Introduction

Ebola also known as Ebola Virus Disease (EVD) is a rare and deadly disease caused by infection with a virus of the family filoviridae, genus Ebola virus. Even though the natural reservoir remains unknown, evidences lead to conclude that the virus is animal-borne where bats are the most likely reservoir [1]. The current Ebola outbreak in West Africa is the largest and most complex outbreak in history since it was first discovered in 1976 in Congo. The first case was notified in March 2014 and it is believed that this outbreak started in Guinea and further spread to neighboring countries of Sierra Leone and Liberia [2]. Sierra Leone, Liberia and Guinea are the hardest hit countries by the outbreak while other countries including Nigeria, Mali, Senegal, Spain, United Kingdom and United States were also affected. As of 1 January 2015, a total of 21,261 cases and 8,414 deaths were reported from the three West African countries. Guinea is the third hardest hit country in the region with 2,806 cases and 1,814 deaths as of January 11, 2015 after Sierra Leone and Liberia respectively. This KAP study was conducted in three sub-prefectures of Kouroussa in the Kankan region of Guinea from 15 December 2014 to 15 January 2015. It was conducted with the general objective of examining the knowledge, attitude and practice related to Ebola prevention and care among the public of Kouroussa Prefecture.

Methods:
a cross-sectional study design was employed to collect quantitative data to examine knowledge, attitude and practice related to Ebola. Structured questionnaire was administered by trained data collectors who were supervised by doctors and epidemiologists from WHO and Africa Union. Data were collected from 358 individuals (93% response rate) and analyzed in STATA 13 while tables and graphs are used to display results.

Results:
over 96% of the respondents have ever heard about Ebola while only 76.2% believed the disease existed in Kouroussa. Avoiding physical contacts including hand shaking and contacts with body fluids, and early treatment of persons sick from Ebola were the two important prevention methods frequently mentioned (96.8% and 93.9%). Only 35.7% of respondents were found to have comprehensive knowledge about Ebola (composite of correctly accepting three methods of prevention (85%) and rejecting misconceptions (55.7%).)

Conclusion: the high level of knowledge about modes of transmission and prevention methods has not positively affected the level of comprehensive knowledge about Ebola. In contrast, the prevailing high level of misconceptions surrounding Ebola was found to be responsible for a low comprehensive knowledge.
Transmission of Ebola Virus Disease

According to the Centers of Disease Control and Prevention (CDC), the Ebola virus can spread through direct contacts with blood or body fluids of a person who is sick with Ebola, objects that have been contaminated with the virus, and infected fruit bats or primates (apes and monkeys). There is no evidence that Ebola is transmitted through the air, by water, or through mosquito bites [5]. In Knowledge, Attitude and Practice (KAP) study conducted in Sierra Leone in 2014, generally low level of knowledge was found regarding modes of transmission of EVD. Only 55% of respondents believed that physical contacts with known Ebola patient could transmit the disease while 32% and 43% believed Ebola could be transmitted through contact with blood and other body fluids. Preparing or eating bush meat was mentioned by 52% of the respondents to transmit the disease. On the other hand, about 30% of the respondents believe that EVD could be transmitted through air or mosquito bites [6].

Prevention and control of Ebola Virus Disease

Careful practice of hygiene remains the mainstay to prevent transmission of EVD. Washing hands with soap and water or an alcohol based hand sanitizer and avoiding contacts with blood and body fluids are the main hygienic practices to prevent EVD. In addition, avoiding funeral or burial rituals that require handling the body of someone who has died from Ebola, and avoiding contact with bats and nonhuman primates or blood, fluids, and raw meat prepared from these animals are among the necessary steps to avoid contracting EVD [7]. Regarding the chances of surviving once caught the disease, evidences suggest that intensive treatment as early as possible in the course of illness would boost survival [8].

The KAP report from Sierra Leone shows that 87% of respondents agreed that Ebola could be prevented by avoiding handling blood or any other body fluids while 85% believed that avoiding funerals that require touching of the dead body could prevent Ebola. Similarly, 91% agreed that by immediately taking a suspect case to health facilities the spread of Ebola in the community could be reduced. The report also shows that significant proportion of the community reported misconceptions regarding prevention and treatment of Ebola. About 40% of the respondents believe that they can prevent Ebola by bathing in salty water while about 20% believe that spiritual healers can successfully treat the disease [6]. There is no KAP study related to Ebola conducted in Guinea and this piece is meant to fill the gap and to inform the behavior change communication strategies in the combat against Ebola.

