2010 CENSUS OF POPULATION AND HOUSING

POST ENUMERATION SURVEY (PES)

Published by

Central Statistical Office
Nationalist Road
P.O. Box 31908
Lusaka

Tel: +260 211 251377

www.zamstats.gov.zm
email: info@zamstats.gov.zm

June, 2013

Page Table of Contents

Preface

A census undertaking is massive and complex, therefore errors are inevitable. Notwithstanding the above, census figures are very valuable when the quality and limitations of the data are presented to the users. It is against this background that it is important to provide users of census data with the magnitude and direction of coverage and content errors for assessment of quality of the data. In addition, this serves as the basis for improvements needed for future censuses including large-scale household inter-censal sample surveys.

The Central Statistical Office, therefore, conducted a Post Enumeration Survey to evaluate, the 2010 Census of Population and Housing. This was the third Post Enumeration Survey to be conducted in Zambia.

I express my gratitude to the Government of the Republic of Zambia for funding the Post Enumeration Survey. My sincere thanks go to donor agencies that provided resources and technical assistance, namely; the African Development Bank, the United States Agency for International Development, United States Census Bureau, Department for International Development (DFID) and the United Nations Population Fund (UNFPA).

My thanks go to the field interviewers, matching clerks and their supervisors who bore the blunt of the survey by collecting the data and the latter for meticulously matching the census and post enumeration survey records. I express my gratitude to the respondents who accepted to be re-interviewed in the post enumeration survey. Thanks also go to those who contributed directly and indirectly to the success of the survey, but not mentioned above.

The report presents, in detail, the procedures and findings which will be useful to users of the 2010 Census results. The results indicate a high coverage of the 2010 Census of Population and Housing. This gives additional confidence in the use of the census data.

John Kalumbi
Director of Census and Statistics

12th July, 2013

Acknowledgements

The Post Enumeration Survey (**PES**) was implemented through the diligent efforts of many people from different organizations.

Central Statistical Office

The Central Statistical Office conducted the Post Enumeration Survey and was mainly responsible for its development and implementation aspects. Various groups contributed to the PES. The PES technical team was instrumental in conceiving the modalities of conducting the survey. Members of the team trained field interviewers, supervisors and matching clerks. Field data collection was done by the interviewers and supervisors under the oversight of PES technical team and coordinated by CSO provincial offices. Matching was carried out, under the oversight of the members of the technical team, by matching clerks and reviewers. The CSO Cartography unit provided maps and guidance in map reading during training of field staff and field work. The Printing section printed the manuals and survey materials.

African Development Bank

The African Development Bank provided technical assistance, through its Consultant, Dr. Jeremiah Banda, in all aspects of the Post Enumeration Survey, including, training of the PES technical team covering all aspects of PES methodology; planning; sample design; development of manuals and training guides, procedural specifications, matching, field reconciliation, analysis and report writing. In addition, the consultant facilitated effective and productive collaboration with experts from the United States Census Bureau who provided various useful short term technical assistance sessions in supporting the 2010 Post Enumeration Survey activities.

US Census Bureau

The United States Census Bureau provided short term technical assistance sessions in many aspects of the 2010 Post Enumeration Survey; including matching; technical training on SAS and how to use SAS in data editing and analysis; procedural guidelines on field reconciliation; and characteristic imputation and analysis, dual system and variance estimation. The funding was provided by the United States Agency for International Development (USAID).

United Nations Population Fund (UNFPA)

United Nations Population Fundprovided funds for most of the PES activities namely; training of members of the PES technical team, PES field work, matching exercise and data analysis.

Department for International Development (DFID)

Provided funds for data cleaning and analysis workshop.

Executive Summary

The Zambian 2010 Census of Population and Housing was carried out from 16th October to 21 November 2010. The Post Enumeration Survey (PES) was undertaken in February 2011.

In general, the objectives of the PES were to provide an indication of coverage and content errors to assess the quality of the census. In addition, it was a basis for exploring areas that needed improvements in future censuses and inter-censal large-scale household sample surveys.

A one stage-cluster stratified sample design was implemented. A sample of 300 clusters, subsequently called Enumeration Areas (EAs) was selected. All households in the selected EAs were included in the sample. This was necessary in order to facilitate the comparison of PES results to those of the census. A 1.1 percent sample of EAs was therefore selected. The sample size was determined taking into account the expected total cost and reliability for subgroups of the population.

A standard PES questionnaire was used in collecting data of households from selected EAs. The sample, however, did not include institutionalized population, like those in hospitals, prisons, boarding schools and hotels. After field enumeration, the matching exercise was carried out by applying procedure C to the de jure population. This procedure involved reconstructing the population as it existed at the time of the census. In line with the methodology, persons whose enumeration status was not ascertained after initial matching, had their enumeration status verified in the field during reconciliation.

The results of the PES indicate that 92.7 percent of the Zambian residents in the country on the census night were captured in the 2010 Census. This represents a net undercount of 7.3 percent. The 2010 Census missed more people in the rural areas than in the urban areas. The under-coverage rate was estimated at 9.5 in the rural and 3.8 percent in the urban area.

Using the Rate of agreement, analysis of results pertaining to content error indicate that information on the type of housing unit (69.8percent) was the least reliably reported between the Enumeration Sample (E-Sample) and the Population Sample (P-Sample). As expected, the most reliably reported information pertained to sex (97.0 percent) followed by relationship to the head of the household (83.6 percent) and age (83.6 percent).

The results are plausible and in line with the main objective of the 2010 PES. These results are not meant to adjust the census results but to ascertain the quality and possible limitations of the census. This is not recommended, in this case becauseit may distort some demographic distributions. Therefore, adjusting the census results can breed some errors because of the relatively small PES samples in some strata. What is recommended is to quote census figures as obtained in the census and then indicate levels of coverage and content errors (UN Economic and Social Council, 1999).

Chapter 1: Background

1.1 Introduction

Since independence in 1964, Zambia has conducted five modern Population and Housing Censuses, in 1969, 1980, 1990, 2000, and 2010. The carrying out of Post Enumeration Surveys, however, has been ad hoc. The first complete and comprehensive Post Enumeration Survey (PES) was conducted in December 1990 to evaluate the results of the 1990 Census. While data was collected for the 2000 Post Enumeration Survey, the results were not fully analyzed. Following the 2010 Census, concerted efforts were made to conduct a comprehensive PES whose results were analyzed and are presented in this report.

The evaluation of error in a census is very necessary in order to respond to questions about the accuracy of the results from users. It cannot be overemphasized that there is an increasing demand for quality census data, in Zambia, such that it was felt necessary to evaluate census results in order to enhance confidence in the use of the data. While there are many methods for evaluating census data with respect to coverage and content, the most ideal, under the Zambian circumstances, was a PES. Demographic evaluation techniques may seem attractive and cost effective; nonetheless, they are not very feasible, under the Zambian circumstances, to be exclusively used in evaluating detailed subgroup coverage error, for example. There is lack of detailed and historical demographic data in the country. For example, the country does not have a comprehensive vital registration system which could have been a good source of historical information on vital events to facilitate the use of sophisticated demographic evaluation techniques. However, this does not preclude the use of basic demographic analytical results to complement the PES evaluation.

In the PES, a probability selected sample of a target population was independently re-interviewed. The results from a PES were matched with census records thereby enabling analysts to obtain separate estimates of coverage and content errors for selected variables. The two-way matching and field reconciliation visits allowed the identification of omissions and erroneous inclusions and estimation of population totals from the sample.

In addition, the PES afforded a chance to identify procedural and conceptual improvements required for future censuses and large scale inter-censal household surveys.

1.2 Objectives

The specific objectives of the PES were to evaluate census results with respect to coverage and response quality of selected variables. In addition, the process helped to evaluate the quality of census enumeration areas which were used as area elements of frames during census enumeration and will be used in drawing samples for the inter-censal household surveys. In general, the objectivesof the 2010 PES were to present census data to users with indications of the quality of coverage and levels of agreement of selected items, between the E-sample and the P-Sample. In this context, it provided an independent check on census coverage and response consistency on selected characteristics. Specifically, the survey objectives included:

- *Estimation of the extent of under-coverage or over-coverage of the population at national, provincial and rural and urban domains.*
- *Establishment of levels of agreement for responses related to sex, age, and relationship to household heads, marital status, age and type of housing unit.*
- *Identifying improvements needed with respect to future censuses and inter-censal household surveys.*
- *In addition, the PES results will:*
- *Help in evaluating the quality of enumeration areas and as units in the sampling frames for inter-censal household surveys.*
- *Allow for an assessment of the effectiveness of the census design, implementation, procedures that would be necessary to improve the planning and implementation of future censuses.*

1.3 Organization and Planning of the PES

A PES technical team of 10 persons was constituted in September 2010. The team was responsible for developing of the survey instruments; enumerator's and supervisor's manuals, matching and reconciliation guidelines. Some members of the team developed the budget and selected the sample. The team was led by a Coordinator who was responsible for the overall logistical management of the activities. A Deputy Coordinator was specifically responsible for overseeing the technical aspects of the evaluation.

As there are many activities associated with the PES, it is preferable and advisable that the planning begins early. This allows for sufficient time to develop and test materials before conducting a PES. The materials in question include the questionnaire; field manuals; matching guidelines; reconciliation guidelines; tabulation and analytical plans including control forms. This ideal situation was not the case for the 2010 PES. Although successfully conducted, the planning was done just a few months before going into the field.

