Citizen Satisfaction Survey

2015 KwaZulu-Natal Citizen Satisfaction Survey: Technical Report

Statistics South Africa

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Department:
Office Of The Premier
PROVINCE OF KWAZULU-NATAL

2015 KwaZulu-Natal Citizen Satisfaction Survey: Technical Report

Statistics South Africa

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Abbreviations and acronyms

ADSC	Assistant District Survey Coordinator
EA	Enumeration Area
EPSEM	Equal Probability Selection Method
CAPI	Computer Assisted Personal Interviewing
CSS	Citizen Satisfaction Survey
CV	Coefficient of Variation
DU	Dwelling Unit
IT	Information Technology
ISR	Inverse Sampling Rate
KZN	KwaZulu-Natal
MoA	Memorandum of Agreement
MOS	Measure of Size
PSU	Primary Sampling Unit
PPS	Probability Proportional to Size
QCC	Questionnaire Clearance Committee
se	Standard Error
Stats SA	Statistics South Africa

1. Survey Background

Statistics South Africa conducted the Citizen Satisfaction survey (CSS) on behest of the Premier of KwaZulu-Natal (KZN) during October and November 2015. The survey aimed to measure how residents evaluated the services provided by the provincial government, and to assess service delivery performance at provincial and municipal levels with a view to inform improved service delivery and to provide a platform to engage with residents of the province. The results of the survey will serve as an indicator of government's governance efficiency and as a high level indicator for Goal 6 (i.e. Governance) of the Provincial Growth and Development Plan (PGDP). Stats SA accepted the agreement to partner subject to the terms contained in the Memorandum of Agreement (MoA) and has undertaken to utilise its expertise and resources to deliver the CSS.

Particular deliverables were:

- Provincial and municipal level indicators of levels and perceptions of citizen satisfaction
- Provincial and municipal level indicators of levels and appropriateness of service delivery and governance
- Narrative report on survey results and level of citizen satisfaction to reflect on perceptions and opinions for service delivery improvement
- Analysis to provide for citizen service delivery perspectives aligned to the accountable sphere of government

2. The Sample

2.1 Target population and survey population

The target population for the KZN CSS 2015 was all persons aged 15 years and above who were residing in private households within the province of KwaZulu-Natal. People who were homeless or staying in institutions such as prisons, hospitals, military barracks, boarding schools, etc. during the survey period did not form part of the CSS 2015 target population. Very small Enumeration Areas (EAs) were excluded from the sampling frame. Their exclusion contributed to under-coverage which was adjusted for during the weighting process.

2.2 Description of the sample design

A stratified two stage sampling design was adopted. In the first stage, all the Census 2011 EAs (less exclusions) were treated as Primary Sampling Units (PSUs). From each sampled PSU, a systematic sample of dwelling units (DUs) was selected. The dwelling frame map reference number within an EA was used to arrange the DUs in sequence. All the eligible persons within the sampled DUs were enumerated for the KZN CSS 2015. This design ties well with the data collection strategy which in the ultimate end will lead to more reduced travel costs.

2.3 Sampling frame of primary sampling units

The data source used to construct the sampling frame was Census 2011 EAs frame with auxiliary information. The required information for CSS 2015 sampling design was: a list of all EAs within KZN, the number of targeted persons for calculating proportions in sample size determination, the geographic information for stratification and the number of households used as measure of size (MOS) in selection of the PSUs. There were 17 530 EAs in KZN. The EAs with no information, institutional EAs, and EAs considered very small were excluded from the frame. However, the excluded EAs with very small household counts were still considered part of the target population. Therefore, the final frame for CSS had 15 654 EAs.

2.4 Sample size and sample allocation in the local municipality

The sample size was determined through three scenarios. Scenario 1 looked at a proxy variable (50/50 Proportion) and fixed desired coefficient of variations (CVs) to determine the sample size. Using this approach, the larger municipalities were under represented in the sample. Scenario 2 looked at the 'access to piped water' variable from census 2011 and fixed desired CVs to determine the sample size. The findings were that, within the municipality, households were highly likely to be homogeneous with respects to their access to piped water. The concern with this approach was that the sample size achieved was too small to provide acceptable levels of precision for other parameters. Lastly, Scenario 3 looked at the unemployment variable and fixed desired CVs to determine the sample size. The outcome from this scenario was convincing in terms of the sample sizes achieved in the large municipalities and also with the realised overall sample size. However, the sample sizes in the small municipalities were slightly insufficient and therefore

were increased. Therefore, scenario 3 with CVs of 12% was recommended with minor improvements in the small municipalities.

Reliable CSS estimates are required at the municipality level. Therefore, different sampling rates were applied in each municipality since there was a large variation in their population sizes. Particularly; the Kwa-Sani, Impendle, Emadlangeni, The Big 5 False bay and other municipalities, were then sampled at a higher rate to produce estimates with the required levels of reliability. Thus, the square root allocation with minor adjustments was implemented to allocate the sample to the municipalities. Table 2.4. below shows the overall sample sizes at different levels of precision from the three scenarios.

Table 2.4.1: Comparison of sample sizes of three different variables and four desired CVs

		CV = 5%	CV = 7.5%	CV = 10%	CV = 12%
Scenarios	1. Assumed 50/50 Proportion	19 910	8 930	5 039	3 504
	2. Access to Piped Water	18 721	8 431	4 761	3 314
	3. Unemployed in the Target Population	119 627	56 329	32 404	22 711
Sample Size: (recommended from Scenario 3)					22 000

**** Note that the sample was adjusted to account for: the size of the population, the effect of the sample design and the non-response ****

2.5 Stratification and sample allocation to strata

Stratification improves the efficiency of the sample design. In the KZN CSS 2015, the 51 municipalities of KwaZulu-Natal were treated as super strata and stratification was carried out independently within the municipalities. Since there are likely to be substantial dissimilarities in population characteristics between different types of areas, the geographic area types as defined in Census 2011 (urban, traditional and farm areas) were used as the next level of stratification. The PSUs were divided into 139 strata; where 38 municipalities had 3 geographic area types, 12 municipalities had 2 geographic area types and 1 municipality is entirely traditional.

In case of allocation to strata, the sampling rates used at municipality level were then applied in the strata. This implies proportional allocation to strata in the municipality to ensure the same reliability at the municipality level.

2.6 Selection of primary sampling units

The PSUs were selected independently within each design stratum using the probability proportional to size (PPS) sampling method; where the measure of size used was the Census 2011 household count. The procedure followed in the selection of the PSUs with the Randomised PPS systematic sampling method is described as follows:

i. Define the measure of size within a PSU
ii. Calculate total measure of size for the stratum
iii. Randomise the list of PSUs within each strata by generating uniform random numbers between 0 and 1, and then sort the list of PSUs in ascending or descending order of these random numbers. Once the PSUs have been randomised, generate a permanent sequence numbers for the PSUs.
iv. Define the normalised measure of size for the PSU
v. Calculate the inverse sampling rates for the PSUs
vi. Calculate the ISRs for the PSUs, and generate a random integer between 1 and SI (stratum inverse sampling rate). Let the generated integer be r.
vii. Then, computed SI, r + SI, r + 2*SI,…, r +(n-1)*SI correspond to the selected PSUs.

The overall sample of 2 170 PSUs was selected.

2.7 Selection of dwelling units

A systematic sample of DUs was selected using the dwelling frame points, count of DUs at a point and the sampling parameters (inverse sampling rate and the starting point) calculated from the selected PSUs. The procedure followed in the selection of the DUs with the systematic sampling method is described as follows:

i. For every PSU, calculate a total count of DUs.
ii. For every point within a PSU, obtain count of DUs to create sequence of DUs from 1 to the total count of DUs at a point. Name the sequence, dwelling number (this refers to dwelling number at a point).

iii. For every PSU, create sequence of DUs from 1 to total count of DUs.

iv. Obtain PSU inverse sampling rate(I) and the random starting point (s)

v. Compute the sequence of sampling numbers s, s + I, s + 2*I, etc.

vi. Flag dwelling numbers corresponding to the calculated s, s + I, s + 2*I, etc.

vii. All flagged records were selected DUs for KZN CSS 2015.

