



POVERTY MAPPING IN SOUTH AFRICA

Applying small area estimation techniques using IES 2010/11 and Census 2011

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Poverty Mapping in South Africa

Applying small area estimation techniques using IES 2010/11 and
Census 2011

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Preface

This report is the result of a collaborative partnership between Statistics South Africa (Stats SA) and the World Bank to enhance poverty and inequality measurement at sub-national levels in South Africa. Using small area estimation techniques, as well as the detailed household consumption expenditure data of the Income and Expenditure Survey (IES) 2010/11 and geographical coverage of the Census 2011, the joint Stats SA-World Bank team was able to construct the Poverty Map 2011. The Poverty Map 2011 allows for the estimation of money-metric poverty rates at district and municipal levels. This report presents a selection of maps based on the findings of the Poverty Map 2011 and examines poverty at both household and individual levels.

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Statistician-General

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Acronyms

AsgiSA	Accelerated and Shared Growth Initiative for South Africa
CPI	Consumer Price Index
CPIX	Consumer Price Index without owner's equivalent rent
CWP	Community Works Programme
DECRG	Development Research Group
EAs	Enumeration Areas
ELL	Elbers, Lanjouw and Lanjouw
EPWP	Expanded Public Works Programme
FPL	Food Poverty Line
GLS	Generalised Least Squares
GEAR	Growth, Employment and Redistribution
IES	Income and Expenditure Survey
LBPL	Lower-Bound Poverty Line
LSMS	Living Standards Measurement Surveys
MS	Master Sample
NPD	National Development Plan
OLS	Ordinary Least Squares
PES	Post-Enumeration Survey
PSU	Primary sample unit
RDP	Reconstruction and Development Programme
RMSE	Root Mean Square Error
SAE	Small Area Estimation
SAMPI	South African Multidimensional Poverty Index
Stats SA	Statistics South Africa
UBPL	Upper-Bound Poverty Line

1. Introduction

Poverty remains a significant and persistent concern in South Africa. A recent report by Statistics South Africa (Stats SA, 2017) showed that while notable gains in poverty reduction were made between 2006 and 2011, poverty levels increased between 2011 and 2015. According to the report, approximately 13.8 million South Africans were living below the food poverty line (FPL) in 2015, this is equivalent to 25.2 percent of individuals and 12 percent of households. This is an increase from 21.4 percent of individuals living in extreme poverty in 2011. Not only did extreme poverty increase between 2011 and 2015, the depth of poverty (measured via the poverty gap) also rose indicating that the average distance of the poor from the poverty line increased. Further, the report highlights the spatial dimension of poverty, with Western Cape and Gauteng having the lowest poverty levels while Eastern Cape, Limpopo and KwaZulu-Natal had the highest. Even when a multidimensional measure of poverty is used, Limpopo and KwaZulu-Natal are found to be amongst the poorest provinces. This shows not only the spatial dimension of poverty, but also suggests these spatial patterns are proving difficult to dismantle over time. Economic development at national and local level remains uneven, which is associated with major disparities in well-being.

More than two decades into democracy, the legacy of apartheid spatial planning is thus still evident in the geographical dispersion of poverty and inequality in South Africa. Apartheid had a strong and enduring influence on the socio-economic configuration of the country, systematically creating spaces of poverty and spaces of affluence. Apartheid adopted a policy of separate development along racial lines. Homeland areas were set aside for black Africans. These areas, also known as Bantustans, were characterized by overcrowding and poor public service delivery. To date, spatial representations of most forms of deprivation consistently reveal the former Homeland areas to be the poorest areas in the country, and potentially characterised by spatial poverty traps. Focusing on poverty and inequality levels aggregated at national and provincial levels is likely to understate the extent of extreme poverty of some districts and thereby mask the heterogeneity across sub-national levels. Geographical dimensions of poverty are central to research into the determinants of economic development and poverty. To inform policies aimed at dealing with the spatial component of poverty and inequality, accurate and reliable information at a local scale is essential.

This report offers complementary information to existing knowledge that has been generated on poverty and inequality at national and provincial levels by analysing poverty and inequality estimates at the sub-national level, that is, district and municipal levels. These estimates will help policy-makers identify people and households living in poverty at sub-national levels and therefore, provide information to better allocate public resources in a more efficient and effective manner.

The identification of deprived areas has been one of the main concerns of governments for allocating social benefits. Several strategies have been developed for this aim. For instance, census data have been widely used for producing community profiles based on infrastructure and socioeconomic characteristics to construct deprivation indices (such as the South African Multidimensional Poverty Index (SAMPI)). However, lack of detailed money-metric information in census data, such as household income or expenditure, has restricted the ability to describe the spatial dispersion of welfare indicators (e.g. poverty and inequality) at local level. To overcome this problem, since the late 1990s, the World Bank (DECRCG) and affiliated researchers have been developing methods to combine the detailed information of household surveys together with the coverage of census data. One of these methods is called "Poverty Mapping" which produces estimators of welfare indicators at a highly detailed level of spatial disaggregation. With a growing body of applied research in country specific applications, the method is now widely recognized as a highly proficient tool for targeting social programs at local level. At present, more than 55 countries have carried out Poverty Maps, with a growing number of these producing second and third rounds. Some applications can be seen in

Hentschel et al. (2000), Demombynes et al. (2007), Bedi et al. (2007), Araujo et al. (2008), and De la Fuente et al. (2015).

In this report, the main results of a poverty mapping exercise that uses the Income and Expenditure Survey (IES 2010/11) and the 2011 Population Census for South Africa are summarized. Using the high quality consumption data of the IES and the geographical coverage of the Census, the Poverty Map 2011 was constructed using the standard method developed by Elbers et al. (2003) – also known as the ELL (Elbers, Lanjouw and Lanjouw) method – and considering the suggestions by Tarrozi and Deaton (2009). To construct poverty estimates, the idea is to use detailed information of household expenditure (or income) to project welfare indicators into census records at geographical partitions not possible when using the IES alone. Thus, the results are expected to help inform provincial and local government where policy implementation occurs and where information about the poor is desperately needed. By updating the poverty map based on the 2011 Population Census and IES 2010/11 data, the study builds on the last poverty mapping exercise done in South Africa which was computed using the IES 1995 and the 1996 Population Census by Alderman et al. (2001).

While this report provides a powerful new tool in the toolkit for poverty measurement in South Africa, the methodology requires the combination of survey and census data. Given that the census is only conducted once every 10 years, the application of this tool is limited to census data points and thus, the poverty estimates generated through the Poverty Map 2011 are somewhat dated in 2018. Nevertheless, given the huge data gap that exists for low level poverty information, this will still add significantly to the discourse around poverty and inequality in South Africa.

The Poverty Map 2011 should not be used to replace the current provincial and national poverty estimates generated through the IES and Living Conditions Survey (LCS) as these household expenditure surveys more accurately measure poverty at higher geographic levels by design. Furthermore, as these poverty estimates are based on money-metric data, their comparability against the South African Multidimensional Poverty Index (SAMPI) faces similar challenges as those highlighted in the most recent Poverty Trends Report (Report No. 03-10-06) published in August 2017 (Stats SA 2017). Ultimately, the Poverty Map 2011 should be used in conjunction with the PTR and SAMPI results to provide a holistic view of the poverty and inequality situation in the country.

Lastly, it is important to note that these estimates are the product of a model and thus, the predictive outputs should be used by researchers and stakeholders with caution. The absolute numbers and levels generated by the model are less relevant compared to the proportions yielded.

The remainder of this report is organised into six sections. Section 2 briefly describes poverty trends in South Africa and the methodology used in their derivation which is based on the IES and Living Conditions Survey (LCS). Section 3 explains the methodology used to produce the Poverty Map 2011. Section 4 describes the survey and census data, their comparability and the econometric models used for producing poverty and inequality estimates. Section 5 presents poverty and inequality estimates at provincial, district and municipal levels. Standard errors of both types of welfare indicators are explored to assess the precision of Poverty Map 2011 estimates. In Section 6, a comparison of the Poverty Map 2011 and the SAMPI is made. The final section concludes and provides some recommendations.

2. Poverty in South Africa

2.1 Poverty Measurement

2.1.1 The Welfare Indicator

Money-metric poverty measures produced by Stats SA use per capita consumption expenditure as a welfare indicator. Adjusting for household size is a standard way of accounting for different socio-economic structures of households and facilitates international comparisons. The use of consumption expenditure is in line with the argument that expenditure provides a better indicator of long-term well-being than current income (Deaton and Zaidi 2002; Ravallion 2016).

The estimates produced in this report use IES 2010/11 data; the per capita consumption expenditure (henceforth referred to as the consumption aggregate) comprised food and non-food components. All food items, collected using a household diary, were included in the computation of the consumption aggregate. The household diary collects items purchased by the household, received as gifts or maintenance, and those produced by households. This includes items purchased in restaurants, fast food outlets, etc. All these have been included in the consumption aggregate. For food items that were not purchased (own-production and gifts received), self-reported values available in the household diary were used. Over 300 different food items were reported in the IES 2010/11. This is well above the average for countries in which Living Standards Measurement Surveys (LSMS) have been conducted, suggesting a highly diverse food preference among South Africans. Beegle et al. (2010: 9) report that “the number of consumption items (or categories) for which data are collected from households in LSMS ranges from 37 to 305, with the mean being 137 and the median 130: the mean number of food items alone is 75”.

The non-food component comprised the following expenditure categories: (a) housing (actual/imputed rent of dwelling and utilities); (b) clothing and footwear; (c) household services and other consumer goods; (d) health (services, products, appliance and equipment); (e) education; (f) transport and fuel; (g) communication; (h) culture and recreation (reading matter, holiday packages, recreational services, etc.); and (i) miscellaneous expenses (personal care, personal effects, compensation for domestic workers, cost of licenses and other rental charges, cost of insurances). Large sized or “lumpy, durable goods” were excluded to reduce their biasing factor in the monthly estimates. To get the welfare indicator, all household consumption expenditures were annualized and then adjusted to consider household size.

2.1.2 Poverty Lines

The history and technical discussion of poverty lines in South Africa can be found in Statistics South Africa (2008) and Statistics South Africa (2015). The country uses a cost-of-basic-needs approach to determine the poverty lines. Using this approach, a suite of three national poverty lines to be used for poverty measurement in the country were adopted by Cabinet in 2012 following extensive stakeholder consultations, expert engagements and several discussion documents. These poverty lines have since been widely used in many academic and most official studies of poverty.

The three poverty lines comprise the food poverty line (FPL), the lower-bound poverty line (LBPL), and the upper-bound poverty line (UBPL). Two stages are used to determine the FPL. The first is the construction of a reference food basket and in the second stage this basket is costed to determine the monetary value of the FPL. The reference food basket comprised 27 items and was constructed

based on nationally common foods¹ and expenditure patterns of a reference group of households (households in deciles 2 to 4 of per capita expenditure). Having identified a reference food basket, the basket is then costed using item-specific consumption expenditure levels, household composition, and price data from the Consumer Price Index (CPI). The FPL is thus, the level of consumption below which individuals are unable to purchase sufficient food to provide them with an adequate diet. This line is also considered the extreme poverty line. It is important to note that poverty lines do not account for spatial differences.

The LBPL and UBPL lines are computed by including an allowance for non-food consumption. Two different sets of non-food expenditure are obtained from two separate reference groups of households to derive the LBPL and the UBPL. The LBPL is based on households that sacrifice some of their basic food requirements in order to meet their non-food needs. The reference group is thus households whose *total* expenditure is close to the FPL. The average expenditure of these households on non-food items is computed and then added to FPL to get to the LBPL. Therefore, the minimum amount set on non-food basic needs is added to the food line. This way, the LBPL includes non-food items, but requires that individuals sacrifice food to obtain these.

The UBPL uses households whose food expenditure is very close to the food line as the reference group. The average expenditure of these households on non-food items is computed and then added to FPL to get to the UBPL. For these households, in addition to the basic food requirements that are measured by the FPL, there are certain basic non-food items that they need. Individuals can purchase both adequate food and non-food items at the UBPL. This report focuses on the FPL in line with policy emphasis on eliminating extreme poverty.

The three poverty lines are updated over time using CPI price data. The mechanism used to update the poverty lines is described in Stats SA (2008: 23): “On a monthly basis, Stats SA publishes an overall CPI, a CPI for food and a CPI excluding food (non-food). The food and non-food CPI are combined in various ways to obtain a range of CPI instruments – such as the CPIX, the Core CPI and many others. An inflation instrument for a poverty line can be derived in a similar way. After testing various scenarios, *it was decided to inflate each portion of the poverty line by the relevant CPI component.*” Table 1 reports the inflation-adjusted poverty lines for the period between 2006 and 2017. The row highlighted in grey reflects the 2011 poverty line values applied to the IES 2010/11; the FPL of R335 per person per month was used for the Poverty Map 2011.

¹ These are items for which food expenditure shares per item represent at least 0.5 percent of total expenditure and the minimum number of households reporting on the food item was at least 10 percent.

Table 1: Inflation-adjusted poverty lines, 2006 to 2017 (per person per month in Rands)

Year	Food Poverty Line	Lower-Bound Poverty Line	Upper-Bound Poverty Line
2006	219	370	575
2007	237	396	613
2008	274	447	682
2009	318	456	709
2010	320	466	733
2011	335	501	779
2012	366	541	834
2013	386	572	883
2014	417	613	942
2015 (April)	441	647	992
2016 (April)	498	714	1077
2017 (April)	531	758	1138

Source: Statistics South Africa (2017)

Notes: Unless otherwise indicated, the values are linked to March prices in the respective years

2.2 Recent Trends in Poverty

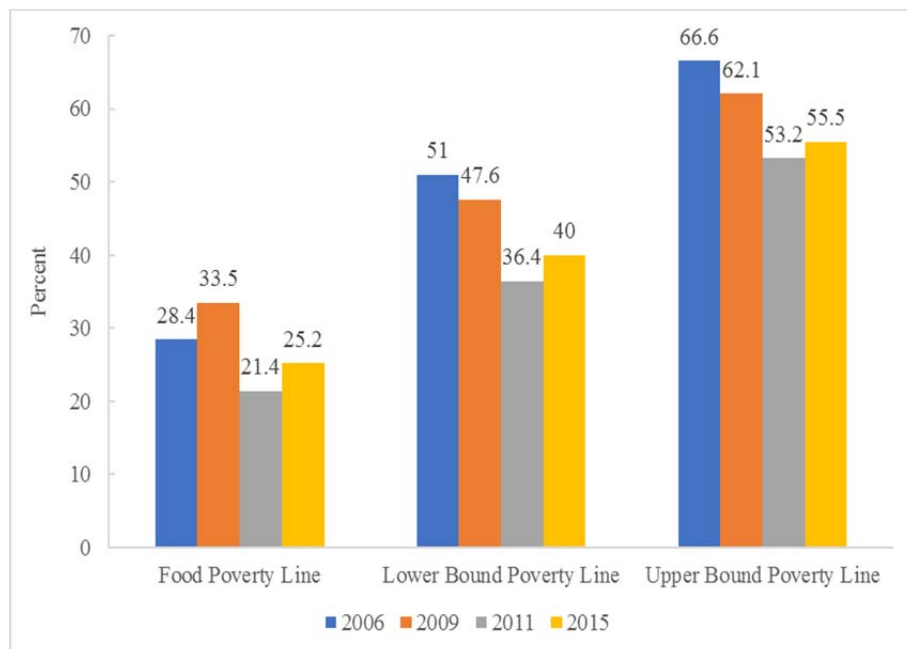
The post-apartheid Government of South Africa has made notable progress towards enhancing the well-being of its citizens. This has been supported by an environment that places poverty and inequality reduction at the core of development policy. This is reflected in major policies such as the Reconstruction and Development Programme (RDP) of 1994 (RSA 1994) and the country's current guiding framework for development – the National Development Plan 2030 (NDP) – published in November 2011. Fiscal policy has also been used to support the government's poverty and inequality reduction goals. The equitable share formula, which is used to determine transfers to the different spheres of government, contains a poverty component as a redistributive measure. The *social wage*, which refers to the redistributive elements of the government budget, has contributed to increased access to basic services by previously marginalized communities through social spending on provision of free basic services, social protection, enhancing access to productive assets by the poor (e.g. housing and land), as well as job creation through the Expanded Public Works Programme (EPWP).²

These government efforts, along with economic gains made between 1994 and 2011, have been attributed to reduced poverty levels between 2006 and 2011. South Africa recorded an impressive decline in consumption poverty between 2006 and 2011 (see Figure 1). The proportion of South Africans living below the FPL fell by 7 percentage points between 2006 and 2011. An even greater decline was recorded at the LBPL and the UBPL which fell by 14.6 and 13.4 percentage points, respectively. Decomposition of changes in incidence of poverty between 2006 and 2011 – based on an analysis of Income and Expenditure Surveys for 2006 and 2011 – suggests that growth in consumption was the driver of overall poverty reduction while the redistribution component of poverty reduction weighed down on overall reduction in poverty. The contribution of growth to poverty

² The Expanded Public Works Programme (EPWP) targets low-skilled, unemployed people. Some of the labour-intensive projects that have been financed under this programme include: Clean Cities Campaign, Municipal Infrastructure Programme, Working for Water, and Community Works Programme (CWP). The strength of these programmes is that they target women, the youth and people with disabilities.

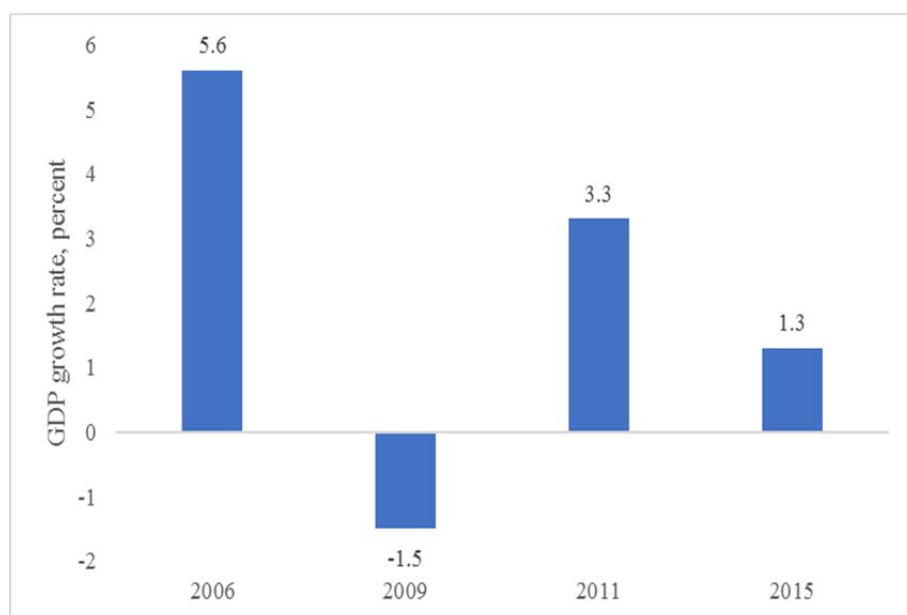
reduction is in addition to substantial government spending on improvements in the social protection system and in the social wage.

