



NAMIBIA HOUSEHOLD INCOME AND EXPENDITURE SURVEY 2015/2016

SUPERVISORS' AND FIELD ADMINISTRATION MANUAL

Introduction

The Namibia Household Income and Expenditure Survey (NHIES) 2015/2016 is the fourth of such surveys to be conducted in independent Namibia. As the sole source of information on incomes and expenditure in the country the survey is used to compute poverty indicators at household and individual levels. It also serves as a statistical framework for compiling the national basket items for the compilation of price indices used in the calculation of inflation. It forms the basis for updating prices or rebasing of national accounts.

The success of the NHIES 2015/2016 will depend on how well various activities of the survey are coordinated and executed and how diligently the personnel involved in the survey activities undertake their responsibilities. This manual outlines the responsibilities of the survey's senior regional, regional and team supervisors.

The instructions in this manual are to be read together with the household questionnaire, the interviewers' manual, the listing manual and any other instructions issued as survey circulars from time to time.

Supervisors are the main administrators of the survey activities at their different levels on the field and therefore the quality of the data will depend mainly on how supervision is implemented at those levels.

1. DESCRIPTION OF THE SURVEY

1.1 Overview

The Namibia Household Income and Expenditure Survey (NHIES) 2015/2016 is the sole source of comprehensive information on incomes and expenditure in Namibia. The survey is used to compute poverty indicators at household and individual levels. It also serves as a statistical framework for compiling the national basket items for the compilation of price indices used in the calculation of inflation. It forms the basis for updating prices or rebasing of national accounts.

Surveys of the type of NHIES are very costly exercises that require a lot of resources, both human and financial. The NHIES 2009/2010 cost over sixty (60) million Namibian Dollars to execute and the coming survey exceeds this amount. Therefore it is important to take extra care to make sure that NSA gets value for money and that tax payer resources are spent wisely.

1.2 Purpose of the survey

For any effective and meaningful planning to take place the Government of Namibia and other developmental stakeholders need to have reliable and accurate information on the socio-economic status of the country. The main objective of the Namibia Household Income and Expenditure Survey (NHIES) is to provide socio-economic indicators to support planning, policy formulation, decision making, and research and development for a knowledge based economy in order to eradicate poverty and income inequalities in Namibia. It will describe the living conditions of Namibians using actual patterns of consumption and income as well as a range of other social and economic indicators. The specific survey objectives include among others:

- i) To provide information for poverty indicators and profiles
- ii) To provide data on income distribution and differentials
- iii) To inform monitoring and evaluation of development programmes and processes
- iv) To obtain consumption and expenditure patterns and other data for the construction of a revised basket and weights for consumer price indices

- v) To provide data to be used for the compilation of the National Accounts, as well as for international reporting.
- vi) To provide basic information on the transformations of the economy following trends and shifts in the consumption patterns of the population.
- vii) To provide labour force indicators.
- viii) To provide information on health and education.

1.3 Survey Sponsorship

Namibia has adopted a 5 year socio-economic planning cycle known as National Development Plans or NDPs. The current cycle is the NDP4 (2012 to 2016) that adopted three major overarching goals to be achieved namely:

- High and sustained economic growth
- Increased income equality
- Employment creation

NDPs are the stepping stones towards achieving Vision 2030, which defines Namibia's long-term development goals.

Conducting the NHIES is consistent with the Government planning and execution of developmental interventions. It is generally believed that change has taken place from 2009 to 2014 but what is not known is the level and direction of that change. The NHIES has served and will be serving as a main instrument for distributional analysis and for formulating the poverty reduction strategy.

The NHIES 2015/2016 is the fourth of this type of survey to be conducted in an independent Namibia, but the first to be carried out by the Namibia Statistics Agency (NSA) under its strategic priorities and objectives as stipulated in the Business Plan for 2012 to 2017.

The NHIES 2015/2016 is conducted under the jurisdiction of the NSA and the government is the main Sponsor. The overall responsibility for NSA is to ensure that the survey delivers quality results that contribute to NSA strategic objective of delivering relevant, quality and timely statistics that is fit for purpose.

1.4 Design of the NHIES Sample

The Household Income and Expenditure Survey 2015/2016 is a household based survey designed to collect data on incomes and expenditure patterns of households. The survey will cover all 14 regions and is expected to yield estimates/indices by regions, urban/rural and selected socio-economic groups. It is also planned that quarterly reports will be produced with figures estimated at the national level. A representative sample of 10,368 households will be selected through a two-stage sampling procedure. To allow for seasonal variations, the survey will be conducted over a period of eleven months and each household will be interviewed for a period of 2 weeks, often referred to as a survey round. The survey round period will include a resting day also for the field teams after the 14 day period thus covering 15 days.