Methods

Study area: Kouroussa is a Prefecture located in the Kankan Region of Guinea, at about 600 kilometers east of Conakry, the Capital. The Prefecture is inhabited by an estimated population of 268,224. The study was specifically conducted in Kouroussa Commune, and Sanguina and Babila Sub-Prefectures with populations of 39,611, 23,809 and 16,290 respectively. The study was limited to these three areas due to factors that include time and resource constraints and the fact that all the contacts to known Ebola cases lived only in these areas before or during the period of the study.

Study period: The study was conducted from 15 December 2014 to 15 January 2015.

Study design: a cross-sectional study design was employed to collect quantitative data to examine knowledge, attitude and practice related to Ebola.

Sampling: a generic formula of \( n = Z^2 \cdot P(1-P)/d^2 \) was used to determine the sample size \( n \) of 384 for this study where \( Z \) is a Z-score at 95% confidence level, \( P \) is a population estimate (50%) and \( d \) is 5% margin of error. Population proportion sampling calculation was then applied to allocate sample sizes to sub-preferences. Accordingly, sample sizes of 191, 115, and 78 were allocated to Kouroussa Commune, Sanguina and Babila respectively.

Selection of study participants: households were selected from each village using systematic random sampling technique where estimated number of households in each sub-Prefecture was used to determine the intervals. Once a household was identified one person per household was selected with preference given to head of household downwards the hierarchy to any one at home during the survey with the minimum age of inclusion being 18 years.

Data collection and analysis: structured questionnaire was administered by trained data collectors who were supervised by doctors and epidemiologists from WHO and Africa Union. Data were analyzed in STATA 13 while tables and graphs are used to display results.

Ethical considerations: approval was obtained from Director of Kouroussa Direction Prefectorale De la Sante, Prefectural Ebola Coordination Body, and Prefectural Council. Informed consents were obtained from individual respondents during the survey.

Limitations of the study: the study was limited to Kouroussa commune and two sub-prefectures due to the factors mentioned above and this may affect generalizability of the findings to the entire prefecture. The study team, however, does not expect significant variability across the prefecture and as a result limitation to cover wider area may not seriously affect the study.

Results

The results of the survey are presented in this section in tables or graphs followed by brief interpretations.

Response rate and characteristics of respondents

Data were collected from 93% of the initially intended respondents with the minimum and maximum being 91% and 99% in Kouroussa and Babila respectively (Table 1). About 48% of the respondents were from Kouroussa commune while Babila contributed only 21.5% of the response. About 58% of the respondents were male while the remaining was constituted by their female counterpart.

Community awareness about Ebola

Table 2 shows that reasonable proportion of the respondents (96.4%) have ever heard about Ebola while below half had known anyone who had survived Ebola. About 98% of those who have ever heard about Ebola believed that Ebola existed in Guinea during the survey period while only 76% believed that it existed in the prefecture.

Causes of Ebola

Figure 1 shows that over 82% of the respondents believe that Ebola is caused by virus whereas significant proportion (36.2%) believe that it is brought to humans by God or other higher power. About 12% believe that Ebola happens to someone due to sins or wrong doings. The beliefs were found to have varied across socio-demographic characteristics.

Modes of Transmission of EVD

Table 3 presents percentage of responses on the mode of transmission of EVD. About 90% of the respondents believed that any physical contact that include hand shaking could transmit EVD while about 89% believe that handling blood or body fluids of a person who is infected with Ebola virus could transmit the disease. Preparing or eating bush meat and wild fruits (69% and 58.8% respectively) were also well recognized by the respondents to transmit EVD. Education appears to be positively associated with the level of knowledge of modes of transmission of EVD except for physical contacts and contacts with body fluids. The results exhibit little variations in the level of knowledge about the modes of transmission across various socio-demographic characteristics.
have correctly identified the three critical methods of preventing Ebola. However, only 56% of the respondents rejected the misconceptions that are detrimental in the fight against Ebola. The comprehensive knowledge about Ebola (35.7%) has been seriously affected by the interplay between accepting appropriate methods of prevention and rejecting misconceptions. While there is little variation across the socio-demographic characteristics education appears to be positively associated with comprehensive knowledge about Ebola.