In general, the PES which is expected to independently produce better results than the census can only be successful with the availability of qualified staff, assigned to different tasks, and adequate financial and material resources. In a well-executed PES, there is bound to be a better control of non-sampling errors compared to the census because of the engagement of more qualified enumerators, supervisors and matching clerks. Efforts were therefore made to adequately train the PES team. The intensive training workshop of the PES technical team took almost 10 days. The training was conducted by an expert on post enumeration surveys who was sponsored by the African Development Bank. In turn, members of the technical team trained master trainers and supervised the training of enumerators and supervisors. Concerted efforts were made to recruit qualified and experienced enumerators and supervisors.

The validity of P-Sample estimates is based on the assumption of "independence" between P-Sample and the E-sample. It was therefore necessary to separate the two activities to the extent possible. However, owing to the limited number of qualified staff and other resource constraints, it was not possible to achieve the theoretical independence. What was feasible and adhered to was the pragmatic approach of maintaining operational independence between the census and the survey. This meant assigning the technical responsibility of the PES to a team independent to that which was responsible for planning the census. A summary outlined below shows how operational independence between the P-Sample and E-sample was achieved;

- ***All census questionnaires were returned to CSO headquarters before the PES data collection.***
- ***In cases where some of the interviewers and supervisors involved in the census enumeration were used in the PES, they were assigned to areas other than those in which they worked during the census.***
- ***PES field staff did not have any knowledge about the EAs that were included in the sample, before their deployment.***
- ***All persons involved in the PES did not have any knowledge of the census preliminary results.***
- ***Matching clerks worked separately from those engaged on manual editing of census questionnaires.***
- ***PES data editing and processing was kept separate from census data editing and processing.***

Chapter 2: Methodology

2.1 Sampling frame

The sampling frame consisted of all Enumeration Areas (EAs) delineated for the 2010 Census of Population and Housing. EAs are clusters of households.

The sampling frame excluded all EAs that were identified to be blank. Blank EAs were those with no households. The total number of EAs in the frame was 25, 207.

2.2 PES Sample Design

A Single-Stage Stratified Cluster sample design was adopted for the PES. All households in the selected EAs were included in the sample. The survey involved a re-enumeration of households and persons in a representative national sample of enumeration areas (EAs) and a two-way matching between E-sample and P-Sample questionnaires of the selected sample areas. The population covered, excluded persons living in institutions and collective dwellings such as schools, prisons and hotels.

2.3 Stratification

In order to improve efficiency of the sample design, the population of EAs was stratified into seemingly homogenous groups. The strata were formed in line with some geographic areas which were assumed to be correlated to coverage error. The strata invariably matched with administrative domains, thus provinces. Rural and urban sub-stratification was done within provinces. Mention should be made that at the time of conducting the PES, in February 2011, there were only nine provinces. However, an additional province was created after the survey. The original nine provincial strata were maintained in order to ensure statistical reliability of the strata estimates in the nine provinces.

2.4 Sample size

The guiding principle was to aim at equal precision for provinces, rural and urban domains. The determination of sample size was based on previous experience. The sample size was supposed to be 1 percent of the total number of clusters. However, after considering the fact that the PES was to be conducted during a period when some rural areas would be flooded and not be accessible by road, it was felt necessary to increase the sample size. The sample size was therefore increased to 1.1 percent of the total number of EAs.

2.5 Sample allocation

Sample allocation to the provinces was done using the square root method of optimal allocation. This method was a compromise between proportional and equal allocation. It accommodated strata/domains that may have, otherwise, been allocated small samples due to their size. The formula below was used in allocating sample EAs to geographical domains.

$$\alpha\sqrt{[(Wh)2 + H-2]}$$

Where,

α = factor

W_h=Relative weight of the i^{th}domain, where i=1, 2,…, 9

H = the total number of domains (provinces)

Table 2.1: PES Sample Allocation to the Nine (9) Provinces

Province	H/holds	Population	Number of selected EAs
Central	243,363	1,267,803	31
Copperbelt	384,035	1,958,623	39
Eastern	341,443	1,707,718	36
Luapula	204,749	958,962	28
Lusaka	456,957	2,198,996	42
Northern	369,415	1,759,588	36
North Western	140,000	706,370	26
Southern	304,606	1,606,793	35
Western	191,022	881,524	27
TOTAL	**2,635,590**	**13,046,377**	**300**

2.6 Sample selection

In order to make the sample selection more efficient, EAs were selected with THE probability proportional to size (PPS) within each stratum. Number of persons was used as the Measure of Size (MoS) for each EA. The EAs were geographically ordered within each stratum. This ensured a systematic selection which resulted into implicit stratification. Systematic sampling procedure was adopted because, in general, it is efficient in terms of simplicity of selection. All households in selected EAs were included in the sample to facilitate the two-way matching of Census and PES questionnaires.

2.7 Sample Selection Procedures

- *For each stratum (province and rural/urban), a list of EAs ordered by identification numbers was developed. EAs were numberedand geographically ordered. The list included, for each EA, the total population and the cumulated measure of size (by adding the population down the list). This frame for each stratum was maintained on a computer file, using excel.*

- *For each stratum, a sampling interval (I_h) was determined by dividing the total population (final cumulated measure of size), by the number of sample EAs allocated to the stratum, n_h.*

- *A random number between 1 and I_h was then selected. This was the random start (R_h) for the systematic PPS selection of EAs.*

- *When determining the selected EAs from the selection numbers, the calculations were as follows:*

$$S_{hi} = R_h + [I_h * (i-1)]$$

- $i = 1,2,---,n_h$, *where rounded up to the next integer. The i^{th} sample EA in the stratum h is the one with the cumulated measure of size closest to S_{hi} without exceeding it.*

Table 2.2: Sample Allocation Enumeration Areas to Strata

Province	Classification	Stratum	Population	Allocation for Province	Allocation to Strata
Central	Rural	1	959,937	31	23
	Urban	2	307,866		8
	Total		1,267,803		
Copperbelt	Rural	3	390,638	39	8
	Urban	4	1,567,985		31
	Total		1,958,623		
Eastern	Rural	5	1,520,833	36	32
	Urban	6	186,885		4
	Total		1,707,718		
Luapula	Rural	7	779,639	28	23
	Urban	8	179,323		5
	Total		958,962		
Lusaka	Rural	9	330,141	42	6
	Urban	10	1,868,855		36
	Total		2,198,996		
Northern	Rural	11	1,433,117	36	29
	Urban	12	326,471		7
	Total		1,759,588		
North-Western	Rural	13	570,565	26	21
	Urban	14	135,805		5
	Total		706,370		
Southern	Rural	15	1,215,145	35	26
	Urban	16	391,648		9
	Total		1,606,793		
Western	Rural	17	778,154	27	24
	Urban	18	103,370		3
	Total		881,524	300	

2.8 Sampling weights

Weighting of sample survey results is needed to achieve unbiased or nearly unbiased estimates of population parameters. Weights compensate for unequal selection probabilities. In order for the P-Sample estimates to be representative at national or any domain level, it was necessary to weight the sample data with appropriate expansion factors. The base weight for each sample EA was equal to the reciprocal/ inverse of its probability of selection.

Under the one-stage sample design which was used for the P-Sample, all households in the selected EA were to be enumerated. The weight was therefore calculated as;

$$p_{hi} = (n_h * N_{hi}) / N_h \quad \text{(Probability of selection)}$$

Where N_{hi} is the total population in the frame for the i^{th} sampled EA of stratum h. The weight for the corresponding EA (***Whi***) is the inverse of

$$W_{hi} = N_h / (n_{h*} N_h)$$

The weights thus varied with the size of the EA. The cartographic operation was designed to demarcate EAs of approximately equal number of households within urban and rural strata, but in reality there was variability in the sizes of EAs.

Three EAs from three provinces (Luapula, Northern and Southern) were not covered in the PES and during field revisit. Therefore, there was need to adjust for non-response for the three affected strata. The adjustment weight was calculated as follows:

Wk= nh/ Ih

Where;

Wk =adjustment weight for stratum h
nh = total number of selected clusters in stratum h
Ih = number of selected clustered covered
Therefore, the final weight, ***W***, for each cluster is expressed as follows;
W = Wh x Wk

2.9 Types of Samples

2.9.1 The P sample and E sample

i) P-Sample:

The Population sample, which is commonly called the P-sample, comprises the PES enumeration areas (EAs) drawn from the same target population covered in the census, but selected independently from the census.

The purpose of the P sample is to generate data that is used in estimating ***omissions*** when compared to the census records.

ii) E-sample

The E sample is alternatively called the enumeration sample which is drawn from cases already enumerated in the census, but selected for independent re-enumeration.

The purpose of the E sample is to generate results used in estimating ***erroneous inclusions*** when compared to original census records. The estimate of erroneous inclusions provides a correction factor required in the ***dual-system estimate*** of the true population.

2.9.2 Overlapping sample

It should be noted that even though the P and E samples may be separate, in practice they may overlap completely in order to reduce costs and to some extent improve the precision of the estimates. This was the case for the Zambian 2010 PES. Thus, a two-way match was carried out from one sample in capturing both ***omissions*** and the ***erroneous inclusions***. The ***matched population*** component needed in the dual-system procedure was also obtained during the two-way matching exercise (details about matching are presented in subsequent chapters).