The sample design for the survey will be a stratified two-stage cluster sample where the units of the first stage will be geographical areas to be designated as the Primary Sampling Units (PSUs) and the second stage units will be the households. The first stage units will be selected from the National Sampling Frame (NSF) of PSUs and the second stage units will be selected from a list of households created in the field (listing will be done just before the interviewing of households within the PSU).

A PSU will be selected with the probability proportional to size sampling procedure where the size measure of a PSU being the number of households as at 2011 population and housing census. Sampling of households within the selected PSUs will take place once the listing of all households in the selected PSUs is completed. The selection of sampled households will be done by the Team Supervisors after the interviewers complete their listing work using the tablets. The process is explained elsewhere in this manual. The table below shows the final sample size by region.

Table1: Distribution of sample PSUs and households by region

Region	PSU	Sample Households per PSU	Total sample households
!Karas	48	12	576
Erongo	72	12	864
Hardap	48	12	576
Kavango East	48	12	576
Kavango West	48	12	576
Khomas	96	12	1152
Kunene	48	12	576
Ohangwena	72	12	864
Omaheke	48	12	576
Omusati	72	12	864
Oshana	72	12	864
Oshikoto	72	12	864
Otjozondjupa	72	12	864
Zambezi	48	12	576
Total	864	12	10368

1.5 About the Survey Instruments

A very distinct feature of this survey is the introduction of new technology for data entry and the partial phasing out of paper-based data capture. For the first time NSA is using tablets to collect data from sample households using Computer Assisted Personal Interviews also known as CAPI. The use of these portable device brings an advantage to the data collection process since it strengthens data quality control at interview level and eliminates some stages of data collection, data capture and processing, thus allowing for minimization of the period before the report is released.

Two questionnaires, Form 1 and Form 2 will be used to collect information in this survey. Form 1 will cover demographic, education, health, labour force information and income etc at the individual level. It will also cover the infrequent and some frequent transactions of durable goods and services acquired and consumed at the household level and also the household income. The CAPI application in the tablet will be used to capture the Form 1 information at the

time of the interview. Form 2, the Daily Record Book will be completed by the household for a period of 7 consecutive days and will also be captured into the tablet using a separate application. It covers the information on daily transactions such as food, beverages (alcoholic and non-alcoholic) and tobacco. Households will be shown how to record daily transactions, however, where there are no literate persons in the households survey officials (specially Team Supervisor) will visit them on daily basis in order to help with recordings.

Data will be collected on the following subjects:

- Household and demographic characteristics, housing type, housing costs, access to services, cost of domestic workers, and main language spoken in households;
- Food adequacy & coping strategy
- Education and literacy
- Health and Assets
- Labour employment, work and wages/salaries
- Household agricultural production: crops and livestock
- Remittances in cash and in kind;
- Household income sources and debts
- Income by individual members of households
- Household expenditures on non-food commodities
- Early childhood development and ICT expenditures
- Transport and holiday expenditures
- Tax, finance charges and insurance premiums
- Savings and investment
- Anthropometric measurements for under-fives.
- Purchases, acquisition and consumption of food, beverages and tobacco

1.6 RELATIONSHIP WITH SUBORDINATES

A supervisor has junior staff working under him/her and supervise their work. The foundation of good relationship between a supervisor and his/her subordinates is the fairness and justice he exercise. No person wishes to be treated unfairly irrespective of whether he/she is a junior or senior. The supervisor therefore shall not only maintain a good relationship but also be firm

and fair in dealing with indiscipline cases. Similar cases of indiscipline by juniors staff should be treated similarly without fear or favour.

A good supervisor is one who listens to his/her subordinates without losing focus of his/her role to lead the team.

Junior staff are very observant and will at times commit offences just to see if any action would be taken against them. If one case is not handled and dealt with properly it can cause problems within the field staff and in turn affect the field work as well as the data quality.

Cases of indiscipline shall be reported to the head office without delays for procedural actions to be taken.