The overall sample of 20819 DUs were selected from 2 146 PSUs. The remaining 24 sampled PSUs had no dwelling unit sample due to:

- Eighteen sampled PSUs with zero DUs count on the dwelling frame
- Six sampled PSUs with total DUs not sufficient to draw the sample because of extreme shrinkage in DUs as compared to Census 2011 totals

3. The Sample Weights

The sample weights, both the person level weight and the household integrated weight, were constructed in such a manner that the respondent persons could be properly expanded to represent the entire KwaZulu-Natal population of persons aged 15 years and above. The sample weights therefore are the result of calculations involving several factors, including the original selection probabilities, adjustments for modified sampling rates within primary sampling units (PSUs), excluded population from the sampling frame, non-response, weight trimming and benchmarking to known local municipality population estimates.

3.1 Base weight

3.1.1 Design weight

The design weight for each sample unit had been computed as part of the sample design process and is equal to the inverse of the probability of selection, which simply is the inverse of the sampling rate (ISR). The sampling rate had been assigned at the municipality level, i.e. all PSUs within a municipality had been sampled at the same rate. Thus, the design weight assigned to the each sample unit in a municipality is simply the ISR for the municipality.

The sampling rate was calculated as $f_j = {}^{n_j}/_{N_j}$ where $\mathrm{n_j}$ represents the sample size in terms of the number of households in the j^{th}municipality and N_j is the total number of households in the j^{th}municipality as at Census 2011. The sample design weight (W_j^D) under the two-stage design is then given by:

$$W_j^D = {}^{1}/_{f_j} \quad (1)$$

3.1.2 Primary sampling unit adjustment

The sampling rates within PSUs were modified during dwelling unit (DU) selection to account for the variations in the DU counts within the PSU between Census 2011 and the dwelling frame. Sub-sampling was done within growth PSUs to maintain the expected number of DUs within the PSUs, for reasons related to operational feasibility (fieldworker workload) and/or cost implications (remain within the budget).

The design weight were adjusted to account for these modifications in the sampling rates by a PSU adjustment factor that had been computed as part of the DU sample selection process. Let D_i^f be the DU count as on the dwelling frame for the i_{th} PSU and D_i^c the corresponding DU count as at Census 2011. The PSU adjustment factor (PSU_ADJ_i)is then given by:

$$PSU\_ADJ_i = {D_i^f}\Big/_{D_i^c} \quad (2)$$

Base Weight

The base weight (W_{ji}^B) was then defined as the product of the design weight (W_j^D) for the j^{th}municipality and the PSU adjustment factor (PSU_ADJ_i) for the i^{th} PSU within the j^{th}municipality, given by:

$$W_{ji}^B = W_j^D \times PSU\_ADJ_i \quad (3)$$

3.2 Adjusted base weights

3.2.1 Synthetic weight adjustment

During the design stage, very small Census EAs were excluded from the area sampling frame because these are often very remote and sparsely populated, representing only a small portion of the population and so have very little effect on the survey estimates. It would be either very inefficient on the basis of cost consideration to include these EAs in the frame or it may not be feasible to conduct field operations in these areas. Since the population in these EAs form part of the target population, excluding these EAs from the sampling frame introduces some non-coverage on the sampling frame.

A synthetic weight adjustment factor to account for the contribution from the excluded population was applied to the base weight. The adjustment factor was calculated using the Census 2011 population counts at the municipality level to reduce the risk of potential synthetic bias. Let N_j be the number of persons 15 years and older from the j^{th}municipality and N_j^f the corresponding number of persons 15 years and older within the sampling frame. Then the synthetic weight adjustment factor is given by:

$$\text{Synth\_Wgt}_j = {N_j}\Big/{N_j^f} \qquad (4)$$

3.2.2 Non-response adjustment

The most common practice to account for unit non-response is to adjust the base weight on the assumption that the responding units represent both the responding and non- responding units and the characteristics measured in the survey for the non-responding are like that for the responding units. The non-response adjustment factor is usually defined as the ratio of the sum of the weights of all eligible units, i.e. respondent and non-respondent units, in the sample to the sum of the weights of the respondent units. The adjustment for total non-response was computed at three levels of non-response: PSU non-response, household non-response and person non-response level.

3.2.2.1 Primary sampling unit non-response

The PSU non-response adjustment factor is based on the classification of PSUs into three response categories. The classification of the PSU is based on the classification of the eligible households within the sampled DUs from the respective PSUs in the following way:

- Responding PSUs
  - PSUs that at least have one eligible DU with a responding household
- Non-Responding PSUs
  - PSUs that have eligible DUs with no responding households;
  - PSUs that were identified to have had target population and were not excluded due to the size during the design stage; however no DU sample was drawn because of extreme shrinkage in DUs as compared to Census 2011.
- Out-of-Scope PSUs
  - PSUs that had no eligible DUs amongst the sampled DU;
  - PSUs that had zero DUs count on the dwelling frame – Vacant PSUs.

Let p_h^r be the number of responding PSUs from design stratum h and p_h^{nr} the corresponding number of non-responding PSUs. The PSU non-response adjustment factor at stratum level is then given by:

$$PSU\_NR\_ADJ_h = {(p_h^r + p_h^{nr})}\Big/{p_h^r} \quad (5)$$

In general, the PSU non-response adjustment was computed within the original design strata. However, in those cases where the original design strata had no responding PSUs, meaning no adjustment factor could be calculated for the stratum, the strata were combined with a neighbouring stratum in the same municipality to calculate the PSU non-response adjustment factors.

3.2.2.2 Household non-response

The household records were assigned to one of three response categories, responding, non-responding or out-of-scope. Only the in-scope household records (responding and non-responding) contributed in computing the household non-response adjustment factor. The in-scope households are all responding and non-responding households from the eligible DUs.

In general, the household non-response adjustment was computed at the PSU level. However, in those cases where the non-response at PSU level was large, meaning an adjustment factor of greater than 4.5, the non-response adjustment was computed at the stratum level for all PSUs within the stratum containing the cases with high non-response. Let $\mathrm{n_{hi}}$ be the weighted number of eligible households in the dwelling sample from PSU i in design stratum h and $\mathrm{n_{hi}^{r}}$ be the weighted number of respondent households out of the $\mathrm{n_{hi}}$ eligible households. The remaining $\mathrm{n_{hi} - n_{hi}^{r}}$ households are then the weighted non-respondent households. The household non-response adjustment factor is then given by:

$$\mathrm{HH\_NR\_ADJ_{hi}} = \begin{cases} \mathrm{n_{hi}}/\mathrm{n_{hi}^{r}}, & \text{for PSUs within strata with all adjustments } \leq 4.5 \\ \sum_{\mathrm{i}} \mathrm{n_{hi}}/\sum_{\mathrm{i}} \mathrm{n_{hi}^{r}}, & \text{for PSUs within strata with at least 1 adjustment } > 4.5 \end{cases} \quad (6)$$

3.2.2.3 Person non-response

The person non-response adjustment factor was based on the number of eligible persons within the responding household. The adjustment is defined to account for any eligible persons within the responding households on the survey data that have not responded to the survey.

