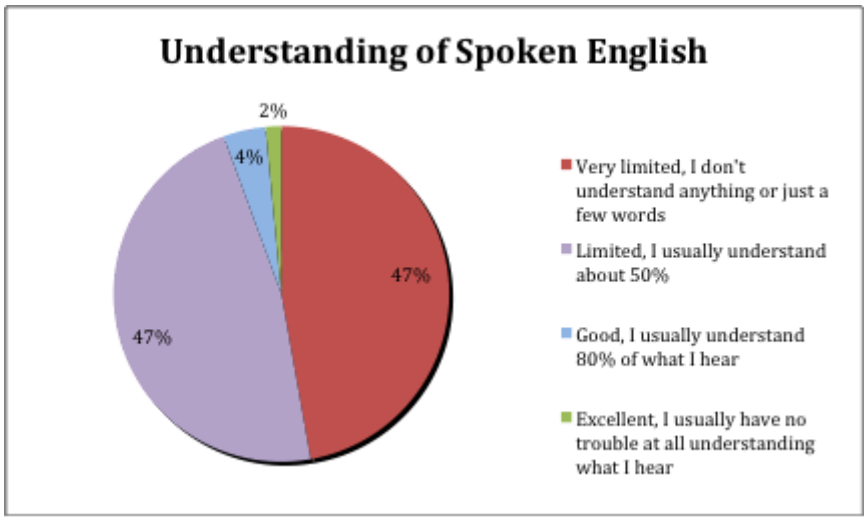

Figure 7. Understanding of spoken English

It is clear from the self-rated responses that participants have a good to high understanding of both spoken and written Kiswahili, but have quite limited understanding of spoken and written English. A question as to the validity of self-reported competencies obviously arises here, but studies suggest that there is a valid relation between self-reporting and actual ability. For instance, Vickstrom *et al.* (2015) report that self-ratings of 'English-ability' in the U.S. National Assessment of Adult Literacy correlate well with actual prose literacy scores. According to Vickstrom *et al.* (2015), this finding is consistent with other studies that investigate correlations between self-reporting and actual ability.

4.2. Communication preferences

Participants were asked the following question in relation to their communication preferences: In which language would you most prefer to receive health-related information: Kiswahili, English or Mother Tongue (Tribal Language)? Participants had to choose between written and spoken communication for their preferred means of receiving health-related information in general. Strikingly, 82% selected spoken over written communication.

They were also asked to list other modes of useful communication, apart from information posters such as those used in the survey. Table 3 shows the other modes mentioned and the number of participants who mentioned these.

Public gathering	72
Church	51
Radio	66
Mosque	7
Spoken by health-care worker	1

Table 3. What other modes would be useful for disseminating important health-related information?

4.3. Pre-task knowledge of Ebola

Before being given either an English or Kiswahili poster for reading, participants were asked four preliminary questions to test their pre-existing knowledge of Ebola. The four questions were as follows:

PQ1: Can Ebola spread through contact with other people? (Correct answer is Yes)
PQ2: Can Ebola spread through the air? (Correct answer is No)
PQ3: Can Ebola be treated with Antibiotics? (Correct answer is No)
PQ4: Is it ok to touch the dead body of somebody who had Ebola? (Correct answer is No)

As mentioned in the introductory section, these questions had been translated into Kiswahili in advance and were posed by the CHWs in Kiswahili.

4.3.1. Answers Given Across All Respondents

The majority of answers given for each question were incorrect. Across all four questions and the total population of 197 participants, the average across the four questions amounted to 136 incorrect, 16 correct, and 45 of the responses were 'don't know.' The numbers for each question are shown in Figure 8. This illustrates that pre-existing knowledge about Ebola was quite low before reading the posters.