1.7 Field Procedures

The main field activities of the survey are household listing, sample selection and the interviewing of the selected households. Below are the composition of the field staff and other important information about the nature of the survey:

- The field staff consists of a Regional Supervisor, Information Technology Technicians (IT), Team Supervisors, and Interviewers. There will be one IT Technician for each two regions.
- A team consists of the Team Supervisor and two Interviewers.
- The Team Supervisor will be responsible for integrating the household listing, selection of the sample and assigning the selected households to Interviewers.
- The Interviewers will interview the selected households assigned to him/her by Team Supervisor.
- The survey period is about one year
- The interview period, covering each set of 6 households per interviewer, is fourteen days or survey round or just a round but depending on the availability of the respondent the interviewer may complete the whole questionnaire in a shorter period of time. In other words, if the respondent is ready to go through the interview in a shorter time the Interviewer should finish interviewing such a household. The Team Supervisor therefore, has to be aware of the decision taken by Interviewer with the household.
- The survey round starts on any day in the week and a calendar of survey rounds is provided as a guide on when to start. The survey period of roughly 11 months will be

divided into 22 surveyrounds. Each selected household in a selected PSU will participate in the survey for one survey round. The main purpose of the 14 day work period is for the household to record on a daily basis its economic transactions. Though the survey round period is 15 days the actual recording time of transactions in the DRB for each household is 7 days. A schedule of the recording time is also provided in the interviewer's manual

- Different sample PSUs (Primary Sample Units) and households will be covered for each round over the 11 months. Each PSU and sampled households will only participate once.
- Once the household listing for a PSU in a particular Survey Round is completed, the Team Supervisor will randomly select the 12 households for that PSU using a tablet.
- Each Interviewer will interview 6 of the selected households in a round.
- The head of the household or the primary respondent will record the daily transactions in the Daily Record Book (DRB), however, it is very important that more than one person (at least two) in the household are shown how to complete the DRB.
- The Team Supervisor will monitor or record all household transactions in the DRB and capture them in electronic form using the tablet.
- Each Team will only work in one region, during the 11 months period and moving only to the next sampled PSU every 15 days.

1.8 Survey calendar by survey rounds

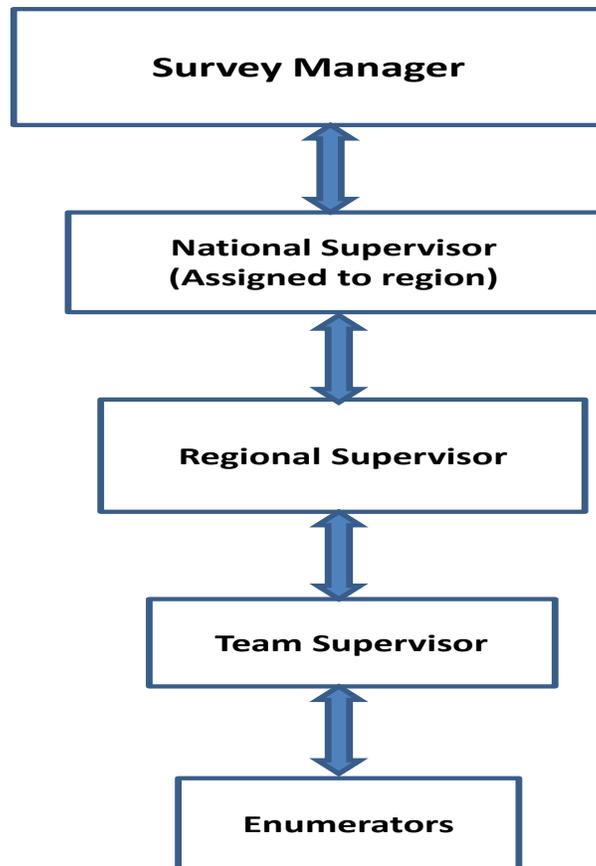
Survey round	Survey month	Survey round period														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SR1	April/May	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11
SR2		12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
SR3	May/June	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10
SR4		11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
SR5	June/July	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10
SR6		11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
SR7	July/Aug	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9
SR8		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
SR9	Aug/Sept	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8
SR10		9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
SR11	Sept/Oct	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8
SR12		9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
SR13	Oct/Nov	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7
SR14		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
SR15	Nov/Dec	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7
SR16		8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
SR17	Dec/Jan	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6
SR18		7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
SR19	Jan/Feb	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5
SR20		6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SR21	Feb/March	21	22	23	24	25	26	27	28	29	1	2	3	4	5	6
SR22		7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

2. Roles and responsibilities of the supervisor

The supervisor is the survey authority in the area allocated to him/her and whatever happens in his/her area is his/her responsibility to make sure that the survey runs smoothly. All supervisory staff have a very important role to play in ensuring the success of the NHIES 2015/2016. It is important for the supervisor to understand his/her role and responsibilities very well. There will be occasions when he/she may have to make decisions or take initiatives to solve a problem or to arrest a situation. Delayed decisions could be very costly for the survey. But supervisor should ensure that all such decisions are consistent with the objectives of NHIES 2015/2016. All decisions taken should be communicated to the next level of supervision without delay.