Let ρ_k be the number of eligible persons in the k^{th} responding household and $\mathrm{\rho_k^{r}}$ the corresponding number of responding persons. The person non-response adjustment factor at household level is then given by:

$$PER\_NR\_ADJ_k = \mathrm{\rho_k}/\mathrm{\rho_k^{r}} \quad (7)$$

Adjusted Base Weights

The person level adjusted based weight (W_{ρ}^{AB}), for person level analysis, is defined as the product of the base weight (W_{ji}^{B}) and all the adjustment factors described above, i.e. synthetic weight adjustment and the PSU, household and person level non-response adjustment factors:

$$W_{\rho}^{AB} = W_{ji}^{B} \times Synth\_Wgt_{j} \times PSU\_NR\_ADJ_{h} \times HH\_NR\_ADJ_{hi} \times \mathrm{PER\_NR\_ADJ_k} \quad (8)$$

The household integrated adjusted base weight W_{k}^{AB}), for household level analysis, is defined as the product of the base weight (W_{ji}^{B}) and three of the adjustment factors discussed above, i.e. synthetic weight adjustment factor, PSU non-response adjustment factor and household non-response adjustment factor:

$$W_{k}^{B} = W_{ji}^{B} \times Synth\_Wgt_{j} \times PSU\_NR\_ADJ_{h} \times HH\_NR\_ADJ_{hi} \quad (9)$$

3.3 Trimmed adjusted base weights

Extremely large weights, even if affecting only a small portion of sampled cases, can result in a substantial increase in the variance of survey estimates. Therefore, it is common practice to trim extreme weights to some maximum value, in order to limit the associated variation in the weights (thereby reducing the variance of survey estimates), and at the same time prevent a small number of sampled units from dominating the overall estimates. Weight trimming is most frequently used after the adjustment of weights for non-response.

Therefore, once the base weights had been calculated and adjusted to account for the imperfections discussed above, the distribution of the respective adjusted base weights (the person level and the household integrated adjusted base weights) were examined for possible extreme weights and were trimmed at the 99th percentile as the maximum cut-off value. Meaning that if the adjusted base weights for the sampled units were greater than the 99th percentile, the adjusted base weights for these cases was set equal to the 99th percentile. The trimmed adjusted base weights is respectively defined as:

Trimmed person level adjusted base weight

$$W_\rho^T = \begin{cases} 99^{th} percentile\ ,\ where\ W_\rho^{AB} > 99^{th} percentile \\ W_\rho^{AB}\ , \qquad\qquad\qquad\qquad other\ wise \end{cases} \tag{10}$$

Trimmed household integrated adjusted base weight

$$W_k^T = \begin{cases} 99^{th} percentile\ ,\ where\ W_k^B > 99^{th} percentile \\ W_k^B\ , \qquad\qquad\qquad\qquad other\ wise \end{cases} \tag{11}$$

3.4 Calibrated weights

In the final step of constructing the respective sample weights, the trimmed adjusted base weights were calibrated such that the aggregate totals matched with the independently derived population estimates for sex and age groups at municipality level. The calibrated weights were constructed using the StatMx software from Statistics Canada, with the lower bound on the calibrated weights set at 1. The household integrated calibrated weights, different from the person level calibrated weights, were constructed using the constraint that each person within the household should have the same calibrated weight.

The population estimates used in the calibration of the trimmed adjusted base weights was the October 2015 population estimates for KZN derived by Stats SA. The population estimates were used in benchmarking the survey estimates to a set of control totals defined at municipality level by the cross-classification of age and sex. There was 51 municipalities, age represents the two age groups of 15-64 and 65+, and sex represents the two groups of male and female. The cross-classification of the municipalities with age and sex resulted in 204 calibration cells.

Final Sample Weight

The final person level sample weight (W_ρ^S), for person level analysis, is defined as the product of the trimmed adjusted base weight (W_ρ^T) and the person level calibration factor ($\mathrm{Cal\_Factor}_\rho$) calculated during the calibration process.

$$W_\rho^S = W_\rho^T \times \mathrm{Cal\_Factor}_\rho \tag{12}$$

The final household integrated sample weight (W_k^S), for household level analysis, is defined as the product of the trimmed adjusted base weight (W_k^T) and the household level calibration factor ($\text{Cal\_Factor}_\text{k}$) calculated during the calibration process.

$$W_k^S = W_k^T \times \text{Cal\_Factor}_\text{k} \quad (13)$$

4. Questionnaire Design

4.1 Background and processes

The questionnaire required the measurement of satisfaction with services as well as the quality of life of provincial citizens. The Office of the Premier provided Stats SA with a questionnaire that was developed by consultants for use in a similar, though more limited survey. The Office also consulted other stakeholders on the content of the questionnaire. Although the Office of the Premier were largely satisfied with the content of the questionnaire, they did request a best-practice review thereof.

While the questionnaire had questions to households on access to services, crime and safety, and their economic situation; the questions that measured satisfaction with services focused largely on the satisfaction with provincial services and the 14 national outcomes. Since the interaction between residents and their respective municipalities could shape the relationship between residents and other spheres of government, additional questions were added to measure the perceived quality of services at municipal level.

It should also be noted that the questionnaire was developed to be completed using pen-and-paper, and that it required manual coding. Since the survey was completed using Computer Assisted Personal Interviewing (CAPI) technology, all questions had to be reviewed and adjusted accordingly.

Using the existing questionnaire as a starting point and consulting best-practice national and international literature on citizen satisfaction surveys and quality of life surveys, an amended questionnaire was developed by Stats SA in consultation with the Office of the Premier.

The first draft of the paper questionnaire was completed by 25 June 2015 and multiple versions were reviewed between then and the end of September 2015 when the CSS questionnaire was ultimately finalized. The more traditional paper format questionnaire underwent screening as required by Stats SA standards and was approved by the Questionnaire Clearance Committee (QCC). Transference to a digital format involved consultations with the World Bank Survey Solutions officials.

4.2 Structure of the survey instrument

The target population of the survey was set as usual residents in private households who were aged 15 years or older. A household roster was included to identify all household members and to identify eligible respondents, the target population. The following structure was utilized.

Table 4.2.1: Questionnaire structure

Name of section	Description	Respondent
Cover page	Description of the dwelling unit	Any household member aged 15 years or older
Household questions	General questions about housing and tenure status, the household amenities (water, sanitation and energy) that households had access to, household income and sources of income.	
Household Roster	List each individual in the household together with information on age, sex, population group, and usual resident status.	
Biographical details of eligible respondents	Questions on relationship to the household head, languages spoken most often in the household, highest level of education, disability.	Selected eligible household member only
Section B: Personal perceptions of and quality of municipal or local government services or amenities	These questions seek to establish individual perceptions on the quality of the services or amenities provided by the local municipality or local government	
Section C: Performance of the local municipality	These questions seek to establish individual perceptions on the performance of local municipalities and their communication with residents.	
Section D: Perceived performance of provincial government departments	These questions seek to establish individual perceptions on the performance of the provincial governments as well as its communication with citizens	

It should be clear from Table 4.2.1 above that proxy responses were not allowed, except in the case of the first two sections (household questions and the household roster) where individual respondents could be used to provide accurate information about household members and services.

4.3 Digital questionnaire

The primary development of the questionnaire was initially done on paper. The digital questionnaire was developed on the World Bank website, https://solutions.worldbank.org, that requires a reasonably fast internet access and a working knowledge of the system. These restrictions were soon overcome with the assistance from the CAPI and IT teams and the first digital drafts of the questionnaire were produced by mid-August 2015. Once the digital questionnaire was fully developed it became the primary questionnaire used for review purposes. The digital questionnaire was reviewed numerous times by a large number of collaborators and the questionnaire was only finalized at the beginning of October to allow small editorial issues and a few important 'skips' that were picked up during the provincial training to be corrected.

4.4 Questionnaire testing

Tight project time lines left very little time for a formal pilot survey and the instrument was therefore tested in a variety of contexts.

