# Survey Quality Review

The below tables and visualizations present the findings on quality of the data collected for the IGA project along general survey quality characteristics: 1) duration of interview, 2) number of don’t know responses in each interview, 3) number of responses that are greater or less than two standard deviations of the mean, and 4) whether the GPS coordinates collected in each health area during the midline correspond to the GPS coordinates of observations collected in the baseline in the same health area.

For surveys identified as having multiple problematic outliers, the entirety of the surveys will be subject to greater scrutiny to determine their quality.

* For surveys that have short durations, we look for reasons for which a survey may be short such as having few household members, not having children under 5 years of age or not having women of birthing age in the household which may lead to a number of sets of questions being skipped.
* For surveys with a high number of don’t know responses, we look for logical consistency in don’t know responses, e.g. if a respondent says he does not know about CODESA, does he also not know about its staffing or medical stocks?
* For surveys cited with a high number of integer outliers, we will work with field staff who are familiar with the context to determine whether the values that are marked as outliers are problematic and not simply a result of a naturally low standard deviation. For those responses thought to be implausible, corrections to the outliers can be made based on call backs to the respondent and/or follow-up with the enumerator who conducted the survey.
* For midline surveys with GPS coordinates which are distant from baseline surveys from the same health area, we will follow up with the field teams to determine whether there are valid reasons for the geographic shift.

If sufficient corrections cannot be made to assure the quality of the responses, the surveys will be judged to be of poor quality and marked for exclusion. Other surveys conducted by the enumerators who produced the poor quality surveys will similarly be subject to individual scrutiny.

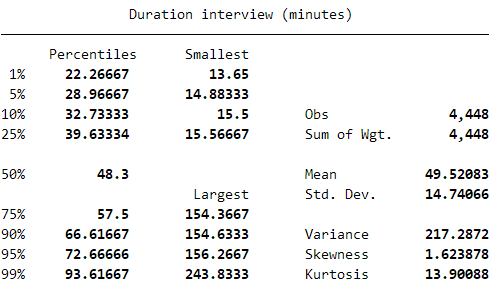
Finally, it is important to note that all unsuccessful attempts recorded and submitted by enumerators are not considered in this data quality review.

# 1.1 Menage: Duration of Interviews

As recommended after the baseline data collection, in order to prevent issues in terms of calculating the duration of an interview, in the midline data collection, Forcier used SurveyCTO to host the ODK scripts rather than Ona. SurveyCTO allows for duration times to be recorded independently of the time and date appearing on the phone. SurveyCTO instead counts the number of seconds that the survey has been open and hence is not affected by interview interruptions in which the enumerator may have to stop the interview temporarily or forgets to finalize the survey.

At the end of the midline’s first phase of data collection, the average duration of a household interview is 49.5 minutes with a standard deviation of 14.7 minutes. Please note that one interview of 482 minutes is not included in calculating these summary statistics. Looking into the metadata collected on this survey about how long the enumerator spent on components of the survey, we found that all questions for the respondent were answered after 71.9 minutes, and then 410 minutes later returned to the survey in order to answer questions about the enumerator’s impression of the respondent (how cooperative, honest, and interested they were), add any comments they had about the survey, and collect GPS points. As these variables completed at the end of survey are not essential to the quality of the survey and because it is an outlier, we have excluded it from the below presentation of data.

Table 1: Summary of duration



**Proposed outlier definition**: Forcier proposes to consider observations less than 20.0 minutes or greater than 79 minutes as duration outliers.

**Number of observations that meet outlier definitions:** There are 108 observations that are greater than the upper bound for duration outliers, and there are 9 observations that are less than the lower bound.

Figure 1: Histogram of interview duration



Figure 2: Box plot of interview duration



Figure 3: Box plots of interview duration by enumerators



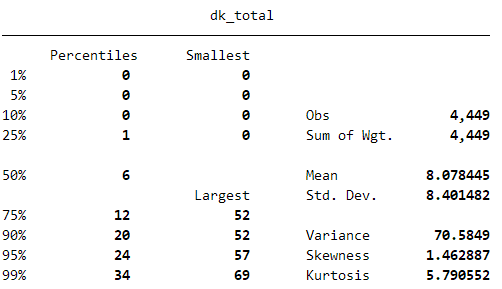
**Individual observation analysis**:

* Short surveys tended to be with people who had fewer household members, fewer children under five years of age, fewer pregnant women, and fewer women who have given birth in the household in the past 12 months. As such, these respondents had fewer looped questions and skipped sections about pregnant women. Note that the sample size of short duration interview outliers is small, thus statistical tests tend to be unsuccessful. More details on some specific variables verified below:
  + Short interviews household with a significantly smaller number of people.[[1]](#footnote-1) Interviews that were short had an average of 3.6 members whereas interviews that were not short had an average of 6.8 members.
  + Short interviews are done with households with fewer children under five years of age.[[2]](#footnote-2) Observations with short interviews had 0.2 children under five years of age, whereas observations that are not short had 1.5 children under five years old.
  + Having a vaccination card available at the time the interview conducted was not correlated with an observation having a short survey duration.
  + Not having a pregnant woman in the household is significantly correlated with having a short survey duration.[[3]](#footnote-3)
  + Not having a woman who has given birth in the household in the last 24 months is significantly correlated with having a short survey duration as expected.[[4]](#footnote-4)
  + Responses to other questions that filter into another set of questions such as whether the household has a child younger than 28 days old who died in the last 24 months, whether a woman has passed away in the last 24 months, and whether any household member five years of age or older was ill in the preceding two weeks, whether the respondent has been in contact with a CODESA member, and whether the performance of the health center has been formally assessed by the community were not linked to short survey durations.
* The 9 short duration observations belonged to 6 different enumerators, indicating that short survey durations were not a systematic issue for any particular enumerator. Below provides a brief analysis of these short surveys.
  + 124: Out of 172 interviews, 3 observations were 2 standard deviations below the mean.
    - 15.6 minutes: In one observation in Karhala Health Area, there were only two members of the household, no children under 5, a pregnant woman, but neither a woman who has given birth in the last 24 months nor an infant who died younger than 28 days old. The roster was filled out properly with name, gender, and age of household members in the roster matching that of the respondent and the head of household.
    - 14.8 minutes: In another observation in Cirimiro Health Area, there were only 2 members of the household, a pregnant woman, no women who have given birth. The roster was filled out properly with name, gender, and age of household members in the roster matching that of the respondent and the head of household.
    - 15.5 minutes: In an observation in Nindja Health Area, there were two household members, no children under 5, a pregnant woman, no women who have given birth. The roster was filled out properly with name, gender, and age of household members in the roster matching that of the respondent and the head of household variables.
  + 133: Out of 196 observations, 2 observations were 2 standard deviations below the mean.
    - 17 minutes: In an observation in Makuta Health Area, there were three household members, but no children under 5, no pregnant women, no women who have give birth, no women who have died during childbirth, and no infants who have died. The roster was filled out properly with name, gender, and age of household members in the roster matching that of the respondent and the head of household.
    - 17 minutes: In an observation in Rwamikundu Health Area, there were three household members, no children under 5, no pregnant women, no women who have given birth, and no infants who have died. The roster was filled out properly with name, gender, and age of household members in the roster matching that of the respondent and the head of household.
  + 115: Out of 186 observations, 1 observation was 2 standard deviations below the mean.
    - 16 minutes: In an interview in Mudirhi, there were 4 household members, no children under 5, no pregnant women, no women who have given birth, and no infants who have died. The roster was filled out properly with name, gender, and age of household members in the roster matching that of the respondent and the head of household.
  + 122: Out of 168 observations, 1 observation was 2 standard deviations below the mean.
    - 17 minutes: In an interview in Ngali, there were 2 household members, no children under 5, a pregnant woman, no women who have given birth, and no child who has died. The roster was filled out properly with name, gender, and age of household members in the roster matching that of the respondent and the head of household.
  + 222: Out of 195 interviews, 1 observation was 2 standard deviations below the mean.
    - 17 minutes: In an interview in Kanshimba, there were 4 household members, 1 child under 5 who did not have a vaccination card, no women who are pregnant, no women who have given birth, and no infant who has died. The roster was filled out properly with name, gender, and age of household members in the roster matching that of the respondent and the head of household.
  + 224: Out of 195 interviews, 1 was 2 standard deviations below the mean.
    - 14 minutes: In an interview in Nsokelwa Health Area, there were 10 household members, 1 child under 5, no vaccination, no pregnant women, no women who have given birth, and no infant who has died. The roster was filled out properly with name, gender, and age of household members in the roster matching that of the respondent and the head of household.
* It should also be noted that none of the 9 short observations had flags with regard to don’t know responses or integer outliers. Given that the answers for these observations with short survey duration times are consistent with broader trends for short survey durations and that we did not uncover discernible quality problems beside a short survey time, we find that these interviews are admissible.

# 1.2 Menage: Number of Don’t Know Responses

The average number of don’t know responses per interview is 8.1 with a standard deviation of 8.4 don’t know responses.

Table 2: Summary of don’t know responses



**Proposed outlier definition**: Forcier proposes considering observations with more than 24.9 don’t know responses as outliers.

**Number of observations that meet outlier definitions:** There are 222 observations that have more than the upper bound of don’t know responses.