2.1 Structure of the supervisory authority

The objective of the supervisory structure is for each person involved in the survey to know how the information should flow from top to bottom of the structure and vice versa. Every staff is expected to follow the structure when reporting or transmitting information from his/her level to the next level of the structure.



2.2 Responsibilities before interviewing

2.2.1 Introduction

Supervisors will be required to understand the Interviewers' manual as a whole (this is a must). The manual explains all that pertains to how to collect accurate information, how to approach the respondents, confidentiality, neutrality in data collection, probing, how to handle unforeseen circumstances, etc. Above all the manual explains the meaning of all concepts and how to comprehensively complete the survey questionnaires. He/she will not be a good and efficient supervisor if is not totally conversant or being familiar with the Interviewers' manual, the Listing manual and any other instructions.

2.2.2 The role of the Regional Supervisor

The NSA regional statisticians will automatically be appointed as Regional Supervisors and will take charge of supervising the Team Supervisors and their respective teams. Therefore before the commencement of fieldwork, the Regional Supervisor (RS) will:

1. Receive all the survey materials and the equipment from head office as per the list by Administrative Division and other supporting units of NSA.
2. Pay courtesy call to the Governor and introduce the survey and the survey team. Hand over the publicity materials.
3. Pay courtesy call to the Regional Officer as well as to the local authority councillors and introduce the survey team as well as handing over the publicity materials.
4. Pay courtesy call to the King/Queen and their Traditional Authority, village headman and local leaders, brief them about the survey and request for their assistance as well as handing over the publicity materials.
5. Meet the Police Commanding Officers and, if applicable, the Agricultural Union officials and explain the survey objectives. Ask for their assistance and cooperation.
6. Make sure the publicity campaign is taking place in your region. If not, carry it out yourself and Team Supervisors before starting any fieldwork.
7. Draw up a fieldwork plan for the survey round. This could be updated as you proceed. Among his/her major activities are the: -listing, interviewing, spot-checking, detail checking and immediate solution to problems encountered in the field.
8. Inform the National Supervisor immediately when:
 - the materials are running low
 - there is a staff problem
 - the payments are not received as scheduled
 - any other problem, which he/she cannot solve
9. Make sure that the household listing is done correctly and that no household that should be listed is left out and that households outside selected PSUs are not included on the list.
10. Be responsible for the selection of households using a tablet. Make sure that the sample selection from the household listing is followed and done properly.
11. Make sure that all the survey personnel have all the required materials as listed in the

Interviewers' manual.

12. Make sure that attendance registers from all Team Supervisors are filed on weekly basis or at the end of each survey round.
13. Make contacts with regional commanding officer and other local authorities to ensure security for all survey officials.
14. Ensure that problems occurring in his/her region are immediately attended to or referred to the National Supervisor without delay.
15. Ensure that all selected households in his/her region are covered.
16. Handle objections and refusals from respondents by explaining the survey objectives; see how to handle objections in the Interviewers Manual. If they still refuse bring the matter to the attention of the CRO and the Governor of the region, also to the national supervisor and head office immediately..
17. Prepare progress reports per survey round and send it to the National Supervisor assigned to his/her region.
18. Ensure that transport control mechanisms are in place and adhered to as per the Transport Plan.
19. Any suspect of abuse or misuse of company property should be reported immediately to the National Supervisor assigned to his/her region. In case of accidents make sure that all procedures are followed as per the Transport Plan.

2.3 Responsibilities of the Regional Supervisor during listing and sampling

During the listing and sampling phase of the survey, the Regional Supervisor must:

1. Ensure that he/she receive the Sample PSU sheet (this sheet will provide information about all the selected PSUs of his/her region) from the sampling statistician after the training. It is his/her responsibility to get this sheet before he/she leave the training centre after the interviewer training.
2. Ensure that he/she receive the PSU maps for each quarter from the sampling statistician. It is his/her responsibility to get these maps on time before the survey work of each round starts.