Figure 1: Overall changes in poverty between 2006 and 2015



Source: Calculations based on the Income and Expenditure Survey for 2005/06 and 2010/11, and the Living Conditions Survey for 2008/09 and 2014/15

Figure 2: Growth in GDP between 2006 and 2015

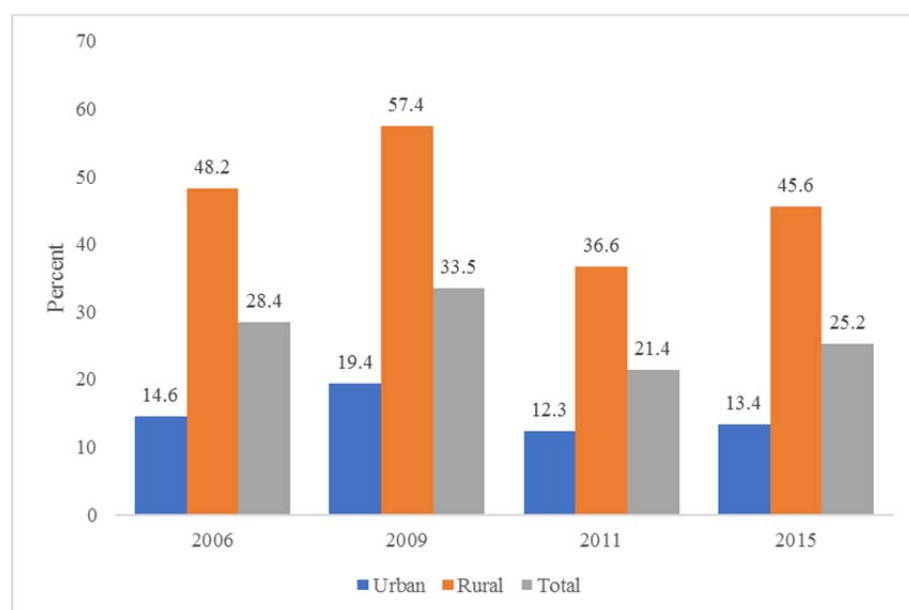


Source: GDP, Stats SA

As illustrated in Figures 1 and 2, South Africa's gains in poverty reduction have recently been challenged by variable and generally modest economic growth prospects. The food poverty rate rose from 21.4 percent in 2011 to 25.2 percent in 2015. The upward trend is also revealed when the LBPL and UBPL are used: the proportion of South Africans living under the LBPL rose by 3.6 percentage points to 40.0 percent in 2015 while the UBPL increased by 2.3 percentage points to 55.5 percent in 2015. A number of factors explain these reversals of poverty reduction gains. Given the role of growth in poverty reduction observed between 2006 and 2011, one of the most important contributors to increased poverty is the slow to modest growth prospects. As growth slows, unemployment rises. A large proportion of the poor in South Africa are not working. The unemployment rates have consistently been above 20 percent since 2003 (Stats SA 2017).

Poverty trends indicate persistence in spatial poverty and inequalities in South Africa. Rural areas remain the regions with the highest poverty incidence, with the gap between urban and rural poverty widening to 32.2 percentage points between 2011 and 2015. In 2011, 36.6 percent of the rural population lived below the FPL and this increased to 45.6 percent in 2015. In urban areas, the food poverty rate was 12.3 percent in 2011 and 13.4 percent in 2015. In all the years reported in Figure 3, rural poverty is always almost thrice that of urban poverty. The increase in poverty between 2011 and 2015 was sharper in rural compared to urban areas. Rural poverty rose by 9.0 percentage points compared to a slower increase of 1.1 percentage points in urban poverty, when the FPL is used.

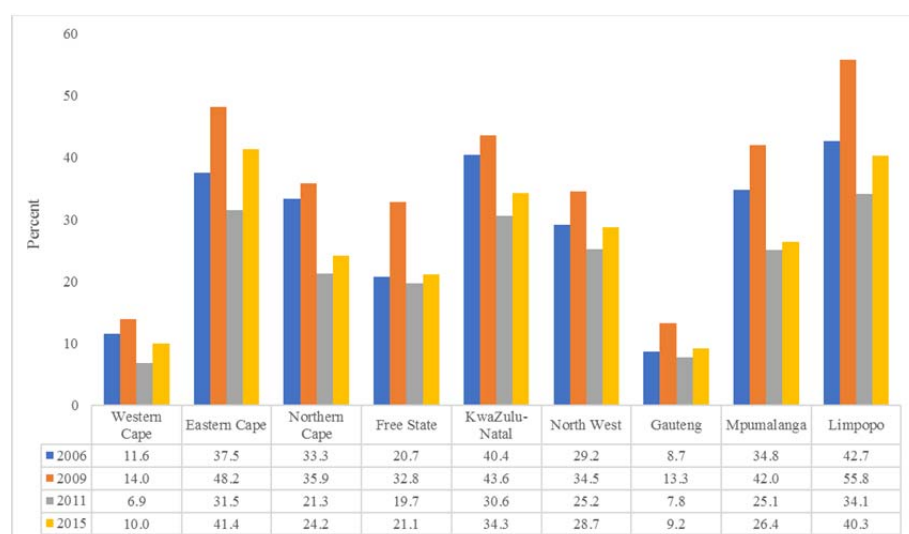
Figure 3: Overall changes in poverty between 2006 and 2015 by settlement type (FPL)



Source: Stats SA (2017)

Large differences in poverty levels exist across provinces and while the disparities have been increasing over time, the structure of poverty has not changed over time (see Figure 4). At 8.7 percent, Gauteng had the lowest food poverty rate in 2006 and the province maintained this ranking in 2015, with a poverty rate of 9.2 percent. Limpopo, on the other hand, was the province with the highest poverty rate in 2006 (42.7 percent) and recorded the second highest (40.3 percent) in 2015, second to the Eastern Cape at 41.4 percent. In general, poverty is associated with geographic isolation characterised by limited access to markets, poorer infrastructure and lower levels of education.

Figure 4: Overall changes in poverty between 2006 and 2015 by province (FPL)



Source: Stats SA (2017)

The reduction in the depth and severity of poverty observed between 2009 and 2011 was reversed between 2011 and 2015 for which both indicators recorded an increase. The depth of poverty is measured via the poverty gap which gives information on the average distance of the poor from the poverty line, treating all the non-poor as having a distance equal to zero. Table 2 shows that the poverty gap at the FPL rose from 6.8 to 9.0 between 2011 and 2015. This implies rising cost of eliminating poverty (relative to the poverty line), i.e. the cost of lifting the poor's consumption expenditure to the poverty line. The severity of poverty is measured via the squared poverty gap which reflects the degree of inequality among the poor themselves. The squared poverty gap rose from 3.0 to 4.5 suggesting inequality in the distribution of expenditures among the poor increased between 2011 and 2015. The upward trend in the depth and severity of poverty is observed in both urban and rural areas. However, rural areas exhibit higher rates of depth and severity of poverty than urban areas. Variations exist across provinces and like poverty rates, Gauteng and Western Cape tend to have the lowest levels while Limpopo, KwaZulu-Natal and the Eastern Cape tend to have the highest.

Table 2: Spatial variation in overall changes in the depth and severity of poverty between 2006 and 2015 (FPL)

	Poverty gap				Severity of Poverty			
	2006	2009	2011	2015	2006	2009	2011	2015
Western Cape	3.3	4.0	1.7	2.6	1.4	1.7	0.7	1.0
Eastern Cape	11.6	18.3	10.2	16.3	5.1	9.0	4.5	8.3
Northern Cape	11.3	11.9	5.6	8.1	5.0	5.4	2.2	3.7
Free State	5.3	10.3	5.6	6.3	2.1	4.4	2.3	2.7
KwaZulu-Natal	15.0	16.8	9.9	12.7	7.3	8.4	4.4	6.5
North West	9.8	12.5	8.6	10.5	4.6	6.2	4.0	5.1
Gauteng	2.2	3.8	2.3	2.6	0.8	1.6	1.1	1.1
Mpumalanga	11.5	15.7	7.2	8.5	5.5	7.8	3.0	3.9
Limpopo	13.9	22.9	11.7	16.1	6.3	11.8	5.7	8.5
Urban	4.0	6.3	3.6	4.1	1.6	2.9	1.5	1.8
Rural	16.9	22.5	12.1	17.7	8.0	11.3	5.6	9.1
Total	9.3	12.3	6.8	9.0	4.2	6.0	3.0	4.5

Source: Stats SA (2017).

South Africa is one of (if not the most) unequal country in the world. Measuring inequality using the Gini coefficient suggests very slow progress has been made in reducing inequality in the country. In 2006, the per capita expenditure Gini coefficient was 0.67 and reduced slightly to 0.64 in 2015. Poor labour market outcomes have been attributed to persistently high inequality. There is an agreement in the literature that income from the labour market has been by far the most important contributor to overall inequality. Decompositions of the Gini coefficient by income source (see inter alia Leibbrandt et al. (2001), Bhorat et al. (2000), and Leibbrandt et al. (2010)) find that, across all years, wage income (including self-employment income) has a dominant share of income (around 70 percent) but makes an even larger contribution to inequality (around 85 percent). Labour markets played a dominant role in driving inequality, accounting for 70 percent of the total income Gini coefficient. In terms of spatial difference in inequality levels, KwaZulu-Natal had the highest with a Gini coefficient of 0.64 in 2011. Limpopo had the lowest at 0.57.

While caution is encouraged in the interpretation of absolute numbers derived from the Poverty Map 2011, the persistent spatial nature of poverty and inequality in South Africa is extremely relevant in understanding variations in poverty and inequality across space. The Poverty Map 2011 will help inform provincial and local governments where policy implementation occurs and where information about the poor is desperately needed. Information generated via the poverty mapping exercise is particularly important for allocation of resources to maximise the impact on poverty and inequality.

3. Small Area Estimation for Mapping Poverty

Since the late 1990s, the World Bank (DECRG) has engaged in an extensive program of research to produce estimators of welfare at geographic levels not represented in household surveys. At present, approximately 55 countries have completed “Poverty Maps.” Moreover, in a growing number of countries, multiple-round Poverty Maps have been conducted or initiated to monitor the movement of poverty and inequality over time. The production of these maps are increasingly being implemented by other international organisations, partner-country statistical organisations, and academic researchers. The extensive use and production of Poverty Maps has also built a body of experience that has enabled Poverty Mapping, and extensions of the method, to receive a measure of validation.³

This report is based on the standard methodology of Small Area Estimation (SAE) developed by Elbers, Lanjouw, and Lanjouw (2000 and 2003) (henceforth ELL). The basic idea is to use detailed survey data to project welfare indicators into census records. The motivation for achieving this goal is to generate estimations in geographic partitions not attainable using household surveys and not available in census data. The stages suggested by ELL are (1) comparability between census and survey variables, (2) modelling the welfare indicator of interest using the survey, and (3) computing welfare indicators on census records (such as headcount ratio, inequality) based on parameters derived from the survey.

3.1 Stage Zero – Comparability of Data

Prior to constructing the econometric model of consumption, which projects the welfare indicator from survey to census, comparable covariates between the two data sources must be identified. To do this, one identifies the geographic partition for which this comparison must be made. This partitioning is country specific and is determined by the representativeness of the household survey. For instance, if the survey is representative at regional, provincial, or district level, the common practice is to model our welfare indicator at that geographic partition. However, the lower the level of disaggregation, the smaller the number of observations, which, in turn, reduces the predictive power of the model. In the last few years, the common practice in Poverty Mapping has been to create national models using various interactions between covariates and geographical partitions for which there is full coverage in census and survey.

After defining the geographic partition for modelling, comparable variables between census and survey are selected. To define a set of strictly comparable variables, definitions of each variable should be compared between the census and survey, based on their respective questionnaires. Subsequently, the comparison of distributions and statistics determines the final set of variables to be used for the modelling stage. Statistical comparisons between census and survey are carried out controlling for the survey sample design. For instance, standard errors must consider the clustering of primary sample units, or other stratification used as part of the sample design.

³ A free software has been produced by the World Bank in parallel with the methodology to ease the computational burden of producing Poverty Maps.

3.2 Stage One – Expenditure Modelling

Once comparable variables between the census and survey are identified, the welfare indicator is modelled using the survey data. The basic idea is, first, to estimate an Ordinary Least Squares (OLS) model with the set of comparable variables. The empirical model follows this structure:

$$\ln(Y_{ch}) = X_{ch}\beta + U_{ch} \quad (1)$$

where $\ln(Y_{ch})$ denotes the logarithm of the household per capita consumption of household h belonging to the cluster c , X_{ch} represents household and dwelling characteristics⁴; and U_{ch} corresponds to the error component. The latter may be decomposed into *cluster* and *household* effects:

$$U_{ch} = \eta_c + \epsilon_{ch} \quad (2)$$

where there is neither correlation between η_c and ϵ_{ch} , nor between household error components. The *household* effect ϵ_{ch} refers to unobservable characteristics intrinsic to the family, such as ability and motivation of household members, as well as socioeconomic variables not collected by the survey that may affect the level of expenditure. In addition, *cluster* effect η_c captures unobservable features at geographic partitions above household level, such as local prices, heterogeneity of returns to schooling, and infrastructure.

The identification of a geographic level to represent the cluster effect is a crucial decision that may affect the standard errors of the welfare indicator projected in census data. Cluster effect defines the partition in which the main variability exists. The empirical distribution of this partition is used for obtaining a similar vector in census records. Hence, the lower the level of disaggregation, the better it captures the heterogeneity at the target geographic level. However, defining the cluster effect at a lower level of disaggregation comes at the cost of having a less reliable distribution derived from survey data. ELL (2003) suggests the definition of cluster effect at the primary sample unit (PSU) or enumeration area (EA) level. However, recent empirical literature has shown that defining the cluster effect at such level may produce “naïve” standard errors of poverty estimates (Tarozzi and Deaton 2009).⁵ This recent evidence suggests that the cluster effect should be defined at the level of the target indicator or at one additional level of disaggregation (see De La Fuente, Murr and Rascon (2015) for an application).

After defining the cluster effect, assuming a heteroskedastic structure, the ELL method suggests a model of the household error component. Subsequently, household residuals, netted out from the cluster effect, are used to correct the standard errors through a Generalised Least Square (GLS) estimation.

⁴ The authors also considered, for the modelling stage, municipality variables constructed from the census records.

⁵ By *naïve* standard errors we mean underestimated errors.

3.3 Stage Two – Computation of the Welfare Measures

Once the selection of the best model is achieved, β , η_c , and ϵ_{ch} are simulated to obtain a final parameter for the imputation in census records. Based on their empirical distributions obtained from survey data, 100 random draws are obtained to generate final parameters based on the mean of these replications. Finally, using the betas of the econometric model, we draw r-replications of betas, using their distributions, to estimate r-expenditures for each household record in the census. The cluster and household component are treated as random effects for obtaining the projection of household adult equivalent expenditure into each census record.

4. Data Comparability and Econometric Model

4.1 Data Sources

The Poverty Map 2011 uses three types of data sources: Income and Expenditure Survey (IES 2010/11), the 2011 Population Census and auxiliary data collected from various sources in South Africa. Whilst data collection of the 2011 Population Census and the IES 2010/11 is completely independent, both sources share important common features. These include: i) households as the units of data collection, ii) similar demographic and household modules; and iii) the time lag between the reference collection periods are minimal. These common features, therefore, allow for proper comparisons of variables between the IES 2010/11 and 2011 Population Census. The software used for the Poverty Map 2011 data preparation was SAS, for producing district and municipality poverty map estimates was PovMap, for the analysis of results was Stata, and for the display of maps R (Poverty Map 2011 results) and ArcGIS (multidimensional poverty). In this section, we briefly describe each source of information.

4.1.1 2011 Population Census

The 2011 Population Census was conducted as a de facto census. Data collection took place from 9 to 31 October 2011. In the same year, a Post-Enumeration Survey (PES) was conducted from November to December to assess the undercount of the 2011 Population Census. The 2011 Population Census aimed to enumerate all persons living in South Africa.

Enumeration of persons in special dwelling institutions such as hospitals, correctional centres and army barracks was conducted on the census night (9 October 2011). Visiting households commenced on 10 October 2011 and lasted for 21 days. Structured questionnaires were administered to households and individuals using face-to-face interviews. Logical imputations were preferred, and in many cases substantial effort was undertaken to deduce a consistent value based on the rest of the household's information.

To evaluate the coverage and content errors of the census, the PES independent sample survey was conducted. The PES for 2011 Population Census was conducted from November to December 2011 in approximately 600 enumeration areas. The main aim of the PES was to determine the omission rate during census. Table 3 presents omission rates for persons and households by province.

Table 3: Omission rate by province for Census 2011

Province	Omission rate: Person	Omission rate: Household
Western Cape	18.6	17.8
Eastern Cape	12.9	10.3
Northern Cape	13.4	14.8
Free State	10.1	9.4
KwaZulu-Natal	16.7	16.5
North West	14.9	17.0
Gauteng	14.7	15.2
Mpumalanga	15.5	14.4
Limpopo	10.0	9.6
RSA	14.6	14.3

Western Cape and KwaZulu-Natal were the provinces presenting the highest omission rates at the individual and household level. Free State and Limpopo were the ones with the lowest omission rates.

4.1.2 IES 2010/11

Data collection for IES 2010/11 was conducted from September 2010 to August 2011. The primary objective of the IES 2010/11 was to provide relevant statistical information on household consumption expenditure patterns and household incomes at national and provincial levels for CPI and poverty purposes.

The IES 2010/11 is a probability sample drawn from a Master Sample (MS) based on the 2001 Population Census EAs. The scope of the Master Sample is national coverage of all households in South Africa. The MS includes private dwelling units, workers' hostels, residential hotels, nurses' and doctors' quarters, but excludes patients in hospitals or clinics, guests in hotels and guesthouses, prisoners in prisons, scholars and students in school or student hostels and the aged in old-age homes. A total of 31,419 sampled dwelling units (DUs) were selected for the IES 2010/11. This sample was divided into four quarterly samples spread over a period of 12 months.

To collect the survey data, a combination of diary and recall methods were used for the IES 2010/11. There were two data collection instruments, namely the household questionnaire and the household diary. The household questionnaire was administered to sampled households using face-to-face interviews whilst the household diary was self-administered by respondents. A household was required to keep a household diary for a period of two weeks, however, the survey was designed to ensure diary data for every day across the whole 12-month data collection period. Not all households that participated in the survey automatically qualified to be included in the final data. Households were disqualified from inclusion if they did not complete a household questionnaire or if the household questionnaire did not have demographic information and/or information on housing. Households that did not have any diary information were also disqualified. Therefore, to be included in the final dataset, a household needed to have a household questionnaire with demographic and housing information properly completed, and with diary information for at least one week. When a household had only one week of diary information, imputation was done for the missing week. A random donor household was chosen from a cluster of households with similar characteristics and its corresponding diary was used to impute for the missing diary.