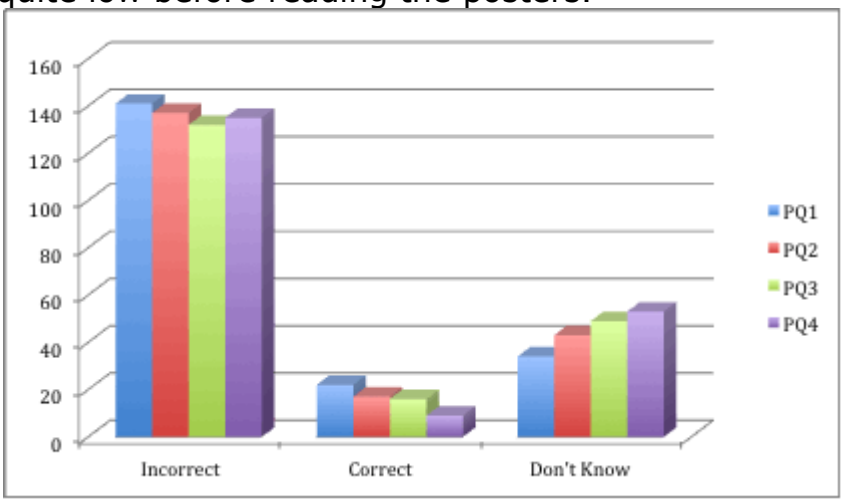

Figure 8. Pre-task responses to questions on Ebola

4.3.2. Rural/Urban Divide

To investigate if there was any evidence of a rural/urban divide in pre-existing knowledge of Ebola, we recorded the correct/incorrect/don't know answers per location. As Table 4 demonstrates, there is no substantial difference in the level of correctness of the responses. This implies that pre-existing knowledge of Ebola was the same, no matter whether the participant lived in an urban or rural setting.

RURAL RESPONDENTS

	P1	P2	P3	P4	AVERAGE
Incorrect	69	68	64	64	66
Correct	10	8	8	6	8
Don't know	16	19	23	25	21

URBAN RESPONDENTS

	P1	P2	P3	P4	AVERAGE
Incorrect	72	69	68	71	70
Correct	12	9	8	3	8
Don't know	18	24	26	28	24

Table 4. Numbers of correct/incorrect/don't know answers per abode

4.3.3. Gender

We also wished to investigate if there were any differences in terms of correctness of responses across gender. Table 5 shows the responses per question and averages for male and female respondents. Although the average number of incorrect respondents is lower for males, it is not substantially lower, and the number of 'don't know' responses is higher for males than females, although again the difference is not substantial. It is reasonable to assume from this data that pre-existing knowledge of Ebola was the same for both male and female respondents.

MALE RESPONDENTS

	P1	P2	P3	P4	AVERAGE
Incorrect	66	65	68	68	67
Correct	11	7	7	3	7
Don't know	22	27	24	28	25

FEMALE RESPONDENTS

	P1	P2	P3	P4	AVERAGE
Incorrect	75	72	64	67	70
Correct	11	10	9	6	9
Don't know	12	16	25	25	20

Table 5. Numbers of correct, incorrect, don't know answers per gender

4.3.4. Age

Finally, we wished to ascertain if there was any difference in pre-existing knowledge of Ebola across the different age categories recorded in the survey, i.e. 18–44, 45–64, 65+. As can be seen from Table 6, the percentage of correct, incorrect and don't know responses for the 18–44 and 45–64 age are very similar. The results differ for the 65+ category. However, as there were only five in the latter category we cannot claim that there are significant differences between this age category and the other two (see Table 6).

AGE: 18-44

	P1	P2	P3	P4	AVERAGE	%
Incorrect	100	98	95	97	98	71.2
Correct	16	11	12	7	12	8.4
Don't know	21	28	30	33	28	20.4

AGE: 45-64

	P1	P2	P3	P4	AVERAGE	%
Incorrect	41	39	37	38	39	70.5
Correct	6	6	4	2	5	8.2
Don't know	8	10	14	15	12	21.4

AGE: 65+

	P1	P2	P3	P4	AVERAGE	%
Incorrect	0	0	0	0	0	0
Correct	0	0	0	0	0	0
Don't know	5	5	5	5	5	100

Table 6 Numbers of correct, incorrect, don't know answers per age

To summarise, the pre-task responses suggest that knowledge of Ebola was low among participants, and that there was no difference across rural or urban dwellers, gender, or the age categories, with the exception of the 65+ category. The latter category had too few respondents to make any claims regarding differences due to age.