Chapter 3: Data Collection

3.1Questionnaire design

The questionnaire for the PES was developed taking into account the 2010 Census questionnaire. The questionnaire captured all the relevant information pertaining to procedure C (which is discussed in later paragraphs). This made it possible to classify each listed person in the household as a ***non-mover, out-mover, and in–mover or out of scope*** with regard to household status as of the census day. The PES enumeration status, therefore, included:

i. Non-movers
ii. Out-movers
iii. In-movers
iv. Born after census

- ***Non-movers:*** *these were persons who were members of the household during the time of the census and were still members at the time of the PES.*

- ***In-movers:*** *these were persons who joined the household after the census.*

- ***Out-movers:*** *these were persons who left (including the dead) the household after the census.*

- ***Out of scope:*** *Persons who did not belong to the target population. Examples:*
  - *Children born after the census*
  - *People who died before the census*
  - *Visitorsand non -residents*

Matching was not attempted for out-of-scope cases.

3.2 Questionnaire content

The PES questionnaire collected basic socio–demographic characteristics, namely, age, sex, relationship to head of household and marital status. Enumerators were trained to probe, in order, to determine correctly the enumeration status of each individual in the household.

3.3 Comparability

Comparability between the PES and Census was a must, therefore, the same response categories and pre-coding system, concepts, definitions, and classifications were maintained in the PES. Shaded spaces were included in the PES questionnaire for the purpose of transcribing answers from the corresponding census questionnaire during the matching operation.

The questionnaire had a section for individuals enumerated in the census but not in the PES. These recorded cases were followed later during field reconciliation. After the field reconciliation visits were completed, the following categories were established:

i. Correctly enumerated

ii. Erroneously enumerated (duplications, fabrications, out-of-scope cases, and geographically misallocated cases).

3.4 Staff involved in PES

Preferably, the PES staff should be drawn from an independent pool to the extent possible and they should be experienced, qualified in the art of survey data collection. Where such staffs are not available or are in insufficient numbers as was the case of Zambia, itwas necessary to draw some of the PES staff from those who participated in the census. However, such people were assigned, for data collection and supervision, to different EAs other than those they worked in during the Census. In general, the PES field staff were qualified and experienced in household survey data collection.

3.5 Training of field staff

Training of field staff started with the training of Master Trainers (22nd-26th January 2011), followed by Supervisors' and Enumerators' training (27th January-1st February 2011). Training materials covered definitions, concepts and PES field procedures.

Field staff composition, countrywide, was as follows: 19 Master Trainers, 100 Supervisors and 300 Enumerators. In addition, at least 2 Mappers in each province assisted with boundary identification of enumeration areas. Regional Statisticians in the provinces coordinated PES activities.

3.6 Field Work

Most teams had been deployed and started their field work by 7th February, 2011. The personal interview method was adopted whereby enumerators re-interviewed householdheads or reference persons.

In some cases, unclear boundariespresented major difficulties in identifying some work areas. Efforts were made, during enumeration, to clearly identify the areas with the assistance of the field Mappers. In addition, there were maps with no landmarks or reference points, this made area identification difficult even with the help of the mappers.

Chapter 4: Matching

4.1 Introduction

After the process of re-enumeration of the selected Enumeration Areas (EAs), a comparison of the two sets of results was undertaken. It involved comparing addresses, names and demographic characteristics between the E-sample and P-Sample records. It was an office operation, whereby households, housing units, and persons enumerated in the E-sample and P-Sample were compared for similarities.

Matching entails pairing each household and each person enumerated in the P-sample with a corresponding E-sample record. The matching exercise was done manually. It should have been advantageous, in terms of speed if computer matching was adopted. A two-way matching was used to identify omissions and erroneous enumerations.As earlier stated, Procedure C was used; therefore, cases that were matched pertained to non-movers and out-moversonly.

4.2 Matching Exercise

Matching started on 18 April 2011 and was completed on 6th September 2011.The matching team comprised of Matching Clerks, Supervisors and professional Reviewers. The training of these groups was hands on. The Matching Clerks were oriented to the matching procedure by members of the PES technical team (Reviewers). This involved matching an E-sample EA to a corresponding selected P-Sample EA. Thereafter, each Matching Clerk matched anE-samplerecord to a corresponding P-Sample record as a way of testing their understanding and competence with regards to the matching process.

A Matching manual prepared by the technical team was used. Experts from the United States Census Bureau, among other recommendations, proposed the use of real case examples which each Matching Clerk was asked to work through so as to have a common understanding of the matching procedures.

4.2.1Matching Process

The steps in matching the results of the P-Sample with the E-sampleincluded:

Identifying the EA (or EAs) to be searched; searching for the household(s) within the identified EA (or EAs); sorting of census questionnaires into households; pairing of the PES questionnaires with the corresponding census questionnaires and matching of individual characteristics for listed individuals in the PES with individuals listed in the Census.

a) Identification of EAs to be searched

The P-sample was passed on to the Census team for them to retrieve the corresponding E-sampleEA questionnaires in readiness for the matching exercise. This was done prior to commencement of the matching exercise. The census questionnaire boxes were isolated and kept side by side with the corresponding PES questionnaire boxes at the government stores warehouse. Retrieval of census questionnaires for PES matching was supervised by the team leaderwho was a custodian of census questionnaires at the warehouse.

b) Sorting of questionnaires

Census questionnaires were split into two before scanning. After scanning, the questionnaires were not put back in the box as pairs. Therefore, it took some time to sort out census questionnaires into households i.e. finding the corresponding half (pair) of each questionnaire. This took almost three hours for one person to sort out one box. For some PES questionnaires the corresponding census questionnaires were not found, most likely were misplaced. This, to some extent, posed a challenge to the matching exercise.

c) Pairing of Questionnaires

This involved finding a corresponding PES questionnaire for each census questionnaire. The pairing process resulted in two situations; paired households and households not paired. Households not paired were grouped in two; PES questionnaires not having corresponding census questionnaires and census questionnaires not having corresponding PES questionnaires. A search in adjacent EAs was conducted for all PES questionnaires that did not have corresponding census questionnaires. Census information from census questionnaires that did not have corresponding PES questionnaires were transcribed onto the PES questionnaires (Field Re-visit section). These questionnaires with transcribed census information were taken back to the field to confirm whether these were correctly enumerated or were erroneous inclusions.

d) Matching of Individual Characteristics

The process involved matching of selected questionnaire information on PES questionnaire with census information, particularly, type of housing unit and personal characteristics of household members. Only paired questionnaires were subjected to the matching process. Matching of personal characteristics was done in two stages. The first stage applied stringent

rules i.e. all characteristics were matched exactly with somerelaxations on age and minor spellings on names. The second stage applied relaxed rules. Contradictions on some characteristics were allowed except for sex. All cases (either the whole household or individuals) with doubtful match status were subjected to field revisits for verification.

4.3 Matching phases

There were two matching phases during the initial matching:

i) During the first phase strict rules were used resulting in obvious matches and possible matches.

ii) During the second and final phase the following was adopted:

Possible matches were reviewed, usually involving some subjective rules to determine matches.

In general, the objective was to minimize the difference between the number of erroneous matches and erroneous non-matches, thus, net matching error.

The matching exercise came up with the classification of P-Sample enumerated persons and E-sample enumerated persons within the sample EAs in specific groups that allowed the calculation of coverage error and the determination of variables for which content error was calculated for matched cases.

Categories resulting from final phase of matching:

i) E-sample enumerated persons

Matched non-movers and out-movers: Residents as of census date matched with corresponding PES records. As earlier stated responses were transcribed onto the PES questionnaire in the reserved space.

Correctly enumerated persons: These are cases which were found in the E-sample records but not in the P-Sample during the matching operation. These were cases which during the field reconciliation visits were discovered that they were enumerated during the census.

Erroneously enumerated: Cases which were found in the E-sample but not in the P-Sample. These were determined from the findings of the field reconciliation visits.

ii) P-Sampleenumerated persons

Matched non-movers: These were current residents who were matched with their corresponding E-sample records.

Matched out-movers: Residents who left the household or were dead during the period between the census and the PES and were captured in both the E-sample and the P-Sample.

Non-matched Non-movers: These arecensus day residents who were excluded from the census. They are also referred to as 'Census Omissions' that could not be matched.

In-movers: Persons who arrived into the household during the period between the Census and PES. For in-movers, matching is not necessary under procedure C.

Born after the census: These are persons who were born into the household during the period between the census and the PES. These were out of scope.

It is important to note that when a particular household was not found, the search was extended to the adjacent EAs. This is because it was possible that, owing to boundary identification errors, a household may have been included in a wrong EA during the census or PES. After the initial match, field reconciliation was undertaken.

Chapter 5: Reconciliation and Final Matching

5.1 Introduction

Reconciliationentailed field follow-up visits to P-sample EAs after the initial matching phase. This helped to verify cases with insufficient information for matching. The exercise facilitated the determination of the final match status of possible matches identified in the initial matching exercise. Specifically, field reconciliation had the following purpose:

i. To resolve the final match status for possible matches.
ii. To determine whether households and persons enumerated in the E-samplebut not in the P-Sample were correctly or erroneously enumerated in the census.
iii. To clarify doubtful cases orcases withinsufficient or vague information in order to assign a final match status.
iv. To investigate EAs where boundary or enumeration quality problems were suspected.

5.1 Field reconciliation

Field revisits were done in order to reconcile problems that could not be solved in the office during the initial matching exercise. As earlier stated, matching was a process that involved comparing the responses of the E-sample with those of the P-sample. Of the 300 Enumeration Areas in the P-sample, 297 EAs were re-visited.

A Reconciliation manual was developed by the Technical team. Training was conducted from 1st to 2nd September, 2011 for the Lusaka based staff. The provincial training sessions took place on different dates between 5th and 8th September, 2011 and lasted for two days, on average.

The Field Revisit team comprised Trainers, Supervisors and Enumerators. Each province had a Trainer from the Central Statistical Office headquarters. Most of the team members were those who took part in the initial matching. This proved to be advantageous because these people were already familiar with the objectives, concepts and procedures applied in matching.