To estimate housing expenditure on owner-occupied dwelling units, rental yields, as published in the Rode and Associates Report from Quarters 1 and 2 of 2011 were used. A segmented approach was used in the application of rental yields, by type of housing and province. An average rental yield per area based on the results of the Rode Report, except for Limpopo and North West which were not covered by the Rode report, was used. An average national rental yield was used for the two provinces. As with any Stats SA household sample survey, the IES household weights are linked to the population numbers published in the Mid-Year Population Estimates (MYPE) series. Every year the MYPE is updated and improved using information about migration, fertility and mortality data.

Regarding the response rate of the IES survey, out of the 31,419 dwelling units sampled across South Africa, 33,420 households were identified. Out of these, there was a sample realisation of 27,665 (82.8%) households, with the remaining 5,755 (17.2%) households being classified as out of scope due to a number of reasons, such as listing error, vacant/unoccupied dwelling, among others. Table 4 presents the response rates by province for the IES 2010/11. The total number of households used for the Poverty Map 2011 analysis was 25,358.

Table 4: Response rates for the IES 2010/11

Province	Response rate (%)
Western Cape	94.3
Eastern Cape	95.8
Northern Cape	95.6
Free State	94.7
KwaZulu-Natal	92.3
North West	91.6
Gauteng	82.9
Mpumalanga	93.5
Limpopo	90.3
RSA	91.6

Because the IES 2010/11 is primarily representative at the national and provincial levels, poverty and inequality measures are constructed at such geographical partitions to inform policy-makers and stakeholders. However, aggregate measures of such indicators may mask heterogeneity across sub-national levels. The Poverty Map 2011 offers a complementary tool to better understand the geographical location of vulnerable populations and thereby, to distribute more efficiently public resources aiming to reduce poverty and inequality in South Africa.

4.1.3 Auxiliary data

The inclusion of auxiliary data at various sub-national levels in the modelling stage is a crucial element for poverty mapping. Auxiliary data allow us control for unobservable characteristics in the modelling stage which have not been captured through the inclusion of household-level variables (e.g. local prices, type of vegetation, precipitation). In addition, these variables help us capture the within and between variation of sub-national levels. Auxiliary data can be obtained from external sources such as national statistics offices, central banks or meteorological stations. The complete census used for Poverty Mapping can also be used to generate aggregates at various sub-national levels and therefore, use such aggregates as predictors in the modelling stage.

The team collected data from various sources and constructed data from GIS files. The main variables that compound the auxiliary data used in the modelling stage are: connectivity (distance to the closest city), education (e.g. public/private schools, location of schools, ownership of land/building), vegetation (e.g. ecoregions) and precipitation (e.g. weather stations, rainfall statistics). In the case of distance variables, we calculated the distance of enumeration areas to the closest municipality-centroid. All variables collected in the complete census were aggregated at the municipal level and were used for selecting the best predictors for the final prediction model.

4.2 Comparability of Census and Survey

This section discusses stage zero using the IES 2010/11 and the 2011 Population Census. To determine the comparability of a pair of variables between the census and survey, we compare questionnaires and summary statistics. The comparison of summary statistics between census and survey was carried out for each variable in the survey calculating 95 and 99 percent confidence intervals.⁶ If the mean of the census falls inside the confidence interval of the survey, the variable is considered comparable between both sources. Otherwise, the variable is not considered comparable between sources and, therefore, is not used for the modelling stage. In the case of continuous variables, we apply an additional check comparing distributions between both sources using Kolmogorov-Smirnov equality of distribution tests. The results of the comparisons between distributions are described in the footnotes of Tables A1-A3 (Appendix A) for those cases in which the tests of distributions do not show significant differences between survey and census.

Tables A1-A3 present the variables that are available in both sources, including their means, 99 confidence intervals, and comparability. These tables statistically describe household head characteristics, dwelling construction materials, assets, and sociodemographic variables. Several definitions of schooling and household composition were constructed to achieve comparability between census and survey. For instance, maximum education was explored in continuous and categorical forms.

Dwelling and asset characteristics are represented primarily by dummy variables. Approximately 26.5 percent of these variables are comparable between census and survey (see Tables A1-A3). This comparability includes variables such as type of floor, roof, and walls in the dwelling, as well as type of toilet and one dummy of type of ownership. Regarding asset possession, such as radio, television washing machine, among others, there was no comparability between census and survey. Finally, household-level variables based on individual characteristics such as population group and age composition of the household, maximum education of household head, and maximum age were constructed in both datasets using continuous and dummy transformations. For several dummies of household composition by age groups and education dummies comparability was found. However, the variable of household size was not comparable between census and survey as in many other Poverty Maps. In our case, the census data captures a higher proportion of “small” households (fewer household members) than the survey. Using Kolmogorov-Smirnov equality tests, household size distributions present significant differences between census and survey for all but two provinces (Northern Cape and Mpumalanga).⁷ Figure A1 (Appendix A) shows histograms of household size for both census and survey by province. This figure shows the census captured a larger proportion of small households, less than 2 household members, than the survey did in the provinces of Kwazulu-Natal, North West and Limpopo. Because individual poverty rates are derived from household poverty rates using as a weight household size to produce individual poverty rates, we analyse in Section 5 both household and individual poverty rates to assess their differences.

⁶ The standard errors of survey variables were not adjusted by sample design for this comparability. The main reason for not considering this adjustment is the existence of 688 households without PSU information out of 25,328 households and 633 households belonging to geographical stratas with only one PSU. Household weights were used in both census and survey.

⁷ Kolmogorov-Smirnov statistics are: Province 1 Western Cape ($D=0.0464$, $p\text{-value}=0.000$), Province 2 Eastern Cape ($D=0.0384$, $p\text{-value}=0.000$), Province 3 Northern Cape ($D=0.0260$, $p\text{-value}=0.405$), Province 4 Free State ($D=0.0318$, $p\text{-value}=0.026$), Province 5 KwaZulu-Natal ($D=0.0626$, $p\text{-value}=0.000$), Province 6 North West ($D=0.0532$, $p\text{-value}=0.000$), Province 7 Gauteng ($D=0.0496$, $p\text{-value}=0.000$), Province 8 Mpumalanga ($D=0.0225$, $p\text{-value}=0.197$) and Province 9 Limpopo ($D=0.0402$, $p\text{-value}=0.026$).

Although the number of individual variables that exist in both sources is quite large, the comparability between IES 2010/11 and the 2011 Population Census is weak. Few sociodemographic variables, such as primary and tertiary education are comparable. None of the employment status dummies was comparable between both sources. To expand the set of comparable variables, we constructed several dummies that represented ranges of values of continuous variables such as maximum education of the household head and composition of the household. The construction of these variables enabled us to include in the models primary and lower secondary education as dummies. Despite the lack of comparable variables between census and survey, the prediction model for the Poverty Mapping exercise achieved a good prediction power in comparison to previous studies. This is discussed in more detail in the next section.

4.3 Modelling of per capita consumption aggregate

The ELL (2003) method was used to obtain poverty and inequality estimates at provincial, district and municipal levels. Using the survey data, the authors modelled the per capita consumption at the household level by using household and geographic controls. The aggregate consumption data was previously constructed by the World Bank team to estimate official poverty rates at national and province level.

Tables B1-B3 (Appendix B) show the final econometric model used for the Poverty Map 2011. Household, district and municipality variables were used as predictors, as well as interactions between variables and province/district dummies and among them. Several OLS models initially displayed significant coefficients of interacted variables by province and urban-rural region. However, after the authors adjusted the standard errors for heteroskedasticity, the parameters of these interactions in the GLS models ceased to be statistically significant.

Table B1 presents the final model with an adjusted- R^2 of 0.599 and a root mean square error (RMSE) of 0.72. Based on previous Poverty Mapping exercises, the prediction of this model is quite high for expenditure/income models (see De la Fuente et al. (2015) and Rascón and Audy (2016)). The cluster component of the error term corresponds to 0.006 percent of the total variance when it is defined at the municipal level. In other words, the inclusion of additional variables at this level may decrease the total variance of the error term by 0.6 percent at most, assuming no correlation of these variables with the household component. In addition, Table B2 presents the variables of the heteroskedastic model. Similar to previous Poverty Mapping exercises where the inclusion of sub-national level dummies provides more precise poverty estimates, the inclusion of district dummy variables in the alpha model gave slightly better results – lower standard errors of poverty rates, than the selection of variables using stepwise procedures.⁸ There is no theoretical background supporting one or the other strategy for the alpha model. Table B3 presents the final estimates used for simulating consumption aggregates into the census household records.⁹

⁸ Variable selection for the beta model was done by using cross validation for household-level variables and forward stepwise procedures (one-by-one) for municipal level variables and interactions.

⁹ Several econometric models with adjusted- R^2 above 55 percent and RMSE between 0.72 and 0.74 were used to obtain poverty estimates at varying sub-national levels. These estimates, as well as their rankings and coefficients of variation, were compared across models. The three models with the lowest RMSE were compared using Friedman and Kendall coefficient tests. Our tests did not show significant differences in poverty rate rankings across models. All models considered alpha models with district/province variables, as well as variables selected through stepwise procedures. In most cases, stepwise selection of variables in alpha models provided poverty estimates with less precision than the models with only geographical dummies. The model selected to produce the final poverty estimates for this report uses district dummies as predictors in the alpha model.

5. Poverty and Inequality in South Africa

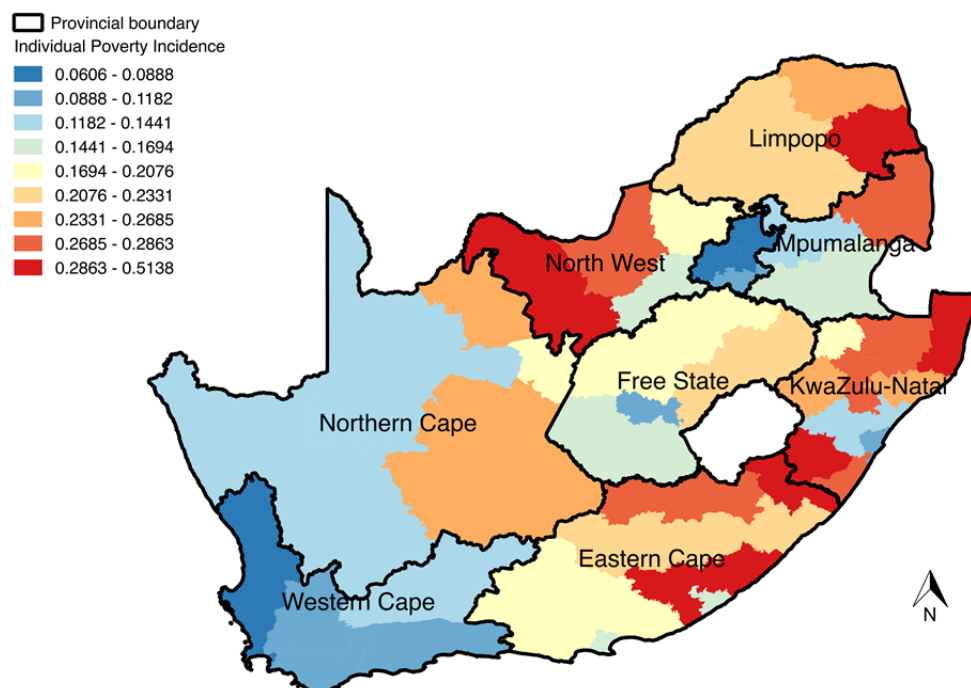
5.1 Poverty Estimates at the District Level

We start the discussion of our findings with district poverty rates. Map 1 and Map 2 present the percentage of individuals and households below the food poverty line (FPL). The maps display in 9 different colours quantiles of the poverty distributions. Thus, the cut-points of this map correspond to equal counts of 6 districts, approximately, per category in which the total number of districts is 52. The darkest blue colour contains 6 districts that present individual poverty incidence from 6–9 percent. The darkest red displays the poorest quantile with poverty rates between 29–51 percent. For household poverty rates, the darkest blue quantile represents poverty rates from 4–5 percent, and the darkest red from 17–34 percent. In both cases, the poorest quantile present a larger variation than the richest quantiles. Both individual and household maps offer similar conclusions, districts with the highest poverty rates are primarily located in the north-east, east and south-east of the country.¹⁰

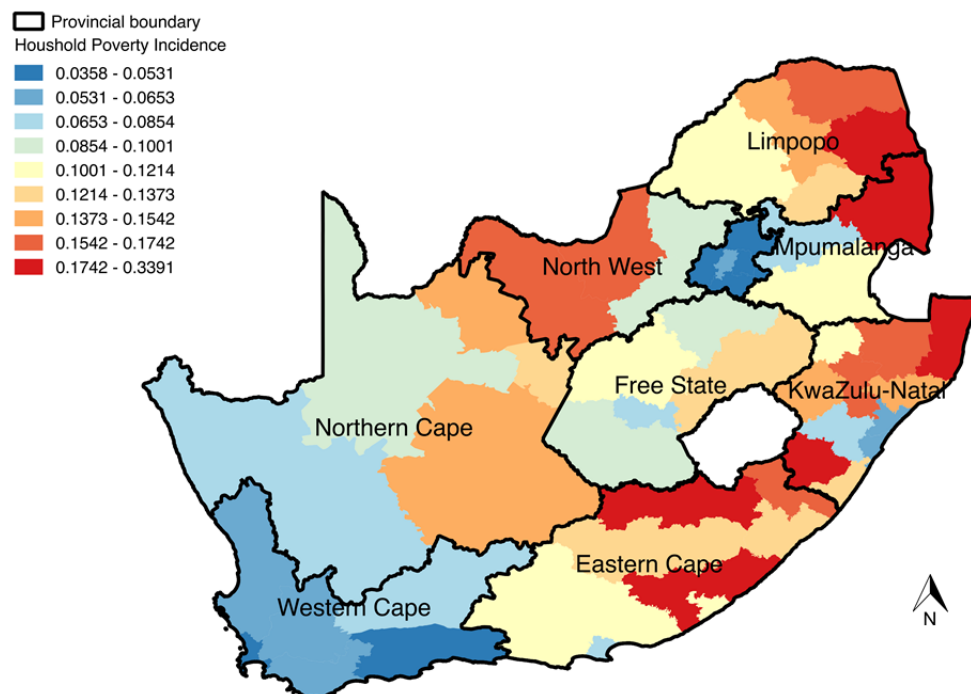
Table B4 summarizes the ten districts with the highest and lowest household poverty rates. Districts with the highest poverty rates are primarily located in the provinces of KwaZulu-Natal, Limpopo, and Eastern-Cape. Districts with the lowest poverty rates are in Western Cape, Free State and Gauteng. Rankings of percentage of households and population living in extreme poverty (below FPL) do not present significant differences [Kendall coefficient for food poverty was equal to 0.9891 (p -value=0.0000), for lower-bound poverty 0.9883 (p -value=0.0000) and for upper-bound poverty 0.9895 (p -value=0.000)]. Hence, our discussion is primarily based on individual poverty rates. The complete list of district poverty rates can be found in Table B5 (Appendix B).

¹⁰ In Figure B1 and B2 we present province level poverty rates calculated in the IES 2010/11 and by the Poverty Map 2011. We observe the confidence intervals for both household and individual poverty rates overlap for all provinces, but one. Because the main objective of the Poverty Map 2011 is to provide additional inputs at sub-national levels for which the IES survey is not representative, the research team does not provide further discussion of national or provincial level poverty rates produced by the Poverty Map 2011.

Map 1: Individual poverty incidence at the district level (Poverty Map 2011)

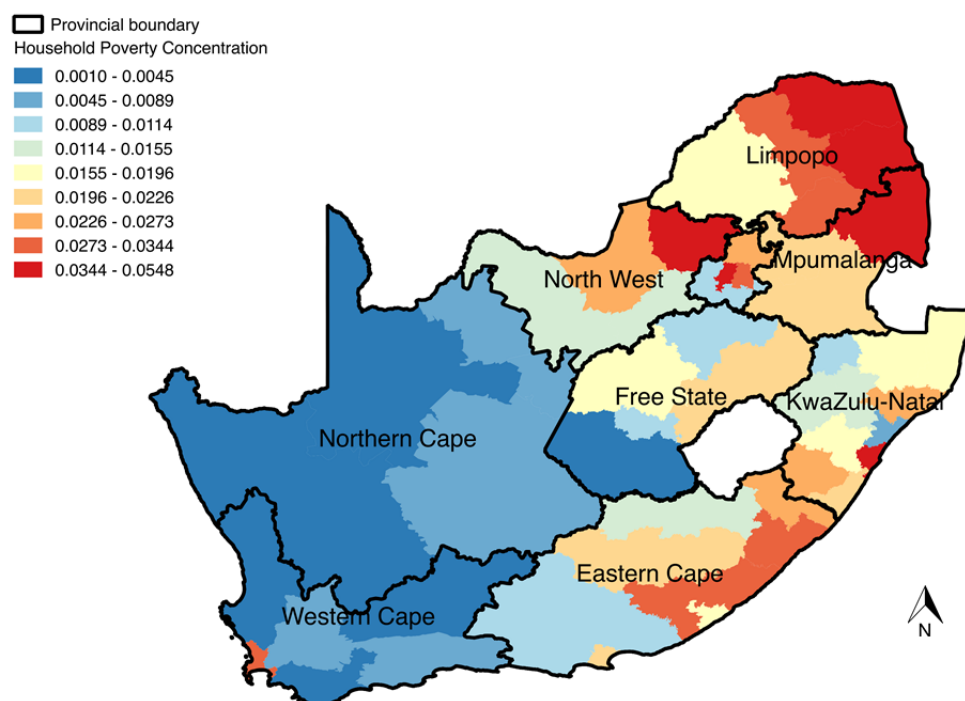


Map 2: Household poverty incidence at the district level (Poverty Map 2011)



Because the poverty incidence rates presented in Map 1 and Map 2 are constructed as a proportion relative to the population of the district, it is relevant to complement these figures with poverty density maps at the district level. In Map 3, we display the 52 South African districts according to the number of households living below the food poverty line. Using quantile partitions, we observe households living in extreme poverty (food poverty) are primarily concentrated in the provinces of Limpopo, North West, KwaZulu-Natal and Eastern Cape.

Map 3: Household poverty density at the district level (Poverty Map 2011)



In Table B6 (Appendix B) we show the ten districts with the highest and lowest numbers of individuals living below the food poverty line. The first ten districts with the largest numbers of people below the poverty line (poverty density) are in six of the nine provinces. The highest density is in Ehlanzeni (Mpumalanga), the City of Johannesburg (Gauteng), eThekweni (KwaZulu-Natal) and Mopani (Limpopo). All of them with approximately 500,000 people living in extreme poverty, accounting for 19 percent of the total number of poor people. Poverty density is similarly distributed across the three types of poverty measurements. The smallest numbers of people living below the poverty line are in the districts of Central Karoo (Western Cape), Namakwa (Northern Cape), Xhariep (Free State) and Overberg (Western Cape).