### Table 2: Community Awareness of Ebola by socio-demographic characteristics, Kouroussa, 2015

| Sub-prefecture | Have heard of EVD | Believe EVD exists in Guinea | Believe EVD exists in Kouroussa | Have heard of EVD survivors | Have knowledge about EVD treatment | Total respondents |
|----------------|-------------------|------------------------------|-------------------------------|----------------------------|-----------------------------------|------------------|
| Babila         | 86.1              | 87.7                         | 87.7                          | 90.5                       | 87.7                              | 277              |
| Seli           | 97.8              | 97.7                         | 97.7                          | 97.7                       | 97.7                              | 117              |
| Total          | 96.4              | 98.3                         | 98.3                          | 96.2                       | 98.3                              | 358              |

### Figure 1: summary of responses on causes of Ebola, Kouroussa, 2015

### Figure 2: percentages of misconceptions about transmission, prevention and treatment of Ebola, Kouroussa, 2015

| Mode of Transmission | Percentage |
|----------------------|------------|
| Air                  | 26.1       |
| Mosquito             | 27.8       |
| Bathing              | 46.4       |
| Traditional Treatment| 14.5       |
| Religious Treatment  | 9          |

### Table 3: Percentage of responses about mode of transmission of Ebola, Kouroussa, 2015

| Sub-prefecture | Teaching infected person (Alive/dead) | Teaching body fluids of symptomatic case | Rating or preparing body mass | Rating wild fruits | Spores of infected person | Breast milk of infected mother |
|----------------|---------------------------------------|----------------------------------------|-------------------------------|------------------|---------------------------|-------------------------------|
| Babila         | 90.1                                  | 90.1                                   | 88.4                          | 90.4             | 84.4                      | 79                            |
| Seli           | 89.1                                  | 89.1                                   | 89.1                          | 89.1             | 89.1                      | 89.1                          |
| Total          | 90.1                                  | 90.1                                   | 89.1                          | 89.1             | 89.1                      | 89.1                          |

### Table 4: Summary of responses about mode of transmission of Ebola, Kouroussa, 2015

| Mode of Transmission | Percentage |
|----------------------|------------|
| Air                  | 26.1       |
| Mosquito             | 27.8       |
| Bathing              | 46.4       |
| Traditional Treatment| 14.5       |
| Religious Treatment  | 9          |

### Misconceptions surrounding EVD

Figure 2 presents percentage of responses that were not in line with scientific evidences and therefore recognized as misconceptions about EVD. About 46% of respondents believe that Ebola could be prevented by bathing in salty water while 26% and 27% of respondents believe that Ebola could be successfully treated by traditional and religious healers respectively.

### Comprehensive knowledge about EVD

Comprehensive knowledge in this context is defined as accepting three main methods of prevention and rejecting three major misconceptions. The three methods of transmission that are critical to prevent EVD include avoiding physical contacts with Ebola cases whether alive or dead, avoiding handling blood or body fluids of a person sick from Ebola, and washing hands with soap and water or chlorinated water or alcohol based hand sanitizer. On the other hand, the three major misconceptions that need to be rejected include perceptions that EVD is transmitted by air or by mosquito, and that EVD could be prevented by bathing in salty water. The following table presents percentage of respondents that accept three methods of prevention and three major misconceptions about Ebola.

Results in Table 5 show that significant proportions of respondents (85%)
Table 4: Attitudes and perceptions of respondents towards prevention of Ebola, Kouroussa, 2015

| Knowledge about three main means of prevention | Rejection of misconceptions | Total |
|-----------------------------------------------|----------------------------|-------|
| Accepts                              | Rejects                    |       |
| 96.8                              | 93.6                       | 94.4  |

Table 4: Percentage of respondents who correctly identified prevention methods and rejected misconceptions, Kouroussa, 2015

| Marital status | Number | Percent | Number | Percent | Number | Percent |
|----------------|--------|---------|--------|---------|--------|---------|
| Single          | 138    | 85.0    | 193    | 55.9    | 296    | 35.7    |
| Marital status  | 95.0    | 94.4    | 94.4    | 94.4    | 94.4    | 94.4    |
| Widowed         | 138    | 85.0    | 193    | 55.9    | 296    | 35.7    |
| Divorced        | 5      | 83.3    | 1      | 16.7    | 5      | 83.3    |
| Separated       | 19     | 90.5    | 8      | 38.1    | 11     | 52.4    |
| Marital status  | 78     | 84.2    | 66     | 57.6    | 344    | 35.7    |
| Married         | 162    | 81.9    | 44     | 26.9    | 62     | 21.9    |
| Unemployed      | 67     | 87.0    | 38     | 49.4    | 31     | 40.3    |
| Education       | 375    | 85.5    | 218    | 53.6    | 83     | 24.7    |
| Degree          | 138    | 85.0    | 193    | 55.9    | 296    | 35.7    |
| Female          | 122    | 83.6    | 70     | 48.0    | 60     | 41.1    |
| Education       | 95.2    | 94.4    | 94.4    | 94.4    | 94.4    | 94.4    |
| Male            | 174    | 86.4    | 113    | 66.1    | 43     | 25.2    |
| Employed        | 57     | 89.4    | 32     | 48.6    | 26     | 42.4    |
| Occupation      | 85.0    | 94.4    | 94.4    | 94.4    | 94.4    | 94.4    |
| Unemployed      | 67     | 85.0    | 38     | 49.4    | 31     | 40.3    |