5.2 Final matching

Final matching guidelines were developed and the final matching team was given a hands-on training by the PES technical committee members. The team comprised Reviewers who were confirming the match status during the initial matching. The final matching began on 26th September, 2011 through to 13th October, 2011

Chapter 6: Data Processing

6.1 Data entry

Data entry took place during a period of two months from the first week of August to the last week of September 2011. The data entry team comprised of ten (10) Data Entry Operators and three supervisors. The data entry application program was designed in CSPro.

The PES questionnaire had three sections and so was the data entry application, namely;

i. P – Section for PES persons
ii. O – Section for Out-movers
iii. R – Section for Field Revisit

PES data entry was conducted in two phases. Cases that were resolved after the first visit were entered during the first phase. Cases that were resolved after the final visit were entered during the second phase.

The identification (ID) particulars of any household consisted of codes of PROV(1 digit), DIST(3 digits), CONST(3 digits), WARD(2 digits), REG(1 digit), CSA(2 digits), SEA(1 digit), SBN(3 digits), SHUN (3 digits) and SHHN(1 digit). These codes formed the ID that uniquely identified each household. Data entry for the two phases was done separately due to some differences in the data dictionaries brought about by some change made after phase one of data entry. This introduced some discrepancies after reformatting and consolidation of the two datasets (one from each phase), because duplicates were created due to households that were both in PES and Field Revisit. This problem, however, was eventually resolved.

During phase two of data entry, some questionnaires received did not have SBNs, SHUNs and SHHNs because information was transcribed from the census questionnaire. In such cases, serial numbers were assigned per EA for SBN, SHUN and SHHN. This was done because the data entry screen did not allow blank fields for SBN, SHUN and SHHN. Due to such 'blind' assignment of numbers, some field revisits households duplicated with some households from the initial visits. Duplicate household problems were resolved by changing the SBN, SHUN or SHHN using numbers that were not used before.

Data entry application was designed according to the questionnaire design which had no direct link between persons recorded in P, O and R sections. However, using persons' information such as relationship to household head, sex, age and marital status recorded in P, O and/or R sections it was possible to match individuals within a household. Each member in a household was, therefore, uniquely identified by the Personal Identification Number (PID) number.

6.2 Data Editing

In the last week of October 2011, preparations for data cleaning commenced. In this regard, a two week workshop was held with technical assistance from two experts from the US Census Bureau.

The objective of the workshop was to train staff on how to use SAS to edit and analyze PES data. During the training, raw PES data was used. Using syntaxes that were developed, the following are some of the outputsof the workshop:

- Cleaning of IDs using the sampling frame. Due to field and data entry errors, IDs that were not on the sampling frame were excluded. The nature of statistical data cleaning and analysis ensured that only sampled EAs were edited and analyzed. For instance, the sample syntax written, highlighted how errors in the ID's: CONST, WARD, REG, CSA, and EA could be resolved with reference to the sampling frame.

- ii.Imputation of missing data on age, sex and relationship to household head was done based on other available data. Based on the available data, imputation was made to determine what the missing value could be. This was necessary when it came to determining the match status of a person on the P-section, O-section and R-section of the questionnaire. However, such imputations were not done when there was insufficient information. In such cases, the match status was deemed unresolved.

- iii.The Computer program was in four parts in order to facilitate editing of the sections, namely, PES front cover; PES persons; out movers; field revisits. Programs were developed to facilitate editing of these sections to come up with the final figures persons for each section.

There was a slack between the time of data entry and editing of about four months owing to lack of funds. This was an unfortunate challenge which delayed the analysis of the PES results accordingly. If all was as planned the PES results and report should have been disseminated at the latest by December 2011.

In March 2012, funds were sourced from UNFPA that were used to pay for data editors. Data editing was done using SPSS. The following tasks were executed during data cleaning:

a) Data was exported to SPSS from CSPro. Four SPSS datasets were created, one for each section. The datasets were RECORD1, SECTION2, SECTION3 and SECTION4. RECORD1 had information on PES sticker information; census enumeration status; household match status and interview status. SECTION2 (P-Section) had household information as recorded during the PES. SECTION3 (O-Section) had out-movers information. SECTION4 (R-Section) had information on Field Revisit (FR) households. After exporting data from CSPro to SPSS, each section's households were linked to their Identification codes.

b) IDs were edited with reference to the sampling frame. According to the dataset, 293 EAs were sampled from the sampling frame. An SPSS program named RECORD_F was made to edit the Record section i.e. the front cover. In this program, IDs were cleaned, blank cases deleted and duplicate cases resolved. In the Record section, each record was unique from SBN up to SHHN. Two other SPSS Programs were developed to edit occupancy status, census enumeration status, household match status and interview status. These were edited based on the information in the P, O and/or R section of the questionnaire.

c) SECTION2_P, SECTION3_O and SECTION4_R were the other programs designed to clean data on the P, O and R sections respectively. SECTION2_P program was designed to clean and fix section 2 IDs, household member information and other relevant information that linked this section to other sections. SECTION3_O program was designed to clean section3 IDs, household member information with respect to section P. Editing of section4 IDs, household member information, was done by SECTION4_R program. The syntax for editing IDs was generic, therefore, applicable to all sections with a few customisations made in each section.

Cleaning some household's Record section's enumeration status; household match status and interview status; was a challenge because their accurate determination largely depended on data collected in other sections with respect to household members match status. Some households had missing household match status or interview status or both. Another challenge was introduced by households whose members were possible matches and then such households went for field revisit and finally became matches. Thus, the household match status had to be changed accordingly.

After the editing was done, frequencies were run on the variables to ensure that only acceptable values were entered for each variable in the dataset. All out of range values found were resolved. Also found in sections 2, 3 and 4 were duplicate members mainly because of same PID number assigned to 2 or more members of the same household. These were resolved as well. This type of error was mostly data entry error.

Errors in the geo-codes were mostly made during field work, though a few were made during data entry. Other types of errors were introduced during data entry especially those directly connected to household members. However, such errors were minimal. The rest of the errors were basic human errors such as those originating from the field (e.g. illegibly written data on questionnaire); during transcribing, and during data entry.

Chapter 7: Coverage Evaluation

7.1 Estimation of 'true population'

The population obtained from the census and the PES is subject to coverage errors. To derivean estimate of the true population, the census-enumerated populationand the PES estimate of the total populationare used. The Dual System provides an estimateof the cases included in the PESbut excluded from the Census and vice versa. The Dual System Estimate is more complete thanthe census or the PES estimate. Table 7.1 illustrates the Dual System of Estimating the True Population.

Table 7.1 Dual System of Population Estimation

	In Census	Out of Census	
In PES	$\hat{N}_{11}$	$\hat{N}_{12}$	$\hat{N}_{1+}$
Out of PES	$\hat{N}_{21}$	$\hat{N}_{22}$	$\hat{N}_{2+}$
Total	$\hat{N}_{+1}$	$\hat{N}_{+2}$	$\hat{N}_{++}$

Where;

$\hat{N}_{11}$ Is an estimate of the number of people counted in both the census and the PES

$\hat{N}_{12}$ Is an estimate of the number of people counted only in the PES

$\hat{N}_{21}$ Is an estimate of the number of people counted only in the census

$\hat{N}_{22}$ Is an estimate of the number of people missed by both the census and the PES

$\hat{N}_{1+}$ Is an estimate of the total number of people counted in the PES

$\hat{N}_{+1}$ Is the total number of people counted correctly in the census (erroneous inclusions are factored out)

$\hat{N}_{++}$ Is the estimate of the total number of people

An estimate of the true population, Candrasekaran-Deming estimator, assuming independence, is expressed as follows:

$$\hat{N}_{++} = \left(\hat{N}_{+1}\right)\left(\hat{N}_{1+}\right) \Big/ \hat{N}_{11}$$

Where;

$\hat{N}_{++}$ is the estimate of the total number of people

$\hat{N}_{+1}$ is the total number of people counted correctly in the census (erroneous inclusions are factored out)

$\hat{N}_{1+}$ is an estimate of the total number of people counted in the PES

$\hat{N}_{11}$ is an estimate of the number of people counted in both the census and the PES

The Dual System Estimation is implemented in the PES to estimate the True Population of persons in households.

7.2 Correctly Enumerated Persons

In order to operationalise the Dual System Estimator, there is need to define the list of persons correctly enumeratedin the census. Correctly enumerated population has four aspects, namely, appropriateness, uniqueness, completeness and geographic correctness.

- Appropriateness: this means that the person should be included in the census. For example, if the census date was 16th October 2010, people who died before or were born after this date are not part of the population to be measured. in the same way, records of fictitious people are not part of the population.

- **Uniqueness:** refers to the need to measure the number of people included in the census and not necessarily in census records. If there are duplicate records, the count of records must be reduced for the purpose of the Dual System of Estimation.

- **Completeness:** means that the census record must be sufficient to identify a person. If records lack sufficient identification information, it will be difficult to ascertain whether such a person was appropriately and uniquely included in the census. It may also not be possible to determine whether the person was included in the PES. Lack of sufficient information on addresses poses a special challenge in many developing countries, including Zambia.

- **Geographic correctness:** People must be included in the census in the EAs they are supposed to be included. Enumerations outside the EA that are enumerated in the census are not considered correctly included in the census for Dual System Estimation purposes.

7.3 Proportion of People Captured in the Census

Having defined the set of correctly enumerated persons, the next step in the Dual System Estimation is to estimate census coverage. The formula is as follows:

Census coverage rate (match rate) = N_{11}/N_{1+}.