Both the paper and electronic questionnaires were tested extensively in-house, before the CAPI version was tested in the field by a Stats SA team between the 24th and 26th August 2015. The tests were aimed at establishing the duration of interviews, reviewing the design and flow of the questions, and to get a sense of the challenges that the use of the device would bring. The results of the tests pointed out the long duration of questionnaires and recommended that some questions be streamlined.

One of the useful recommendations was that prompt cards be developed to be used in conjunction with the digital devices. These prompt cards would outline response categories (e.g. Very dissatisfied, Dissatisfied, Somewhat satisfied, Satisfied, Very satisfied) in both English and isiZulu.

The testing also recommended that the questionnaires be translated into isiZulu as that would allow enumerators to use more accurate and consistent translations. The translations were subsequently facilitated by the KZN Office of the Premier.

A few telephonic interviews were also done but it was found that that questionnaire was too long and complex to be enumerated telephonically.

Interviews done in the field during the training of trainers also benefitted the questionnaire design. Although changes to the questionnaire would necessarily affect the manuals and other supporting documentation, the fact that most materials were in electronic format made the final modifications possible in a short space of time.

4.5 Questionnaire approval

A paper copy of the questionnaire was submitted to and reviewed by the Stats SA's Questionnaire Clearance Committee (QCC) between 20 and 22 July 2015, and again on 11 and 12 August 2015. The QCC reviewed the overall content of the questionnaire as well as proposed skips. It also made recommendations regarding the wording of questions, as well as grammar and general editing. The questionnaire received preliminary approval in August, and was finally signed off by the end of September.

4.6 Finalization and approval

Final approval of the questionnaire content by the Office of the Premier was achieved by the end of September 2015.

5. Training and Data Collection

CSS was conducted using a technology-driven data collection mode representing a departure from the traditional model used by Stats SA. The survey provided an opportunity for Stats SA to test digital data collection processes making use of hand-held devices, providing cheaper and faster outputs as compared to paper-based questionnaire and printed maps for navigation in the field.

A 3-tier cascade training approach was used for the project. The training team consisted of Head Office, Provincial Office and District Office personnel. Subject matter specialist were identified from all relevant areas to be capacitated on Train the Trainer skills. They were responsible for transferring knowledge and skills to National Trainers, who in turn trained Assistant District Survey Coordinators (ADSCs) that trained Fieldworkers at District Level. Training was characterized by content theory, demonstration, and practical exercises. Data collection was undertaken from October to November 2015.

6. Data and Methods

6.1 Raw data file

The file contains all person and household records for the survey, including all records that were excluded during the editing and imputation process. The file contained 64 602 records with all demographic information complete and valid after imputation; amongst which there were 10 duplicated records.

Table 6.1.1: Distribution of person result codes for unique records within the 'CSS_2015_Final' file

Person Result Code	Label	Number of Unique Persons	Percentage
1	Response	38 845	60,1
2	Non-Response	104	0,2
3	Initially missing Age, imputed	649	1,0
6	Age less than 15 years	22 564	34,9
7	Non-Usual Resident	2 430	3,8
Total		**64 592**	**100,0**

The design of the survey required person level enumeration; therefore, person level result codes were defined. Table 6.1.1 above shows the distribution of the records by result codes for all the person records. The questionnaire was supposed to be fully completed for persons that had indicated that they were members of the household, however, there were a few records (155) with missing information for this variable. This being the raw data file contained records for all persons whose information was collected during the interview, including the ineligible respondents (less than 15 years) and ineligible members of the household or non usual residents. Table 6.1.2 below indicates the distribution of these records by residence status, age group and person result code.

Table 6.1.2: Distribution of raw data file records by usual residence, age group and person result code

Usual Residence Status	Age	Person Result Code	Number of Records	Total
Missing	Less than 15 years	**3**	72	
		7	5	
	15 years and above	**3**	75	
		7	3	**155**
Usual Residence	Less than 15 years	**3**	160	
		6	22 564	**22 724**
	15 years and above	**1**	38 845	
		2	104	
		3	284	**39 233**
Non Usual Residence	Less than 15 years	**3**	14	
		7	249	
	15 years and above	**3**	44	
		7	2 173	**2 480**
			Total	**64 952**

From Table 6.1.2 above, it is clear that only 39 233 records would be considered for preparation of the final data file.

The Full Person file contained 64 592 unique person records from 16 955 households within 15 204 DUs. There were 467 households containing in entirety out-of-scope person records with person result codes ‘6’ and ‘7’ as shown in Table 6.1.1. After removing these records, the household file had 16 488 records.

6.2 The CSS 2015 final data file

This is a person level file containing the 39 233 unique records as described above in Table 6.1.2. The file contained eligible respondents, i.e. members of the household who are aged fifteen and above. The person result codes vary from '1', to '3' as per the descriptions in Table 6.1.1. Thus, for analysis purposes, only records with person result code '1' were used. The remainder were used for person level and household level non-response adjustment. Note that the household level non-response adjustment was done in the case of 72 persons who came from households where all eligible persons were non-respondents and as such the entire household was a non-responding household.

The relationship between the person records, the households and dwelling units in the final file is such that the 39 233 persons were from 16 488 households within 15 085 DUs.

In terms of the 16 488 households described in Section 6.1 above, the file also contained 42 households that contained the 72 persons described in the aforementioned text. The 42 were subsequently excluded and the final household record file has 16 446 records.

6.3 Comparison with other data sources

All three previous censuses (1996, 2001, and 2011) and the 2014 GHS are tabulated against KwaZulu-Natal CSS 2015 to illustrate comparability with previous enumerations for demographics and household services. For household level analysis comparison with the census information is done by extracting the households in the census where the household head is aged 15 years and above. Even though such tabulations may reflect expected trends, care should be taken in interpretations as data collection methodologies vary, e.g. while GHS focuses on one proxy respondent in the sampled household, CSS focused on persons aged 15 years and above that were eligible for enumeration.

6.4 Analysis and interpretation of the response categories

Beyond the aforementioned comparability issues, the middle perception category (either somewhat agree or somewhat satisfied) provided on the questionnaire tended to skew responses towards satisfaction or agreement instead of being neutral, as can be expected. This scenario was also observed by the independent Survey Coordination, Monitoring & Evaluation, where translation into isiZulu proved to be difficult for most of the response categories, calling for either agree or disagree or alternatively satisfied or dissatisfied (Statistics South Africa, 2015). As a result, although visual representations and tables are run for all provided response categories, analysis focuses on the grouped categories. The response categories were grouped as follows, 'very dissatisfied' and 'dissatisfied' are grouped into 'dissatisfied', the 'somewhat satisfied' category stands on its own and the 'satisfied' and 'very satisfied' categories are grouped into 'satisfied'. Thus the tables reflect the five categories as per questionnaire design while analysis reflects the three categories as defined above.

6.5 Reliability of some variables

Readers are cautioned about the perception findings associated with performance of the provincial governments as well as its communication with citizens**.** Analysis of the experiences citizens encountered while they visited different government departments do not give reliable estimates for some domains as there were few responses recorded, which makes it impossible to have reliable estimates. In addition to this, some of the categories are too small to provide meaningful results. In its present status, the responses to the question on whether people have visited some government department in the last 12 months indicate that majority of citizens are not aware of Provincial Growth and Development Plan (PGDP) or Vision 2030. They also do not attend consultative meetings such as Public Hearings with the Provincial Government. Reports about KZN Provincial Government and its development projects are followed by fewer citizens. However, the meaningfulness and reliability of this information is highly questionable. Table 6.5.1 presents unweighted and weighted frequencies of the number of persons that visited provincial departments.