While the districts with the highest poverty incidence and density rates belong to the provinces of KwaZulu-Natal and Limpopo, the City of Johannesburg appears as one of the districts with the lowest poverty incidence, but with the largest number of poor individuals (8 percent of FPL poverty incidence and 4.5 percent of the total number of poor individuals). It is important to highlight that the districts that have large numbers of poor people but relatively low poverty rates is due to their high population density.

5.2 Poverty Estimates at the Municipal Level

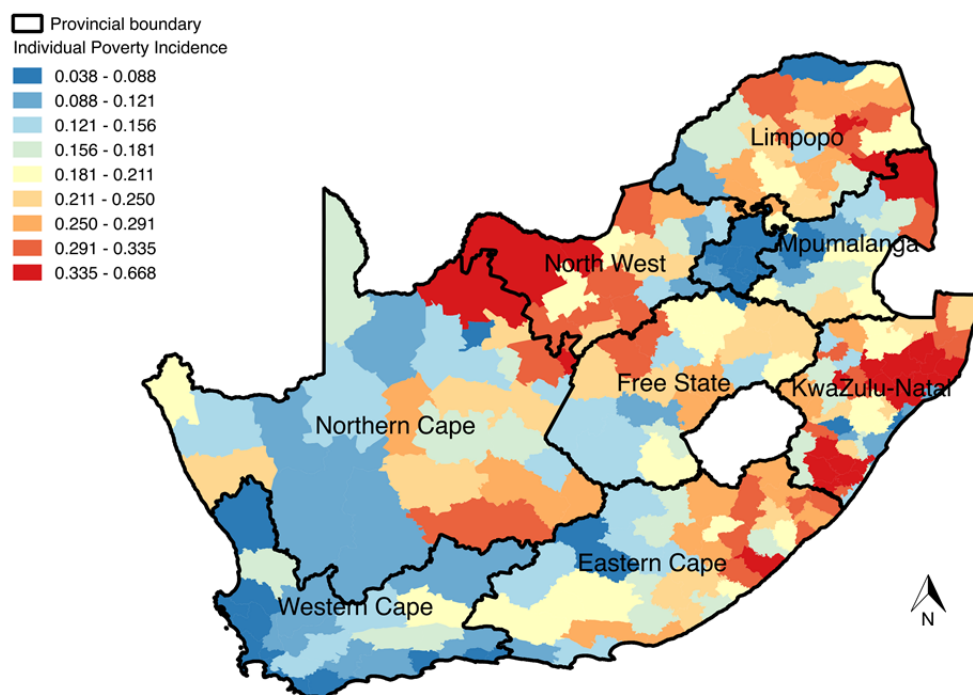
Based on the econometric model discussed earlier, household and individual poverty estimates were calculated for the 234 municipalities in the country.

Map 4 and Map 5 depict the geographic dispersion of individual and household food poverty at the municipal level, shedding light on several heterogeneities that were hidden by the district-level estimates. A visual inspection of poverty rankings ratifies the existence of various pockets of concentrated poverty at the municipal level within some districts, but also the notable dispersion of municipal poverty rates in others. Comparing Map 1 and Map 4, we observe the east of Northern Cape presents various pockets of poverty which are hidden in the district-level map. Similarly, Free State shows higher district-level poverty in the north-east than in the rest of the province, but higher municipal-level rates in the centre.

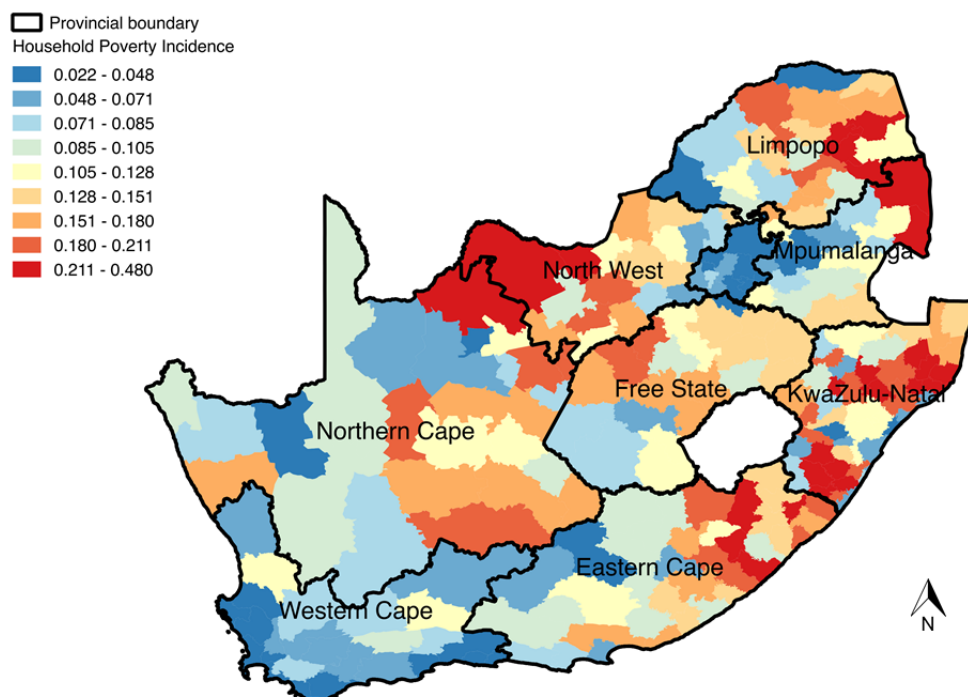
In the case of municipal-level maps, the maps display the 234 municipalities. The darkest blue represents 26 municipalities that present individual poverty incidence from 4–9 percent. The darkest red displays the poorest quantile with poverty rates between 33–67 percent. For household poverty rates, the darkest blue quantile represents poverty rates from 2–5 percent, and the darkest red from 21–48 percent. As in district-level poverty rates, in both cases the poorest quantile present a larger variation than the blue quantiles. Both individual and household maps offer similar conclusions, municipalities with the highest poverty rates are primarily located in the north-east, east and south-east of the country.

Similar to Maps 1 and 2, Map 4 and Map 5 show that the highest individual and household poverty rates at the municipal level are in KwaZulu-Natal, Eastern Cape, Limpopo and North West provinces. Table B7 (Appendix B) shows the thirty municipalities with the highest and lowest poverty rates. KwaZulu-Natal, Limpopo and Eastern Cape concentrate most of the thirty municipalities with the highest rates of individuals living in extreme poverty (below the FPL). The thirty municipalities with the lowest poverty rates are in the provinces of Gauteng and Western Cape. Table B8 presents a complete list of the 234 municipalities with the Poverty Map 2011 calculations for all poverty rates with their corresponding standard errors and rankings.

Map 4: Individual poverty incidence at the municipal level (Poverty Map 2011)



Map 5: Household poverty incidence at the municipal level (Poverty Map 2011)



In Map 6, the municipal map of poverty density reveals the municipalities that present larger numbers of households living in extreme poverty. In particular, the east of Limpopo and north-east of North West and Eastern Cape present the highest numbers of extremely poor households of the country. Further discussion of the poverty density based on individual poverty rates is provided at the end of this section when comparing the 1996 and 2011 Poverty Map estimates.

Map 6: Household poverty density at the municipal level (Poverty Map 2011)

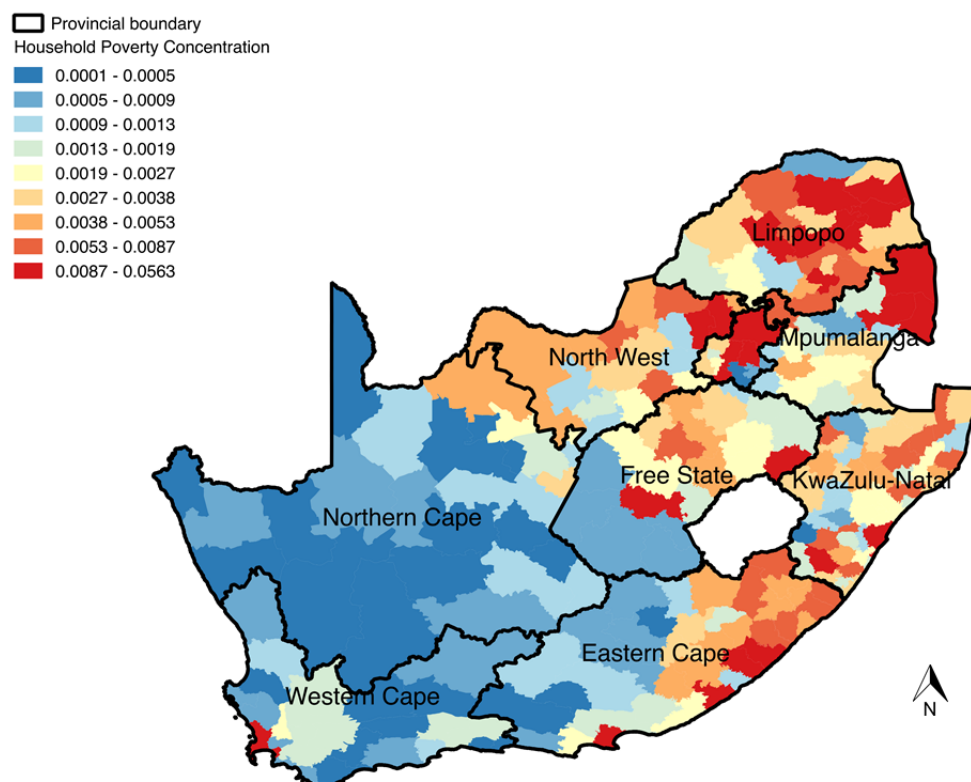


Table B9 presents the thirty municipalities with the largest and smallest number of individuals living below the food poverty line. The previous section revealed that only four districts accounted for approximately 19 percent of the population living in extreme poverty. Looking at municipality-level estimates, only five municipalities are shown to account for 17 percent of the individuals living in such condition. These municipalities are eThekweni (KwaZulu-Natal), City of Johannesburg (Gauteng), Bushbuckridge (Mpumalanga), City of Cape Town (Western Cape) and Ekurhuleni (Gauteng).

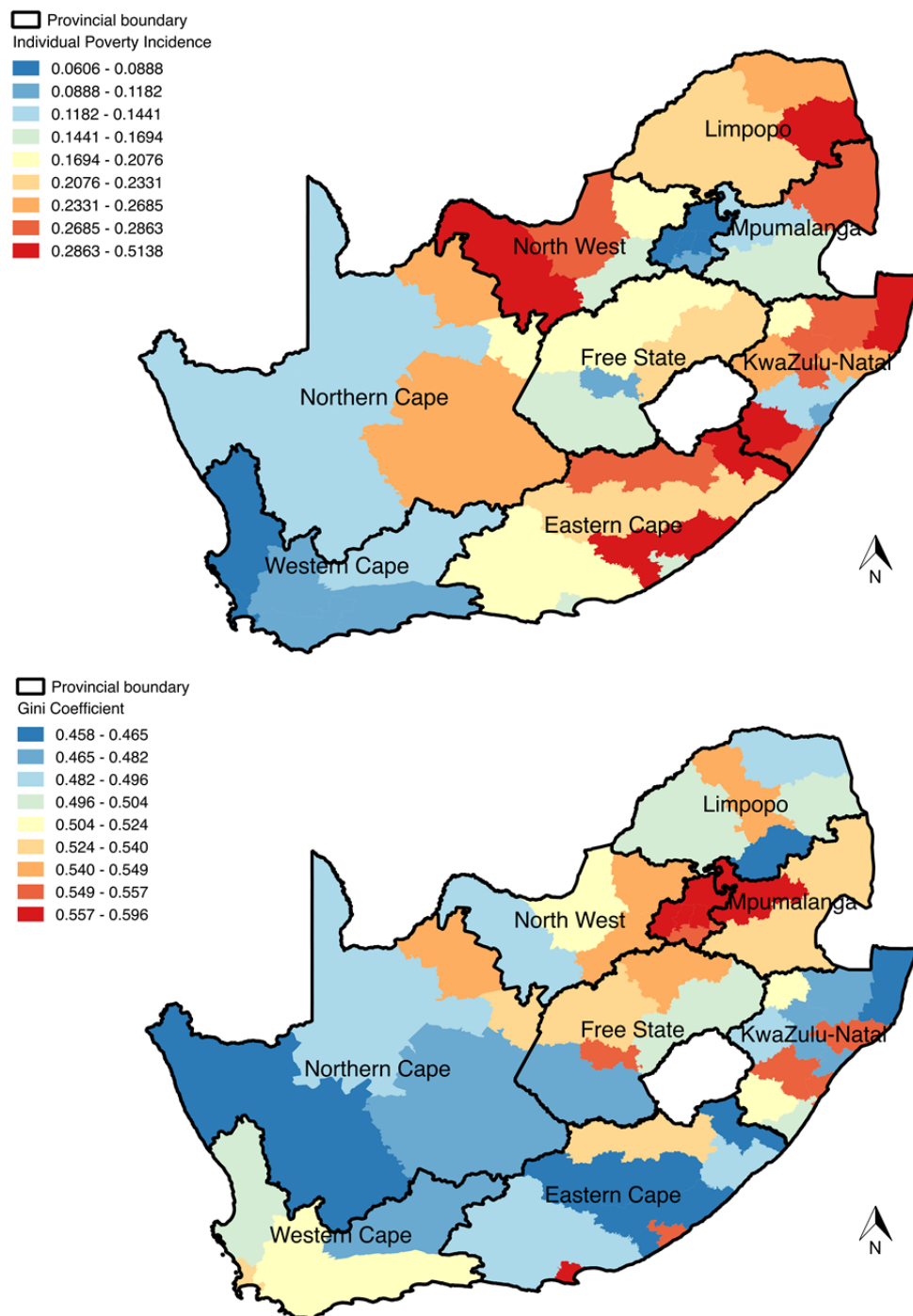
5.3 Gini Coefficient Estimates at the District and Municipal Level

In this section, poverty estimates at the district and municipal level are compared to the Gini coefficients estimates produced by the Poverty Map 2011. Gini coefficients calculated in the survey and the poverty map at the individual level present close similarities. As a result, individual-level Gini coefficients are compared with our previous district and municipal level individual poverty estimates.

Map 7 displays both individual poverty rates (as seen in Map 1) and Gini coefficients at the district level. The first map corresponds to the map of poverty incidence and the one at the bottom to the Gini coefficients. The range of inequality measured with Gini coefficients takes values from 0.46 to 0.60.

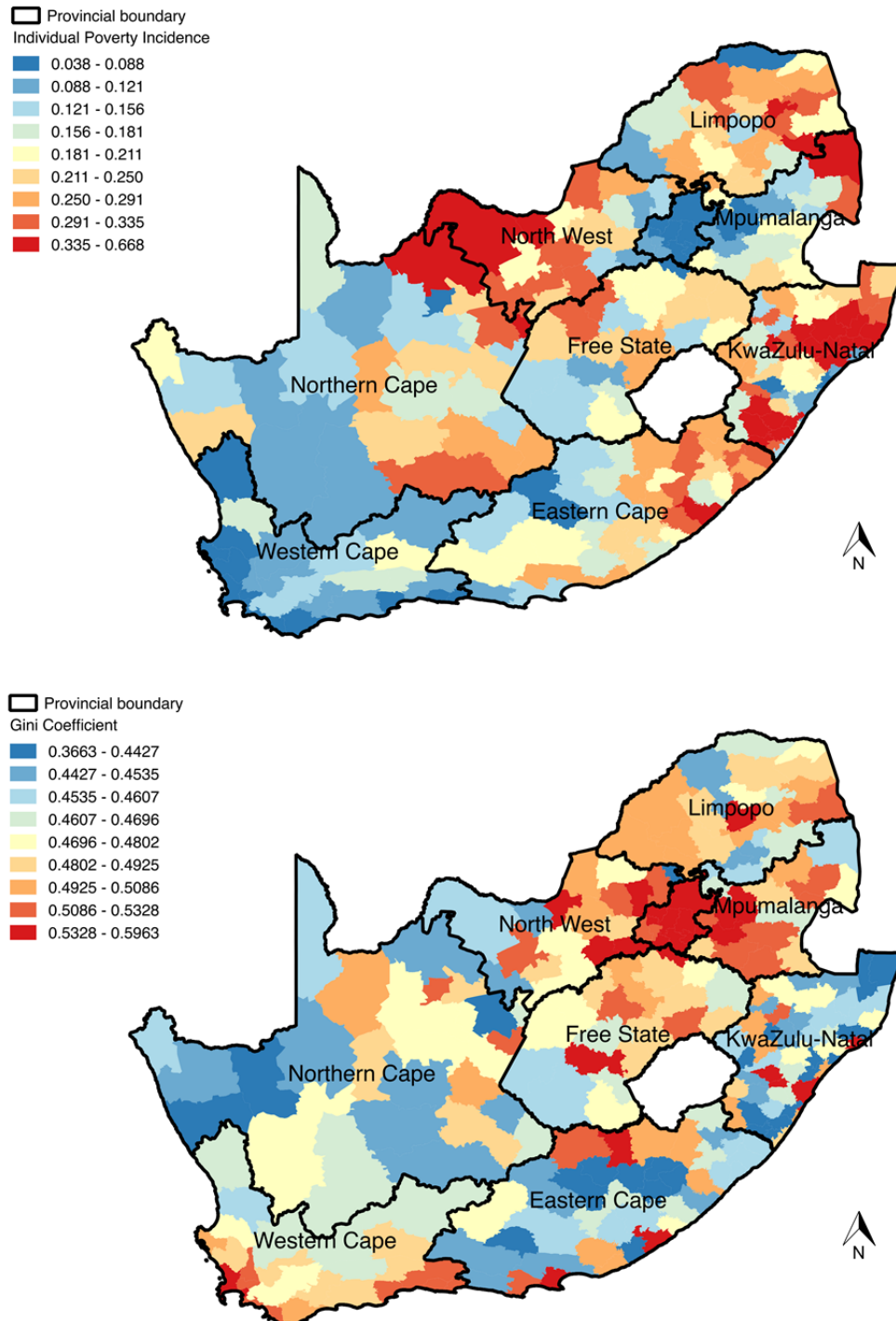
The highest levels of inequality (red colours) are observed in the provinces of Gauteng (to the right of North West) and Mpumalanga, and the lowest levels (blue colours) in Northern Cape, north of KwaZulu-Natal, Eastern Cape and the south of Free State.

Map 7: Individual poverty and Gini coefficients at the district level (Poverty Map 2011)



As discussed earlier, Eastern Cape presents some of the highest poverty rates in the country at the district level, and according to the Gini district-level map, the level of inequality is relatively lower than in other provinces.