Figure 4: Histogram of don’t know responses



Figure 5 Box plot of number of don’t know responses

Figure 6: Box plots of number of don’t know responses by enumerators

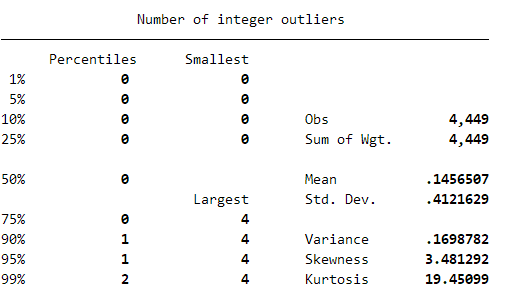


**Individual observation analysis**:

* The surveys with a relatively high number of don’t know responses have often have many children that are dependent on them and many don’t know responses to the questions about how many times and when those vaccinations were given. For each child that depends on the respondent, there are a series of questions about the vaccinations received by that child. The enumerator asks about each dose of that vaccination and when the dose was given. If the respondent has several children each with multiple doses of vaccinations about whose vaccinations they are not clear about, then we would expect there to be many don’t know responses in that observation, and in fact, that is what we observe. Observations that have respondents that have multiple dependent children are significantly more likely to have a high number of don’t know responses.[[5]](#footnote-5) On average, a respondent that does not have many don’t know responses has 1.6 children, and a respondent that does have many don’t know responses has 2.8 dependent children.
* This issue of high numbers of don’t know responses affected nearly every enumerator: 23 of the 29 enumerators had at least one observation that had a relatively high number DK responses.
* The sections of the survey that collect many don’t know responses are questions about the health center’s staffing, nurses, equipment, and services as well as about the CODESA’s performance, and suggest a coherent usage of “Don’t know” as a response.
* No observation had a high number of don’t know responses and was also a short interview as defined by the proposed definition described in the above section.

# 1.3 Menage: Number of Integer Outliers

The average number of potential integer outliers is 0.15 with the majority of observations not having any integer outlier and a standard deviation of 0.41. The number of integer outliers is significantly lower than during baseline – this is due to the additional integer constraints included in the midline programming of the household questionnaire which prevented enumerators from entering very high values for some integer variables.



**Proposed integer outlier definition**: Forcier proposes 0.97 integer outliers as the upper bound.

**Number of observations that meet outlier definitions**: There are 58 observations that had more than 0.97 integer outlier responses.

Figure 7: Histogram of integer outliers



Figure 8: Box plot of number of integer response outliers



Figure 9: Box plots of number of integer outliers by enumerators



**Individual observation analysis**:

* To understand the plausibility of each variable’s outliers, the outliers were reviewed by DRC national staff members familiar with the project and context. With the staff member’s assistance, outliers were marked as either plausible or implausible. Implausible outlier were followed up on with the respondent, and if the outlier cannot be confirmed or recoded, comments in the dataset will mark it as an integer outlier.
* The number of occurrences of implausible outliers will then be summed at the observation level to detect whether particular surveys had frequent problems with integer outliers.
* These observations with integer outliers were not symptomatic of any individual enumerator with 22 different enumerators among all 29 enumerators used.

# 1.4 Menage: Overlap between Duration and Other Characteristics

In this section, the goal is to compare how duration overlaps with other conditions that check for quality. Duration is here considered a primary indicator of quality, because it is the most straightforward check on whether an enumerator is cheating. The observations that meet two conditions below can serve as a starting point to determine which observations are likely of low quality and should potentially be removed from the dataset. Only three observations met two or more quality assurance outlier conditions. These were checked individually, and they were completed in 3 different places by 2 different enumerators. Household rosters were checked, and it appears that Marie will be over care of everything else. Moreover, no observation combined the short duration outlier condition with any other quality assurance outlier condition.

All observations which combined more than one quality assurance outlier condition were subject to individual analysis.

# 1.5 Menage: GPS Checks

As a check on the location variables, all observations’ GPS coordinates were mapped using QGIS and checked to see whether the coordinates of health areas clustered in the same village and were located in the correct territory.

There were 13 instances in which there were discrepancies between the GPS coordinates recorded and the health area that was selected by the enumerator. Along with the GPS coordinates, the start date and health area variables were used to identify observations that had been completed in a given health area on the same date as all other observations from the health area but which had incorrectly inputted health areas. In two instances, the health area variable was recoded to correspond to the correct health area the interviews took place in.

The remaining 11 observations appeared to be farther away from any health area clusters of household surveys. Among these 11, two could be identified as being in a more remote part or village within the health area, and both interviews correspond to the location where a CODESA interview was conducted. These interviews do not meet any of the criteria for quality assurance, and data indicates that both interviews were done with a baseline respondent and were ones in which the enumerator indicated in the interview comment variable that the households moved within the health area due to insecurity.

For the other 9 observations, we could not gather satisfactory explanations to understand why the GPS coordinates seemed to be farther away from the other observations from the same health area– thus we dropped them from the dataset. Note that these observations are not from one enumerator or one team in particular. More details on these observations can be found in the below table:

Table 3: Details on the Dropped Interviews

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Key | Enumerator Code | Province | Health Zone | Health Area | Attempt result | Quota after dropping the observation |
| uuid:1611a7b7-5179-4bab-96e9-ed3fa6de3ace | 122 | Sud Kivu | Bunyakiri | Tushunguti | Interview done with a random household in replacement of baseline one | 24 complete household interviews |
| uuid:1757aa2f-6012-498b-9dcf-7d8dee1b696c | 134 | Sud Kivu | Bunyakiri | Mingazi | Baseline household not available at first attempt | No impact on the quota as such attempt does not count as a complete interview |
| uuid:36cd2ce4-bddd-4c0d-ae74-ce4e09efd729 | 212 | Haut Katanga | Kafeubu | Kitanda | Interview done with the baseline respondent | 23 complete household interveiws |
| uuid:51dc0bc3-2c6e-4e4d-8950-e2551a3f9491 | 136 | Sud Kivu | Bunyakiri | Mingazi | Interview done with a random household in replacement of baseline one | 24 complete household interviews |
| uuid:8962f29f-81fe-43c8-aa4d-5259a0bca57c | 212 | Haut Katanga | Kafubu | Kitanda | Household from baseline could not be located | 23 complete household interviews |
| uuid:b7da7815-7334-4278-82b6-688d048bb456 | 224 | Haut Katanga | Mitwaba | Lusinga | Interview done with the baseline respondent | 24 complete household interviews |
| uuid:d7cb373f-6fe5-42f1-8af8-6c209550bd71 | 212 | Haut Katanga | Kafubu | Kitanda | Interview done with the baseline respondent | 23 complete household interviews |
| uuid:5e5f91c9-508e-4924-8273-74e0bff3586e | 132 | Sud Kivu | Minova | Kishinji | Interview done with the baseline respondent | 24 complete household interviews |
| uuid:1d7f20e4-e795-483f-a81e-1de5ca19ad54 | 132 | Sud Kivu | Kalonge | Ntulu | Interview done with a rand household in replacement of baseline one | 25 complete household interviews |

We also calculated the distances between baseline and midline interviews conducted with the same household. Below are the summary statistics and histogram of the calculated distances.

Table 5: Summary of distance between baseline and midline interviews

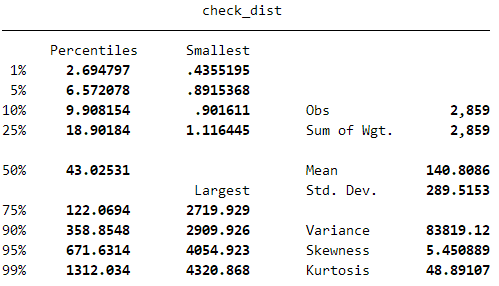


Figure 10 Histogram of distance between baseline and midline interviews



In order to calculate the distance between individual baseline observations and midline observations with the same HHID, the two datasets were merged on HHID and distances between waves of data collection were calculated. The tables below present the average distance between baseline and midline interviews by enumerator, health area, health zone, and province. The tables also present the percent of midline interviews that are more than a given distance from the baseline interview. For the household interviews the intervals are set at 30-meter intervals.