Table 6.5.1: Distribution of Government Departments by frequency of visit of citizens

Provincial department visit recently	Frequency	Weighted Frequency
Health	1 209	165 561
SASSA	519	53 787
Home Affairs	233	43 477
Other	18	1 726
Social Development	18	2 744
Higher Education (DHET)	30	11 223
Defence and Military Veterans	9	785
Labour	20	3 670
Energy	5	812
Department of Basic Education	24	7 926
Community Safety and Liaison	7	1 314
KZN Office of the Premier	8	323
Agriculture and Rural Development	7	674
Sport and Recreation	4	236
Arts and Culture	2	370
Total	**2 113**	**294 625**

7. Response Categories

An analysis of the response categories revealed abnormally high out-of-scope rates for some of the municipalities. In addition to the high out-of-scope rates, high response rates were reported for these municipalities. This observations implied that either the quality of the geo-referenced frame from which the sample was drawn was deficient and as such most structures and features had been misclassified. On the other hand this could also mean that the quality of the geo-referenced dwelling frame is good but there was a reduction in the population of these municipalities. The second scenario was quickly ruled out by a contradicting picture that was painted by the population projections. The projection showed that between 2011 and 2015 there is nothing that untoward that would suggest that the population of these municipalities shrunk in some instances by a margin as large as 50%.

Diagnosis of the causes of the high out of scope revealed that there were four main factors amongst others that contributed to the high out-of-scope:

- The age of the geo-referenced dwelling frame could be one factor. In the event that there had been changes on the ground since the development of the dwelling frame, these would not be reflected on the dwelling frame. The result of this would be that structures and features on the ground would be misclassified as dwelling units, leading to legitimate out-of-scope cases.
- In the design of the CAPI system, the allocation of the non-response result codes was embedded in the household module implying that before accessing that module the non-response codes could not be allocated to relevant interview outcomes. To counteract this fieldworkers used out-of-scope result codes due to the inability to access the correct result codes.
- The allocation of resources, specifically the ratio of fieldworkers to supervisors was large. Supervisors had to approve on average 200 questionnaires per day. This work assignment proved to be too high causing backlogs in the rejection of questionnaires that still needed the fieldworker to correct mistakes. Therefore, a lack of supervision and proper follow up mechanism led to erroneous out-of-scope cases creeping through without the supervisors intervening.
- In the final push to close off data collection, it seems field workers that were behind with their work did not do data collection at the selected dwelling units and gave an out-of-scope result code to these dwelling units. Also in some instances, due to the terrain or battling to get access to the sampled dwelling units the fieldworker gave an out-of-scope result code.

While a majority of these cases were corrected through the post data collection verification process, this report serves to highlight some weaknesses in the frame, systems development, data collection and fieldwork management processes. These are important lessons for future surveys.

Also, given that most of these issues were corrected, the survey results are not negatively affected. Comparison of the final result codes before and after the post data collection intervention is made below.

7.1 Household result codes and response codes

The final result codes were mapped to the three response status categories showed in Table 7.1.1 where 1=Respondent, 2=Non-respondent, and 3=Out-of-scope. There were new final result codes that were defined during the out-of-scope verification process; where code '24' was assigned to records verified to be general non-response from the initial out-of-scope file and code '38' was assigned to records with navigation errors or where the image shifted.

Table 7.1.1: Mapping of the final result codes to the response categories

Final Result Code	Label	Response Categories
11,12	Completed and Partly Completed	1
21,22,23	Non-contact, Refusal and Other Non-Response	2
24	Records verified to be non-response from the initial OOS file	2
31	Unoccupied Dwelling	3
32	Vacant Dwelling	3
33	Demolished Dwelling	3
34	New Dwelling Under Construction	3
35	Status Change	3
36	Listing (Classification) Error	3
37	Dwelling Unit Result Code 1 was Missing	3
38	Navigation Error / Image Shift	3

Table 7.1.2below compares the distribution of the result codes on the final household file between the original result codes and the final result codes after re-classification. It is clear from the table that result codes 31 to 36 were mainly affected and was reclassified as either 24 or 38. A total of 2,232 (9.72%) records was re-classified as general non-response (24), decreasing the percentage of record classified as out-of-scope. With 101 records being re-classified as 38, but remaining out-of-scope.

Table 7.1.2: Distribution of the household final result codes

Final Result Code	Label	Pre-reclassification		Post-reclassification	
		Frequency	Percentage	Frequency	Percentage
11,12	Completed and Partly Completed	16 446	71,62	16 446	71,62
21,22, 23	Non-contact, Refusal and Other Non-response	1 587	6,91	1 587	6,91
24	Records verified to be non-response from the initial OOS file	-	-	2 232	9,72
31	Unoccupied Dwelling	1 425	6,21	370	1,61
32	Vacant Dwelling	636	2,77	234	1,02
33	Demolished Dwelling	672	2,93	433	1,89
34	New Dwelling Under Construction	115	0,50	58	0,25
35	Status Change	150	0,65	87	0,38
36	Listing (Classification) Error	1 543	6,72	1 026	4,47
37	Dwelling Unit Result Code 1 was Missing	390	1,70	390	1,70
38	Navigation Error / Image Shift	-	-	101	0,44

Table 7.1.3 gives the distribution of the response codes, comparing the original response codes and the final response codes after re-classification on the final household file. It is clear from the table that the re-classification increased the percentage non-response from 4.88% to 14.6% and decreased the percentage out-of-scope to 13.79% from 23.51%; while the percentage response remained unchanged.

Table 7.1.3: Distribution of the household response codes

Response Code	Pre-reclassification		Post-reclassification	
	Frequency	Percentage	Frequency	Percentage
1 - Respondent	16 446	71,62	16 446	71,62
2 - Non-respondent	1 120	4,88	3 352	14,60
3 - Out-of-Scope	5 398	23,51	3 166	13,79

7.2 Indicators

7.2.1 Out-of-scope rate

The out-of-scope rate is defined as the proportion of dwelling units in which no eligible household was found to the total number of sampled dwelling units. There are several reasons why dwelling units may not contain eligible households. At the time of enumeration the dwelling unit could have been vacant or unoccupied, the dwelling unit could have been demolished or converted into a shop, or the structure could have been erroneously classified as a dwelling unit on the frame.

Let$\mathrm{d_g}$ be the total number of dwelling units, sampled from the geographic area g and $\mathrm{d_g^{(os)}}$the corresponding number of dwelling units with no eligible household. The out of scope rate is then given by:

$$Out\ of\ Scope\ Rate_g = \frac{d_g^{(os)}}{d_g} \times 100 \qquad (2)$$

Table 7.2.1 compares the out-of-scope rates for KwaZulu-Natal and the municipalities. It also highlights the municipalities which based on the original dwelling counts exhibited abnormally high out-of-scope rates.

Table 7.2.1: Provincial and municipal out of scope rates

Municipality	Pre-reclassification	Post-reclassification
KwaZulu-Natal	25,93	15,21
Abaqulusi	23,82	9,20
Dannhauser	13,40	7,17
eDumbe	31,02	18,45
Emadlangeni	33,88	16,39
Emnambithi/Ladysmith	26,48	10,99
Endumeni	27,89	12,96
eThekwini	8,70	3,90
Ezingoleni	16,98	6,29
Greater Kokstad	19,64	13,84
Hibiscus Coast	31,25	13,59
Hlabisa	19,52	10,36
Imbabazane	26,36	16,05
Impendle	26,38	15,54
Indaka	42,56	35,78
Ingwe	18,41	7,73
Jozini	33,85	17,37
Kwa Sani	51,15	28,29
KwaDukuza	17,10	12,77
Mandeni	16,18	10,29
Maphumulo	22,86	12,27
Mfolozi	18,60	12,62
Mkhambathini	24,79	18,18
Mpofana	28,12	19,81
Msinga	25,24	12,81
Mthonjaneni	15,47	12,15
Mtubatuba	24,22	17,27
Ndwedwe	34,02	21,39
Newcastle	7,71	2,31
Nkandla	28,57	19,05
Nongoma	43,16	26,32
Nqutu	23,51	9,90
Ntambanana	20,00	15,20
Okhahlamba	30,96	27,16
Richmond	32,96	13,36
The Big 5 False Bay	44,77	32,53
The Msunduzi	16,70	6,61
Ubuhlebezwe	32,37	15,30
Ulundi	25,49	16,67
Umdoni	30,72	23,89
Umhlabuyalingana	28,79	14,95
uMhlathuze	28,70	26,38
uMlalazi	21,96	19,16
uMngeni	24,77	13,60
uMshwathi	21,99	14,18
Umtshezi	23,79	10,48
Umuziwabantu	17,91	9,66
Umvoti	25,48	13,02
Umzimkhulu	30,94	11,76
Umzumbe	30,77	15,38
Uphongolo	17,93	10,08
Vulamehlo	27,27	11,78