3. Check the maps against the sample PSU sheet for the PSUs of each round well before the start of that round . Make sure the information on the map corresponds with the information on the Sample PSU sheet. If there is a discrepancy then inform the sample statistician/survey and field operations/GIS unit immediately.
4. In addition to the publicity carried out by the Strategic Communication officers, he/she shall make sure that he/she brief the relevant regional staff (Governor, Chief Executive Officer, Regional Planner(s) and Councillors) about the areas where the survey activities will take place during each particular round.
5. He/she must visit the PSUs of any survey round before the commencement of that round (probably two rounds before).

The purpose of this visit is to identify the PSUs where the population has gone down (less than 12 households) or where the growth has taken place (200 or more households). In the case of smaller numbers, PSU may have to be replaced depending on the number of households found. PSUs with a growth of 200 or more households need to be split into two or more PSUs. After the inspection he/she should report the findings to the National supervisor so that necessary action can be taken timely. In any such situations he/she should follow the guidelines given by the National Supervisor.
6. Hand over the PSU maps of any particular survey round in advance to the Team Supervisors. Guide the teams to the PSUs using the guiding map. Handover a copy of the sampled PSU sheet to the Team Supervisors.
7. Check the listing work (identification of the PSU boundary, segmentation and listing) of the teams while on the job and retrain the staff if necessary.
8. If the teams are faced with refusing households then take immediate action by informing the regional authorities (Governor, Chief Executive Officer, Regional Planner(s) and Councillors) and the National Supervisor.
9. Check whether sufficient reasons are given by the Team Supervisor when the listed households are 20% more or less than the 2011 Population and Housing Census figures.
10. It is also his/her responsibility to monitor and inform the National Supervisor with regard to natural disasters such as floods where the PSUs cannot be accessed for field work so that timely interventions could be put in place.

11. All survey materials are the property of NSA and unless stated otherwise, on completion of the field work the materials must be returned back to the head office.

2.4 The role of the Team Supervisor before field work

The role of the Team Supervisor before the commencement of the field work is to:

1. Ensure that each interviewer has adequate supply of survey materials as listed in the Interviewers' manual.
2. Make sure that field staff under his/her supervision signs the attendance register on a daily basis. Signed registers should be handed over to the Regional Supervisor on a weekly basis.
3. Clearly identify the boundaries of the sampled PSUs and carry out the listing operations according to the instructions. Ensure that no households in the selected PSU are excluded and none from adjacent PSUs are included.
4. Ensure that all selected households in the PSU are covered.
5. He/she will be provided with a notebook in which to record details of progress of work and problems encountered and how they were solved. The notebook is an accountable document

2.5 Responsibilities of the Team Supervisor during listing and sampling and interview phase

During the listing and sampling phase, the Team Supervisor shall:

1. Be in charge of the listing operation and the sampling process.
2. Once he/she is in the PSU, he/she should check whether the responsible persons and the general public in the area know about the survey. If not it is his/her responsibility to inform the local area leaders about the survey before starting the listing work.
3. It is his/her responsibility to identify the boundary of the PSU correctly as per the given guidelines. But he/she should also work with the two interviewers in this identification.
4. Divide the PSU into segments as per the given guidelines in the listing manual. Allocate the segments to the two interviewers for the listing process.

5. Monitor the work of the two Interviewers as they proceed with the listing in each segment. Make sure the Interviewers visit all structures irrespective of their status and appearance to check about the presence of households.
6. Make sure the interviewers check about the private households within institutions by visiting and talking to a responsible officer in the institution.
7. Do a thorough check independently of at least one segment in a PSU of each interviewer in each survey round. Record the results and compare with the actual listing done by the interviewer. If there are lapses highlight such to the interviewers so that they can improve. Keep a record of these findings so that monitoring can be done over time.
8. Since the listing is done using tablets he/she need to be very well acquainted with the operation of the tablets so that immediate problems could be solved within the team. If such problems occur and he/she cannot solve it he/she need to inform the Regional Supervisor and also the IT technician responsible for his/her area immediately so that a solution can be arrived without delay.
9. Once he/she is satisfied that the interviewers have finished the listing in their segments, should follow the given instructions in the listing and sampling manual to merge the two files. It is his/her responsibility to merge the two files in their tablets to form a single data set (list of households) in his/her tablet as per the given guidelines.
10. It is also his/her responsibility to check that all households listed are within the PSU boundary using the applications in the tablet. If some households are out of the boundary then they need to be checked on the ground by the interviewers and corrective measures taken as instructed.
11. It is also his/her responsibility to compare the total number of listed households in the merged data set in his/her tablet with the 2011 Population and Housing Census figures. If the difference is more than 20% he/she need to find out the reasons and indicate them in the application.
12. Once these final checks are over and he/she has the list of households of the PSU in his/her tablet for the selection of the 12 sample households, it is his/her responsibility now to select the 12 sample households following the instructions given.
13. It is also his/her responsibility then to allocate the six sampled households to each interviewer.
14. In case of any type of refusals, he/she shall make sure that all diplomacy and use of local leadership is followed. Inform also the Regional Supervisor immediately about such cases.