Table 6: Average Distance between Baseline and Midline by Enumerator

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Enumerator | Avg. Dist. (m) | gt30 | gt60 | gt90 | gt120 | gt150 | gt180 | gt210 |
| 112 | 61.4 | 55.0% | 35.0% | 20.0% | 5.0% | 5.0% | 5.0% | 5.0% |
| 113 | 90.2 | 40.4% | 29.8% | 21.3% | 19.1% | 17.0% | 14.9% | 10.6% |
| 114 | 84.4 | 48.8% | 23.3% | 18.6% | 18.6% | 16.3% | 14.0% | 14.0% |
| 115 | 109.9 | 54.0% | 38.0% | 28.0% | 18.0% | 14.0% | 14.0% | 10.0% |
| 116 | 67.5 | 61.5% | 26.9% | 19.2% | 13.5% | 9.6% | 9.6% | 7.7% |
| 122 | 140.0 | 48.3% | 28.3% | 21.7% | 20.0% | 18.3% | 15.8% | 15.8% |
| 123 | 132.0 | 43.9% | 20.3% | 15.4% | 13.8% | 13.0% | 10.6% | 8.9% |
| 124 | 149.0 | 61.0% | 42.4% | 29.7% | 25.4% | 18.6% | 16.9% | 15.3% |
| 125 | 92.6 | 49.5% | 26.7% | 18.8% | 15.8% | 14.9% | 12.9% | 11.9% |
| 126 | 139.4 | 54.1% | 29.7% | 20.7% | 16.2% | 11.7% | 11.7% | 11.7% |
| 132 | 210.7 | 65.3% | 49.0% | 39.5% | 32.7% | 31.3% | 27.9% | 25.9% |
| 133 | 181.9 | 66.9% | 45.5% | 33.8% | 29.9% | 27.9% | 25.3% | 23.4% |
| 134 | 191.8 | 69.6% | 50.0% | 39.9% | 32.9% | 27.2% | 24.1% | 22.8% |
| 135 | 249.2 | 73.1% | 50.8% | 43.1% | 35.4% | 32.3% | 27.7% | 26.2% |
| 136 | 247.9 | 69.1% | 53.2% | 41.0% | 38.1% | 34.5% | 31.7% | 28.1% |
| 142 | 127.7 | 64.3% | 53.6% | 32.1% | 21.4% | 17.9% | 17.9% | 14.3% |
| 212 | 124.4 | 69.6% | 47.1% | 33.3% | 27.5% | 23.5% | 21.6% | 16.7% |
| 213 | 124.7 | 56.2% | 38.1% | 29.5% | 26.7% | 19.0% | 18.1% | 18.1% |
| 214 | 105.3 | 60.4% | 34.4% | 27.1% | 21.9% | 17.7% | 13.5% | 11.5% |
| 215 | 104.3 | 60.4% | 37.5% | 29.2% | 22.9% | 18.8% | 14.6% | 14.6% |
| 216 | 86.1 | 68.1% | 42.2% | 27.6% | 23.3% | 17.2% | 10.3% | 8.6% |
| 222 | 162.1 | 74.9% | 56.1% | 46.5% | 37.4% | 31.6% | 28.3% | 25.1% |
| 223 | 154.9 | 65.1% | 48.4% | 37.3% | 32.5% | 25.4% | 20.6% | 19.8% |
| 224 | 87.4 | 55.6% | 34.9% | 26.6% | 20.1% | 17.2% | 16.0% | 14.2% |
| 225 | 85.0 | 61.4% | 37.3% | 25.9% | 21.5% | 13.9% | 8.9% | 7.6% |
| 226 | 112.6 | 57.6% | 36.7% | 28.8% | 20.9% | 15.1% | 13.7% | 11.5% |
| 232 | 53.8 | 52.5% | 22.0% | 11.9% | 8.5% | 8.5% | 5.1% | 5.1% |
| 236 | 120.8 | 76.9% | 69.2% | 61.5% | 38.5% | 38.5% | 23.1% | 15.4% |