That is, the matched population relative to the PES population.

People who move between the census reference date and the time of the PES present a challenge for designing a Dual System Estimation for census application. For example, nomads, homeless persons and street kidsare more likely to be missed by the census and PES thereby, creating correlation bias.

It is advisable to apply the Dual System Estimation procedure within post-strata formed, for instance, by the sex-age groups. Small post-strata shouldbe avoided as they areprone to large sampling errors and bias.

It is helpful to identify all the elements that are essential in making Dual System Estimates. We hereby to facilitate the developments of compact standard formulae, symbols are assigned to various estimates. In this case:

o – Total number of non-movers (estimated from PES sample);

p – Estimated total number of out-movers (from PES sample);

q – Estimated total number of in-movers (from PES sample);

r Estimated total number of matched non-movers (based on matched case between census and PES sample);

s – The total number of matched out-movers (based on matched cases between census and PES sample);

t = The estimated total number of matched in-movers (from the PES sample);

n – Total number of erroneous inclusions in the population (based on reconciliation visits)

v – Total number of census cases correctly enumerated in the census but missed in the PES (based on reconciliation visits).

7.4 Matched population

Matched Population = Matched non-movers + estimated matched in-movers $\hat{N}_{11} =$

It should be noted that in-movers, under procedure C are not matched. Instead, the hypothesis of a closed population is cite where the out-movers and in-movers constitute the same population of the movers. It can be assumed therefore, that the match rate of in-movers would be the same as that of out-movers. This is symbolically estimated by (s/p). It, therefore, follows that the matched in-movers can be estimated by $(s/p)*q$.

7.5 Census Population Estimate

Census Population =

7.6 PES Estimate of Total Population

PES population = Total estimate of non-movers+ in-movers

PES population = o+q

7.7 Coverage rate

$$\text{Coverage rate} = \frac{Matchedpopulation}{PESpopulation} \times 100$$

7.8 True Population

$$\text{True Population} = \text{PES Population } \frac{(\text{Census population- Erroneous inclusions})}{\text{Matched population}}$$

7.9 Net Coverage Error

Net coverage error =True population – Census population

7.10 Net coverage rate (Under-coverage rate)

$$\text{Net error rate} = \frac{\text{True population – Census population*100}}{\text{True Population}}$$

This is an important measure for evaluating census coverage.

7.11 Census Coverage

Table 7.1 shows the estimates of population and undercount rates.The national undercount rate was 7.3 percent. The rural undercount rate was higher than that of urban at 9.5 and 3.8 percent, respectively.

By age group, the 0-17 years had the highest undercount rate at 9.0 percent while the 30-49 years had the least at 2.6 percent.

Lusaka Province had the lowest undercount rate estimate at 4.2 percent while Eastern Province had the highest at 8.7 percent.

Rura/Urban, Sex, Age Group and Province	Census Count	True Population	Undercount Rate (%)
Zambia	**13,256,260**	**14,302,975**	**7.3**
Rural	8,035,913	8,877,558	9.5
Urban	5,220,347	5,425,417	3.8
Sex			
Male	6,520,689	7,052,581	7.5
Female	6,735,571	7,250,394	7.1
Age Group			
Age 0-17	6,937,527	7,624,663	9.0
Age 18-29	2,904,159	3,145,083	7.7
Age 30-49	2,400,968	2,464,046	2.6
Age 50+	1,013,606	1,069,178	5.2
Provinces*			
Central	1,322,955	1,436,891	7.9
Copperbelt	1,998,574	2,128,023	6.1
Eastern	1,714,525	1,878,407	8.7
Luapula	1,002,354	1,092,716	8.7
Lusaka	2,225,912	2,323,599	4.2
Northern	1,733,387	1,891,533	8.4
North Western	735,592	801,203	8.2
Southern	1,609,188	1,750,339	8.1
Western	913,773	1,000,260	8.7
*Provincial estimates are synthetic			

Chapter 8: Content Error Evaluation

8.1 Introduction

Content errors are errors in recording characteristics of persons who are enumerated in boththe census and the PES. These errors may occurdue to flaws in data processing,interviewer bias, respondents' bias, vague questionnaires and misreporting. The response error commonly estimated in PES is variability and not bias. Three indicators used in the analysis of content errors are Rate of Agreement (RA), Net Difference Rate (NDR) andIndex of Inconsistency (I) for the selected variables. The selected variables were age, sex, relationship to household head, marital status and type of housing unit.

8.2 Rate of Agreement (RA)

Indicates accuracy in reporting. It shows levels of agreement on the same response between the census and the PES. A lower rate indicates less reliability in reporting of a particular response and a higher rate indicates more reliability in reporting.

The rate of agreement for selected items is given by;

$$R_A = \frac{M_j}{n} x100$$

Where:
Mij = number of matched cases in ijth category
n = total number of reported Cases

Table 8.1 Rate of Agreement by Characteristic, Province and Rural/Urban

Area	Characteristic				
	Type of Housing Unit	Sex	Relationship to Head of Household	Marital Status	Age
Zambia	69.8	97.0	83.6	82.7	83.6
Rural	62.5	97.6	82.3	81.2	82.3
Urban	77.6	96.4	85.1	84.4	85.1
Province					
Central	62.0	97.1	76.9	75.8	76.9
Copperbelt	83.1	97.2	84.3	83.5	84.3
Eastern	70.9	98.1	87.7	86.4	87.7
Luapula	66.5	96.6	81.4	80.4	81.4
Lusaka	80.0	96.3	85.0	84.2	85.0
Northern	62.6	97.9	81.7	80.9	81.7
North Western	56.9	97.1	80.4	79.6	80.4
Southern	64.5	96.3	86.4	85.4	86.4
Western	60.8	97.1	86.1	85.3	86.1

The most reliably reported variable was sex at 97.1 percent followed by relationship to household head and age at 83.6 percent each. The result for sex is consistent with other African countries (98.0 percent for Uganda in 2002).

The type of housing unit had the widest variationat 69. 8 percent. It was observed that the subjective determination, for example, between traditional and improved traditional housing type was problematic for enumerators, it varied considerably between the census and PES periods.

The rate of agreement for all characteristics was higher in urban than rural areas except for sex.

8.3 Net Difference Rate

The Net Difference Rate (NDR) is the difference between the number of cases in the census and the number of cases in the PES that fall under each response category relative to the total number of reported persons in both the census and PES in all response categories. We symbolically illustrate below the calculation of the i^{th} category (e.g. 15-19 age group)

$$\text{NDR} = \frac{x_{\bullet i} - x_{i\bullet}}{n} \times 100$$

For

Where

$X_{\bullet i}$ = unweighted census number of cases in the i^{th} category

$X_{j\bullet}$ = unweighted PES number of cases in the i^{th} category

n = unweighted total number of reported persons in both census and PES

s = Total number of response categories for characteristic Y

This is a measure of bias only when the re-interview is considered more accurate than the original response.

8.2.3 Index of Inconsistency (I) is computed using the following formula;

$$I = \frac{N_J + N_{\hat{p}} - 2M_j}{\frac{1}{n}(N1j(n - N2j) + N_{\hat{p}}(n - M_j)}$$

Where:

Mij = number of matched cases in ijth category

n = total number of reported cases

N1j = number of cases in the census for jth category

N2j = number of cases in the PES for jth category

The index of inconsistency is the ratio of the Simple Response Variance (SRV) to the total variance for a given characteristic where, total variance includes the variability in the population of the characteristic being measured (US Bureau of Census 1985). The index measures the extent of variation in the responses between the Census and PES.

Table 8.2 shows the Net Difference Rate and Index of Inconsistency by characteristics. Theresults show that almost all under-reporting and over-reporting occurred at less than a percentage point across the selected categories.

Table 8.2: Net Difference Rate and Index of Inconsistency by characteristic

Selected Characteristic	Net Difference Rate	Index of Inconsistency
Sex		
Male	0.1	3.2
Female	-0.1	3.2
Relationship		
Head of Households	0.1	4.1
Spouse	0.0*	4.6
Own son/daughter	0.1	8.4
Step son/Daughter	0.2	43.4
Parent	0.0	30.9
Brother/Sister	0.1	26.1
Other Relative	-0.5	16.3
Unrelated	0.0*	22.2
Marital Status		
Never Married	1.2	7.4
Married	-2.0	10.1
Divorced	-0.3	39.0
Separated	0.2	50.1
Widowed	-0.3	16.1
Cohabiting	1.2	70.8
Age Groups		
0-17	-0.2	6.3
18-29	0.2	13.5
30-49	0.1	12.0
50+	0.0*	10.2
*numbers rounding to zero but not zero		

Females were underreported while the males were overreported, each by 0.1 percent.All the categories under relationship to the household head were overreported except for 'other relative' which was under reported at 0.5 percent.

Under reporting or over reporting was not more than 2.1 percent under the marital status category.

The youngest and oldestage groups, 0-17 years and 50 years and older, respectively were under reported. The younger age group is usually missed during household roster listing in censuses and surveys.

Sex remains a stable variable as shown by the lowest inconsistency in reporting of 3.2 percent. Head of household and spouse also showed lower inconsistency in reporting (4.1 and 4.6 percent, respectively). These relationship categories are rarely mistaken and easily ascertained and therefore, consistently reported. Step son/daughter had the highest index of inconsistency among the relationship categories at 43.6. This may be attributed

to the cultural norm of reporting step children as biological children so as not to make them feel alienated.

Cohabiting was highly inconsistently reported at 70.8 percent. This may be so because it is common for persons who have been living together to think of themselves as married.

Table 8.3 provides guidelines for interpretation of different content error measures.