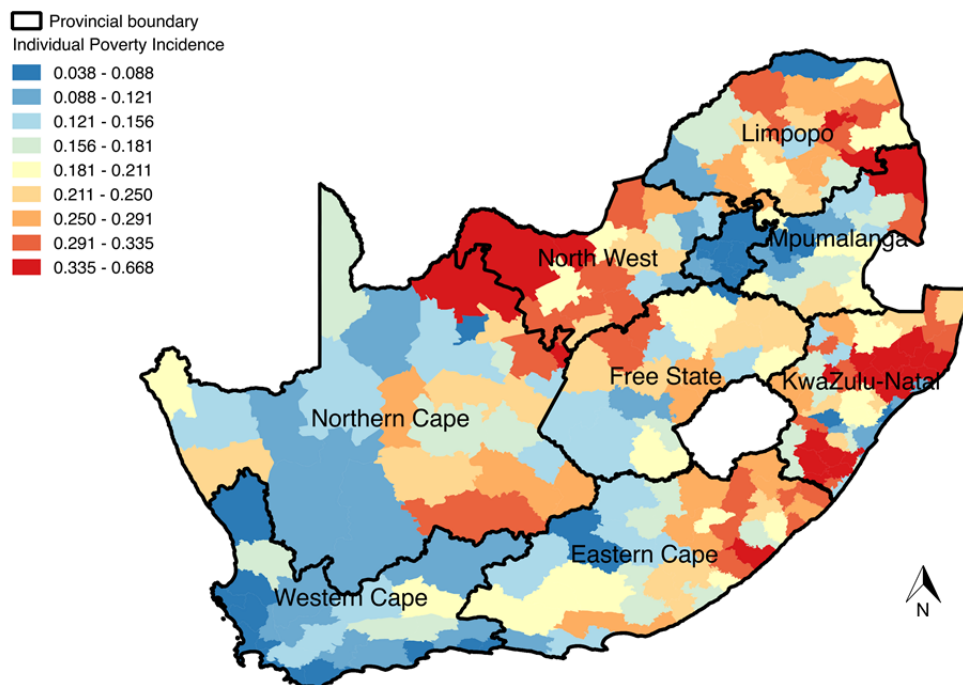
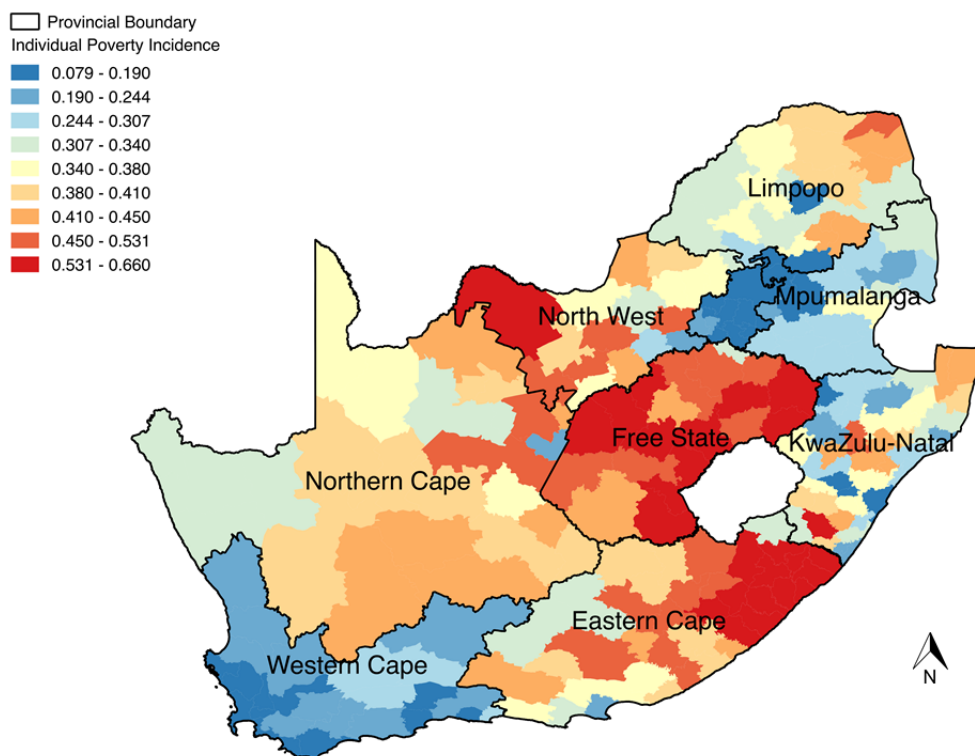
Map 8: Individual poverty and Gini coefficients at the municipal level (Poverty Map 2011)



In Map 8 we display individual poverty rates (as seen in Map 4) and Gini coefficients at the municipality level. In here, we find a quite heterogeneous picture in most of the provinces. For instance, Western Cape presents quite low poverty rates in the south, but high levels of inequality along the coast. KwaZulu-Natal and North West are not only the provinces with some of the highest poverty rates at the municipal level, but also with many of their municipalities ranking in the highest quantiles of inequality revealing an extremely heterogeneous map of pockets of wealth. When comparing inequality measures at the municipal level in the south of South Africa, the closer the municipality is to the coastal area, the more unequal it appears. The spillovers of the economic growth generated by these areas are not uniformly spread across neighbouring municipalities.

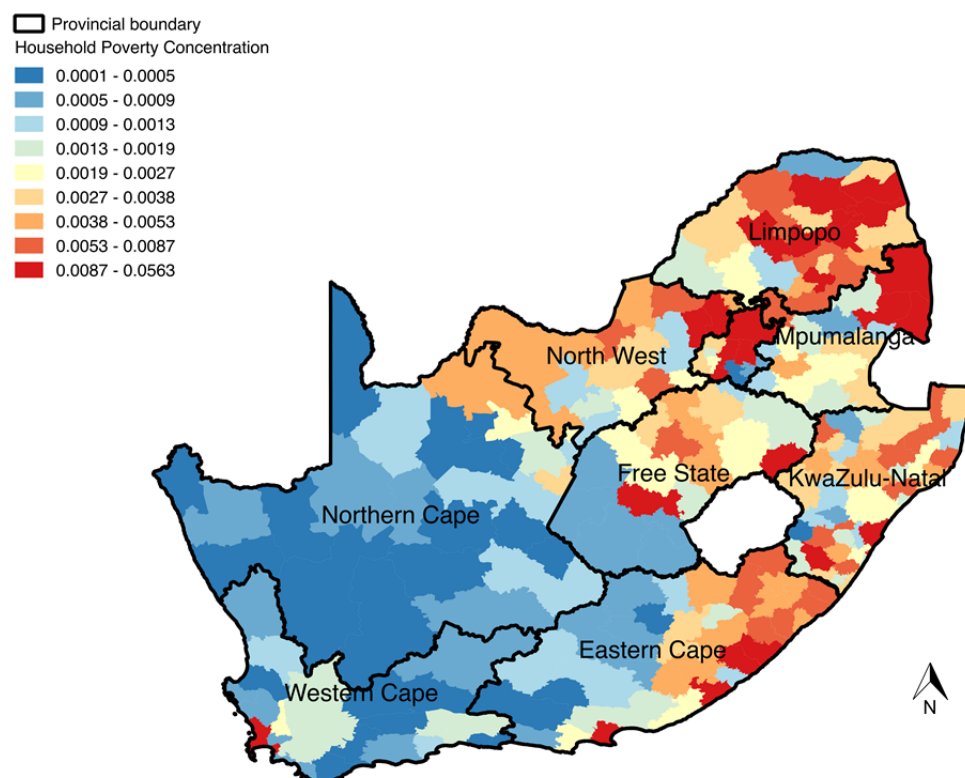
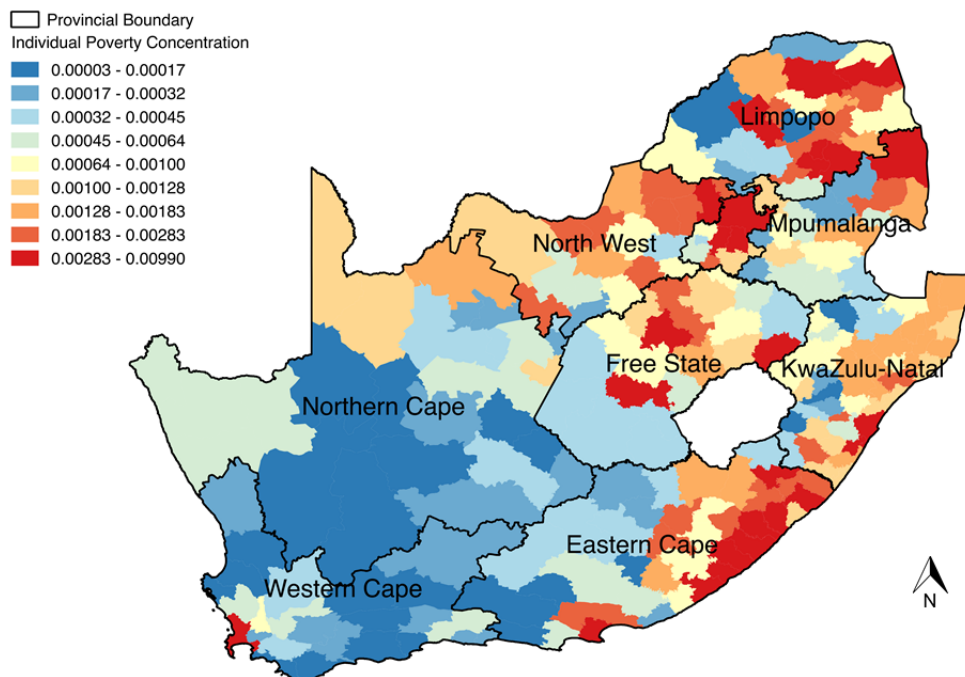
Finally, comparing the quantiles of the 1996 and 2011 Poverty Maps at the municipal level, Map 9 shows that the municipalities ranking as those with the highest extreme poverty rates (red colours) have faced a modest change over time in the north-east of Northern Cape and the east of North West. And new geographical areas have experienced an increase in their ranking of extreme poverty such as the province of KwaZulu-Natal and the east of Limpopo. Northern Cape and Free State have faced a decrease in individual poverty rates. Overall, Northern Cape and Free State have improved their ranking in the individual poverty rate distribution at the municipal level. However, in general, individual poverty rates present a larger heterogeneity in the poorest quantile (red colours) in 2011 than in 1996 (see ranges presented in the legend for each map).

Map 9: Individual poverty incidence at the municipal level (Poverty Map 1996 and 2011)



Source: Poverty Map 1996 calculations (map at the top) are from Alderman et al. (2001) and Poverty Map 2011 calculations (map at the bottom)

Map 10: Individual poverty density at the municipal level (Poverty Map 1996 and 2011)



Source: Poverty Map 1996 calculations (map at the top) are from Alderman et al. (2001) and Poverty Map 2011 calculations (map at the bottom)

Map 10 displays the poverty density in 1996 and 2011. The labels at the left of each map corresponds to the percentage of poor population living in the municipality of the total number of poor people in the country. Looking at both maps, we observe that the municipalities presenting the highest proportions of poor population (darker red colours), in both years, are in Limpopo, Gauteng, North West, KwaZulu-Natal and the eastern part of Eastern Cape. The west of Northern Cape and the south of Free State show a modest improvement in their poverty density rankings.

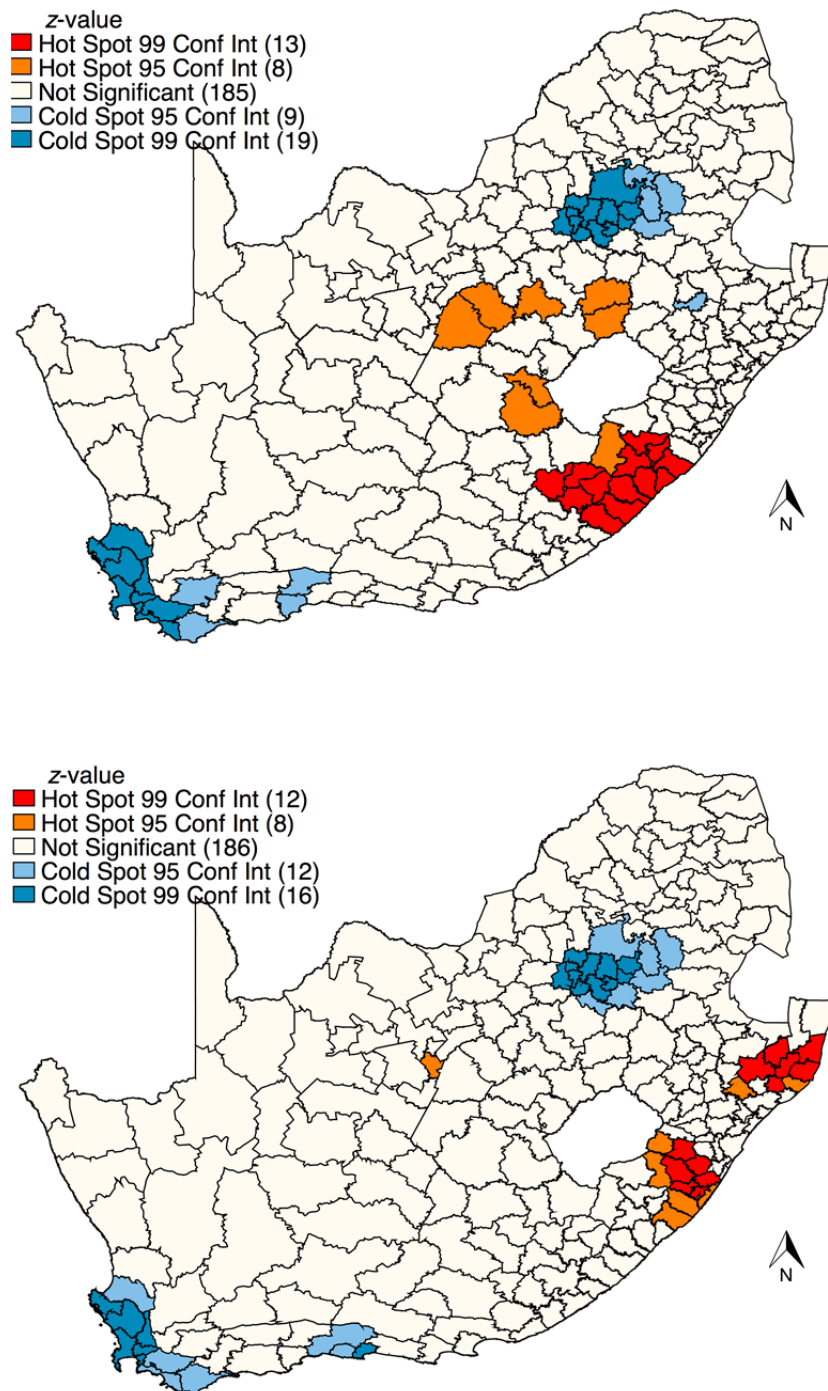
To complement the comparison between 1996 and 2011 Poverty Map estimates, we used Getis-Ord analysis to identify possible clustering of poverty and density rates. Getis and Ord (1992) developed a method for hot and cold spot analysis motivated by the idea that spatial associations may be locally heterogeneous even when global spatial autocorrelation is observed. The method used to construct hot and cold spot areas is *zone of differences* using the average distance between points.¹¹ The main idea of this analysis is to identify clusters where within clusters the inter-point distance is smaller than between clusters. Thus, clusters have similar levels of wealth. Red clusters represent municipalities with high levels of poverty and blue clusters low levels of poverty.¹²

Map 11 shows 99 and 95 percent confidence intervals of hot and cold spots based on Poverty Map estimates of individual poverty rates in 1996 and 2011. We observe the hot spot municipalities are primarily concentrated in the north of Eastern Cape (red colour) and in Free State. In 2011, the hot spot in Free State and Eastern Cape is no longer significant, however, the province of KwaZulu-Natal appears to have significant poverty clustering. In other words, Free State and Eastern Cape not only faced a reduction in poverty rates, but their clustering of poverty is no longer as significant in 2011.

¹¹ The zone difference method combines the Inverse Distance and Fixed Distance Band models. Features within the distance threshold are included in the analysis for the target feature and once the critical distance is surpassed the level of influence quickly declines. See further details in: <http://pro.arcgis.com/en/pro-app/tool-reference/spatial-statistics/modeling-spatial-relationships.htm>. The team used the "getisord" command in Stata (see Kondo 2016) together with a mata-based do file shared by the reviewer Paul Andreas Corral Rodas.

¹² The reader should be aware that the *cluster effect* previously explained in the ELL method section is not the same as hotspot clusters.

**Map 11: Hot and Cold Spot Analysis of individual poverty rates at the municipal level
(Poverty Map 1996 and 2011)**

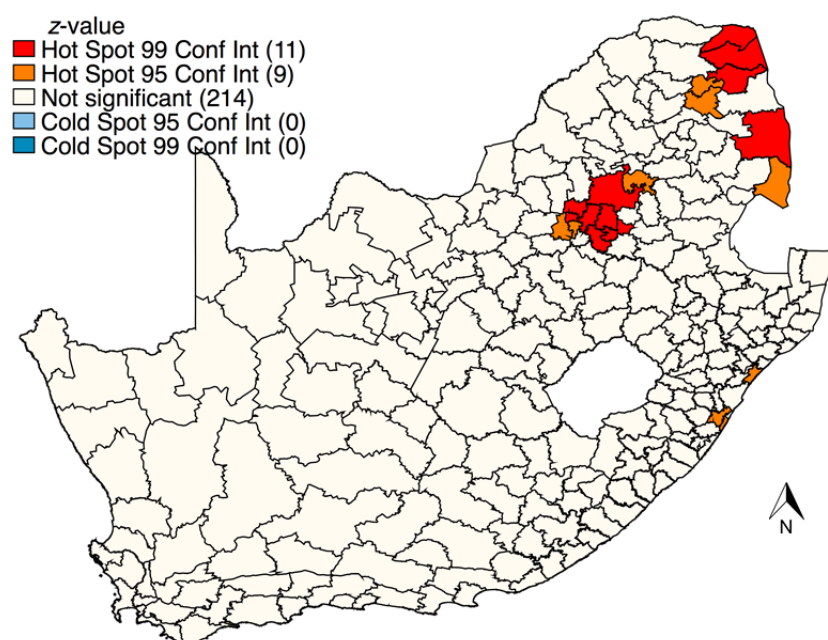
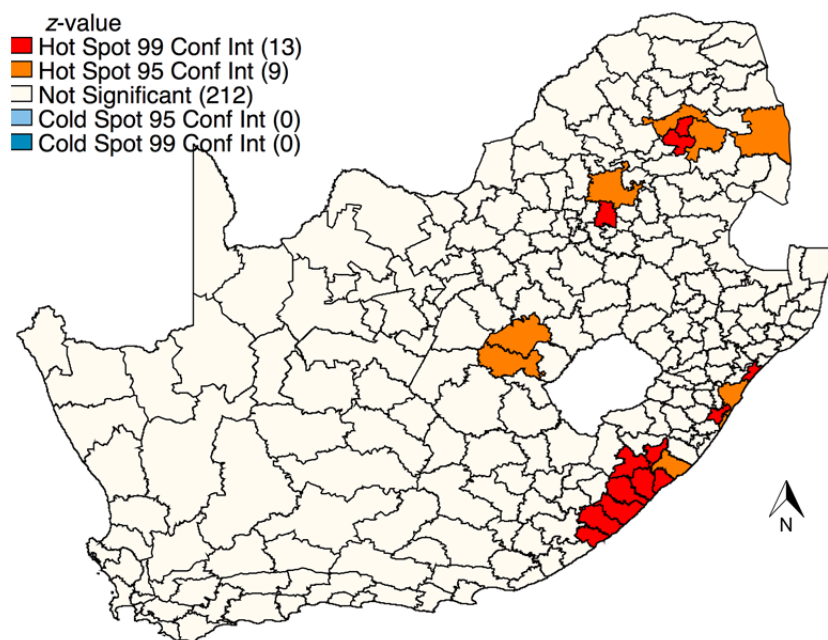


Source: Poverty Map 1996 calculations (map at the top) are from Alderman et al. (2001) and Poverty Map 2011 calculations (map at the bottom)

Map 12 shows a similar analysis for poverty density at the municipal level. While in 1996 the poverty clusters were primarily located in Free State, Eastern Cape, Limpopo and Gauteng. The clustering of poverty density became insignificant in 2011 for Free State and Eastern Cape, but increased in

Gauteng and Limpopo. Thus, the last two provinces not only have faced high levels of extreme poverty between 1996 and 2011, but their clustering of poverty density has worsened.