Table 7: Average Distance between Baseline and Midline by Health Area

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Health Area | Avg. Dist. (m) | gt30 | gt60 | gt90 | gt120 | gt150 | gt180 | gt210 |
| Bagana Aire de Sante | 221.8 | 42.1% | 36.8% | 31.6% | 21.1% | 15.8% | 15.8% | 15.8% |
| Bitobolo Aire de Sante | 157.3 | 72.7% | 63.6% | 45.5% | 45.5% | 36.4% | 27.3% | 18.2% |
| Chabunda Aire de Sante | 334.3 | 60.0% | 40.0% | 35.0% | 35.0% | 35.0% | 35.0% | 35.0% |
| Chinganda Aire de Sante | 152.5 | 72.2% | 61.1% | 44.4% | 38.9% | 33.3% | 22.2% | 22.2% |
| Ciriba Aire de Sante | 72.8 | 64.7% | 47.1% | 29.4% | 23.5% | 11.8% | 11.8% | 5.9% |
| Fumya Aire de Sante | 210.0 | 73.7% | 52.6% | 47.4% | 42.1% | 36.8% | 36.8% | 36.8% |
| Irangi Aire de Sante | 60.1 | 66.7% | 33.3% | 13.3% | 13.3% | 13.3% | 13.3% | 6.7% |
| Kachiri Aire de Sante | 85.7 | 50.0% | 22.2% | 22.2% | 16.7% | 16.7% | 16.7% | 16.7% |
| Kusisa Aire de Sante | 240.6 | 70.6% | 47.1% | 35.3% | 35.3% | 35.3% | 35.3% | 29.4% |
| Lwana Aire de Sante | 246.9 | 57.9% | 36.8% | 36.8% | 31.6% | 31.6% | 31.6% | 31.6% |
| Maibano Aire de Sante | 139.1 | 76.5% | 41.2% | 29.4% | 29.4% | 29.4% | 23.5% | 17.6% |
| Makuta Aire de Sante | 80.7 | 61.9% | 38.1% | 19.0% | 14.3% | 14.3% | 14.3% | 9.5% |
| Mangaa Aire de Sante | 972.3 | 81.3% | 81.3% | 68.8% | 62.5% | 56.3% | 56.3% | 56.3% |
| Matutira Aire de Sante | 86.0 | 47.4% | 21.1% | 10.5% | 10.5% | 10.5% | 10.5% | 10.5% |
| Mianda Aire de Sante | 62.9 | 52.6% | 36.8% | 31.6% | 15.8% | 15.8% | 10.5% | 10.5% |
| Mingazi Aire de Sante | 131.7 | 62.5% | 50.0% | 50.0% | 43.8% | 43.8% | 31.3% | 18.8% |
| Miowe Aire de Sante | 129.9 | 63.2% | 31.6% | 26.3% | 21.1% | 21.1% | 21.1% | 15.8% |
| Mulonge Aire de Sante | 131.4 | 52.6% | 42.1% | 31.6% | 21.1% | 21.1% | 15.8% | 15.8% |
| Muoma Aire de Sante | 112.1 | 55.6% | 55.6% | 55.6% | 33.3% | 33.3% | 22.2% | 22.2% |
| Mushunguti Aire de Sante | 150.4 | 72.7% | 50.0% | 45.5% | 36.4% | 36.4% | 36.4% | 27.3% |
| Tushunguti Aire de Sante | 78.6 | 66.7% | 50.0% | 33.3% | 33.3% | 16.7% | 16.7% | 16.7% |
| Bumoga Aire de Sante | 292.0 | 87.5% | 68.8% | 62.5% | 62.5% | 62.5% | 56.3% | 50.0% |
| Chaminunu Aire de Sante | 366.1 | 47.6% | 42.9% | 38.1% | 38.1% | 38.1% | 38.1% | 38.1% |
| Chega Aire de Sante | 193.1 | 69.6% | 60.9% | 43.5% | 39.1% | 39.1% | 39.1% | 39.1% |
| Chibinda Aire de Sante | 586.8 | 92.0% | 88.0% | 88.0% | 88.0% | 88.0% | 84.0% | 84.0% |
| Chigiri Aire de Sante | 262.6 | 78.9% | 68.4% | 52.6% | 31.6% | 26.3% | 21.1% | 21.1% |
| Cholobera Aire de Sante | 128.8 | 68.0% | 56.0% | 40.0% | 32.0% | 28.0% | 16.0% | 16.0% |
| Fendula Aire de Sante | 132.1 | 76.5% | 58.8% | 41.2% | 41.2% | 23.5% | 23.5% | 11.8% |
| Kachuba Aire de Sante | 85.3 | 66.7% | 38.1% | 23.8% | 14.3% | 14.3% | 9.5% | 9.5% |
| Kakunda Aire de Sante | 411.7 | 87.0% | 52.2% | 47.8% | 43.5% | 43.5% | 43.5% | 43.5% |
| Kashesha Aire de Sante | 178.2 | 77.3% | 45.5% | 40.9% | 31.8% | 27.3% | 22.7% | 18.2% |
| Mukaba Aire de Sante | 236.1 | 76.5% | 47.1% | 41.2% | 41.2% | 41.2% | 29.4% | 29.4% |
| Mule Aire de Sante | 320.6 | 71.4% | 47.6% | 33.3% | 33.3% | 23.8% | 23.8% | 23.8% |
| Ntulu Aire de Sante | 354.9 | 75.0% | 50.0% | 41.7% | 33.3% | 33.3% | 33.3% | 33.3% |
| Rambo Aire de Sante | 74.3 | 64.7% | 35.3% | 17.6% | 11.8% | 5.9% | 5.9% | 5.9% |
| Rwamikundu Aire de Sante | 209.3 | 76.5% | 52.9% | 35.3% | 29.4% | 17.6% | 17.6% | 17.6% |
| Buhumba Aire de Sante | 329.7 | 78.9% | 68.4% | 47.4% | 47.4% | 42.1% | 31.6% | 31.6% |
| Bwisha Aire de Sante | 62.7 | 64.7% | 35.3% | 29.4% | 17.6% | 11.8% | 5.9% | 0.0% |
| Chebumba Aire de Sante | 89.9 | 61.9% | 38.1% | 28.6% | 23.8% | 19.0% | 14.3% | 9.5% |
| Karango Aire de Sante | 259.1 | 84.2% | 52.6% | 47.4% | 47.4% | 47.4% | 42.1% | 42.1% |
| Kishinji Aire de Sante | 116.0 | 73.7% | 52.6% | 36.8% | 26.3% | 15.8% | 15.8% | 15.8% |
| Kisongati Aire de Sante | 236.7 | 68.4% | 57.9% | 52.6% | 47.4% | 42.1% | 36.8% | 36.8% |
| Minova Aire de Sante | 103.2 | 38.5% | 23.1% | 23.1% | 23.1% | 23.1% | 23.1% | 23.1% |
| Muchibwe Aire de Sante | 109.1 | 76.0% | 44.0% | 36.0% | 28.0% | 28.0% | 24.0% | 24.0% |
| Nyamasasa Aire de Sante | 73.8 | 61.9% | 47.6% | 23.8% | 9.5% | 9.5% | 4.8% | 4.8% |
| Ruhunde Aire de Sante | 87.0 | 72.2% | 61.1% | 33.3% | 22.2% | 11.1% | 11.1% | 5.6% |
| Budoodo Aire de Sante | 348.6 | 66.7% | 50.0% | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% |
| Cagala Aire de Sante | 80.7 | 25.0% | 18.8% | 6.3% | 6.3% | 6.3% | 6.3% | 6.3% |
| Izege Aire de Sante | 77.9 | 61.5% | 38.5% | 7.7% | 7.7% | 7.7% | 7.7% | 7.7% |
| Luhago Aire de Sante | 240.8 | 58.3% | 50.0% | 50.0% | 50.0% | 50.0% | 41.7% | 41.7% |
| Luntukulu Aire de Sante | 60.7 | 42.9% | 28.6% | 21.4% | 21.4% | 7.1% | 7.1% | 7.1% |
| Mudirhi Aire de Sante | 131.4 | 68.8% | 56.3% | 50.0% | 25.0% | 25.0% | 25.0% | 18.8% |
| Murhali Aire de Sante | 30.1 | 31.3% | 6.3% | 6.3% | 6.3% | 0.0% | 0.0% | 0.0% |
| Mwirama Aire de Sante | 35.9 | 27.3% | 9.1% | 9.1% | 9.1% | 9.1% | 9.1% | 0.0% |
| Nindja Aire de Sante | 138.5 | 31.3% | 25.0% | 25.0% | 25.0% | 25.0% | 25.0% | 25.0% |
| Nyamarhege Aire de Sante | 87.1 | 70.6% | 52.9% | 29.4% | 17.6% | 17.6% | 17.6% | 11.8% |
| Buzonga Aire de Sante | 245.8 | 70.6% | 47.1% | 41.2% | 35.3% | 35.3% | 35.3% | 29.4% |
| Cibanda Aire de Sante | 140.4 | 66.7% | 55.6% | 22.2% | 22.2% | 16.7% | 16.7% | 11.1% |
| Ciburhi Kaz Aire de Sante | 100.2 | 60.9% | 21.7% | 13.0% | 13.0% | 13.0% | 13.0% | 13.0% |
| Cihumba Aire de Sante | 37.4 | 64.7% | 11.8% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Cirimiro Aire de Sante | 102.9 | 66.7% | 44.4% | 27.8% | 11.1% | 11.1% | 5.6% | 5.6% |
| Kafindjo Aire de Sante | 61.3 | 68.4% | 31.6% | 15.8% | 10.5% | 5.3% | 5.3% | 5.3% |
| Kasheke Aire de Sante | 176.7 | 35.0% | 30.0% | 25.0% | 25.0% | 20.0% | 20.0% | 15.0% |
| Lubanda Kar Aire de Sante | 26.6 | 30.8% | 7.7% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Mushenyi Aire de Sante | 121.6 | 52.4% | 33.3% | 28.6% | 23.8% | 14.3% | 9.5% | 9.5% |
| Namushwaga Aire de Sante | 115.9 | 70.6% | 35.3% | 29.4% | 23.5% | 23.5% | 11.8% | 11.8% |
| Ngali Aire de Sante | 294.6 | 45.0% | 35.0% | 30.0% | 25.0% | 20.0% | 20.0% | 20.0% |
| Ntagereka Aire de Sante | 224.2 | 60.0% | 45.0% | 30.0% | 25.0% | 20.0% | 20.0% | 20.0% |
| Ciburhi Aire de Sante | 297.2 | 75.0% | 60.0% | 40.0% | 35.0% | 35.0% | 30.0% | 30.0% |
| Karhala Aire de Sante | 99.0 | 55.6% | 27.8% | 22.2% | 22.2% | 11.1% | 11.1% | 11.1% |
| Kimalanjala Aire de Sante | 291.3 | 42.1% | 26.3% | 15.8% | 15.8% | 15.8% | 15.8% | 15.8% |
| Luciga Aire de Sante | 113.4 | 31.3% | 25.0% | 18.8% | 18.8% | 12.5% | 12.5% | 12.5% |
| Lurhala Aire de Sante | 96.0 | 46.2% | 15.4% | 7.7% | 7.7% | 7.7% | 7.7% | 7.7% |
| Mugamba Aire de Sante | 32.8 | 24.0% | 12.0% | 12.0% | 8.0% | 4.0% | 4.0% | 4.0% |
| Mulama Aire de Sante | 36.4 | 42.9% | 14.3% | 4.8% | 0.0% | 0.0% | 0.0% | 0.0% |
| Ntondo Aire de Sante | 89.5 | 30.4% | 13.0% | 13.0% | 13.0% | 13.0% | 8.7% | 8.7% |
| Bisembe Aire de Sante | 39.5 | 36.4% | 18.2% | 13.6% | 4.5% | 4.5% | 4.5% | 0.0% |
| Buziba Aire de Sante | 35.2 | 33.3% | 8.3% | 8.3% | 8.3% | 8.3% | 8.3% | 0.0% |
| Iganda Aire de Sante | 62.5 | 35.7% | 28.6% | 21.4% | 14.3% | 14.3% | 14.3% | 14.3% |
| Kasika Aire de Sante | 270.9 | 57.9% | 26.3% | 21.1% | 21.1% | 21.1% | 15.8% | 15.8% |
| Kibanda Aire de Sante | 104.9 | 63.2% | 42.1% | 31.6% | 26.3% | 15.8% | 15.8% | 15.8% |
| Kitagana Aire de Sante | 106.5 | 55.0% | 40.0% | 30.0% | 20.0% | 15.0% | 15.0% | 15.0% |
| Kitamba Aire de Sante | 35.1 | 40.0% | 10.0% | 10.0% | 5.0% | 5.0% | 0.0% | 0.0% |
| Mbobole Aire de Sante | 58.3 | 35.7% | 7.1% | 7.1% | 7.1% | 7.1% | 7.1% | 7.1% |
| Mulombozi Aire de Sante | 70.6 | 40.9% | 13.6% | 9.1% | 9.1% | 9.1% | 9.1% | 9.1% |
| Sungwe Aire de Sante | 68.7 | 66.7% | 28.6% | 23.8% | 23.8% | 9.5% | 9.5% | 9.5% |
| Adra 31 Aire de Sante | 31.1 | 31.3% | 12.5% | 6.3% | 6.3% | 0.0% | 0.0% | 0.0% |
| Kafubu Aire de Sante | 72.2 | 50.0% | 22.2% | 16.7% | 16.7% | 11.1% | 11.1% | 11.1% |
| Kalunda Aire de Sante | 78.4 | 73.7% | 36.8% | 26.3% | 21.1% | 15.8% | 10.5% | 10.5% |
| Kinama Aire de Sante | 63.5 | 52.6% | 47.4% | 36.8% | 21.1% | 5.3% | 5.3% | 0.0% |
| Kitanda Aire de Sante | 239.3 | 70.6% | 35.3% | 23.5% | 23.5% | 23.5% | 23.5% | 23.5% |
| Kiwele Aire de Sante | 40.0 | 16.7% | 8.3% | 8.3% | 8.3% | 8.3% | 8.3% | 8.3% |
| Mulyashi Aire de Sante | 56.0 | 53.8% | 23.1% | 23.1% | 23.1% | 7.7% | 0.0% | 0.0% |
| Sambwa Aire de Sante | 115.5 | 47.1% | 23.5% | 23.5% | 23.5% | 11.8% | 11.8% | 11.8% |
| Kyenge Aire de Sante | 79.7 | 69.6% | 34.8% | 21.7% | 8.7% | 8.7% | 8.7% | 8.7% |
| Lubuko Aire de Sante | 97.5 | 73.9% | 39.1% | 21.7% | 17.4% | 17.4% | 17.4% | 8.7% |
| Lutandula Lwalala Aire de Sante | 100.5 | 72.7% | 50.0% | 31.8% | 22.7% | 13.6% | 9.1% | 9.1% |
| Malambwe Aire de Sante | 110.7 | 52.9% | 29.4% | 23.5% | 23.5% | 17.6% | 17.6% | 17.6% |
| Minga Aire de Sante | 144.5 | 66.7% | 33.3% | 33.3% | 27.8% | 27.8% | 22.2% | 22.2% |
| Mupanda Mukenge Aire de Sante | 99.9 | 61.1% | 50.0% | 33.3% | 33.3% | 27.8% | 22.2% | 16.7% |
| Mwemena Aire de Sante | 76.3 | 45.0% | 30.0% | 25.0% | 25.0% | 25.0% | 15.0% | 15.0% |
| Nkonko Aire de Sante | 44.3 | 52.4% | 23.8% | 4.8% | 4.8% | 4.8% | 4.8% | 0.0% |
| Dikula Aire de Sante | 186.5 | 71.4% | 57.1% | 52.4% | 38.1% | 38.1% | 28.6% | 19.0% |
| Disanga 2 Aire de Sante | 221.6 | 75.0% | 43.8% | 37.5% | 37.5% | 37.5% | 31.3% | 18.8% |
| Disanga 3 Aire de Sante | 152.6 | 62.5% | 37.5% | 25.0% | 25.0% | 25.0% | 25.0% | 25.0% |
| Kyaba Aire de Sante | 80.2 | 68.4% | 47.4% | 26.3% | 21.1% | 15.8% | 5.3% | 5.3% |
| Mpande Aire de Sante | 160.3 | 88.2% | 70.6% | 58.8% | 47.1% | 35.3% | 29.4% | 29.4% |
| Mukumbi Aire de Sante | 51.0 | 60.0% | 33.3% | 13.3% | 13.3% | 0.0% | 0.0% | 0.0% |
| Mulungwishi Aire de Sante | 143.4 | 72.2% | 61.1% | 50.0% | 38.9% | 33.3% | 27.8% | 22.2% |
| Kapulwa Aire de Sante | 61.0 | 61.9% | 33.3% | 19.0% | 14.3% | 9.5% | 9.5% | 9.5% |
| Katobio Aire de Sante | 179.3 | 85.7% | 66.7% | 57.1% | 47.6% | 33.3% | 28.6% | 28.6% |
| Kibangu Aire de Sante | 77.4 | 47.4% | 26.3% | 21.1% | 21.1% | 21.1% | 10.5% | 10.5% |
| Kidimudilo Aire de Sante | 78.7 | 64.3% | 42.9% | 35.7% | 28.6% | 7.1% | 7.1% | 7.1% |
| Kyembe 1 Aire de Sante | 96.5 | 65.0% | 45.0% | 25.0% | 25.0% | 25.0% | 20.0% | 20.0% |
| Lupidi1 Aire de Sante | 86.8 | 55.0% | 35.0% | 25.0% | 20.0% | 20.0% | 20.0% | 20.0% |
| Mulandi Aire de Sante | 72.1 | 69.6% | 39.1% | 17.4% | 17.4% | 17.4% | 8.7% | 8.7% |
| Ditengwa Aire de Sante | 222.5 | 56.3% | 37.5% | 31.3% | 25.0% | 25.0% | 25.0% | 25.0% |
| Kaluwe Aire de Sante | 107.7 | 71.4% | 42.9% | 33.3% | 23.8% | 23.8% | 23.8% | 19.0% |
| Kamikolo Aire de Sante | 143.4 | 63.6% | 54.5% | 45.5% | 36.4% | 27.3% | 18.2% | 18.2% |
| Lupaji Aire de Sante | 96.8 | 76.0% | 32.0% | 16.0% | 12.0% | 12.0% | 12.0% | 12.0% |
| Ngalu Aire de Sante | 45.7 | 40.0% | 24.0% | 12.0% | 8.0% | 4.0% | 4.0% | 4.0% |
| Shamalenge Aire de Sante | 51.3 | 70.8% | 25.0% | 12.5% | 8.3% | 8.3% | 8.3% | 0.0% |
| Dilenge Aire de Sante | 75.6 | 62.5% | 37.5% | 31.3% | 25.0% | 25.0% | 12.5% | 12.5% |
| Kabanda Aire de Sante | 79.1 | 47.1% | 29.4% | 29.4% | 29.4% | 17.6% | 17.6% | 11.8% |
| Kanshimba Aire de Sante | 85.4 | 44.4% | 33.3% | 22.2% | 22.2% | 22.2% | 16.7% | 16.7% |
| Kasungeshi 1 Aire de Sante | 348.0 | 93.8% | 68.8% | 68.8% | 56.3% | 50.0% | 50.0% | 50.0% |
| Kibula Aire de Sante | 91.0 | 50.0% | 35.0% | 25.0% | 15.0% | 15.0% | 10.0% | 10.0% |
| Kisele Aire de Sante | 217.8 | 54.2% | 37.5% | 37.5% | 33.3% | 33.3% | 33.3% | 33.3% |
| Kwiyongo Aire de Sante | 113.4 | 66.7% | 42.9% | 33.3% | 28.6% | 23.8% | 23.8% | 23.8% |
| Lusinga Aire de Sante | 43.6 | 52.6% | 26.3% | 21.1% | 5.3% | 0.0% | 0.0% | 0.0% |
| Mubidi Aire de Sante | 150.5 | 66.7% | 55.6% | 44.4% | 44.4% | 33.3% | 33.3% | 33.3% |
| Mumbolo Aire de Sante | 89.2 | 60.0% | 40.0% | 30.0% | 20.0% | 10.0% | 10.0% | 10.0% |
| Muombe Aire de Sante | 209.5 | 56.5% | 43.5% | 21.7% | 21.7% | 21.7% | 17.4% | 17.4% |
| Mwema Aire de Sante | 110.5 | 63.6% | 54.5% | 45.5% | 36.4% | 36.4% | 27.3% | 27.3% |
| Nkonga Aire de Sante | 246.5 | 64.7% | 47.1% | 47.1% | 47.1% | 47.1% | 41.2% | 35.3% |
| Nsokelwa Aire de Sante | 71.4 | 78.6% | 42.9% | 42.9% | 21.4% | 7.1% | 0.0% | 0.0% |
| Dikulwe Aire de Sante | 123.1 | 65.2% | 47.8% | 34.8% | 26.1% | 21.7% | 21.7% | 21.7% |
| Kalera Aire de Sante | 120.7 | 81.3% | 62.5% | 43.8% | 31.3% | 18.8% | 18.8% | 18.8% |
| Kapoya Aire de Sante | 53.5 | 52.0% | 20.0% | 16.0% | 12.0% | 8.0% | 8.0% | 4.0% |
| Kasungami Aire de Sante | 130.6 | 60.0% | 48.0% | 44.0% | 40.0% | 24.0% | 16.0% | 16.0% |
| Katala Aire de Sante | 109.2 | 77.8% | 55.6% | 50.0% | 38.9% | 33.3% | 16.7% | 16.7% |
| Kimungu Aire de Sante | 99.4 | 76.0% | 36.0% | 28.0% | 24.0% | 20.0% | 16.0% | 16.0% |
| Kitobo Aire de Sante | 52.5 | 30.4% | 26.1% | 17.4% | 17.4% | 4.3% | 4.3% | 4.3% |
| Lwika Aire de Sante | 65.7 | 78.3% | 39.1% | 21.7% | 21.7% | 4.3% | 4.3% | 0.0% |
| Lwishi Aire de Sante | 93.1 | 45.8% | 29.2% | 20.8% | 12.5% | 8.3% | 8.3% | 8.3% |
| Mpwaki Aire de Sante | 80.1 | 55.0% | 45.0% | 40.0% | 20.0% | 20.0% | 15.0% | 15.0% |
| Mufunga Aire de Sante | 153.4 | 45.5% | 40.9% | 27.3% | 27.3% | 22.7% | 22.7% | 18.2% |
| Mukana Aire de Sante | 116.0 | 71.4% | 66.7% | 57.1% | 47.6% | 28.6% | 19.0% | 19.0% |
| Mushiza Aire de Sante | 93.6 | 68.2% | 50.0% | 45.5% | 27.3% | 22.7% | 22.7% | 13.6% |
| Muvule Aire de Sante | 115.4 | 55.0% | 30.0% | 25.0% | 20.0% | 20.0% | 20.0% | 15.0% |
| Nsangwa Aire de Sante | 149.1 | 80.0% | 52.0% | 40.0% | 28.0% | 20.0% | 16.0% | 16.0% |
| Sumpwa Aire de Sante | 164.2 | 76.5% | 76.5% | 64.7% | 58.8% | 52.9% | 35.3% | 23.5% |
| Tomombo Aire de Sante | 111.4 | 87.0% | 82.6% | 52.2% | 34.8% | 21.7% | 17.4% | 8.7% |
| Toyota Aire de Sante | 245.1 | 82.6% | 56.5% | 47.8% | 43.5% | 43.5% | 39.1% | 39.1% |