Table 8.3: Interpretation of content errors

Measure	Level		
	Low	Moderate	High
Absolute value of NDR	<0.01	0.01-0.05	>0.05
Index of Inconsistency	<20	20-50	>50

Chapter 9: Synthetic Estimation

9.1 Introduction

To facilitate proper interpretation of survey results, it is necessary to include the measurement of reliability of the estimates. Sampling errors and confidence intervals for estimates are presented in this chapter.

9.2 Post-stratification Variables

The post-stratification variables used were based on the following characteristics:Sex (Male, Female), Age (0-17 years, 18-29 years, 30-49 years and 50 years and older) and Region (Rural/ Urban).

9.3 Synthetic Estimation

All provincial estimates were calculated using synthetic estimation. Synthetic estimates are created by combining coverage measurement results with census counts to obtain population estimates for any desired geographic area. Synthetic estimation is a useful procedure for small area population estimates mainly because of its simplicity and potential to increase accuracy and reliability in estimation. The synthetic estimation model assumes a uniform correction factor within pro-strata.

The synthetic estimate for any given pro-stratum is the product of the census count of that pro-stratum and its coverage correction factor. Aggregating all the synthetic estimates of the pro-strata of any given geographic area forms the synthetic estimate of the population in that area.

9.4 Confidence Interval

For easy interpretation of some PES results, confidence intervals have been provided. The confidence interval is a statement which combines a point estimate with the precision of that estimate. It is given by the following formula:

$$\omega \pm 1.96\ SE(\omega)$$

Where ω is a statistic and $SE(\omega)$ is the computed standard error.

Table 9.1 shows the reliability of the Dual System Estimated Population for sex,rural/urban and provinces. The Dual System Estimated Population at national level was 14,302, 975 and its standard error was 166,564. There was a 95 percent chance that the true DSE was between 13,976,510 and 14, 629,440.

Table 9.1: Reliability of Dual System Estimated Population (DSE)

Area	Dual System Estimated Population	Standard Error (DSE)	Confidence Interval	
			Lower Limit	Upper Limit
Zambia	14,302,975	166,564	13,976,510	14,629,440
Rural	8,877,556	160,191	8,446,358	9,308,758
Urban	5,425,414	45,929	4,974,617	5,876,217
Male	7,052,577	87,761	6,582,181	7,522,981
Female	7,250,393	80,261	6,838,794	7,661,994
Provinces				
Central	1,436,891	20,761	1,396,199	1,477,583
Copperbelt	2,128,023	16,885	2,094,928	2,161,118
Eastern	1,878,407	30,293	1,819,033	1,937,781
Luapula	1,092,716	16,570	1,060,239	1,125,193
Lusaka	2,323,599	28,472	2,267,794	2,379,404
Northern	1,891,533	28,810	1,835,065	1,948,001
North-Western	801,203	11,850	777,977	824,429
Southern	1,750,339	25,436	1,700,484	1,800,194
Western	1,000,260	16,064	968,775	1,031,745

Table 9.2 shows the reliability of estimates for age groups. The Dual System Estimated Population for the 0-17 years was 7,624,663 and its standard error was 90,600. There was a 95 percent chance that the true DSE was between 7,447,088 and 7,802,238.The confidence intervals for the other age groups can be interpreted in the same way.

Table 9.2: Reliability of Estimates for Age Groups, Zambia				
Age Group	DSE	Standard Error	95% Confidence Interval	
			Lower Limit	Upper Limit
All	14,302,970	166,564	13,976,505	14,629,435
0-17	7,624,663	90,600	7,447,088	7,802,238
18-29	3,145,083	41,706	3,063,340	3,226,826
30-49	2,464,046	26,458	2,412,188	2,515,904
50+	1,069,178	16,985	1,035,888	1,102,468

Table 9.3 shows the reliability of the undercount rate. The national undercount rate was 7.3 percent and had a standard error of 1.1 percent. The 95 percent confidence interval was from 5.2 to 9.4 percent.

Table 9.3: Reliability of the Undercount Rateby Rural/Urban, Sex and Provinces, Zambia				
Area	Undercount Rate (%)	Standard Error (%)	Confidence Level (%)	
			Lower Limit	Upper Limit
Zambia	**7.3**	**1.1**	**5.2**	**9.4**
Rural	9.5	2.2	5.1	13.9
Urban	3.8	4.1	-4.2	11.8
Male	7.5	3.1	1.4	13.7
Female	7.1	2.7	1.8	12.4
Central	7.9	1.3	5.3	10.5
Copperbelt	6.1	0.7	4.6	7.5
Eastern	8.7	1.5	5.8	11.6
Luapula	8.3	1.4	5.5	11.0
Lusaka	4.2	1.2	1.9	6.5
Northern	8.4	1.4	5.6	11.1
North Western	8.2	1.4	5.5	10.9
Southern	8.1	1.3	5.4	10.7
Western	8.6	1.5	5.8	11.5

Urban areas had a larger standard error at 4.1 percent compared to 2.2 percent for rural areas, implying a wider confidence interval.

By province, the standard error ranged from 0.7 percent in Copperbelt to 1.5 percent in Eastern and Western Provinces.

Table 9.4: Reliability of the Undercount Rate(UR)for Age Groups, Zambia				
Age Group	Undercount Rate (%)	Standard Error	95% Confidence Interval	
			Lower Limit	Upper Limit
All	7.3	1.1	5.2	9.4
0-17	9.0	1.1	6.9	11.1
18-29	7.7	1.2	5.3	10.1
30-49	2.6	1.0	0.5	4.6
50+	5.2	1.5	2.2	8.1

The standard error for the undercount rate for age groupsranged from, 1.0 percent for the 30-49 years to 1.5 percent for the 50 years and older.

Chapter Ten: Conclusion And Recommendations

10.1 Conclusion

The Post Enumeration Survey was carried out after three months of the completion of the 2010 Census enumeration. This period was considered reasonable in that not major population changes were expected in the population. In addition, in a bid to comply with one aspect of independence, field work could not start when some 2010 Census materials were still in the field. It was, therefore, prudent to wait until all census materials were transported to the central place at the Government Stores in Lusaka. To the extent possible, the PES methodology was followed at every stage, namely, sample design, enumeration, matching, reconciliation and the application of the Dual System Estimation methodology. It is against this background that the PES results are reasonable. The under - coverage rates while varying between rural and urban areas, are within reasonable ranges.

The major lessons from this PES are that during the next post enumeration surveys, all the listed recommendations should be adhered to. In order to have a better PES, all methodological requirements should be followed to the letter.

10.2 Recommendations

In order to implement a superior PES in future there is need to adhere to the following recommendations.

10.2.1 Pilot PES

A pilot PES should be conducted immediately after a pilot census. This will help in testing all the phases of the PES including, questionnaire design, implementation, editing, matching, data processing and estimation procedures.

10.2.2 Sample Design and Data Collection

i. Maintain design which is simple but that yields reliable results for all the designated domains.

ii. The EAs should be verified in terms of extent and physical boundaries.

iii. The PES questionnaire should be tested during the pilot. It should have comparable items so as to facilitate the matching between the census and PES.

iv. Care should be taken in designing the questionnaire such that omissions, erroneous enumerations and correct enumerations are unambiguously ascertained.

10.2.3 Matching

i. A pilot Matching Exercise using questionnaires from the pilot census and pilot PES in order to test all aspects of PES which include matching, field reconciliation data processing and estimation.

ii. For future PESs', it would bedesirable to have maps for the selected EAs during the matching exercise.

iii. PES and the Census questionnaires should have the name of the main respondent.

iv. There is need to record alternate names in the Census and the PES questionnaires as this will greatly assist in matching persons.

v. Computer matching would speed up the whole matching process. A combination of computer and some aspects of manual matching is equally a possibility.

vi. Cell phone and telephone numbers of the respondents would help to clear unresolved cases without going back in the field.

Bibliography

Australian Bureau of Statistics (2007).Census of Population and Housing – Undercount, Canberra.

Bureau of Statistics. Post Enumeration Survey: 2006 Lesotho Population and Housing Census, Maseru, Lesotho

The Egyptian Cabinet (Information and Decision Support Center) (2008). Egypt Post-Enumeration Survey (PES), Coverage and Content,

Central Statistical Office (1990). Post Enumeration Survey, Lusaka, Zambia

Kish. L, (1965). Survey Sampling, John Wiley & Sons, New York

Daphin.D and Canamucio.A (1993). Design and Implementation of a Post-Enumeration Survey: Developing Country Example, International Statistical Program Center, U.S. Bureau of the Census

Statistics South Africa (2004). Post-Enumeration Survey, Results and Methodology

United Nations (2008).Principles and Recommendations Revision 2, Population and Housing Censuses

United Nations (2008). Designing Household Surveys: Practical Guidelines

United Nations, (2009). Technical report: Practical Guidelines to Implementation of Post Enumeration Surveys

U.S Census Bureau (1985).Evaluating Censuses of Population and Housing, Washington D.C.