4.4. Post-Task Knowledge of Ebola

For this study, we are mostly interested in whether reading the *translated* poster in Kiswahili results in higher comprehension of the content when compared with the English version. First, however, it is also interesting to ask if reading *any* information led to an increase in the number of correct responses, regardless of whether this information was in English or Kiswahili. We assume, of course, that reading some information will improve knowledge, especially seeing as the rate for 'incorrect' and 'don't know' responses was so high in the pre-task questions (see above).
In Figure 9 we present the number of 'incorrect,' 'correct' and 'don't know' responses for each survey question post-task. In this figure we do not distinguish between which language version was read.

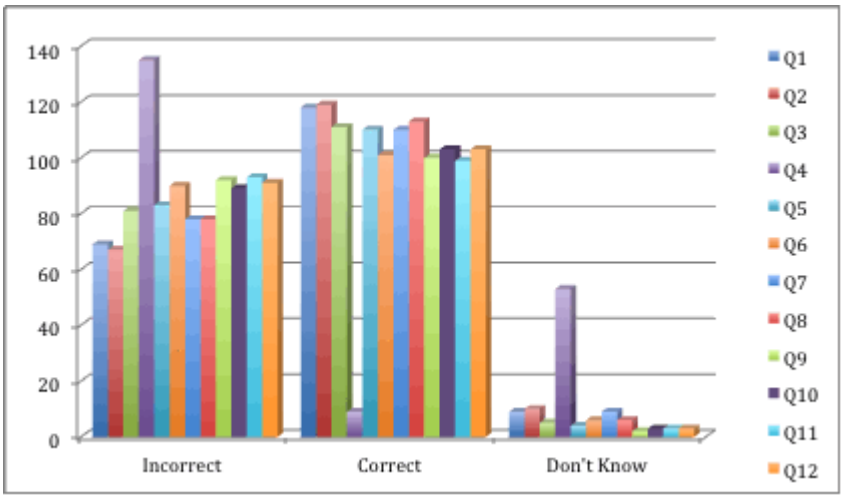

Figure 9. Number of incorrect, correct, don't know responses in total, post-task

These results demonstrate that there is an increase in the rate of correct responses given to questions about Ebola after having read the posters. However, the rate of 'incorrect' answers and 'don't know' responses remains high.

4.4.1. Those Who Read the English Poster

In the following, we will distinguish between the answers given depending on whether an English or Kiswahili version of the poster was read.

The results in Figure 10 give an overwhelming indication that reading the poster in English did not significantly improve comprehension regarding Ebola. On average, the wrong answer was given 78% of the time by those who were given the English version. 16% of the answers were correct and 6% of the responses were 'don't know.' These numbers are broken down per question in Figure 10.