**Map 12: Hot and Cold Spot Analysis of poverty density at the municipal level
(Poverty Map 1996 and 2011)**



Source: Poverty Map 1996 calculations (map at the top) are from Alderman et al. (2001) and Poverty Map 2011 calculations (map at the bottom)

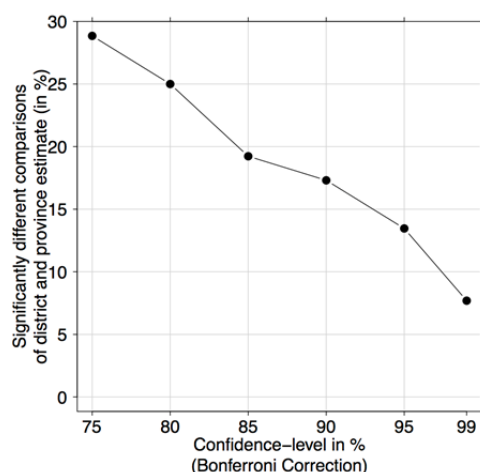
The Poverty Mapping team recommends extreme caution when comparing individual poverty rates over time given the main differences in: (a) the ELL implementation and (b) the selection of comparable variables between census and survey. During the period of 1999-2017, the ELL method has been revised and improved by academics and World Bank staff. The method used for the Poverty Map 2011 already considers the latest recommendations derived from such revisions.

5.4 Precision of Poverty Measurements

In this section, we discuss the precision of poverty measures. All standard errors of poverty measures were calculated by defining the cluster effect at the level of the target population. For instance, to obtain standard errors for municipal level poverty rates, the cluster effect was defined at the municipal level. To analyse the precision of our estimates we compare poverty rates within and between sub-national levels. To summarise the precision of our Poverty Map 2011 estimates, this section focuses on individual poverty rates (FPL poverty) at the district and municipal levels. The analysis of the precision of poverty rates is useful to understand: (a) gains from disaggregating provincial poverty rates into district and municipal level rates and (b) differences of municipalities within districts and provinces.

To understand the statistical differences among municipalities, Figure 5 summarises pairwise comparisons between district and province-level poverty rates. Figure 5 shows the percentage of municipalities that present significant differences between district and provincial poverty rates. For instance, 17 percent of districts significantly differ at a confidence level of 90 percent with the province-level poverty rate.¹³

Figure 5: Significantly different pairwise comparisons between individual poverty rates at the district and provincial level by confidence level

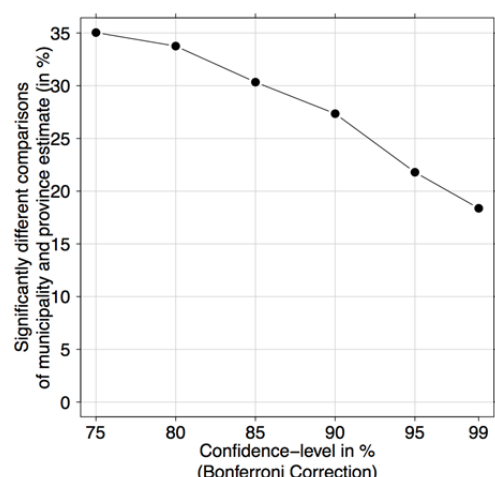


These proportions already consider Bonferroni corrections which adjust the significance level (α) by the number of comparisons among districts. This adjustment, known as the Bonferroni correction, aims to minimise the Type I error (rejection of the null hypothesis when it is true).

¹³ At the 99 percent confidence level, 1 percent of the comparisons will test as significantly different even if none of them is. The reader should bear in mind that the same interpretation applies to the rest of comparisons at various confidence levels.

Comparing municipality and province-level poverty rates, Figure 6 shows that 27 percent of municipalities present significant differences with the province-level poverty rate at the 90 percent confidence level.

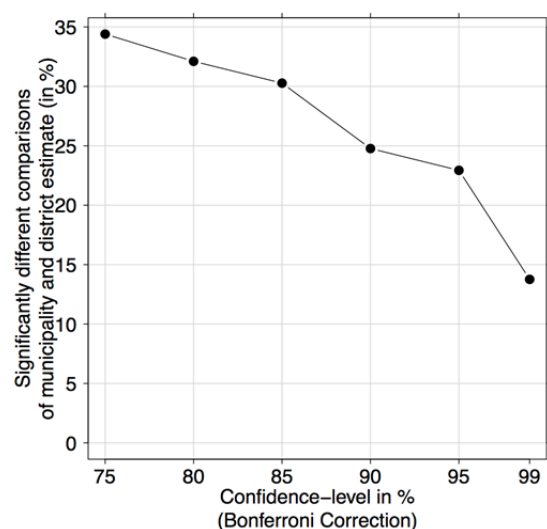
Figure 6: Significantly different pairwise comparisons between individual poverty rates at the municipal and provincial level by confidence level



The above comparisons shed light on the relevance of obtaining poverty rates at sub-national levels given that the most aggregated geographical partition may mask the heterogeneity within provinces. Figures B3 and B4 of Appendix B report food, lower- and upper-bound poverty rates (household and individual) including their confidence intervals to provide a general picture of the precision of Poverty Map 2011 estimates.

When comparing district and municipal level poverty rates, 25 percent of municipalities present significantly different poverty rates from the district-level rates (see Figure 7).

Figure 7: Significantly different pairwise comparisons between individual poverty rates at the municipal and district level by confidence level



To better understand the differences among municipalities, Figure 8 shows the proportion of significant pairwise comparisons between municipality and district-level poverty rates. Eight districts contain only one municipality; hence, Figure 8 presents only the 44 districts that contain more than one municipality. The panel of the 90 percent confidence level shows that 32 of 44 districts have municipalities with significant differences between municipality and district poverty rate. This panel reveals that, in four districts, approximately 18 percent of the pairwise comparisons are statistically significant; in 14 districts, between 20–40 percent; and in 12 districts, more than 40 percent of the pairwise comparison between municipalities and their district are statistically different. Hence, distinguishing between municipalities and districts is crucial to highlight the heterogeneous composition of aggregated sub-national partitions.

Figure 8: Significantly different pairwise comparisons of individual poverty rates at the municipal and district level by confidence level

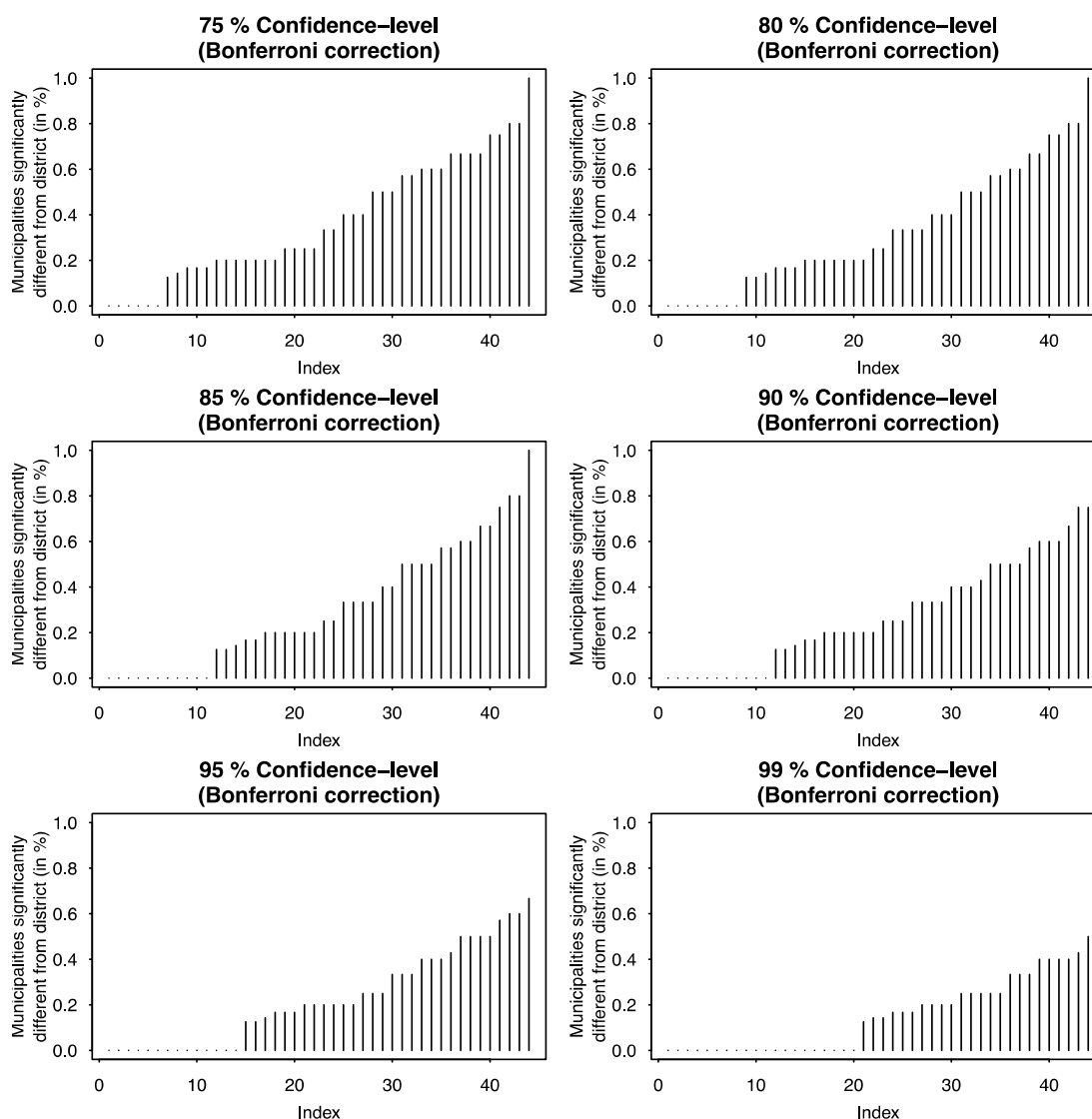
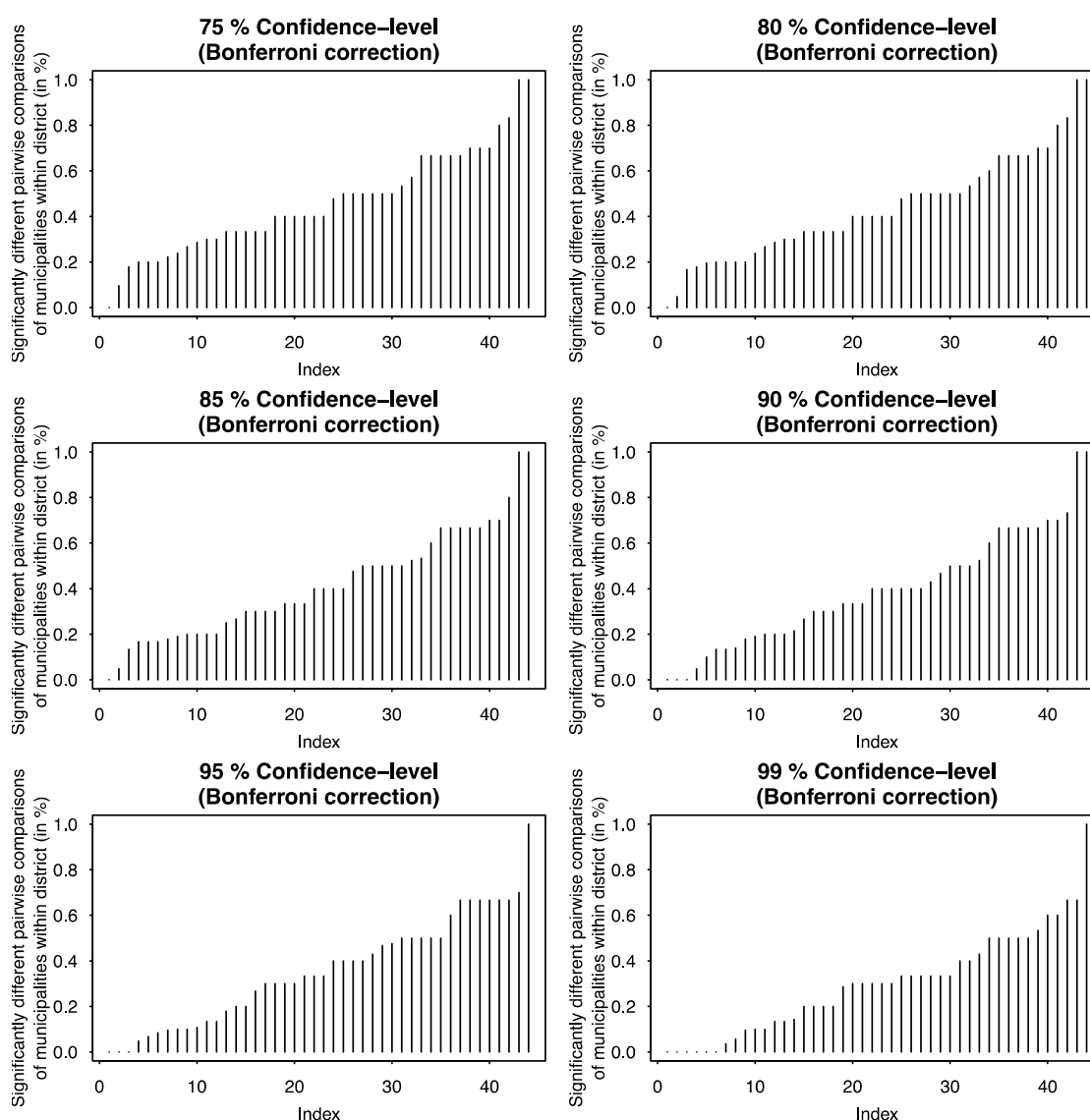


Figure 9 presents the proportion of significant pairwise comparisons within districts. The panel of the 90 percent confidence level shows that 41 of 44 districts have municipalities with significant differences among them. This panel reveals that, in seven districts, approximately 20 percent of the pairwise comparisons are statistically significant; in 10 districts, between 20–40 percent; and in 24 districts, more than 40 percent of the pairwise comparisons between municipalities are statistically different. Hence, distinguishing between municipalities within districts is crucial to achieve more efficient allocations of public resources at local level.

Figure 9: Significantly different pairwise comparisons of individual poverty rates between municipalities and districts by confidence level



The above analysis provides strong evidence about the gain from disaggregating poverty rates into district and municipal levels using the Poverty Map 2011.

6. Social Programmes and Multidimensional Poverty

The apartheid era in South Africa left a legacy characterised by social, economic and spatial inequalities. Since the end of apartheid, one of the key objectives of the South African government has been to reduce the level of poverty and improve the living circumstances of all South Africans. With the advent of democracy, policies such as the Reconstruction and Development Programme (RDP), the Accelerated and Shared Growth Initiative for South Africa (AsgiSA) and the Growth, Employment and Redistribution (GEAR) strategy, aim to reduce poverty and inequality through economic growth. Since 1994, the RDP sought to address the disparities that existed between black and white populations through meeting basic needs, developing human resources, building the economy and democratising the state.

In 2011, the government released its National Development Plan (NDP) which is the current framework for ensuring pro-poor economic growth strategies in South Africa. The plan maintains that a decent standard of living can be realised through a multi-prolonged strategy which begins by identifying elements involved, such as employment opportunities, acquisition of quality education and skills, adequate nutrition, among others. The overarching goal of the NDP then becomes the reduction of poverty (reduce the proportion of the population living below the LBPL to zero percent) and inequality (reduce Gini-coefficient from 0.7 to 0.6) by 2030. Additionally, the NDP highlights programmes and projects to be put in place to promote building infrastructure (among others) as a mean for job creation, fast-tracking service delivery and creation of business opportunities.

Over the years, various government initiatives have been implemented to address poverty and inequality in South Africa. These initiatives can be categorised into two groups, namely: i) those aiming to provide an environment for which individuals are able to gain decent livelihoods such as job creation, government subsidies supporting small businesses, etc.; and ii) those aiming to reduce the cost of living for the poor (social wage). This social wage includes provision of social grants to qualifying individuals, provision of free housing to qualifying households, provision of free basic services to indigent households, free basic education and school feeding schemes in poor areas, among other benefits.

Significant strides have been made by the South African government through the provision of the social wage towards poverty and inequality reduction. To date, more than 17 million social grants are monthly issued to people who qualify the means test. Approximately, 4.3 million households have been allocated RDP houses or subsidies, about 3.6 million households are registered as indigent households of which 62.8 percent receive free electricity, 67.8 percent receive free piped water, 57.6 percent receive free sanitation services and 57.6 percent receive free refuse removal services. In addition, about 76.2 percent of pupils in South Africa are benefiting from school feeding schemes and more than 20,000 schools are declared as no fee schools.

Comparing the South African Multidimensional Poverty Index (SAMPI) between 2001 and 2016 we observe important changes in poverty. The SAMPI is an index compounded by four dimensions: health, education, living standards and economic activity. Because the SAMPI mostly focuses on access to services and facilities without concerning itself with monetary measures, the poverty levels are lower compared to money-metric measures of poverty (such as the ones discussed in the previous sections). The contribution of the government's poverty reduction programs such as no-fee schools, free primary health care, access to free basic services and provision of free formal housing are well captured by the SAMPI.

In Table 5 we show the SAMPI in 2001, 2011 and 2016. These results indicate a significant drop in the proportion of households that were multidimensionally poor between 2001 and 2011 from 17.9 to 8.0 percent whilst a slight drop by about one percentage point is observed between 2011 and 2016. In addition, a slight decrease in the intensity of poverty experienced from 43.9 in 2001 to 42.3 percent in 2011 is observed whilst intensity did not decrease between 2011 and 2016 (42.3 in 2011 and 42.8 percent in 2016).