U.S. Census Bureau (2000). Accuracy and Coverage Evaluation of Census 2000: Design and Methodology, Washington D.C

Whitford D. and Banda J.P. (2001). Post Enumeration Surveys (PESs): are they worth it?
-

Appendix A

Table A.1: P-Sample Estimates of the Population by Sex and Stratum			
Age/Stratum	Total	Sex	
		Male	Female
National			
0-17	6,804,044	3,335,806	3,468,238
18-29	2,845,762	1,346,488	1,499,274
30-49	2,412,993	1,237,689	1,175,304
50+	1,099,236	529,311	569,925
Lusaka Urban			
0-17	798,290	383,180	415,110
18-29	432,948	199,634	233,314
30-49	397,456	213,666	183,790
50+	105,268	52,382	52,886
Copperbelt Urban			
0-17	650,277	321,055	329,222
18-29	356,771	172,840	183,931
30-49	287,808	149,930	137,878
50+	132,179	71,741	60,438
Other Urban			
0-17	750,778	356,524	394,254
18-29	392,920	178,759	214,161
30-49	310,054	163,260	146,794
50+	111,925	54,484	57,441
Rural			
0-17	4,604,699	2,275,047	2,329,652
18-29	1,663,123	795,255	867,868
30-49	1,417,675	710,833	706,842
50+	749,864	350,704	399,160

Table A.2 : Dual System Estimates of the Population by Sex and Stratum			
Age/Stratum	Total	Sex	
		Male	Female
National			
0-17	7,624,666	3,779,431	3,845,235
18-29	3,145,084	1,497,361	1,647,723
30-49	2,464,047	1,269,861	1,194,186
50+	1,069,178	505,928	563,250
Lusaka Urban			
0-17	907,070	438,613	468,457
18-29	518,429	243,988	274,441
30-49	413,920	225,828	188,092
50+	108,546	53,469	55,077
Copperbelt Urban			
0-17	828,620	403,535	425,085
18-29	422,807	206,597	216,210
30-49	329,323	171,750	157,573
50+	125,033	63,594	61,439
Other Urban			
0-17	887,713	432,782	454,931
18-29	445,248	209,277	235,971
30-49	322,149	166,696	155,453
50+	116,559	55,304	61,255
Rural			
0-17	5,001,263	2,504,501	2,496,762
18-29	1,758,600	837,499	921,101
30-49	1,398,655	705,587	693,068
50+	719,040	333,561	385,479

Matching Guidelines

A. For Matching Clerks
P-Section Personal Characteristics

I. Use blue pencil/pen to transcribe names from census questionnaire on to shaded spaces of PES questionnaire.

II. Use blue pencil/pen to transcribe personal characteristics up to P5 for each transcribed name

III. Use blue pencil/pen to enter the moving status code in P7
a. 3a. P7 = 1 if P6 =1
b. 3b. P7 = 2 if P6 = 2 or 3
c. 3c. P7 = 8 if P6 = 4

IV. Use red pencil/pen to enter match status code in P8
4a. P8 = 1 if Names are the same with minor spelling mistakes, relationship, sex, and marital status are the same. See table below for allowed age ranges:

Allowed Age range	Age Limit
Within -1 to + 2	Under 20
Within -2 to + 3	20-40
Within -3 to + 4	Over 40

b. P8 = 2 if all the conditions in 4a. hold, but contradictions in any three conditions are allowed. See table below for allowed ranges for possible match status i.e. P8 = 2:

Allowed Age range	Age Limit
Within -2 to + 4	Under 20
Within -4 to + 6	20-40
Within -6 to + 8	Over 40

c. P8 = 3 if household member (s) is (are) found in PES but not in census.

d. P8 = 4 if household member(s) is (are) found in PES but no sufficient census information to assign a definite match status with certainty.

e. P8 = 8 if P7 = 2 or 8

O Section-Out movers
For Section O, apply the same conditions above (conditions for section P)

R-Section-Field Revisits

I. Transcribe to R-section only household members found in PES but not in census if P7 = 1.

II. Transcribe to R-section all household members found in census but not in PES.

III. All other possible matches must be reviewed before a decision is made.

B. For Supervisors

I. For sex determination, for persons 12 years and above, use P-38 on the Census questionnaire to help you decide. For example, if MulengaChola was recorded as male during the Census and female at PES, CHECK if MulengaChola was asked P-38 in the Census questionnaire. If MulengaChola was asked this question, then she must be FEMALE. However, you are not supposed to alter the Census or PES responses.

II. On marital status, it is possible to have a member married during Census but divorced during PES. Also, widowed during census but married at PES. Separated and divorced were also treated as the same response.

III. When there are two households at Census which are merged at PES i.e. the two households become one at PES. The relationship will vary because of the head but will still be a match. For example, at Census, in household 1, there was Job Kasengele and his spouse Janet N. Kasengele. In the 2nd household, there was Justine Kasengele (the son of Job Kasengele) with his spouse InongeLubinda and their daughter Gale Kasengele. The relationship will be as follows:

AT CENSUS			
Household 1	R/Ship	Household 2	R/Ship
Job Kasengele	1	Justine Kasengele	1
Janet N. Kasengele	2	InongeLubinda K.	2
		Gale Kasengele	3
AT PES			
Only one household (household1 plus household 2)			
	R/Ship		
Job Kasengele	1		
Janet N. Kasengele	2		
Justine Kasengele	3		
InongeLubinda K.	8		
Gale Kasengele	9		

In this case, you cannot record Justine, Inonge and Gale as possible matches (assuming all the other variables are within the set standard) because these are obvious matches.

C. Reviewers Notes

I. For relationship, a number of variations are accepted 7/9, 7/3, 3/4, 3/9, 3/11, 6/11, 12/6, 4/7, 7/11, 10/12. Other relationship may be paired with any of the relations from 3-11.

II. Relationship to the Head was not correctly asked in some cases and resulted in the opposite relationship being recorded. For example, children of the Head of the

Household, their relationship was captured as "parent". This relationship was also accepted 3/5.

III. If there is a sex discrepancy, check other sections of the questionnaire to help to determine the actual gender. For instance, if you suspect that the person recorded as male could be female, check the fertility section of the Census questionnaire. If it was answered, it would be determined with certainty that this person is actually female. Hence, if it was a possible match due to sex difference, this will become a match. In the absence of information that will help make that decision, such cases will be taken to the field.

IV. On marital status, it is possible to have a member married during Census but divorced during PES. Also, widowed during census but married at PES. Separated and divorced were also accepted. Never married may be paired with divorced, separated and widowed. The reason for this is attributed to marital status not having an equivalent word in the local language. Hence, if the enumerator does not probe, the actual relationship may not be recorded.

V. For households that reported that they were not enumerated (P-24 =3) or that they were enumerated i.e. question 24=1 but there is no Census record even after searching in the adjacent SEAs; these cases will go for data entry.

D. Instructions for Matching Clerks

I. Find the corresponding census questionnaire for the entire household in case of In-movers where possible.

II. Transcribe to R-section, a household that is a non-contact at PES but was captured at Census. Non-contacts at PES with corresponding Census questionnaire will be taken for field revisits i.e., the members at Census will be transcribed to R of the PES questionnaire.

III. Do not transcribe to R-section, a housing unit that was occupied at Census but is vacant at PES.

IV. Usual members absent and usual members present on the census questionnaire should be transcribed to R-section if they do not appear on the PES record. However, VISITORS who appear on the Census record but not the PES record should not be transcribed to R-section.

V. Ensure that Out-movers that need to be taken for Field revisits are transcribed to R-section as expected e.g. if a person is listed as an out-mover at PES but does not appear in the Census record. If the response in O-1 is 1, ensure that out-movers are matched; REMEMBER WE ARE MATCHING NON-MOVERS AND OUT-MOVERS ONLY!

VI. If the response in P-6 is 2 but the person was a usual resident at Census {usual member present OR usual member absent (P2)} P-7 will be 1 and P-8 may either be 1 or 2.

VII. Ensure that when you are transcribing from the Census questionnaire to the PES questionnaire and from the general characteristics section and the out-movers section to R-section, transcribe correctly and record in the designated spaces.

Guidelines for Field Reconciliation

REASON	QUESTION	RECORDING RESPONSE
a. Possible Match	Are these the same people?	**1. If the possible match is a match, you will:**
		a. keep the records on the listed together. Ask and fill in the answers for R6-R7,
		b. Write a note prefixed with the serial number to say these are the same people.
		2. If the possible match is not a match, the Interviewer will:
		a. cross through both names for the serial number,
		b. write the PES person's detail on the next available serial number and collect the information for that person,
		c. write the Census person's detail on the next available serial number and collect the information for that person.
		3. If the possible match was a non-interview, the Interviewer will:
		a. Follow the same procedures for non-interviews. (Write a note with the serial number stating this person is a non-interview).
b. In PES not in Census	Ask R6 and R7.	**In PES not in Census (partial Household non-match)**
		Ask and answer R6-R7
c. In Census not in PES	Ask R-2 through to R-7	Ask and answer R2-R7
		1. If you find the housing unit:
		a. Ask and answer R2-R7
		b. Write a household note ('HH:') for the geography of the housing unit using the map. The note should include ***items 1 – 7 on the cover sheet and village name*** for the area where the housing unit is located.
		2. If the Interviewer does not find the housing unit:
		a. Tell the supervisor. Supervisor will follow up. If the supervisor does not find it, write a household note ('HH:') that states they could not locate the housing unit
		b. Do not enter any answers in R section

2010 Census of Population and Housing Post Enumeration Survey Questionnaire

STRICTLY CONFIDENTIAL

CENTRAL STATISTICAL OFFICE
P.O. BOX 31908, LUSAKA
TEL: 211 251377 FAX: 211 253468

REPBULIC OF ZAMBIA

FORM NO. | | | | | | | |

NAME OF HOUSEHOLD HEAD_____

2010 CENSUS OF POPULATION AND HOUSING
POST ENUMERATION SURVEY

QUESTIONNAIRE IDENTIFICATION

1. PROVINCE …… ☐
2. DISTRICT…….. ☐☐☐
3. CONSTITUENCY…….. ☐☐☐
4. WARD…… ☐☐
5. REGION — 1. RURAL 2. URBAN ☐
6. CSA NUMBER ☐☐
7. SEA NUMBER ☐