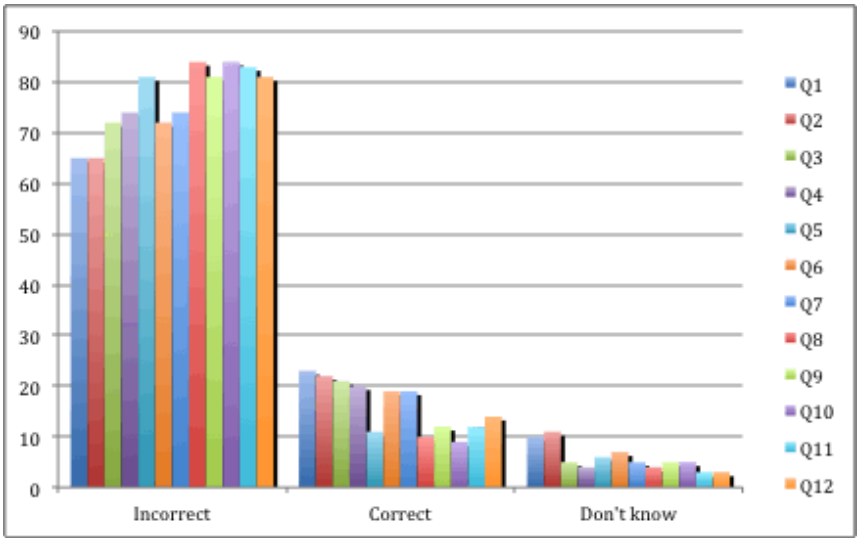

Figure 10. Number of incorrect, correct, don't know answers after reading the English Poster

This result is unsurprising in light of the self-ratings for English competency (Figures 4-7). The majority of participants rated themselves as having either very limited, or limited understanding of spoken or written English. If we compare the percentage of incorrect, correct, and 'don't know' responses from the entire set of respondents *before* reading the information poster, and the percentage *after having read the English poster*, we see that the number of 'don't know' responses is lower, the number of 'correct' responses is greater, but so too is the number of 'incorrect' responses (see Table 7). It would appear then, that the effect of reading the English poster is to lower the number of 'don't knows', but this does not transfer directly into 'correct' responses only.

	Entire group before reading info poster	Group who read English poster
Incorrect (%)	69.16	77.89
Correct (%)	8.12	16.33
Don't know (%)	22.72	5.78

Table 7. Percentage incorrect, correct etc. answers entire group vs. English

4.4.2. Those Who Read the Kiswahili Poster

The answers provided by those who were given the Kiswahili version of the poster lie in stark contrast to those who read in English. Having read the Kiswahili version of the poster led to 93% correct answers on average, with 7% wrong and 0% 'don't knows.' These results are broken down by question in Figure 11.

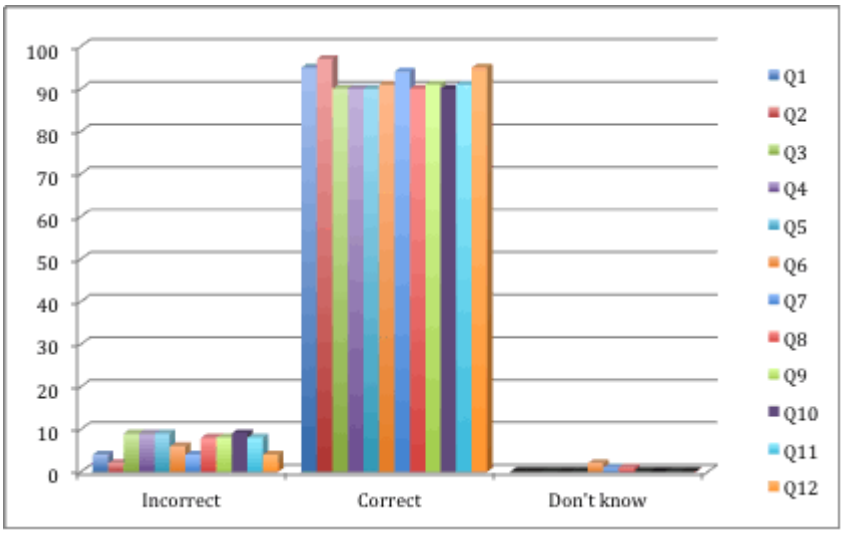

Figure 11. Number of incorrect, correct, don't know answers after reading the Kiswahili poster