During the interview, the Team Supervisor shall:

15. Ensure that household revisits are carried out in the case of incomplete and/or inconsistent information in the questionnaire.
16. Check on his/her interviewers from the very first day of interviewing to ensure that all questionnaires are completed correctly and any mistakes noted with the interviewer should be corrected immediately. Make note of weak interviewers, who will need close supervision and re-training.
17. Observe at least one interview for each interviewer per survey round make note and correct errors that the interviewer might have committed. Do not argue in front of the respondent as this will have a negative effect. This notes and observations should form part of the round report forwarded to the Regional Supervisor.
18. He/she shall keep track of pending interviews and make necessary arrangements to finish them off before proceeding to a different PSU.
19. He/she must prepare survey round reports to be forwarded to the Regional Supervisor.
20. Ensure that selected households record all food, beverage and tobacco expenditure, on the DRB (Daily Record Book) on daily basis including gifts and goods from nature.
21. Always carry extra survey materials with him/her in case some interviewers run out of supply.
22. Misuse or suspected of misusing of any company property should be immediately reported to the Regional Supervisor.
23. In case of any type of refusals, he/she shall make sure that all diplomacy and use of local leadership are followed. Inform also the Regional Supervisor immediately about such cases.

2.6 Introducing and administering the Daily Record Book

The DRB is part of the survey instrument that was designed for the collection of food, beverages and tobacco items acquired by the households.

The administration of the DRB is the responsibility of the Team Supervisor who will provide printed copies of the DRB to selected households, explain the purpose and get the information on transactions filled in by the households on daily basis for 7 consecutive days.

The Team Supervisor will transfer the recorded information from the DRB booklet to the tablet.

The Team Supervisor will enter appropriate COICOP codes of items recorded on the booklets

for cross reference purposes

2.7 Other responsibilities of the Team Supervisors

Besides the specified responsibilities above, the Team Supervisor will also be responsible for keeping the team's vehicle, its maintainance, safety and good running conditions.

Team Supervisors will be transporting interviewers to and from the PSUs by making sure that each interviewer starts his/her work on time and that he/she is dropped off close as possible to the household for interviewing.

Team Supervisors will also be responsible for the safety of the team members during working hours in particular the female members.

The Project Team may issue instructions from time to time depending on the need and such instructions will form part of additional responsibilities of supervisors and survey staff.

3.0 NHIES Data Transfer

This Chapter describes how data captured on tablets in the field for the NHIES will be stored and transferred to the NSA headquarter.

3.1 Goals of the Data Transfer System

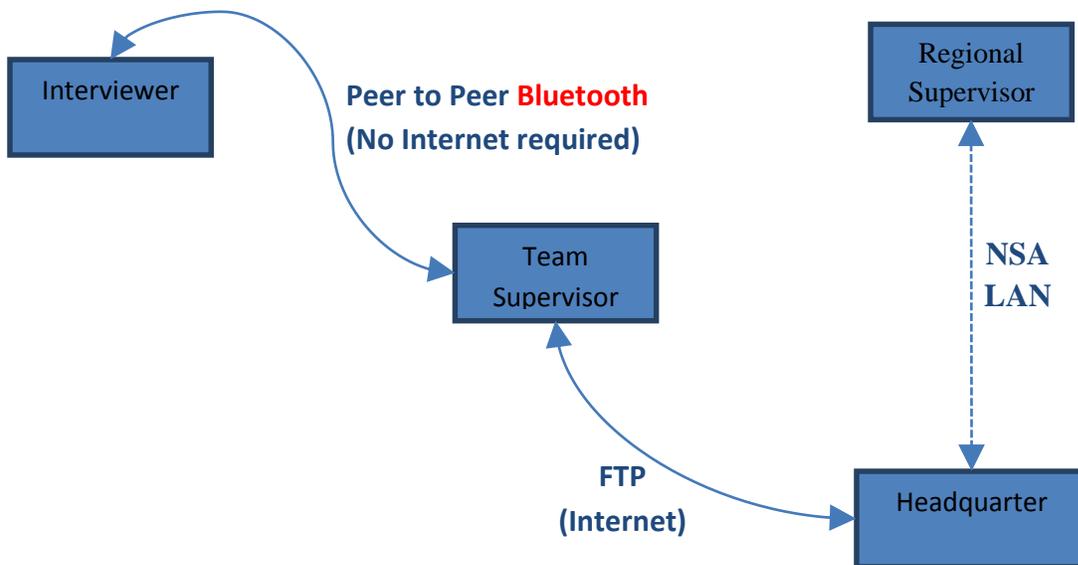
The goals of the data transfer system is three fold, namely:

- **Automated:** to reduce the risk of mistakes, data transfer should require minimal intervention on the part of field staff. They should push a button to run a data transfer without having to specify which server to send to or which files to send.
- **Controlled:** in order to avoid duplicated/miscoded data, interviewers and Team Supervisors should only be allowed to send data to the server for PSUs/households that have been assigned to them.
- **Tolerant of poor Internet:** the system should be flexible enough to permit staff to continue to collect data in the absence of an Internet connection and allow data transfer when an Internet connection is available.

3.2 Data Flow

Data will be transferred in two directions:

- PSU assignments and other control files will be sent from headquarter to Team Supervisors and interviewers in the field.
- Collected data will be sent from interviewers and Team Supervisors in the field to headquarter.



Both interviewers and Team Supervisors will have tablets, however only Team Supervisors will have access to the Internet. Team Supervisors will send and receive files to/from a server at headquarter using FTP. Interviewers will send/receive data to/from Team Supervisors using a local peer to peer **Bluetooth connection** that does not require Internet access. This way data will be indirectly transferred between headquarter and the interviewers via the Team Supervisor.

Note that Regional Supervisors are **NOT** included in the data flow, neither the National Supervisors. Regional Supervisors will have access to the data by accessing it through the headquarter server rather than receiving it first and forwarding it to the headquarter. This gives them the ability to run reports and do any review and analysis they need to, but avoids complicating the data flow by adding a potential failure point.

Team Supervisors will transfer data to/from headquarter daily and upon completion of a PSU.

Interviewers will transfer data to/from Team Supervisors on a daily basis.

3.3 Files Stored on Tablets

Team Supervisors and interviewers will have the following directory structure on their tablets. These files will all be created and maintained by the data entry program itself.

```

Backup
  <staff code>
    <date&time>
      <complete copy of data folder for staff member>
      MD LastSync.dat (information about the last interviewer that synced
  
```

with a supervisor)

Daily Record Book

Daily Record Book.pen

Data

CW<staff code>.dat (current work file for the staff member)

AH<Region&Constituency&PSU>.dat (household assignments)

AH<Region&Constituency&PSU>.dat (listing assignments)

L<Region&Constituency&PSU>.dat (supervisor listing)

L<Region&Constituency&PSU&Segment>.dat (interviewer listing)

D<Region&Constituency&PSU&Segment&DU&HH>.dat (daily record book)

D<Region&Constituency&PSU&Segment&DU&HH>C.dat (DRB - COICOP)

E<Region&Constituency&PSU&Segment&DU&HH>.dat (household enterprises)

H<Region&Constituency&PSU&Segment&DU&HH>.dat (household)

I<Region&Constituency&PSU&Segment&DU&HH&LN>.dat (individual)

R<Region&Constituency&PSU&Segment&DU&HH>.dat (roster)

MD_whoami.dat (staff code of the last login)

MD_LastMenuAction.dat (last household worked on by an interviewer)

MD_LastStaff.dat (last two interviewers that a supervisor worked with)

MD_UseBluetooth.dat (use Bluetooth, not Wi-Fi, sync)

Household

Household.pen

Individual

Individual.pen

Listing

Listing.pen

Menu

Menu.pen

Reference

Geography

<kml files, one per PSU>

COICOP.dat (COICOP codes)

NHIES_PSU.dat (PSU sample file)

NHIES_Staff.dat (staff file)

Roster

Roster.pen

Temp

<temporary storage for custom maps opened in Google Earth>

3.4 FTP Server

Data transferred between headquarter and the Team Supervisor will be sent via FTP to/from an FTP server located at NSA headquarter.

The FTP server will support secure FTP, specifically FTP over secure socket layer (SSL). This will encrypt the data transmission. (Note that this requires that NSA purchase an SSL certificate to place on the FTP server.)

The FTP server will need to be accessible both inside and outside of the NSA LAN.