PES STICKER INFORMATION

8. SURVEYBUILDING NUMBER (SBN) ☐☐☐
9. HOUSING UNIT NUMBER (HUN) ☐☐☐
10. HOUSEHOLD NUMBER (HHN) ☐
11. PES DATE: ……/……/…… (DD MM YY)

AREA IDENTIFICATION

12. VILLAGE/ LOCALITY

13. CHIEF'S AREA ☐☐☐
14. RESIDENTIAL ADDRESS/VILLAGE

CENSUS STICKER INFORMATION (if available)

15. CONSTITUENCY…….. ☐☐☐
16. WARD…… ☐☐
17. CENSUS BUILDING NUMBER (CBN) ☐☐☐
18. HOUSING UNIT NUMBER (HUN) ☐☐☐
19. HOUSEHOLD NUMBER (HHN) ☐

20. CENSUS DATE: ……/……/…… (DD MM YY)

OCCUPANCY STATUS

21. (**OBSERVE**) Is this housing unit occupied? — 1. YES – GO TO 24 2. NO ☐

22. (**OBSERVE**) What is the condition of this vacant unit? — 1. Habitable all year round 2. Habitable seasonally 3. Abandoned ☐

23. **(ASK NEIGHBOUR)** Was this housing unit occupied at the time of 2010 census? — 1. YES 2. NO 3. DON'T KNOW → **GO TO 27 AND END INTERVIEW** ☐

CENSUS ENUMERATION STATUS

24. Was this household enumerated during the 2010 Census? — 1. YES – In this housing unit – GO TO 27 2. YES – Elsewhere – GO TO 26 3. NO ☐

25. Why was this household not enumerated? — 1. Was not visited 2. Was away/ unavailable 3. Refused → GO TO 27 ☐

26. Where was this household enumerated from?

1. District:…….. ☐☐☐
2. Constituency:…… ☐☐☐
3. Locality (Residential Address)

……

……

TYPE OF HOUSING UNIT

27. **(OBSERVE)** What type of housing unit is this:

1. Traditional
2. Improved Traditional
3. Mixed
4. Conventional Flat
5. Conventional House
6. Mobile
7. Part of Commercial
8. Improvised/Makeshift
9. Collective/Institutional Quarters
10. Unintended
96. Other

☐☐

INTERVIEW STATUS

28a. Interview Status
1. Completed
2. Non-contact (Occupied)
3. Not Interviewed (Vacant)
4. Non-residential
5. Refusal
6. Other ☐

28b. Household Match Status (FOR OFFICIAL USE ONLY)
1. Match 1 to 1
2. Match 1 to 2 or more
3. Match 2 or more to 1
4. Non-match
8. Not Applicable ☐

ASSIGNMENT RECORD

ENUMERATOR'S NAME	DD MM YY ……/……/……
SUPERVISOR'S NAME	DD MM YY ……/……/……
OFFICE EDITOR	DD MM YY ……/……/……
MATCHING CLERK	DD MM YY ……/……/……
FIELD REVISIT (ENUMERATOR)	DD MM YY ……/……/……
DATA ENTRY OPERATOR	DD MM YY ……/……/……
DATA ENTRY VERIFIER	DD MM YY ……/……/……

SUMMARY COUNT

MALE		
FEMALE		
TOTAL		

INDICATE WHETHER OR NOT CONTINUATION SHEET WAS USED

1. CONTINUATION SHEET USED
2. CONTINUATION SHEET NOT USED

☐

FORM ☐☐ **OF** ☐☐

FOR ALL PERSONS - GENERAL CHARACTERISTICS								
SERIAL NUMBER	***P- 1: HOUSEHOLD MEMBERS*** *Please give me the names of all usual members of the household (including visitors who spent the night here) starting with the head of household. Be sure to include all babies, elderly persons and persons who may be away on vacation, holiday or business, or are in hospital.*	**P - 2: RELATIONSHIP** What is (name)'s relationship to the head of household? 01. Head of household 02. Spouse 03. Own Son/Daughter 04. Step Son/Daughter 05. Parent 06. Brother/Sister 07. Nephew/Niece 08. Son/Daughter in-Law 09. Grandchild 10. Parent in-Law 11 .Cousin 12. Other relative 13. Unrelated	**P - 3: SEX** Is (name) Male or Female? 1. Male 2. Female	**P - 4: AGE** How old was (name) at his/her last birthday? **ENTER AGE IN COMPLETE YEARS** **If less than 1 year enter "00"** **If aged 95 or older enter "95"**	**P - 5: MARITAL STATUS** **(ASK PERSONS 12 YEARS AND OLDER ONLY)** Is (name)? 1. Never Married 2. Married 3. Divorced 4. Separated 5. Widowed 6.Cohabiting	**P - 6: RESIDENCE ON CENSUS DAY** Was (name) a usual resident of this housing unit at Census time? 1. Yes 2. No- Because was a usual resident after census day 3. No- Born after the census day 4. No-visitor	**P - 7: MOVING STATUS** **(FOR OFFICIAL USE)** 1. Non Movers 2. In-Movers 8. Not Applicable	**P - 8: MATCH STATUS** **(FOR OFFICIAL USE)** 1. Match 2. Possible Match 3. Definite Non-match (In PES but not in Census) 4. Insufficient Information (In PES but not in Census)
_1								
_2								
_3								
_4								
_5								
_6								
_7								
_8								
_9								
_0								

FOR PERSONS WHO HAVE MOVED OR DIED

O - 1: OUT-MOVERS
Are there any persons who were usual members of the household at Census time who are no longer usual members of this household (including those who died after Census day)?

1. Yes – LIST THE NAME(S) OF ALL PERSONS WHO HAVE MOVED SINCE CENSUS DAY AS OUT-MOVERS ☐
2. No (END INTERVIEW)

SERIAL NUMBER	NAMES OF OUT-MOVERS	O - 2: RELATIONSHIP What is (name)'s relationship to the head of household? 01. Head of household 02. Spouse 03. Own Son/Daughter 04. Step Son/Daughter 05. Parent 06. Brother/Sister 07. Nephew/Niece 08. Son/Daughter in-Law 09. Grandchild 10. Parent in-Law 11. Cousin 12. Other relative 13. Unrelated	O - 3: SEX Is (name) Male or Female? 1. Male 2. Female	O - 4: AGE How old was (name) at his/her last birthday? **(if less than 1 year enter "00')** **If aged 95 or older enter "95"**	O - 5: MARITAL STATUS **(ASK PERSONS 12 YEARS AND OLDER ONLY)** Is (name) 1. Never Married 2. Married 3. Divorced 4. Separated 5. Widowed 6.Cohabiting	O - 6: MATCH STATUS (FOR OFFICIAL USE) 1. Match 2. Possible Match 3. Definite Non-match (In PES but not in Census) 4. Insufficient Information 5. Not applicable
_1		☐☐	☐	☐☐	☐	☐
_2		☐☐	☐	☐☐	☐	☐
_3		☐☐	☐	☐☐	☐	☐
_4		☐☐	☐	☐☐	☐	☐
_5		☐☐	☐	☐☐	☐	☐
_6		☐☐	☐	☐☐	☐	☐
_7		☐☐	☐	☐☐	☐	☐
_8		☐☐	☐	☐☐	☐	☐
_9		☐☐	☐	☐☐	☐	☐
_0		☐☐	☐	☐☐	☐	☐

FOR FIELD REVISIT

SERIAL NUMBER	R- 1: NAMES INDICATE NAMES OF USUAL MEMBERS OF THIS HOUSEHOLD WITH THE FOLLOWING CONDITIONS: 1. POSSIBLE MATCH 2. IN CENSUS NOT IN PES 3. IN PES NOT IN CENSUS (DEFINITE NON-MATCH) 4. INSUFFICENT OR UNCLEAR INFORMATION 5. UNKNOWN MOVING STATUS	R - 2: RELATIONSHIP What is (name)'s relationship to the head of household? 01. Head of household 02. Spouse 03. Own Son/Daughter 04. Step Son/Daughter 05. Parent 06. Brother/Sister 07. Nephew/Niece 08. Son/Daughter In-Law 09. Grandchild 10. Parent in-Law 11. Cousin 12. Other relative 13. Unrelated	R – 3: SEX Is (name) Male or Female? 1. Male 2. Female	R - 4: AGE How old was (name) at his/her last birthday? (if less than 1 year enter "00')	R - 5: MARITAL STATUS (ASK PERSONS 12 YEARS AND OLDER ONLY) Is (name) 1. Never Married 2. Married 3. Divorced 4. Separated 5. Widowed 6. Cohabiting	R - 6: MEMBERSHIP STATUS (PAST) Was (name) a usual resident of this housing unit at Census time? 1. Yes 2. No	R - 7: MEMBER-SHIP STATUS (PRESENT) Is (name) still usual member of this household? 1. Yes 2. No	R - 8: MATCH STATUS 1. Match 2. Possible Match 3. Definite Non-match (In PES but not in Census) 4. Insufficient Information 5. In Census but not in PES	R – 9: CENSUS ENUMERATION STATUS 1. Correct Enumeration 2. Erroneous Enumeration/ Fabrication 3. Erroneous Enumeration/ Duplication 8. Not Applicable
_1									
_2									
_3									
_4									
_5									
_6									
_7									
_8									
_9									
_0									

COMMENTS ON SPECIFIC QUESTIONS
(To be filled during enumeration)

COMMENTS ON SPECIFIC QUESTIONS

(To be filled during field revisits)