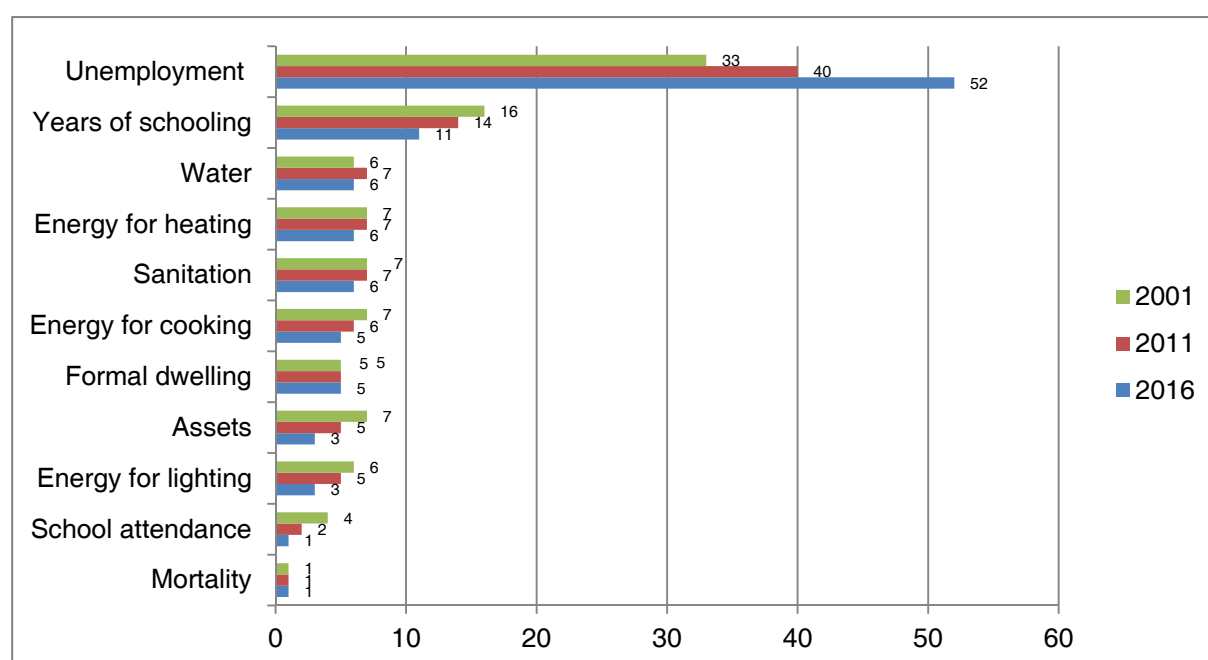
Table 5: Multidimensional poverty at national level (SAMPI)

Year	Headcount (H)	Intensity (A)	SAMPI (HxA)
2001	17.9%	43.9%	0.08
2011	8.0%	42.3%	0.03
2016	7.0%	42.8%	0.03

Source: Census 2001, Census 2011 and Community Survey 2016

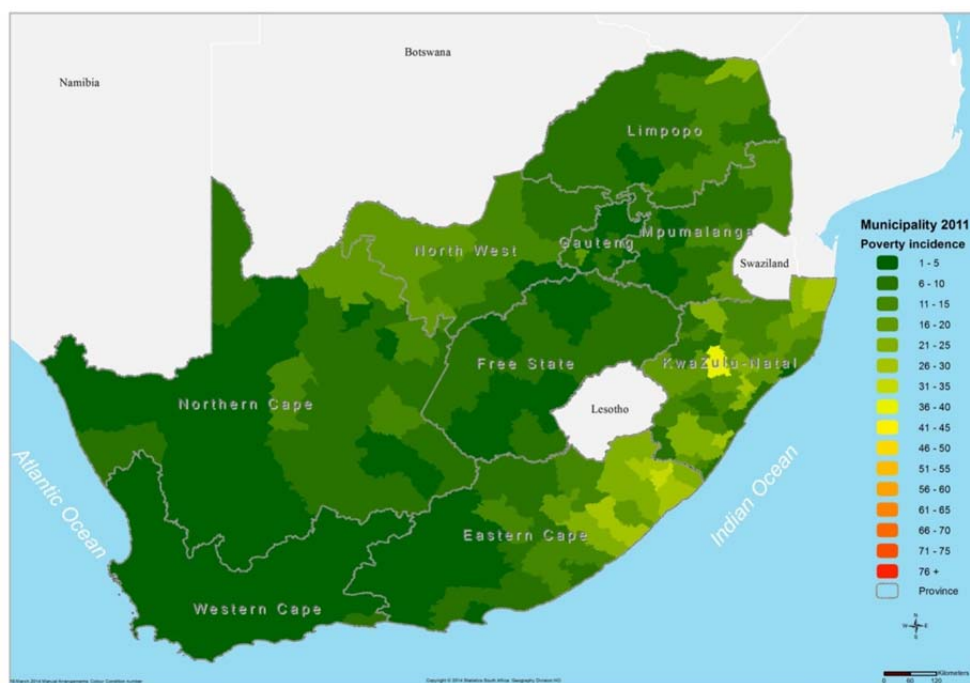
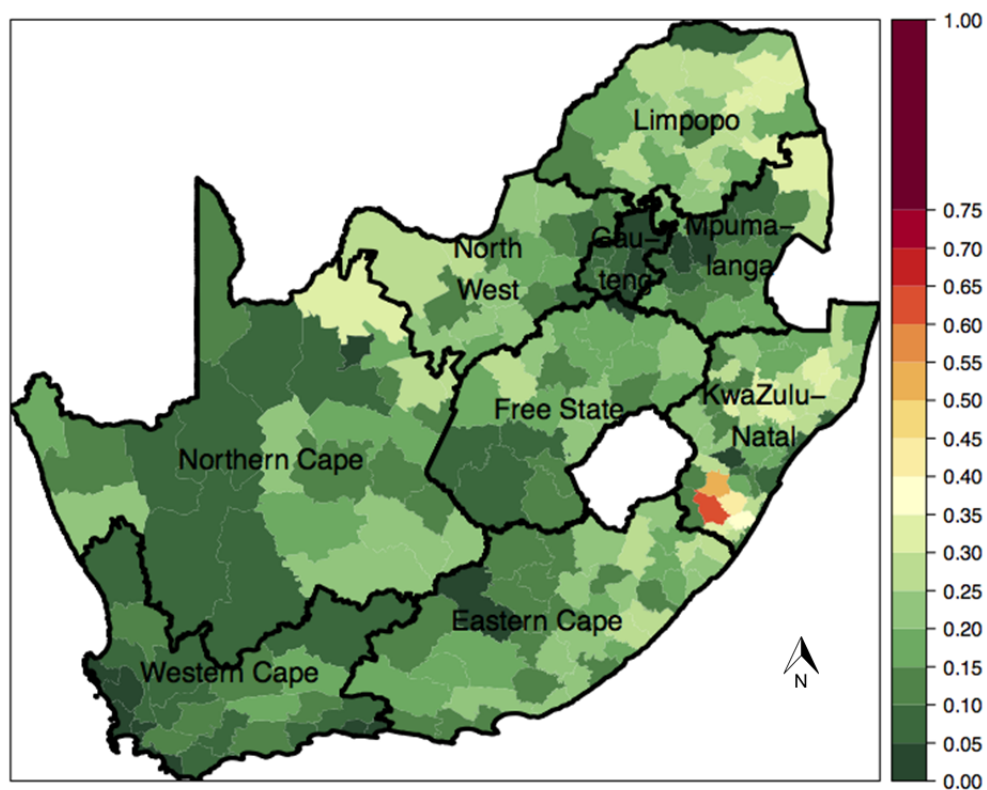
While the SAMPI indicates significant improvements regarding poverty reduction, unemployment and education are still significant challenges in South Africa. Unemployment and education remain the two main contributors of poverty in the country, see Figure 10.

Figure 10: Contributors of weighted indicators to SAMPI at national level



Comparing the SAMPI in 2011 and the Poverty Map 2011 findings in Map 13, we observe a similar geographical dispersion of the poorest municipalities. To approximate the comparability of maps, we show the display of household poverty rates produced by the Poverty Map 2011 with the palette used by Stats SA for multidimensional poverty.

Map 13: Household poverty rates at the municipal level (Poverty Map 2011 and SAMPI)



Both consumption-based and multidimensional measures reveal similar geographical dispersion of household poverty rates. The provinces of Eastern Cape, Limpopo and KwaZulu-Natal concentrate the municipalities with the highest poverty rates. However, while the north of Northern Cape and the south of KwaZulu-Natal present relatively low multidimensional poverty rates of 26–30 percent, the consumption-based Poverty Map 2011 estimates show a higher monetary poverty of 30–35 percent for the north of Northern Cape and above 56 percent for some municipalities in the south of KwaZulu-Natal.

7. Conclusions and Recommendations

This report presents consumption-based Poverty Map estimates at the district and municipal levels in South Africa based on the Income and Expenditure Survey 2010/11 and Census 2011. Such poverty estimates are accompanied by standard errors to evaluate their precision. Therefore, what the Poverty Map 2011 has produced is a range of poverty rates at district and municipality levels.

After analysing the standard errors of the poverty estimates at the district and municipal levels, the authors conclude that the precision of district and municipal estimates allows to statistically distinguish poverty rates between and within sub-national partitions. The estimation of poverty rates considers the identification of the cluster effect at the target population (district and municipality level).

Some of the key Poverty Map 2011 findings are:

- The highest individual and household poverty rates at the municipal level are in KwaZulu-Natal, Eastern Cape, Limpopo and North West provinces.
- KwaZulu-Natal, Limpopo and Eastern Cape concentrate most of the thirty municipalities with the highest poverty rates from 33 to 67 percent of people living in extreme poverty (below FPL).
- The thirty municipalities with the lowest poverty rates are primarily in the provinces of Gauteng and Western Cape. The range of poverty rates for this group goes from 9 to 20 percent of people living in extreme poverty.
- KwaZulu-Natal, Gauteng, Mpumalanga and Western Cape have the municipalities with the highest density of extremely poor individuals in the country.
- Four districts account for approximately 19 percent of the people living in extreme poverty. Looking at municipal level estimates we observe that only five municipalities account for 17 percent of the households living in such condition. These municipalities are eThekweni (KwaZulu-Natal), City of Johannesburg (Gauteng), Bushbuckridge (Mpumalanga), City of Cape Town (Western Cape) and Ekurhuleni (Gauteng).
- The highest levels of inequality at the municipality level are observed in the provinces of Gauteng and Mpumalanga, and the lowest levels in Northern Cape, north of KwaZulu-Natal, Eastern Cape and the south of Free State.
- At the municipality level, the poorest quantile of individual poverty rates range between 33–67 percent of the population living in extreme poverty (below the food poverty line) and the richest quantile between 4–9 percent. For household poverty rates, the poorest quantile ranges from 21–48 percent and the richest from 2–5 percent. As in district-level poverty rates, in both cases the poorest quantile present a larger variation than their richer counterparts. Both individual and household maps offer similar conclusions, municipalities with the highest poverty rates are primarily located in the north-east, east and south-east of the country.
- Comparing 1996 and 2011 Poverty Map findings, Eastern Cape and Free State show a decrease in extreme poverty at the municipal level, and a reduction in poverty clustering. The state of KwaZulu-Natal present in the Poverty Map 2011 shows significant poverty clustering. When comparing the 1996 and 2011 poverty density, we observe municipal clustering became insignificant for Free State and Eastern Cape in 2011, but increased for the provinces of Gauteng and Limpopo.

Poverty and inequality estimates at lower geographic levels can be a powerful tool for South Africa's policy-makers. When comparing poverty estimates among municipalities within districts, and between sub-national levels and the province, we observe statistically significant differences. These differences will help policy-makers to identify households and individuals living in poverty at district and municipality levels and therefore, to allocate resources to reduce poverty and inequality in South Africa.

When the authors compare district poverty rates with municipality poverty rates, they find that in 25 percent of the municipality pairwise comparisons, the poverty incidence is significantly different from the district poverty rate at the 90 percent confidence level. In addition, out of the 44 districts having more than one municipality, the team has found that 32 of them present significant pairwise comparisons between municipalities and district-level poverty rates. When comparing poverty rates of municipalities within districts, 41 of 44 districts have municipalities with significant differences among them. Hence, distinguishing between municipalities and districts and between municipalities within districts is crucial to achieve more efficient allocations of public resources at the local level. This finding justifies the need to apply targeting rules beyond the district level when allocating resources.

This report also emphasises the need to complement the analysis of poverty incidence with the identification of areas with large numbers of individuals living below the poverty line. In several cases, the rankings derived from both welfare indicators provided different conclusions because of the density of the poor population in districts and municipalities.

In sum, the Poverty Map 2011 estimates shed light on the geographic dispersion and density of poverty and inequality among districts, and within them at the municipal level. This information holds important value for policy-makers to prioritise the use of scarce resources in areas that need them most.

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Appendix A: Comparability between Survey and Census

Table A1: Household head variables

		Census			Survey		
Variable definition	Variable Name	Mean	Mean	St. Error	99 Confidence Inte		Comp.
		3.50	3.51	0.03	LB	UB	
Household Size	hsize				3.43	3.58	yes
Household Head							
Gender (1=Male)	genderhh	0.58	0.68	0.01	0.66	0.69	no
African/Black	popgrouphh_dum1	0.79	0.74	0.01	0.71	0.76	no
Coloured	popgrouphh_dum2	0.07	0.09	0.00	0.07	0.10	no
Indian/Asian	popgrouphh_dum3	0.02	0.03	0.00	0.02	0.04	yes
White	popgrouphh_dum4	0.11	0.15	0.01	0.13	0.17	no
Maximum Education of Household Head							
Grade 0	max_education_dum1	0.00	0.00	0.00	0.00	0.00	no
Grade 1	max_education_dum2	0.01	0.01	0.00	0.00	0.01	no
Grade 2	max_education_dum3	0.02	0.01	0.00	0.01	0.01	no
Grade 3/standard 1/abet 1	max_education_dum4	0.02	0.02	0.00	0.02	0.03	yes
Grade 4/standard 2	max_education_dum5	0.03	0.03	0.00	0.02	0.03	yes
Grade 5/standard 3/abet 2	max_education_dum6	0.03	0.03	0.00	0.02	0.03	yes
Grade 6/standard 4	max_education_dum7	0.04	0.04	0.00	0.03	0.05	yes
Grade 7/standard 5/abet 3	max_education_dum8	0.05	0.06	0.00	0.05	0.06	yes
Grade 8/standard 6	max_education_dum9	0.08	0.07	0.00	0.06	0.08	no
Grade 9/standard 7/abet 4	max_education_dum10	0.05	0.06	0.00	0.06	0.07	no
Grade 10/standard 8/ntc i	max_education_dum11	0.09	0.10	0.00	0.09	0.11	no
Grade 11/standard 9/ntc ii	max_education_dum12	0.09	0.12	0.00	0.11	0.13	no
Grade 12/standard 10/ntc iii	max_education_dum13	0.23	0.21	0.00	0.19	0.22	no
Certificate with less than grade 12/std10	max_education_dum14	0.01	0.00	0.00	0.00	0.01	no
Diploma with less than grade 12/std 10	max_education_dum15	0.00	0.01	0.00	0.01	0.01	no
Certificate with grade 12/std 10	max_education_dum16	0.01	0.03	0.00	0.03	0.04	no
Diploma with grade 12/std 10	max_education_dum17	0.02	0.07	0.00	0.06	0.08	no
Bachelors degree 3 years	max_education_dum18	0.02	0.02	0.00	0.02	0.03	yes
Bachelors degree 4 years or more & post.	max_education_dum19	0.04	0.03	0.00	0.02	0.04	yes
Honours degree	max_education_dum20	0.01	0.01	0.00	0.01	0.02	yes
Higher degree (masters, phd)	max_education_dum21	0.01	0.01	0.00	0.01	0.02	no
No Schooling	max_education_dum22	0.12	0.05	0.00	0.04	0.05	no
Other schooling, unspecified and NA	max_education_dum23	0.78	0.00	0.00	0.00	0.00	no
Schooling above grade 12	max_education_dum14_21	0.13	0.20	0.01	0.18	0.22	no
Primary Schooling	max_educ_level_first	0.15	0.13	0.00	0.12	0.15	no
Secondary Schooling	max_educ_level_second	0.65	0.73	0.01	0.72	0.75	no
Terciary Schooling	max_educ_level_third	0.08	0.08	0.00	0.07	0.10	yes
No Schooling (version 2)	max_educ_level_none	0.12	0.05	0.00	0.04	0.05	no
Other Schooling (version 2)	max_educ_level_other	0.00	0.00	0.00	0.00	0.00	no
Income Group based on Household Head's Income							
No Income	income_dum1	0.30	0.00	0.00	0.00	0.00	no
Income: 1-5k	income_dum2	0.04	0.03	0.00	0.02	0.03	no
Income: 5-10k	income_dum3	0.05	0.05	0.00	0.04	0.05	yes
Income: 10-19k	income_dum4	0.25	0.10	0.00	0.10	0.11	no
Income: 19-38k	income_dum5	0.12	0.19	0.01	0.18	0.20	no
Income: 38-77k	income_dum6	0.09	0.20	0.01	0.19	0.22	no
Income: 77-154k	income_dum7	0.07	0.16	0.00	0.14	0.17	no
Income: 154-307k	income_dum8	0.06	0.13	0.00	0.12	0.14	no
Income: 307-614k	income_dum9	0.03	0.09	0.00	0.08	0.10	no
Income: 614-1229k	income_dum10	0.01	0.04	0.00	0.04	0.05	no
Income: 1229-2458k	income_dum11	0.00	0.01	0.00	0.00	0.01	yes
Income: over2458k	income_dum12	0.00	0.00	0.00	0.00	0.00	no

Table A2: Dwelling characteristics (1/2)