5. Summary of Results

Prior knowledge of Ebola was low among participants, regardless of age, gender, or abode, which is somewhat surprising given that this survey was carried out in early 2015 soon after the 2014 Ebola outbreak in West Africa. This low level of knowledge might be explained by the fact that the outbreak was in West Africa, and Kenya was not listed as a country affected, according to the Centers for Disease Control and Prevention (2014). Nevertheless, there is evidence that the Kenyan government considered Ebola to be a threat and mobilised its health workers as a result. A strategic investment plan published by Kenya's Ministry of Health in 2014 describes the threat from Ebola as real (Ministry of Health of Kenya 2014a). The Ministry's Disease Surveillance and Response Unit, which is tasked with responding to threats caused by infectious diseases such as Ebola, gathered information about the outbreak, planned interventions, and allocated resources; as part of this work, a page of informational resources on the Ebola outbreak was presented on the unit's website (Ministry of Health of Kenya 2014b). Interestingly, the information presented here is mostly in English and in the form of written texts, except for two audio files which have been recorded in Kiswahili. This suggests some recognition at the institutional level that multilingual and multimodal information is needed in crisis communication. A 2014 press release from the Kenya Medical Association urged the Kenyan government to ensure that sufficient response measures were put in place and underlines how highly the risk of an Ebola outbreak in Kenya was perceived by those medical personnel who would have been at the front line of response (Kenya Medical Association 2014). Furthermore, the seriousness of the threat from Ebola and the need for preparation was considered not just at the national Kenyan level, but also by the East African region as a whole (East African Community 2014).

The chance of infection from Ebola – especially as a result of international travel – was not insignificant, and so one would assume that knowledge about the disease and its prevention might have been widespread in Kenya, but this is not evident among our participants. As was shown above, there is evidence that information on this disease was made available by the Kenyan government. International organisations, too, provided information online in English (see, for example, World Health Organisation [2014]). The low level of knowledge of Ebola among participants in this study suggests that this information was not successfully communicated to our participants, at least.

Understanding of both written and spoken English (self-reported) was very limited among participants, despite the fact that English is an official language in Kenya, which reflects the claims by Piper, Schroeder and Trudell (2016), reported above. Not surprisingly then, comprehension of the information poster in English was low, whereas comprehension of the poster in Kenya's other official language, Kiswahili, was much higher. No

differences were found in comprehension levels across the urban and rural participants. Translation, therefore, facilitated comprehension of important information regarding a health-related crisis.

These results lead us to conclude that English is not a suitable medium for the transfer of important information among representatives of these communities, whereas Kiswahili seems to function well as a language of communication, and translation of official information into Kiswahili is, therefore, essential. For this population, Kiswahili could be used as the main channel for communicating important information where it is not feasible to do so through the multitude of community languages. This emphasises the importance of translation work by organisations like Translators without Borders in multilingual countries such as Kenya.

It emerged during the study, however, that 82% of participants said that they would prefer to receive health-related information in *spoken* format. This is interesting because it suggests that written modes of communication for health-related crisis information are perhaps not the most suitable for some countries and cultures. In addition, public gatherings, church, and radio were listed as preferred modes of communication for health-related information. This finding creates significant economic and logistical challenges for organisations that are working to provide translated information to populations that do not have access to such information, such as Translators without Borders and The Rosetta Foundation. On a broader perspective, it highlights the role that culture, gender, and age might play in crisis communication, which cannot be ignored by translation efforts, nor should it be ignored in disaster studies or crisis communication studies.

6. Discussion

While the findings presented above are not astounding, the key contribution here is to have tested comprehension of translated content empirically in a country where multilingualism is the norm and where there are two official languages, using relevant and current information on a recent health-related crisis. In this context, it is highly unlikely that crisis information would be communicated in several of the country's languages and it is more likely that communication would be restricted to one or both of the official languages. According to the Languages of Kenya Bill, 2015 (Commission for the Implementation of the Constitution 2015: 15), the Kenyan government will "progressively establish measures" to ensure that public documents (public policies, laws, official documents and journals, and 'other records') are available in both English and Kiswahili, but health-related information is not included in this list. Translation is mentioned only fleetingly in the Bill as follows: "Where a person is not able to communicate with a public officer in either English or Kishwaili, professional translation or interpretation services shall be provided as appropriate" (Commission for the Implementation of the