7.2.2 Response rate

The response rate is defined as the proportion of eligible households which completed a questionnaire with usable information to the total number of eligible households. While on the other hand, the non-response rate has been defined as the proportion of eligible households for which a questionnaire could not be completed to the total number of eligible households. There are many different reasons for household non-response; for example householders refused to complete the interview, householders could not be contacted, householders did not provide usable information, householder was temporarily away during the data collection period, etc.

Let $\mathrm{n_g}$ be the number of eligible households in the dwelling sample from the geographic area g and $\mathrm{n_g^r}$ the corresponding number of respondent households. Where eligible households include both respondent and non-respondent households, but exclude out-of-scope households. The response rate is then given by:

$$Response\ Rate_g = \frac{n_g^r}{n_g} \times 100 \qquad (1)$$

Table 7.2.2 compares the response rates for KwaZulu-Natal and the municipalities based on both the original and final response codes as in Table 7.1.3.

Table 7.2.2: Provincial and municipality response rates

Municipality	Pre-reclassification	Post-reclassification
KwaZulu-Natal	93,62	83,07
Abaqulusi	87,92	74,05
Dannhauser	97,53	91,09
eDumbe	98,50	83,76
Emadlangeni	93,43	75,74
Emnambithi/Ladysmith	99,00	83,62
Endumeni	90,48	75,77
eThekwini	82,13	78,25
Ezingoleni	66,22	59,46
Greater Kokstad	97,52	91,63
Hibiscus Coast	98,14	79,04
Hlabisa	99,53	89,92
Imbabazane	98,18	86,77
Impendle	97,80	85,34
Indaka	99,22	93,95
Ingwe	99,20	88,18
Jozini	100,00	81,17
Kwa Sani	100,00	69,85
KwaDukuza	73,67	70,78
Mandeni	88,75	83,38
Maphumulo	94,68	83,64
Mfolozi	94,65	89,27
Mkhambathini	97,13	89,44
Mpofana	84,65	76,40
Msinga	100,00	87,11
Mthonjaneni	98,58	95,34
Mtubatuba	100,00	92,10
Ndwedwe	90,73	76,30
Newcastle	89,09	84,58
Nkandla	97,18	87,69
Nongoma	98,28	77,03
Nqutu	99,53	86,21
Ntambanana	100,00	94,71
Okhahlamba	95,43	92,42
Richmond	98,05	76,26
The Big 5 False Bay	100,00	83,07
The Msunduzi	89,67	80,52
Ubuhlebezwe	99,70	80,88
Ulundi	85,53	76,84
Umdoni	94,07	86,72
Umhlabuyalingana	100,00	84,52
uMhlathuze	85,69	84,55
uMlalazi	98,07	94,92
uMngeni	67,12	59,57
uMshwathi	89,61	82,01
Umtshezi	100,00	85,40
Umuziwabantu	97,40	88,79
Umvoti	98,21	84,62
Umzimkhulu	100,00	78,54
Umzumbe	99,67	82,24
Uphongolo	99,73	92,73
Vulamehlo	97,47	81,63

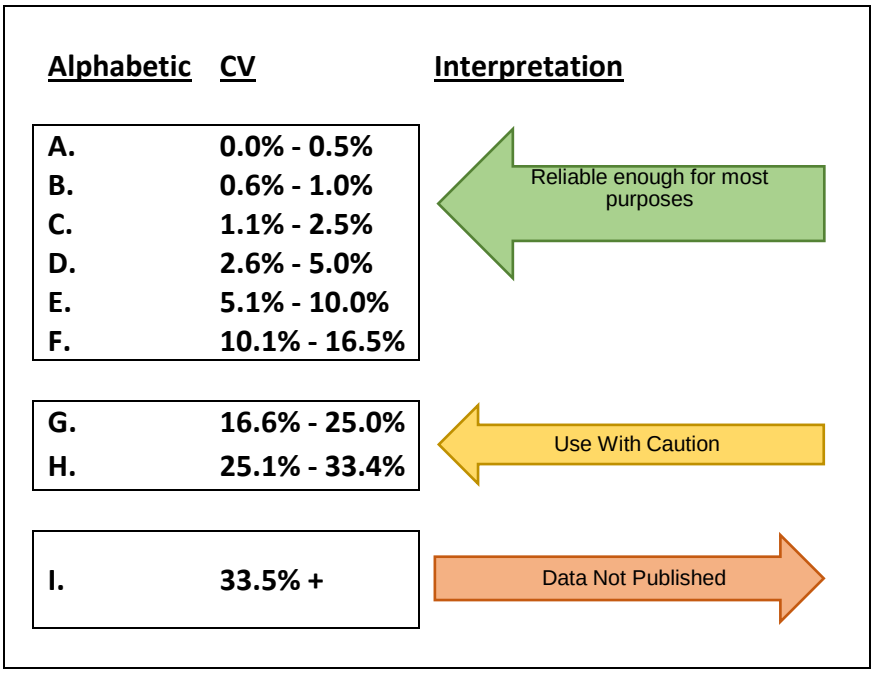
8. Estimation

The statistical precision of a sample statistic can be defined as the closeness with which it can be expected to estimate the relevant population values (Cohen, 1988). The precision can be estimated using standard errors and/or coefficients of variation; which estimate the amount of variability that can be expected from the estimates. There are several factors that can affect the precision of survey estimates; the sample size is one of them.

8.1 Data quality indicators

To ascertain the precision of the CSS estimates the standard error (se), coefficient of variation (CV) and confidence intervals for selected variables were calculated. The coefficient of variation is the ratio of the standard error of a survey estimate to the value of the estimate itself. It is a measure of relative variability of the estimator (Statistics Canada, 2010). The smaller the CV of an estimate, the more precise the estimate. Figure 8.1.1 illustrates a model that is generally used to determine the reliability of survey estimates, based on the CV_s obtained for the survey estimates.

Figure 8.1.1: Indicators of sampling variability



The standard error and the coefficient of variation are calculated using the standard formulas that are illustrated below. These formulas are on the basis that a stratified sample design was implemented for the survey.

Proportions based on a stratified design:

Given that N is the total population, n is the total sample size, N_h is the stratum population and $n_h$is the stratum sample size, the overall proportion, $\hat{p}_{str}$ is given by:

$$\hat{p}_{str} = \sum_{h=1}^{H} \frac{N_h}{N} \hat{p}_h, \quad (14)$$

where$H$ is the total number of strata and $\hat{p}_h$ is the estimated stratum proportion defined as a ratio of the estimated total within the stratum ($\hat{t}_h$) to the stratum population given by

$$\hat{p}_h = \frac{\hat{t}_h}{N_h} \quad (15)$$

Standard error for sample proportions based on a stratified design:

$$\widehat{se}(\hat{p}_{str}) = \sqrt{\sum_{h=1}^{H} \left(1 - \frac{n_h}{N_h}\right) \left(\frac{N_h}{N}\right)^2 \frac{\hat{p}_h(1-\hat{p}_h)}{n_h - 1}} \quad (16)$$

Confidence Interval for the sample proportions based on a stratified design:

$$CI(\hat{p}_{str}) = \hat{p}_{str} \mp (1.96 \times se(\hat{p}_{str})) \quad (17)$$

Coefficient of Variation for the sample proportions based on a stratified design:

$$CV(\hat{p}_{str}) = {se(\hat{p}_{str})}/{\hat{p}_{str}} \quad (18)$$

Both the se and the CV are dependent on the sample size; this implies that ultimate outcomes of the se and the CV are dictated by the size of the sample for each of the sub-groups that the quality indicators are determined for.