Table 8: Average Distance between Baseline and Midline by Health Zone

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Health Zone | Avg. Dist. (m) | gt30 | gt60 | gt90 | gt120 | gt150 | gt180 | gt210 |
| Bunyakiri | 185.8 | 62.6% | 43.5% | 34.6% | 28.9% | 26.7% | 24.2% | 21.1% |
| Kalonge | 259.9 | 74.3% | 54.7% | 43.9% | 38.9% | 35.1% | 31.8% | 30.4% |
| Minova | 146.7 | 69.1% | 48.7% | 36.1% | 29.3% | 25.1% | 20.9% | 19.4% |
| Kaziba | 141.0 | 57.8% | 33.6% | 22.4% | 18.4% | 15.2% | 13.5% | 12.1% |
| Kaniola | 108.1 | 47.4% | 32.8% | 23.4% | 19.0% | 16.8% | 16.1% | 13.9% |
| Mwana | 128.8 | 42.6% | 23.9% | 16.8% | 14.8% | 12.3% | 11.0% | 11.0% |
| Mwenga | 87.2 | 47.5% | 23.0% | 18.0% | 14.2% | 10.9% | 9.8% | 8.7% |
| Kafubu | 89.6 | 51.1% | 27.5% | 21.4% | 18.3% | 10.7% | 9.2% | 8.4% |
| Lukafu | 92.8 | 62.3% | 36.4% | 24.1% | 19.8% | 17.3% | 14.2% | 11.7% |
| Kambove | 142.8 | 71.9% | 51.8% | 39.5% | 32.5% | 27.2% | 21.1% | 16.7% |
| Kapolowe | 93.8 | 64.5% | 41.3% | 28.3% | 24.6% | 19.6% | 15.2% | 15.2% |
| Kilela Balanda | 103.5 | 63.2% | 35.3% | 24.1% | 18.0% | 15.8% | 14.3% | 12.0% |
| Mitwaba | 139.9 | 60.4% | 41.2% | 34.3% | 27.8% | 23.7% | 20.4% | 19.6% |
| Mufunga Sampwe | 114.6 | 65.6% | 47.1% | 36.7% | 28.9% | 21.3% | 17.5% | 14.9% |