Constitution 2015: 16). We have shown that the assumption that communication will be understood if communicated in one of the official languages, English, is a risky one that potentially compromises well-being. On a broader scale, therefore, questions emerge regarding the use of 'official languages' for communicating crisis information in a multilingual society. Noske (2016) highlights that, in the case of Sub-Saharan Africa, the 'official' language is often the language of the coloniser. However, "a large number of people on the continent either do not speak the colonial languages at all or they do not speak them well" (Noske 2016: 58). As another example of failed communication in an official language, Santos-Hernández and Hearn Morrow (2013) report a lack of understanding among school children in Puerto Rico when school evacuation messages were broadcast in English, one of Puerto Rico's 'official languages'. Assumptions made about the level of comprehension of official languages should be tested before that language is adopted for crisis communication. Ideally, crisis messages should be translated into the languages of common use so that a greater proportion of the population can understand and act on them. However, this raises many questions regarding translation planning and capacity. It is unrealistic to expect that governments or international organisations will spend limited financial resources translating content for crisis prevention or crisis management. Translation, if it happens at all, is likely to be fuelled by activists and volunteers, possibly in conjunction with translation technology, as mentioned briefly in our introduction. It is important for both translation studies scholars and practitioners to lead initiatives to examine the possibilities, and limitations, of such translation activity and to influence policy and training initiatives.

As mentioned earlier, some work has been done on interpreting in crisis contexts and, in contrast, our preliminary focus was on translation of written communication. The participants in this study expressed a preference for the spoken medium, which needs to be considered. Nevertheless, the use of spoken information would also have a significant weakness: spoken language is temporary and the recipients would not be able to refer to the spoken message as they would if they had a leaflet or poster to refer to and to re-read. This issue could be addressed by supplementing spoken material with simple written material such as posters or with visual material, which would be advantageous for low literacy communities and potentially also for the older generations. Additionally, some people may not be in a position to attend public events where information is transferred or to listen to radio broadcasts at specific times. There is, therefore, still merit in providing simple written material that is then reinforced through spoken and public channels. But, importantly, one health message in Kiswahili in a church sermon or in the community hall, or in Spanish in Puerto Rico, could be more effective than thousands of brochures delivered in English. Audio-visual materials (perhaps with subtitling) might also be useful, but they are entirely dependent on access to technology, which is not always a realistic option

during a crisis. The inclusion of people with hearing and/or reading limitations would require the presentation of materials in formats suitable for that population. Some possibilities for alternative modes/materials include pictorial representations, braille and/or Kenyan Sign Language (KSL) interpreting. We note here that the responses in our survey support the need for communicating with vulnerable communities as outlined earlier with reference to Nsiah-Kumi (2008), Fu *et al.* (2010), Pfefferbaum *et al.* (2012), and Yip *et al.* (2013).

Our sample of 197 participants is relatively small and (partially) represents the situation in Kenya, but not in other countries. It would be beneficial to repeat the study in other countries and with other languages. Moreover, it would be useful to test comprehension of spoken vs. written information, comprehension of different spoken media (e.g., radio vs. church), how best to communicate efficiently with the 65+ generation, with deaf communities, and with those of limited literacy, and, of course, it is necessary to consider what challenges these pose for translation of crisis-related information which must be reliable and delivered in a timely manner to those who need it most.