8.2 Observations made in relation to the data quality indicators

The key variables as listed in below in Table 8.2.1 were considered for determining the quality indicators for the KZN CSS 2015. The quality indicators are determined for the estimates of percentages and they were determined using the SAS procedure accounting for the sample design with variance estimation method 'Taylor series linearization'.

Table 8.2.1: The list of variables used in determining the data quality indicators

Variables Analysed (as listed on the dataset)	**Description of the variables**
D7_overall_perf	Level of satisfaction with overall performance of the provincial government • At province level, • By population group, • At district council level, • At local municipal level, • By highest level of education attained and • By household annual income.
D7_prov_governance	Level of satisfaction with governance of provincial government[1] • At province level, • By population group, • At District Council level, • At Local Municipality level, • By highest level of education and • By household annual income
D17_equal_access *D17_funds* *D17_public_services* *D17_service_needs*	Level of agreement towards implementation of Batho Pele principles at a provincial level
C8_peformance_rating	Level of satisfaction with general performance of Local Municipality • At province level, • By population group, • At District Council level, • At Local Municipality level, • By highest level of education and • By household annual income
Variables for cross-classification (as listed on the dataset)	**Description of the variables**
A3_education_level	Highest level of education[1]
Race	Population group
DC_name	District Council name
MN_Name	Local Municipality name
H16_IncomeCateg	Household annual income

[1] The categories for this variable were collapse to eight (8) categories

In relation to the CVs of the key variables as outlined in the tables below, two observations related to the sample size are made. Firstly, for some of the categorical variables, the sample size for some of the variables is too small to yield reasonable and reliable interpretation. Secondly, when cross tabulating the key variables with geographic and demographic variables, the cell sizes for some of the cross tabulations are too small such the reliability of the estimates becomes questionable. These observations are elaborated further and demonstrated below.

Table 8.2.2 below shows the standard errors and coefficients of variation that were achieved for the satisfaction levels with the overall performance of the KwaZulu-Natal provincial government at provincial level. It is clear, based on the cut-off levels as illustrated in Figure 8.1.1 that these estimates at provincial level are reliable for publication.

Table 8.2.2: Level of satisfaction with overall performance of the KwaZulu-Natal provincial government, quality indicators at provincial level

Overall Performance Rating	Raw count of persons	Weighted count of persons	Percentage	Standard error of percentage	Lower confidence limit of percentage	Upper confidence limit of percentage	Coefficient of variation of percentage
Very Dissatisfied	3 599	452 341	6,36	0,32	5,73	6,99	5,05
Dissatisfied	12 167	2 108 317	29,64	1,01	27,66	31,62	3,41
Somewhat Satisfied	10 937	2 224 656	31,28	0,76	29,78	32,77	2,44
Satisfied	11 426	2 236 467	31,44	1,12	29,25	33,64	3,56
Very Satisfied	492	91 127	1,28	0,18	0,93	1,63	13,79
Total	**38 621**	**7 112 909**	**100,00**				

Table 8.2.3 on the other hand shows that cross-tabulating the satisfaction with the overall performance of the provincial government with a sub-population such as population group; a number of estimates move into an area of ‘use with caution’ or ‘do not publish’ based on the cut-off margins in Figure 8.1.1. This is most likely due to the low number of persons of a particular population group in the sample having the relevant level of satisfaction. In other words, it is important to always cross check the precision level of every variable that is critical for the survey against the cut-off margins at different levels, e.g. provincial and local municipality level before publication.

Table 8.2.3: Level of satisfaction with overall performance of the KwaZulu-Natal provincial government, quality indicators at provincial level by population group

Population Group	Overall performance rating	Raw count of persons	Weighted count of persons	Percentage	Standard error of percentage	Lower confidence limit of percentage	Upper confidence limit of percentage	Coefficient of variation of percentage
Black/ African	Very Dissatisfied	3 494	433 703	6,87	0,36	6,17	7,58	5,25
	Dissatisfied	11 627	1 935 154	30,67	1,10	28,51	32,83	3,59
	Somewhat Satisfied	10 309	1 889 672	29,95	0,72	28,53	31,37	2,41
	Satisfied	10 858	1 975 935	31,32	1,19	28,98	33,66	3,81
	Very Satisfied	462	74 702	1,18	0,13	0,93	1,44	11,00
	Total	**36 750**	**6 309 166**	**100,00**				
Coloured	Very Dissatisfied	10	1 641	1,95	0,94	0,05	3,84	48,45
	Dissatisfied	60	11 935	14,17	4,90	4,35	23,99	34,56
	Somewhat Satisfied	75	30 212	35,87	6,18	23,46	48,27	17,24
	Satisfied	98	38 825	46,09	4,60	36,87	55,31	9,97
	Very Satisfied	3	1 624	1,93	0,95	0,02	3,83	49,22
	Total	**246**	**84 237**	**100,00**				
Indian/ Asian	Very Dissatisfied	29	6 622	1,49	0,55	0,40	2,59	36,98
	Dissatisfied	215	82 395	18,57	2,66	13,27	23,86	14,35
	Somewhat Satisfied	338	216 565	48,80	4,76	39,34	58,26	9,76
	Satisfied	288	136 221	30,70	4,67	21,42	39,97	15,21
	Very Satisfied	8	1 964	0,44	0,28	0,00	1,00	63,06
	Total	**878**	**443 766**	**100,00**				
White	Very Dissatisfied	66	10 375	3,76	1,00	1,79	5,73	26,45
	Dissatisfied	265	78 834	28,59	3,53	21,61	35,57	12,33
	Somewhat Satisfied	215	88 207	31,99	3,50	25,05	38,93	10,96
	Satisfied	182	85 486	31,00	4,16	22,77	39,23	13,41
	Very Satisfied	19	12 838	4,66	2,24	0,22	9,09	48,09
	Total	**747**	**275 740**	**100,00**				

Table 8.2.4 below shows an extract of standard errors and coefficients of variation achieved within some local municipalities where the number of persons that have a particular level of satisfaction are very low or zero. This was observed especially for the categories of 'Very Satisfied' and 'Very Dissatisfied'; which leads to several estimates in the table having extremely high standard errors and coefficient of variation that makes these estimate unreliable based on cut-off margins in Figure 8.1.1.

Generally estimation based on such low counts is not performed as it is not representative of the population and can be highly biased, e.g. the perception of a few individuals cannot be generalised to the population. In cases like these, it is recommended that the categories of the variable of interest be collapsed where possible to improve the realised sample size per sub-group and improve the precision of the estimates.