Table 9: Average Distance between Baseline and Midline by Province

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Province | Avg. Dist. (m) | gt30 | gt60 | gt90 | gt120 | gt150 | gt180 | gt210 |
| Sud Kivu | 164.4 | 59.8% | 39.5% | 30.0% | 25.3% | 22.3% | 19.9% | 18.2% |
| Haut Katanga | 113.3 | 63.0% | 41.4% | 31.3% | 25.3% | 20.0% | 16.5% | 14.6% |

# 1.6 Menage: Attrition Rate

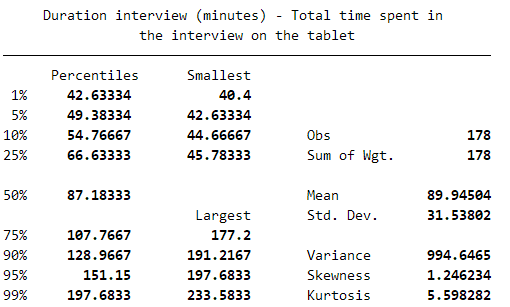
Enumerators were asked to attempt to recontact baseline respondents twice before replacing the household. The attrition rate of the household for each enumerator is calculated by dividing the number of interviews done with a baseline respondent or with another eligible household member by all interviews completed in a health area. The attrition rate of the respondent for each enumerator is calculated by dividing the number of interviews done with a baseline respondent by all interviews completed in a health area. Please note that the table below does not include interviews which were completed in health areas which were not visited in the baseline.

Table 10: Attrition Rate by Enumerator

|  |  |  |  |
| --- | --- | --- | --- |
| **Enumerator code** | **ATTRITION HOUSEHOLD** | **ATTRITION RESPONDENT** | **Count** |
| 111 | 0.0% | 0.0% | 2 |
| 112 | 20.0% | 36.0% | 154 |
| 113 | 32.9% | 42.9% | 190 |
| 114 | 38.6% | 42.9% | 211 |
| 115 | 28.6% | 28.6% | 195 |
| 116 | 25.7% | 30.0% | 206 |
| 122 | 26.2% | 53.0% | 190 |
| 123 | 25.5% | 37.0% | 205 |
| 124 | 29.3% | 46.1% | 212 |
| 125 | 37.2% | 43.3% | 199 |
| 126 | 31.7% | 40.9% | 214 |
| 132 | 24.1% | 25.1% | 248 |
| 133 | 21.4% | 28.1% | 256 |
| 134 | 19.4% | 29.6% | 238 |
| 135 | 32.1% | 49.2% | 243 |
| 136 | 28.2% | 48.2% | 250 |
| 142 | 37.8% | 44.4% | 55 |
| 212 | 29.0% | 29.0% | 204 |
| 213 | 27.6% | 28.3% | 189 |
| 214 | 33.1% | 33.8% | 197 |
| 215 | 26.2% | 30.8% | 94 |
| 216 | 20.0% | 20.7% | 181 |
| 222 | 4.1% | 6.7% | 201 |
| 223 | 27.8% | 36.9% | 193 |
| 224 | 13.3% | 24.6% | 209 |
| 225 | 19.0% | 35.4% | 215 |
| 226 | 29.4% | 29.4% | 221 |
| 232 | 27.7% | 38.6% | 110 |
| 236 | 35.0% | 35.0% | 21 |
| Total | 25.6% | 34.2% | 4742 |

# 2.1 Audit: Duration Outliers

**Summary of duration of interviews:**



**Proposed outlier definition**: Duration less than 26.9 minutes and greater than 153.0 minutes

**Number of observations that meet outlier definitions:** There are no observations shorter than the lower bound and 8 observations longer than the upper bound.

Figure 11 Histogram of duration



Figure 12 Box plot of duration

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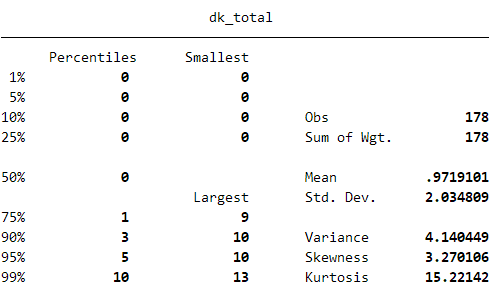
Figure 13 Box plot of duration by enumerator

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* Surveys that fit criteria: 0

# 2.2 Audit: Number of Don’t Know Responses

**Summary of number of don’t know responses:**



**Proposed outlier definition**: Forcier proposes a DK outlier definition of more than 5.0 don’t know responses.

**Number of observations that meet outlier definitions:** 8 observations with more than the upper bound of don’t know responses.

Figure 14 Histogram of don’t know responses



Figure 15 Box plot of don’t know responses



Figure 16 Box plot of don’t know responses by enumerator

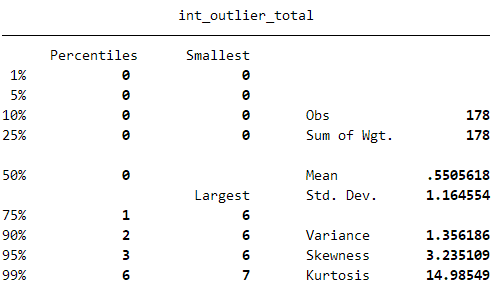


**Individual observation analysis**:

* The observations which had relatively higher numbers of DK responses largely registered their DK responses in a few areas of the survey. The most common series of questions to receive several “Don’t know” responses in a row were the questions relating to the different services provided by the health center, e.g. “How many clients visited this health center for outpatient care?”, “How many preschool consultations did the health center provide”, and “How many vaccinations did the health center provide?” Indeed, 10 of the 13 “Don’t know” responses from the observation which had the highest number of DK responses were related to the health center’s service alone—a similar case can be found in two friends who also the answers to these health center questions were all DK responses.
* For the remaining 4 observations, I’ve looked at where the “Don’t know” responses occur, and they are largely coherent together.
* The 8 surveys are spread among three enumerators: 111 (3 survey), 121 (4 surveys), and 131 (1 survey).

# 2.3 Audit: Number of Integer Outliers

**Summary of integer outlier of interviews:**



**Proposed outlier definition**: More than 2.9 integer outlier responses

**Number of observations that meet outlier definitions:** 10 observations with more than 3.601007 integer outlier responses

Figure 17 Histogram of integer outliers



Figure 18 Box plot of number of integer response outliers



Figure 19 Box plot of number of integer response outliers by enumerator



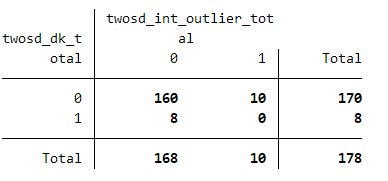
**Individual Observation Analysis:**

* We have followed-up with the enumerators on information regarding all the integer outliers we found and have inserted edits to implausible values back into the data.
* Where we did not get clarification about an integer outlier, we have left comments in the dataset explaining that the values are implausible, but that we have not been able to correct that value.

# 2.4 Audit: Overlap between Duration and Other Characteristics

In the midline dataset, there are no interviews that are considered to have short survey durations so there are obviously no surveys that are both short and have other potentially problematic characteristics. There are also no surveys that have high numbers of don’t know responses and integer outlier responses, as shown in the table below.

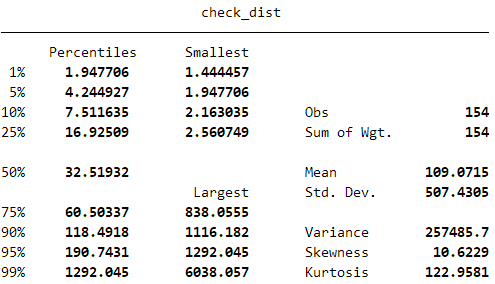
Table 11: High Don’t Know Responses by High Integer Outlier Responses



# 2.5 Audit: GPS Check

In order to verify the accuracy of the geographic location of the midline data, the GPS coordinates of the midline and the baseline Audit data were compared using one observation per health area. For this comparison, the distance between the midline and the baseline audit observations were calculated. As shown in the table below, 75% of the observations in the midline were located within 60.5 meters of the baseline observation.

Table 12: Summary of distance between baseline and midline interviews



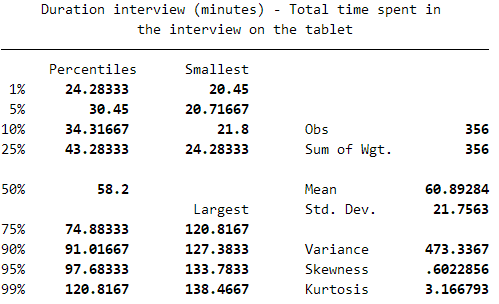
However, there are 6 observation in which the midline observation is more than 200 meters from the baseline observation. These are presented in the table below ordered from least to greatest distances from baseline. All baseline observations were mapped alongside midline observations in QGIS, and it was evident that the five observations within 1300 meters of the baseline observation were within the visited community. The Mingazi health center audit had 6 integer outliers which was higher than the average of 0.6 integer outliers, but the observation was within the normal range of survey duration and don’t know responses.