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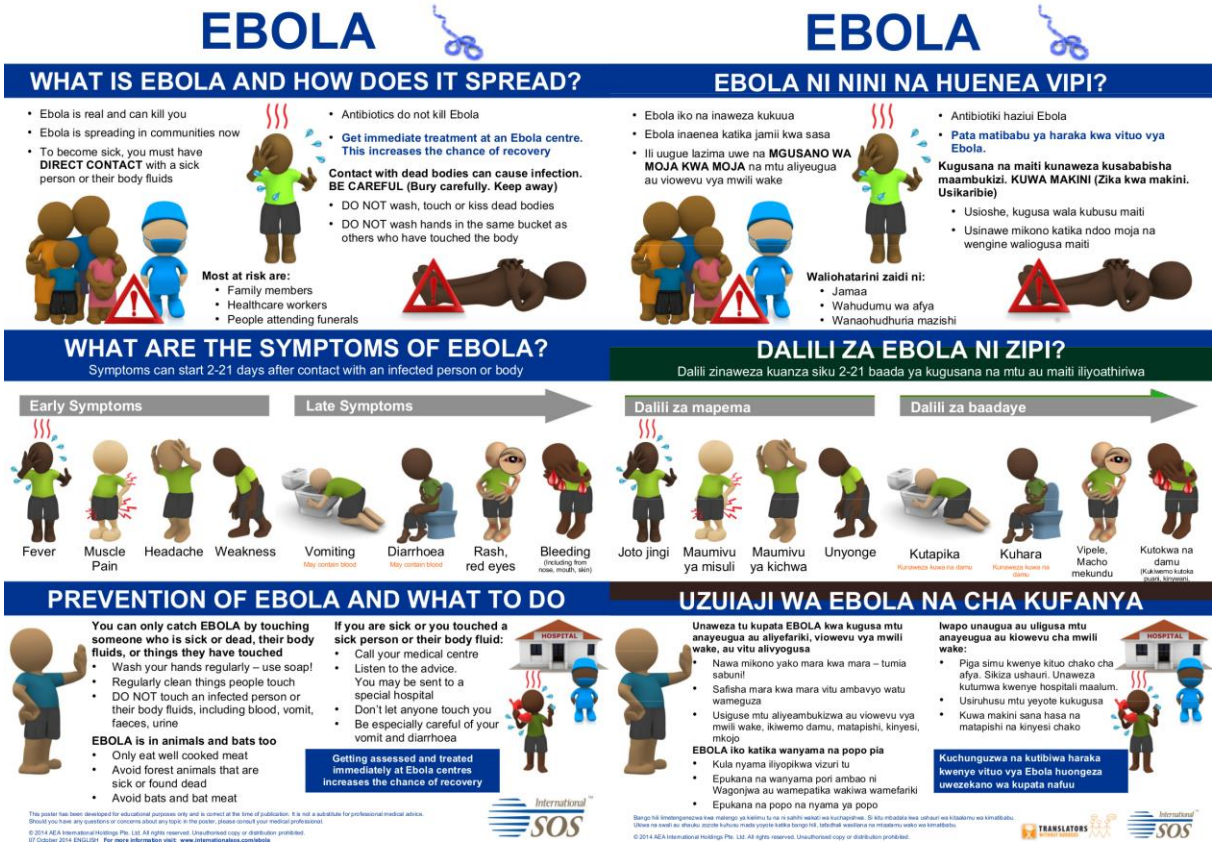
Appendix 1. Posters



Appendix 2. Survey Questions following the presentation of the posters

(a) Can Ebola spread through contact with other people? Yes/No/Don't know
(b) Can Ebola spread through the air? Yes/No/Don't know
(c) Can Ebola be treated with antibiotics? Yes/No/Don't know
(d) Is it ok to touch the dead body of somebody who had Ebola? Yes/No/Don't know
(e) Is Ebola found in animals too? Yes/No/Don't know
(f) Which animal in particular spreads Ebola?
(g) Which of the following are symptoms of Ebola

1. Fever? Yes/No/Don't know
2. Diarrhoea? Yes/No/Don't know
3. Muscle Pain? Yes/No/Don't know
4. Rash? Yes/No/Don't know

(h) What should you do if you have symptoms of Ebola?
(i) Is it true that washing hands regularly can help to prevent the spread of Ebola? Yes/No/Don't know