Table 8.2.4: Level of satisfaction with overall performance of the KwaZulu-Natal provincial government, quality indicators at local municipal level and original categories of satisfaction

Local Municipality Name	Overall Performance Rating	Raw count of persons	Weighted count of persons	Percentage	Standard error of percentage	Lower confidence limit of percentage	Upper confidence limit of percentage	Coefficient of variation of percentage
Dannhauser	Very Dissatisfied	6	583,8	0,93	0,69	0,00	2,34	73,44
	Dissatisfied	116	8 957	14,32	1,88	10,46	18,18	13,14
	Somewhat Satisfied	486	39 738	63,52	4,07	55,16	71,88	6,41
	Satisfied	166	13 207	21,11	4,32	12,25	29,97	20,45
	Very Satisfied	1	75,3	0,12	0,12	0,00	0,37	99,80
	Total	**775**	**62 561**	**100,00**				
KwaDukuza	Very Dissatisfied	16	3 340	1,76	0,69	0,38	3,15	39,03
	Dissatisfied	189	46 735	24,69	3,36	17,94	31,44	13,60
	Somewhat Satisfied	273	67 029	35,41	2,35	30,67	40,14	6,65
	Satisfied	300	71 735	37,90	3,53	30,79	45,00	9,33
	Very Satisfied	2	459,2	0,24	0,17	0,00	0,58	68,53
	Total	**780**	**189 298**	**100,00**				
Ulundi	Very Dissatisfied	43	12 654	10,51	2,67	5,10	15,92	25,38
	Dissatisfied	231	60 967	50,65	4,77	40,97	60,32	9,42
	Somewhat Satisfied	153	34 120	28,34	4,42	19,39	37,30	15,58
	Satisfied	57	12 439	10,33	2,77	4,72	15,95	26,79
	Very Satisfied	1	195,2	0,16	0,17	0,00	0,51	104,71
	Total	**485**	**120 375**	**100,00**				
Umzimkhulu	Very Dissatisfied	45	7 333	6,53	1,35	3,80	9,27	20,71
	Dissatisfied	179	28 606	25.48	2,81	19,80	31,15	11,02
	Somewhat Satisfied	234	36 098	32,15	2,53	27,03	37,27	7,88
	Satisfied	258	39 986	35,61	2,91	29,72	41,50	8,18
	Very Satisfied	1	259,9	0,23	0,23	0,00	0,70	99,87
	Total	**717**	**112 283**	**100,00**				

Table 8.2.5 below also shows an extract of standard errors and coefficients of variation for a number of local municipalities where there is somewhat reasonable number of persons who hold a specific level of satisfaction. However, these municipalities still have extremely high standard errors and coefficient of variation for the categories of 'Very Satisfied' and 'Very Dissatisfied', making these estimate unreliable based on cut-off margins in Figure 8.1.1.

Table 8.2.5: Level of satisfaction with overall performance of the KwaZulu-Natal provincial government, quality indicators at local municipal level and original categories of satisfaction

Local Municipality Name	Overall Performance Rating	Raw count of persons	Weighted count of persons	Percentage	Standard error of percentage	Lower confidence limit of percentage	Upper confidence limit of percentage	Coefficient of variation of percentage
Ethekwini	Very Dissatisfied	42	49459	1.93	0.60	0.74	3.11	30.99
	Dissatisfied	590	699800	27.29	2.55	22.23	32.34	9.34
	Somewhat Satisfied	767	934383	36.43	1.93	32.6	40.27	5.31
	Satisfied	692	847496	33.05	2.78	27.53	38.57	8.42
	Very Satisfied	27	33431	1.30	0.44	0.43	2.17	33.64
	Total	**2118**	**2564568**	**100.00**				
Nkandla	Very Dissatisfied	109	4954	7.95	3.07	1.79	14.12	38.55
	Dissatisfied	366	27865	44.73	8.76	27.11	62.35	19.58
	Somewhat Satisfied	289	17900	28.74	2.20	24.3	33.17	7.67
	Satisfied	285	10837	17.40	7.23	2.86	31.93	41.54
	Very Satisfied	19	739	1.19	0.63	0.00	2.45	52.78
	Total	**1068**	**62295**	**100.00**				
The Msunduzi	Very Dissatisfied	20	7618	1.74	0.71	0.32	3.15	40.66
	Dissatisfied	180	75517	17.22	2.13	12.96	21.49	12.37
	Somewhat Satisfied	320	135624	30.93	2.78	25.36	36.51	9.00
	Satisfied	475	207417	47.30	3.97	39.34	55.27	8.40
	Very Satisfied	30	12293	2.80	0.97	0.87	4.74	34.42
	Total	**1025**	**438470**	**100.00**				
uMlalazi	Very Dissatisfied	35	5199	4.11	1.64	0.80	7.42	39.80
	Dissatisfied	204	27932	22.09	2.57	16.89	27.28	11.62
	Somewhat Satisfied	419	54649	43.21	3.28	36.57	49.85	7.60
	Satisfied	282	38049	30.08	3.14	23.73	36.44	10.44
	Very Satisfied	5	645	0.51	0.21	0.08	0.94	41.66
	Total	**945**	**126475**	**100.00**				

8.3 Improving the CVs of some categories

Due to the fact that the quality indicators determined above are largely dependent on the sample size, this implies that the smaller the sample size the estimates are based on, the higher the standard errors and coefficient of variations. Table 8.3.1 below illustrates the impact of collapsing some of the variable categories according to their similarities.

To illustrate the said impact of collapsing the variable categories, the satisfaction with the overall performance of the provincial government was re-tabulated with collapsed rating categories. It is therefore clear that by collapsing the response categories improves the realized sample size and therefore improves the measure of the standard errors and coefficient of variations. The categories used on Table 6 were derived by collapsing 'Very Dissatisfied' and 'Dissatisfied' to obtain 'Dissatisfied', and 'Satisfied' and 'Very Satisfied' to obtain 'Satisfied'.

Also, there could be improvement in the coefficient of variation when the analysis is restricted at district municipality level rather than local municipality. See Appendix 1A for the quality indicators at district municipality level.

NB: It is acceptable practice that in the cases where the sample size (weighted or unweighted) yielded a very small number of units after data collection, such numbers should be suppressed in the publication (with a caution that the numbers might not make meaningful observations) and be replaced by a symbol.

Table 8.3.1: Level of satisfaction with overall performance of the KwaZulu-Natal provincial government, quality indicators at local municipal level - Collapsed categories of satisfaction

Local Municipality Name	Overall Performance Rating	Raw count of persons	Weighted count of persons	Percentage	Standard error of percentage	Lower confidence limit of percentage	Upper confidence limit of percentage	Coefficient of variation of percentage
Dannhauser	Dissatisfied	122	9 541	15,25	2,00	11,15	19,35	13,09
	Somewhat Satisfied	486	39 738	63,52	4,07	55,16	71,88	6,41
	Satisfied	167	13 283	21,23	4,35	12,30	30,16	20,5
	Total	**775**	**62 561**	**100,00**				
KwaDukuza	Dissatisfied	205	50 074	26,45	3,61	19,19	33,72	13,66
	Somewhat Satisfied	273	67 029	35,41	2,35	30,67	40,14	6,65
	Satisfied	302	72 194	38,14	3,57	30,97	45,31	9,35
	Total	**780**	**189 298**	**100,00**				
Ulundi	Dissatisfied	274	73 621	61,16	6,44	48,11	74,21	10,52
	Somewhat Satisfied	153	34 120	28,34	4,42	19,39	37,30	15,58
	Satisfied	58	12 634	10,50	2,81	4,80	16,19	26,76
	Total	**485**	**120 375**	**100,00**				
Umzimkhulu	Dissatisfied	224	35 939	32,01	3,40	25,13	38,88	10,63
	Somewhat Satisfied	234	36 098	32,15	2,53	27,03	37,27	7,88
	Satisfied	259	40 246	35,84	2,88	30,02	41,66	8,03
	Total	**717**	**112 283**	**100,00**				

See the appendices for the full tables with the measures of precisions for all the variables in Table 8.2.1 and for the tables with collapsed response categories. Similar observation are made in the standard errors and coefficients of variation for the other sub-populations and variables of interest. The appendices are not included in this report, they are published on the web

9. Appendices

The appendices are available on the web.

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