Table 13: Details of the Interviews > 200 meters from Baseline Interview

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Health Area** | **Enumerator** | **Duration (minutes)** | **key** | **Distance from BL (m)** |
| Maibano Aire de Sante | Maimouna Habimana Jolie | 93.48333 | uuid:8c489b35-83cf-40c1-9858-d0a4419db234 | 245.2288 |
| Kasungeshi 1 Aire de Sante | Ebondo Sarah | 59.13334 | uuid:a0e2990e-fcb7-4e49-9210-a1829e11899a | 735.7595 |
| Mukana Aire de Sante | Ebondo Sarah | 79.75 | uuid:7686bf68-eb94-43ee-ad57-b91dda05c221 | 838.0555 |
| Budoodo Aire de Sante | Baraka Minani Matthieu | 48.5 | uuid:f4ce1146-6c39-4e03-a026-ad9efbf8c6cc | 1116.182 |
| Nindja Aire de Sante | Baraka Minani Matthieu | 88.63333 | uuid:388da793-6fe9-4480-948f-63e8bfd867f9 | 1292.045 |
| Mingazi Aire de Sante | Maimouna Habimana Jolie | 135.7667 | uuid:b0610f7a-4209-4275-b294-c99991125bba | 6038.057 |

# 3.1 CODESA: Duration Outliers

**Summary of duration of interviews:**



**Proposed outlier definition**: Forcier proposes a duration outlier definition of less than 17.4 minutes and greater than 104.4 minutes.

**Number of observations that meet outlier definitions:** There were no observation shorter than the lower bound and there were 11 observations longer than the upper bound.

Figure 20 Histogram of duration



Figure 21 Box plot of duration



Figure 22 Box plot of duration by enumerator

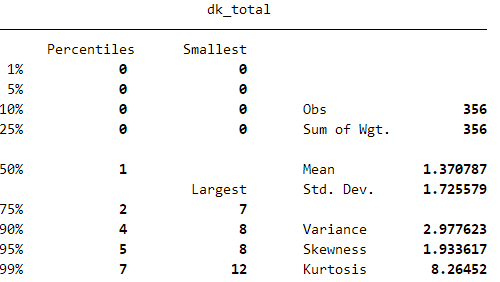


**Individual observation analysis**:

* Surveys that meet criteria: 0

# 3.2 CODESA: Number of Don’t Know Responses

**Summary of number of don’t know responses:**



**Proposed outlier definition**: Forcier proposes a DK outlier definition of more than 4.8 don’t know responses.

**Number of observations that meet outlier definitions:** 21 observations with more DK response than the upper bound

Figure 23 Histogram of don’t know responses:



Figure 24 Box plot of number of don’t know responses



Figure 25 Box plot of number of don’t know responses by enumerator

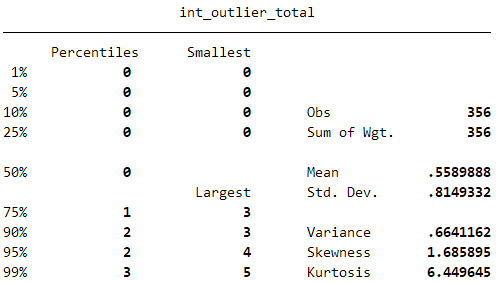


**Individual observation analysis**:

* The don’t know responses of the 21 observations were analyzed, and while even among the outliers there were not many don’t know responses in an observation, the don’t know responses that were registered tended to be entered on questions about dates. These questions included questions such as “107. When was the last time the CODESA met?”, “110. When was the last time the CODESA meet with staff from the centre de sante?”, and “301a. Have you ever visited the health area to seek care for yourself or someone else?” For the survey that had the most “Don’t know” responses with 12, 6 of those came as “Don’t know” responses to the date-related questions of 107, 110, and 301a, and this is indicative of other surveys with an outlier number of “Don’t know” responses.

# 3.3 CODESA: Number of Integer Outliers

**Summary of integer outlier of interviews:**



**Proposed outlier definition**: Forcier proposes an integer outlier definition of more than 2.2 integer outlier responses.

**Number of observations that meet outlier definitions:** 11 observations with more than the upper bound.

Figure 26 Histogram of integer outliers



Figure 27 Box plot of number of integer response outliers



Figure 28 Box plot of number of integer response outliers by enumerator



Individual observation analysis:

* We have followed-up with the enumerators on information regarding all the integer outliers we found and have inserted edits to implausible values back into the data.
* Where we did not get clarification about an integer outlier, we have left comments in the dataset explaining that the values are implausible, but that we have not been able to correct that value.

# 3.4 CODESA: Overlap between Duration and Other Characteristics

In no instances do interviews have short survey durations and other problematic quality assurance characteristics. There are also no instances of surveys having both high numbers of integer outliers and high numbers of don’t know responses.

# 3.5 CODESA: GPS Check

We calculated the distances between baseline and midline interviews conducted with the same CODESA respondent. Below are the summary statistics and histogram of the calculated distances.

Table 17: Summary of distance between baseline and midline interviews

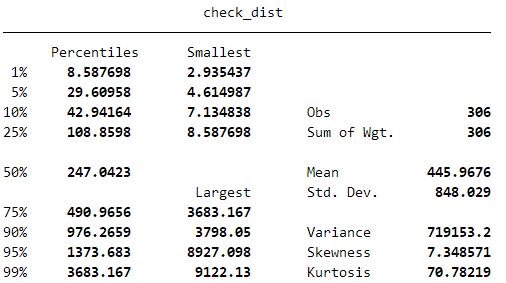


Figure 29 Histogram of distance between baseline and midline interviews



The tables below present the average distance between a centroid coordinate generated from the baseline interviews and the midline interviews’ GPS coordinates by enumerator, health area, health zone, and province. While we could have attempted to match baseline interviews and midline interviews, such an analysis would have been limited to the 37.4% of midline observations that were completed by the same CODESA member as in the baseline. The tables also present the percent of midline interviews that are more than a given distance from the centroid.

For the CODESA interviews, we don’t expect that the CODESA member is in the same location within the health area as the baseline interview, and, as expected, the range of distances between baseline and midline observations are broad: 95% of the observations are within 2.9 to 1450.4 meters of the baseline centroid. There are only 6 observation which are more than 2500 meters from their baseline which we examined more closely: 2 observations in Mwemena health area and 2 observations in Kanshimba health area.

When examined on a map, the midline observations in Mwemena are actually clustered in the same area as the household and audit surveys from the baseline and midline. However, in the baseline, the only CODESA survey submitted had GPS coordinates 3,370 meters (2.1 miles) from the next closest Mwemena observation. In Kanshimba health area too, the baseline CODESA interview were distant from the main cluster of observations, 8506 meters (5.3 miles) from the next nearest observation from Kanshimba. The midline CODESA observations, in contrast, are within the cluster of observations collected in Kanshimba.

Table 18: Average Distance between Baseline and Midline by Enumerator

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Enumerator | Avg. Dist. (m) | gt30 | gt100 | gt200 | gt300 | gt400 | gt500 | gt600 |
| Baraka Minani Matthieu | 411 | 96.9% | 81.3% | 54.7% | 42.2% | 28.1% | 25.0% | 21.9% |
| Ebondo Sarah | 458 | 91.0% | 75.6% | 48.7% | 26.9% | 12.8% | 9.0% | 6.4% |
| Kasongo Ngoy Mwenge Don de Dieu | 465 | 100.0% | 81.0% | 63.8% | 46.6% | 32.8% | 24.1% | 22.4% |
| MAROYI Judith | 611 | 100.0% | 89.3% | 71.4% | 64.3% | 53.6% | 53.6% | 46.4% |
| Maimouna Habimana Jolie | 389 | 91.0% | 65.4% | 53.8% | 44.9% | 33.3% | 28.2% | 17.9% |