To simplify configuration of the individual tablets, all the Team Supervisors will connect to the FTP server using the same account (same credentials). Note that the Team Supervisors will never manually enter the FTP login information, it will be coded into the data entry program and the data entry program will connect to the server automatically.

The file layout on the server will be as follows:

```
Data
  <Region&Constituency&PSU>
    <staff code>
      <date&time>
        <all data files associated with the PSU>
  Crash Reports
    <CSEntry crash reports>
  Problem Reports
    <problems logged by supervisors & interviewers via tablet interface>
  Recovery
    <staff code>
      CW<staff code>.dat (current work file for the staff member)

Programs
  Daily Record Book.pen
  Household.pen
  Listing.pen
  Roster.pen
  Individual.pen
  Menu.pen

Reference
  Geography
    <kml files, one per PSU>
  COICOP.dat (COICOP codes)
  NHIES_PSU.dat (PSU sample file)
  NHIES_Staff.dat (staff file)
```

The FTP account used by the supervisor will require read access to the entire directory tree as well as permissions to write to and create subdirectories in the data directory and its subdirectories. The Programs and Reference directories should be read-only.

All data on the FTP server should be backed up nightly to minimize the risk of data loss.

Data should be copied on a regular basis from the FTP server to another server/shared folder on the headquarter LAN. This other copy of the data should be the ONLY way that the Regional Supervisors and others at headquarter who wish to run reports and do analysis should access the data. This will avoid someone inadvertently modifying or deleting a data file or locking a data file when a Team Supervisor is trying to update it. Access to data on the FTP server itself should be limited to a small number of staff in charge of maintaining the site, as changes to the files and file structure could cause problems with the field operation.

Software will be developed to automatically copy the data from the FTP server to this other location. This software will also concatenate the individual household data files together to make analysis easier. It may also generate automated reports and email them to selected staff members.

3.5 Team Supervisor to FTP Server Transfer

Data transfer between the Team Supervisors and headquarter will be done over secure FTP. The process will be fully automated; i.e. the Team Supervisors will ensure that their tablet is connected to the Internet, choose “Connect to NSA Headquarters” from the data entry program on their tablet, and the program will transfer all required files. Once complete, the program will inform the Team Supervisor whether or not the file transfer was successful.

When the Team Supervisors chooses to synchronize with headquarter, the following files will be copied from the FTP server to the Team supervisor’s tablet:

- Data entry program files
- Reference files

The following files will be transferred from the Team Supervisors tablet to the FTP server:

- All data files for completed PSUs that have not already been sent to headquarters
- Latest work file for the supervisor.

3.6 Interviewer to Team Supervisor Transfer

Transfers between Team Supervisors and interviewers will be done over a local peer to peer **Bluetooth connection** that does not require an Internet connection. Once connected, the two tablets will exchange files using the HTTP protocol. The contents of all transfers will be verified

by CSEntry by comparing the fingerprint (the MD5 hash) of the file received with that of the original. This will prevent any corruption of data during the transfer.

The Team Supervisor to interviewer connection will be done automatically by the data entry program with minimal intervention on the part of the interviewer and Team Supervisor. The interviewer will simply select “Connect to Supervisor” from the data entry program on his/her tablet and then the Team Supervisor will select “Connect to an Interviewer” from the data entry program on his/her tablet. The data entry program will automatically connect, **via Bluetooth**, and transfer the required files, notifying both the interviewer and the Team Supervisor when the data transfer is complete and if there were any errors.

When the Team Supervisor and interviewer choose to synchronize, the following files will be copied from the Team Supervisor’s tablet to the interviewer’s tablet:

- Data entry program files
- Reference files
- Interviewer PSU listing assignments
- Interviewer household assignments
- Backup copy of supervisor’s data.

The following files will be transferred from the interviewer’s tablet to the Team Supervisor’s tablet:

- Household interview assignment files with updated status for completed households
- Listing assignment files with updated status for completed PSUs
- Household interview assignment files with updated status for completed households
- All household data files for households assigned to the interviewer that have not already been sent to supervisor (household, individual, roster, daily record book, etc.)
- Listing data files not already sent to supervisor
- Backup copy of interviewer’s data.

3.7 Interviewer and Team Supervisor Backup

Whenever the interviewers and Team Supervisors synchronize, a complete backup copy of the data from each tablet is sent to the other tablet. This will allow the system to restore either an interviewer’s or Team Supervisor’s data from another tablet in the case of loss, damage or theft. The data entry program will have options to automatically restore a backup from either the FTP server or another tablet.