Table 5: Percentage of respondents who correctly identified prevention methods and rejected misconceptions, Kouroussa, 2015

Discussion

The percentage of respondents who have reported to have ever heard about Ebola (96.4%) was significantly lower than the finding from a neighboring country Sierra Leone (100%) [6]. Even though the belief that EVD exists in Guinea was as high as 98.3%, the belief that it existed in Kouroussa was very low (76.2%). In the contrary, reports reveal that the belief that EVD existed in neighboring country Sierra Leone (100%) [6]. Even though the belief that EVD exists in Guinea was as high as 98.3%, the belief that it existed in Kouroussa was very low (76.2%). In the contrary, reports reveal that the belief that EVD existed in neighboring country Sierra Leone (100%) [6].

The apparently high proportion (96.4%) of respondents that have ever heard about Ebola is not sufficient to effectively control and prevent the disease. Given the nature of the disease and prevalence of information in the local and international media, the deficit of 3.6% of hearing about Ebola remains unacceptable. To make things worse, only 76.2% believe that the disease exists in Kouroussa, a prefecture where 19 were sick from the disease and 11 have already died.

Table 5: Percentage of respondents who correctly identified prevention methods and rejected misconceptions, Kouroussa, 2015

| Education | Marital status | Occupation |
|-----------|----------------|------------|
| 38        | 57             | 87         |
| 20.8      | 38.8           | 40.3       |
| University| Married        | Total      |
| 38.8      | 85.6           | 35.7       |
| Secondary | Unemployed     |            |
| 85.0      | 84.2           |            |
| Female    | Male           |            |
| 83.6      | 87.4           |            |
| Marital status | 85.0    | 35.7    |
| Widowed   | Divorced       |            |
| 90.5      | 83.3           |            |
| Married   | Separated      |            |
| 96.2      | 90.5           |            |
| Female    | Single         |            |
| 91.8      | 85.5           |            |
| Marital status | 85.5    | 35.7    |
| Married   | Unemployed     |            |
| 89.4      | 87.0           |            |
| Male      | Occupation     |            |
| 86.4      | University     |            |
| 57.6      | 85.0           |            |

Conclusion

The comprehensive knowledge level of the respondents about EVD was very low (35.7%) in spite of the fact that 85% of them correctly identified the three main methods of preventing EVD (Table 5). This is close to the finding from Sierra Leone where it was at 38.8% [6]. The comprehensive knowledge about Ebola was affected by the interplay between accepting appropriate methods of prevention and rejecting misconceptions. The belief that bathing in salty water would prevent Ebola (46.4%) (Figure 2) was the prominent misconception that skewed the level of comprehensive knowledge about EVD.

Competing interests

The authors declare no competing interests.

Authors’ contributions

Benti Geleta Bull: Protocol development, study design, data analysis and write up; Landry N. Mayige: Participated in protocol development and study design; Aguide Soumouk: Report Review; Julius F. Oketta (MG, Dr): Protocol Review; Tamba Emile Sandounou, Bole Camara, Mory Saidu Toure, and Aissata Conde: Field supervision and review of draft report. All authors read and agreed to the final manuscript.

Acknowledgments

The households and individuals who participated in this study deserve our utmost gratitude for their willingness and time to generously respond to the survey. The authorities of Kouroussa Prefecture, Kouroussa Commune, Sanguiana and Babila sub-prefectures ought to receive our thanks for allowing access to households and individuals during the survey. We are also sincerely grateful to the Coordinator of the Ebola Coordination Team in Kouroussa and the Director of DPS of Kouroussa for the continuous support during the survey. Our thanks also go to the data collection teams without whose diligent work this would not be a success. Finally, it is worth mention that the excellent coordination between the Epidemiologists from African Union and Supervising doctors from WHO was key to the successfully conducting the survey.
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