Table 19: Average Distance between Baseline and Midline by Health Area

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Health Area | Avg. Dist. (m) | gt30 | gt100 | gt200 | gt300 | gt400 | gt500 | gt600 |
| Adra 31 Aire de Sante | 165 | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Bagana Aire de Sante | 280 | 100.0% | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Bisembe Aire de Sante | 817 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Bitobolo Aire de Sante | 410 | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% |
| Budoodo Aire de Sante | 368 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Buhumba Aire de Sante | 873 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Bumoga Aire de Sante | 317 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% |
| Buziba Aire de Sante | 131 | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Bwisha Aire de Sante | 403 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Cagala Aire de Sante | 562 | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Chabunda Aire de Sante | 293 | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% |
| Chaminunu Aire de Sante | 513 | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Chebumba Aire de Sante | 142 | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Chega Aire de Sante | 302 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% |
| Chibinda Aire de Sante | 101 | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Chigiri Aire de Sante | 1379 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Chinganda Aire de Sante | 229 | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Cholobera Aire de Sante | 821 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Cibanda Aire de Sante | 580 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Ciburhi Aire de Sante | 95 | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Ciburhi Kaz Aire de Sante | 676 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% |
| Cihumba Aire de Sante | 255 | 100.0% | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Ciriba Aire de Sante | 65 | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Cirimiro Aire de Sante | 394 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Dikula Aire de Sante | 530 | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% |
| Dikulwe Aire de Sante | 57 | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Dilenge Aire de Sante | 229 | 100.0% | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Disanga 2 Aire de Sante | 647 | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% |
| Disanga 3 Aire de Sante | 551 | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Ditengwa Aire de Sante | 179 | 100.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Fendula Aire de Sante | 396 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Fumya Aire de Sante | 31 | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Iganda Aire de Sante | 304 | 100.0% | 100.0% | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% |
| Irangi Aire de Sante | 219 | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% |
| Izege Aire de Sante | 1018 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Kabanda Aire de Sante | 232 | 100.0% | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kachiri Aire de Sante | 40 | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kachuba Aire de Sante | 40 | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kafindjo Aire de Sante | 67 | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kafubu Aire de Sante | 1404 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Kakunda Aire de Sante | 103 | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kalera Aire de Sante | 65 | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kalunda Aire de Sante | 284 | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Kaluwe Aire de Sante | 226 | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kamikolo Aire de Sante | 123 | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kanshimba Aire de Sante | 9025 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Kapoya Aire de Sante | 113 | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kapulwa Aire de Sante | 499 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% |
| Karango Aire de Sante | 159 | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Karhala Aire de Sante | 265 | 100.0% | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kasheke Aire de Sante | 1632 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Kashesha Aire de Sante | 281 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% |
| Kasika Aire de Sante | 280 | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Kasungami Aire de Sante | 239 | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kasungeshi 1 Aire de Sante | 345 | 100.0% | 100.0% | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% |
| Katala Aire de Sante | 344 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% |
| Katobio Aire de Sante | 171 | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kibanda Aire de Sante | 291 | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Kibangu Aire de Sante | 164 | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kibula Aire de Sante | 267 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% |
| Kidimudilo Aire de Sante | 852 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Kimalanjala Aire de Sante | 496 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% |
| Kimungu Aire de Sante | 378 | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% |
| Kinama Aire de Sante | 601 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Kisele Aire de Sante | 328 | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Kishinji Aire de Sante | 278 | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Kisongati Aire de Sante | 430 | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 0.0% |
| Kitagana Aire de Sante | 294 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% |
| Kitamba Aire de Sante | 97 | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kitanda Aire de Sante | 418 | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% |
| Kitobo Aire de Sante | 129 | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kiwele Aire de Sante | 123 | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kusisa Aire de Sante | 977 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Kwiyongo Aire de Sante | 284 | 100.0% | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kyaba Aire de Sante | 330 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Kyembe 1 Aire de Sante | 132 | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Kyenge Aire de Sante | 58 | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Lubanda Kar Aire de Sante | 68 | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Lubuko Aire de Sante | 473 | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% |
| Luciga Aire de Sante | 533 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Luhago Aire de Sante | 193 | 100.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Luntukulu Aire de Sante | 415 | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 0.0% |
| Lupaji Aire de Sante | 150 | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Lupidi1 Aire de Sante | 164 | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Lurhala Aire de Sante | 152 | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Lusinga Aire de Sante | 94 | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Lutandula Lwalala Aire de Sante | 230 | 100.0% | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Lwana Aire de Sante | 272 | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% |
| Lwika Aire de Sante | 15 | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Lwishi Aire de Sante | 175 | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Maibano Aire de Sante | 252 | 100.0% | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Makuta Aire de Sante | 110 | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Malambwe Aire de Sante | 200 | 100.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Mangaa Aire de Sante | 52 | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Matutira Aire de Sante | 729 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Mbobole Aire de Sante | 767 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Mianda Aire de Sante | 100 | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Minga Aire de Sante | 54 | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Mingazi Aire de Sante | 1054 | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Minova Aire de Sante | 144 | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Miowe Aire de Sante | 630 | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Mpande Aire de Sante | 269 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% |
| Mpwaki Aire de Sante | 138 | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Mubidi Aire de Sante | 312 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% |
| Muchibwe Aire de Sante | 595 | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% |
| Mudirhi Aire de Sante | 804 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Mufunga Aire de Sante | 132 | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Mugamba Aire de Sante | 329 | 100.0% | 100.0% | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% |
| Mukaba Aire de Sante | 146 | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Mukana Aire de Sante | 306 | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Mukumbi Aire de Sante | 118 | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Mulama Aire de Sante | 91 | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Mulandi Aire de Sante | 323 | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Mule Aire de Sante | 408 | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 0.0% |
| Mulombozi Aire de Sante | 167 | 100.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Mulonge Aire de Sante | 634 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% |
| Mulungwishi Aire de Sante | 387 | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% |
| Mulyashi Aire de Sante | 119 | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Mumbolo Aire de Sante | 273 | 100.0% | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Muoma Aire de Sante | 316 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% |
| Muombe Aire de Sante | 733 | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% |
| Mupanda Mukenge Aire de Sante | 79 | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Murhali Aire de Sante | 932 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% |
| Mushenyi Aire de Sante | 685 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Mushiza Aire de Sante | 230 | 100.0% | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Mushunguti Aire de Sante | 316 | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Muvule Aire de Sante | 212 | 100.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Mwema Aire de Sante | 251 | 100.0% | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Mwemena Aire de Sante | 3741 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Mwirama Aire de Sante | 1656 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Namushwaga Aire de Sante | 168 | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Ngali Aire de Sante | 1733 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Ngalu Aire de Sante | 215 | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Nindja Aire de Sante | 485 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Nkonga Aire de Sante | 303 | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% |
| Nkonko Aire de Sante | 276 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% |
| Nsangwa Aire de Sante | 30 | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Nsokelwa Aire de Sante | 228 | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Ntagereka Aire de Sante | 332 | 100.0% | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Ntondo Aire de Sante | 130 | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Ntulu Aire de Sante | 663 | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% |
| Nyamarhege Aire de Sante | 583 | 100.0% | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% |
| Nyamasasa Aire de Sante | 182 | 100.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |
| Rambo Aire de Sante | 1251 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Ruhunde Aire de Sante | 109 | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Rwamikundu Aire de Sante | 581 | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Sambwa Aire de Sante | 212 | 100.0% | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Shamalenge Aire de Sante | 434 | 100.0% | 100.0% | 100.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Sumpwa Aire de Sante | 232 | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Sungwe Aire de Sante | 206 | 100.0% | 100.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Tomombo Aire de Sante | 175 | 100.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Toyota Aire de Sante | 586 | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Tushunguti Aire de Sante | 199 | 100.0% | 50.0% | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% |

Table 20: Average Distance between Baseline and Midline by Health Zone

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Health Zone | Avg. Dist. (m) | gt30 | gt100 | gt200 | gt300 | gt400 | gt500 | gt600 |
| Bunyakiri Zone de Sante | 343 | 88.1% | 61.9% | 50.0% | 40.5% | 28.6% | 21.4% | 14.3% |
| Kafubu Zone de Sante | 416 | 100.0% | 93.8% | 62.5% | 43.8% | 31.3% | 25.0% | 25.0% |
| Kalonge Zone de Sante | 487 | 93.3% | 66.7% | 50.0% | 50.0% | 46.7% | 43.3% | 30.0% |
| Kambove Zone de Sante | 405 | 100.0% | 78.6% | 71.4% | 64.3% | 42.9% | 28.6% | 28.6% |
| Kaniola Zone de Sante | 701 | 100.0% | 95.0% | 80.0% | 70.0% | 60.0% | 60.0% | 50.0% |
| Kapolowe Zone de Sante | 329 | 100.0% | 92.9% | 64.3% | 35.7% | 28.6% | 21.4% | 14.3% |
| Kaziba Zone de Sante | 599 | 95.5% | 77.3% | 63.6% | 50.0% | 40.9% | 36.4% | 36.4% |
| Kilela Balanda Zone de Sante | 221 | 91.7% | 75.0% | 58.3% | 16.7% | 8.3% | 8.3% | 8.3% |
| Lukafu Zone de Sante | 639 | 100.0% | 56.3% | 50.0% | 37.5% | 25.0% | 18.8% | 18.8% |
| Minova Zone de Sante | 332 | 100.0% | 75.0% | 55.0% | 40.0% | 20.0% | 20.0% | 15.0% |
| Mitwaba Zone de Sante | 922 | 96.4% | 92.9% | 67.9% | 46.4% | 21.4% | 14.3% | 10.7% |
| Mufunga Sampwe Zone de Sante | 197 | 86.1% | 63.9% | 33.3% | 16.7% | 8.3% | 5.6% | 2.8% |
| Mwana Zone de Sante | 261 | 93.8% | 87.5% | 43.8% | 31.3% | 18.8% | 12.5% | 6.3% |
| Mwenga Zone de Sante | 335 | 100.0% | 85.0% | 65.0% | 50.0% | 25.0% | 25.0% | 20.0% |

Table 21: Average Distance between Baseline and Midline by Province

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Province | Avg. Dist. (m) | gt30 | gt100 | gt200 | gt300 | gt400 | gt500 | gt600 |
| Haut-Katanga | 461 | 94.9% | 77.9% | 55.1% | 35.3% | 21.3% | 15.4% | 13.2% |
| Sud-Kivu | 434 | 94.7% | 75.3% | 57.1% | 47.1% | 34.7% | 31.2% | 24.1% |

1. P-value = 0.003 in two-tailed T-test of members of households and dummy variable identifying short interviews. [↑](#footnote-ref-1)
2. P-value = 0.0001 in two-tailed T-test of children under five years of age in household and dummy variable identifying short interviews. [↑](#footnote-ref-2)
3. P-value = 0.0342 in one-tailed T-test of pregnant women in household and a dummy variable identifying short interviews. [↑](#footnote-ref-3)
4. P-value = 0.0014 in two-tailed T-test of whether any woman in the household has been pregnant in the last 24 months and dummy variable identifying short interviews. [↑](#footnote-ref-4)
5. P-value of 0.0000 in two-tailed T-test of number of dependent children and a dummy variable identifying observations that have many don’t know responses. [↑](#footnote-ref-5)