Variable definition	Variable Name	Census			Survey		Comp.
		Mean	Mean	St. Error	99 Confidence Inte		
					LB	UB	
Dwelling Characteristics: Type							
House	maindwelling_dum1	0.63	0.67	0.01	0.64	0.69	no
Traditional dwelling/hut	maindwelling_dum2	0.08	0.05	0.00	0.05	0.06	no
Flat	maindwelling_dum3	0.05	0.05	0.01	0.04	0.07	yes
Cluster house iin security complex	maindwelling_dum4	0.01	0.01	0.00	0.00	0.02	yes
Town House/Semi-detached	maindwelling_dum5	0.03	0.02	0.00	0.01	0.03	yes
Room in house/flat	maindwelling_dum6	0.03	0.05	0.00	0.04	0.06	no
Informal dwelling/shack in backyard	maindwelling_dum7	0.04	0.04	0.00	0.03	0.05	yes
Informal dwelling/shack not in backyard	maindwelling_dum8	0.08	0.07	0.01	0.05	0.08	yes
Room/Flatlet on a property	maindwelling_dum9	0.01	0.03	0.00	0.02	0.04	no
Caravan/Tent	maindwelling_dum10	0.00	0.00	0.00	0.00	0.00	yes
Other type of dwelling	maindwelling_dum11	0.01	0.01	0.00	0.00	0.01	yes
Dwelling Characteristics: Roof Construction Material							
Brick	roof_dum1	0.00	0.01	0.00	0.01	0.01	no
Cement block/Concrete	roof_dum2	0.03	0.05	0.01	0.03	0.06	no
Corrugated iron/zinc	roof_dum3	0.54	0.56	0.01	0.53	0.58	yes
Wood	roof_dum4	0.01	0.01	0.00	0.00	0.01	no
Plastic	roof_dum5	0.00	0.00	0.00	0.00	0.01	yes
Cardboard	roof_dum6	0.00	0.00	0.00	0.00	0.00	yes
Mud and cement mix	roof_dum7	0.00	0.00	0.00	0.00	0.00	no
Wattle and daub	roof_dum8	0.01	0.00	0.00	0.00	0.00	no
Tile	roof_dum9	0.20	0.24	0.01	0.22	0.26	no
Mud and cement mix	roof_dum10	0.00	0.00	0.00	0.00	0.00	yes
Thatch/Grass	roof_dum11	0.07	0.02	0.00	0.01	0.02	no
Asbestos	roof_dum12	0.10	0.11	0.01	0.09	0.12	yes
Other type of dwelling	roof_dum13	0.01	0.00	0.00	0.00	0.00	no
Missing information	roof_dum14	0.03	0.00	0.00	0.00	0.01	no
Dwelling Characteristics: Wall Construction Material							
Bricks	walls_dum1	0.61	0.62	0.01	0.59	0.64	yes
Cement block/Concrete	walls_dum2	0.14	0.16	0.01	0.14	0.17	yes
Corrugated iron/zinc	walls_dum3	0.10	0.12	0.01	0.10	0.14	yes
Wood	walls_dum4	0.02	0.02	0.00	0.02	0.03	yes
Plastic	walls_dum5	0.00	0.00	0.00	0.00	0.00	yes
Cardboard	walls_dum6	0.00	0.00	0.00	0.00	0.00	yes
Mud and cement mix	walls_dum7	0.03	0.02	0.00	0.01	0.02	no
Wattle and daub	walls_dum8	0.00	0.00	0.00	0.00	0.01	yes
Tile	walls_dum9	0.00	0.00	0.00	0.00	0.00	no
Mud	walls_dum10	0.04	0.04	0.00	0.04	0.05	yes
Thatch/Grass	walls_dum11	0.00	0.00	0.00	0.00	0.00	yes
Asbestos	walls_dum12	0.00	0.00	0.00	0.00	0.01	yes
Other type of dwelling	walls_dum13	0.01	0.01	0.00	0.00	0.01	yes
Missing information	walls_dum14	0.03	0.00	0.00	0.00	0.01	no
Dwelling Characteristics: Main Source of Water							
Regional/local water scheme	watersource_dum1	0.79	0.92	0.00	0.91	0.93	no
Borehole	watersource_dum2	0.06	0.02	0.00	0.01	0.02	no
Spring	watersource_dum3	0.01	0.01	0.00	0.00	0.01	no
Rain water tank	watersource_dum4	0.01	0.01	0.00	0.00	0.01	no
Dam/pool/stagnant water	watersource_dum5	0.02	0.01	0.00	0.00	0.01	no
River/stream	watersource_dum6	0.05	0.02	0.00	0.02	0.03	no
Water vendor	watersource_dum7	0.04	0.01	0.00	0.01	0.02	no
Other	watersource_dum8	0.03	0.02	0.00	0.01	0.02	no
Missing information	watersource_dum9	0.00	0.00	0.00	0.00	0.00	yes
Dwelling Characteristics: Main Source of Water							
Regional/local water scheme	watersourcealt_dum1	0.02	0.88	0.01	0.86	0.90	no
Borehole	watersourcealt_dum2	0.01	0.02	0.00	0.01	0.02	no
Spring	watersourcealt_dum3	0.01	0.01	0.00	0.00	0.01	yes
Rain water tank	watersourcealt_dum4	0.01	0.00	0.00	0.00	0.01	no
Dam/pool/stagnant water	watersourcealt_dum5	0.02	0.01	0.00	0.00	0.01	no
River/stream	watersourcealt_dum6	0.02	0.03	0.00	0.02	0.03	no
Water vendor	watersourcealt_dum7	0.09	0.02	0.00	0.01	0.03	no
Other	watersourcealt_dum8	0.02	0.04	0.00	0.03	0.05	no
Missing information	watersourcealt_dum9	0.81	0.00	0.00	0.00	0.01	no

Table A2: Dwelling characteristics (2/2)

		Census			Survey		
Variable definition	Variable Name	Mean	Mean	St. Error	99 Confidence Inte		Comp.
					LB	UB	
Dwelling Characteristics: Toilet Facility							
None	toilet_dum1	0.05	0.04	0.00	0.03	0.04	no
Connected to sewerage	toilet_dum2	0.57	0.66	0.01	0.63	0.68	no
Septic Tank	toilet_dum3	0.03	0.03	0.00	0.03	0.04	yes
Chemical toilet	toilet_dum4	0.02	0.01	0.00	0.00	0.01	no
Pit toilet with ventilation (VIP)	toilet_dum5	0.09	0.09	0.00	0.08	0.11	yes
Pit toilet without ventilation (VIP)	toilet_dum6	0.19	0.16	0.01	0.14	0.18	no
Bucket toilet	toilet_dum7	0.02	0.01	0.00	0.00	0.01	no
Other	toilet_dum9	0.00	0.00				no
Dwelling Characteristics: Electricity and Rooms							
Connection to electricity	electricity	0.85	0.88	0.01	0.86	0.90	no
Number of bedrooms	bedroom	1.80	1.86	0.03	1.80	1.93	yes
Number of livingrooms	livingroom	0.86	0.48	0.01	0.45	0.51	no
Number of diningrooms	diningroom	0.96	0.24	0.01	0.22	0.25	no
Number of multipurpose rooms	multipurpose	1.51	0.42	0.01	0.39	0.44	no
Total number of rooms	totalrooms	4.69	3.62	0.07	3.44	3.80	no
Dwelling Characteristics: Tenure of Main Dwelling							
Rented	tenure_dum1	0.23	0.54	0.01	0.52	0.57	no
Owned but not fully paid	tenure_dum2	0.12	0.13	0.01	0.11	0.14	yes
Occupied rent-free	tenure_dum3	0.18	0.25	0.01	0.23	0.27	no
Owned fully paid	tenure_dum4	0.41	0.07	0.01	0.06	0.09	no
Other	tenure_dum5	0.03	0.00	0.00	0.00	0.00	no
Dwelling Characteristics: Assets							
Radio	radio	0.67	0.56	0.01	0.54	0.58	no
TV	television	0.75	0.80	0.01	0.79	0.82	no
DVD player	dvdplayer	0.60	0.66	0.01	0.65	0.68	no
Fridge	refridgerator	0.69	0.74	0.01	0.72	0.76	no
Stove	stove	0.77	0.89	0.01	0.88	0.91	no
Wash machine	washingmachine	0.32	0.38	0.01	0.35	0.40	no
Motor car	motorcar	0.29	0.35	0.01	0.32	0.37	no
Computer	computer	0.21	0.24	0.01	0.22	0.26	no
Mobile	cellular	0.89	0.94	0.00	0.93	0.95	no
Landline	landline	0.14	0.17	0.01	0.15	0.18	no
Internet	internet	0.36	0.11	0.01	0.10	0.13	no
Geographical Stratum							
Urban	urban	0.68	0.74	0.01	0.72	0.75	no
Traditional	traditional	0.28	0.21	0.01	0.20	0.23	no
Rural	farms	0.04	0.05	0.00	0.04	0.06	yes

Table A3: Household composition

Variable definition	Variable Name	Census			Survey		Comp.
		Mean	Mean	St. Error	99 Confidence Inte		
					LB	UB	
Number of Household Members							
0-5 years old	sum_age0_5	0.45	0.43	0.01	0.41	0.45	yes
6-10 years old	sum_age6_10	0.32	0.36	0.01	0.34	0.38	no
11-15 years old	sum_age11_15	0.32	0.35	0.01	0.33	0.36	no
16-25 years old	sum_age16_25	0.68	0.70	0.01	0.67	0.73	yes
26-45 years old	sum_age26_45	0.98	1.11	0.01	1.09	1.14	no
46-60 years old	sum_age46_60	0.43	0.43	0.01	0.41	0.46	yes
Older 60 years old	sum_ageabove60	0.26	0.13	0.01	0.11	0.14	no
African/Black	sum_popgroup_dum1	2.77	2.61	0.04	2.51	2.72	no
Coloured	sum_popgroup_dum2	0.30	0.35	0.02	0.30	0.40	yes
Indian/Asian	sum_popgroup_dum3	0.09	0.11	0.01	0.08	0.14	yes
White	sum_popgroup_dum4	0.29	0.44	0.03	0.37	0.50	no
Husban/wife/partner	sum_relationwhh_dum2	0.40	0.49	0.01	0.48	0.51	no
Offsprings	sum_relationwhh_dum3	1.12	1.28	0.02	1.24	1.33	no
Parents	sum_relationwhh_dum4	0.02	0.02	0.00	0.01	0.03	yes
Grandparents	sum_relationwhh_dum5	0.00	0.01	0.00	0.01	0.02	no
Other relatives	sum_relationwhh_dum6	0.85	0.64	0.02	0.60	0.68	no
Non-relatives	sum_relationwhh_dum7	0.06	0.04	0.00	0.04	0.05	no
Attending school	sum_attendsch	1.08	1.19	0.02	1.15	1.24	no
Employed	sum_employ_status_dum1	0.89	1.38	0.01	1.35	1.40	no
Unemployed	sum_employ_status_dum2	0.45	0.67	0.01	0.64	0.70	no
Less than 15 years	sum_employ_status_dum3	1.03	1.07	0.02	1.03	1.12	no
Student and >=15	sum_employ_status_dum4	0.39	0.36	0.01	0.34	0.38	no
Retiree	sum_employ_status_dum5	0.02	0.03	0.00	0.02	0.03	no
Employed for pay	sum_employedforpay	0.79	1.16	0.01	1.13	1.18	no
Run a business	sum_runsbusiness	0.14	0.24	0.01	0.22	0.26	no
Missing attendance	sum_miss_attendsch	0.00	0.06	0.00	0.05	0.07	no
Missing emp. status	sum_miss_employedforpay	0.00	2.00	0.03	1.93	2.07	no
Missing run a business	sum_miss_runsbusiness	0.00	2.00	0.03	1.93	2.07	no
Percentage of Household Members							
0-5 years old	per_age0_5	0.09	0.09	0.00	0.09	0.09	yes
6-10 years old	per_age6_10	0.07	0.07	0.00	0.07	0.08	no
11-15 years old	per_age11_15	0.07	0.07	0.00	0.07	0.07	no
16-25 years old	per_age16_25	0.19	0.19	0.00	0.18	0.19	yes
26-45 years old	per_age26_45	0.34	0.39	0.00	0.38	0.40	no
46-60 years old	per_age46_60	0.15	0.14	0.00	0.14	0.15	yes
Older than 60 years old	per_ageabove60	0.10	0.05	0.00	0.04	0.06	no
African/Black	per_popgroup_dum1	0.79	0.74	0.01	0.71	0.76	no
Coloured	per_popgroup_dum2	0.07	0.09	0.00	0.08	0.10	no
Indian/Asian	per_popgroup_dum3	0.02	0.03	0.00	0.02	0.04	yes
White	per_popgroup_dum4	0.11	0.15	0.01	0.13	0.17	no
Husban/wife/partner	per_relationwhh_dum2	0.12	0.14	0.00	0.14	0.15	no
Offsprings	per_relationwhh_dum3	0.24	0.27	0.00	0.27	0.28	no
Parents	per_relationwhh_dum4	0.00	0.00	0.00	0.00	0.01	yes
Grandparents	per_relationwhh_dum5	0.00	0.00	0.00	0.00	0.00	no
Other relatives	per_relationwhh_dum6	0.17	0.12	0.00	0.12	0.13	no
Non-relatives	per_relationwhh_dum7	0.02	0.01	0.00	0.01	0.01	no
Attending school	per_attendsch	0.25	0.27	0.00	0.26	0.28	no
Percentage of Household Members who Attended the Following Institutions							
Pre-school (including day care)	per_institution_dum1	0.00	0.03	0.00	0.03	0.04	no
Primary School	per_institution_dum2	0.20	0.11	0.00	0.10	0.12	no
Secondary School	per_institution_dum3	0.30	0.07	0.00	0.07	0.08	no
Higher Education Institution	per_institution_dum4	0.00	0.03	0.00	0.02	0.03	no
Further Education and Training College	per_institution_dum5	0.04	0.01	0.00	0.01	0.01	no
Literacy Classes	per_institution_dum6	0.00	0.00	0.00	0.00	0.00	no
Adult Basic Education and Training Centre	per_institution_dum7	0.00	0.00	0.00	0.00	0.00	no
Other type of institution	per_institution_dum8	0.45	0.74	0.00	0.73	0.75	no
Public pre-school	per_institutionpriv_dum1	0.00	0.02	0.00	0.02	0.03	no
Private pre-school	per_institutionpriv_dum2	0.00	0.01	0.00	0.01	0.01	no
Public primary school	per_institutionpriv_dum3	0.09	0.10	0.00	0.09	0.10	no
Private primary school	per_institutionpriv_dum4	0.01	0.01	0.00	0.01	0.02	no
Public secondary school	per_institutionpriv_dum5	0.06	0.07	0.00	0.06	0.07	no
Private secondary school	per_institutionpriv_dum6	0.01	0.01	0.00	0.01	0.01	yes
Other private institution	per_institutionpriv_dum7	0.50	0.03	0.00	0.02	0.03	no
Employed	per_employ_status_dum1	0.34	0.52	0.00	0.51	0.53	no
Unemployed	per_employ_status_dum2	0.14	0.16	0.00	0.16	0.17	no
Less than 15 years	per_employ_status_dum3	0.21	0.22	0.00	0.21	0.23	no
Student and >=15	per_employ_status_dum4	0.10	0.08	0.00	0.08	0.09	no
Retiree	per_employ_status_dum5	0.01	0.01	0.00	0.01	0.02	yes
Employed for pay	per_employedforpay	0.31	0.44	0.00	0.43	0.45	no
Run a business	per_runsbusiness	0.05	0.09	0.00	0.08	0.09	no
Missing attendance	per_miss_attendsch	0.00	0.01	0.00	0.01	0.01	no
Missing emp. status	per_miss_employedforpay	0.00	0.42	0.00	0.41	0.44	no
Missing run a business	per_miss_runsbusiness	0.00	0.43	0.00	0.41	0.44	no

Note: All continuous variables presented significant differences in distributions between census and survey with exception of percentage of India/Asian population in the households ($D=0.0069$ and $p\text{-value}=0.401$, percentage of household members who attended literacy classes ($D=0.0070$ and $p\text{-value}=0.377$) and percentage of household members who attended private primary school ($D=0.0042$ and $p\text{-value}=0.932$).

Figure A1: Household size distributions using 10 percent sample from Census 2011 and IES 2010/11 (1/2)

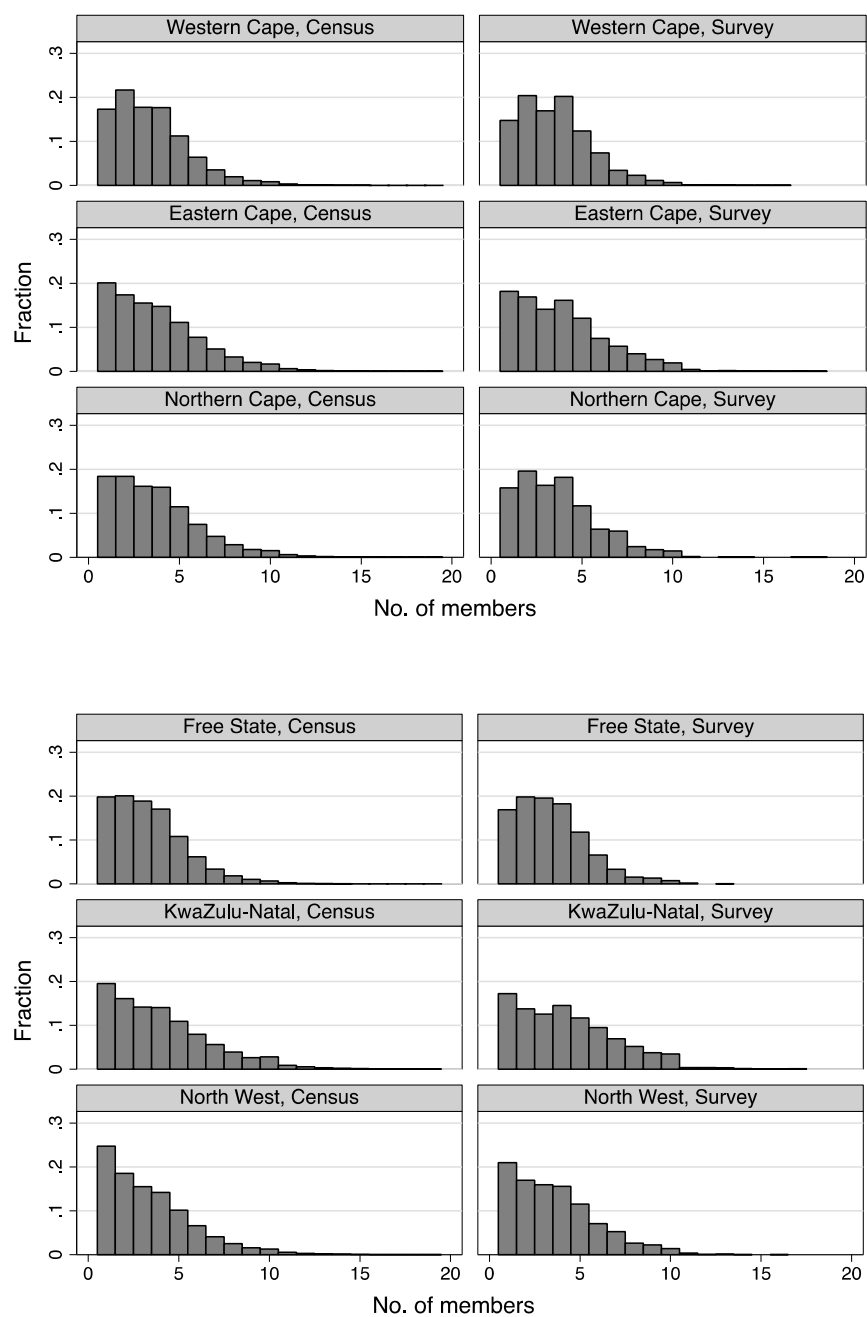
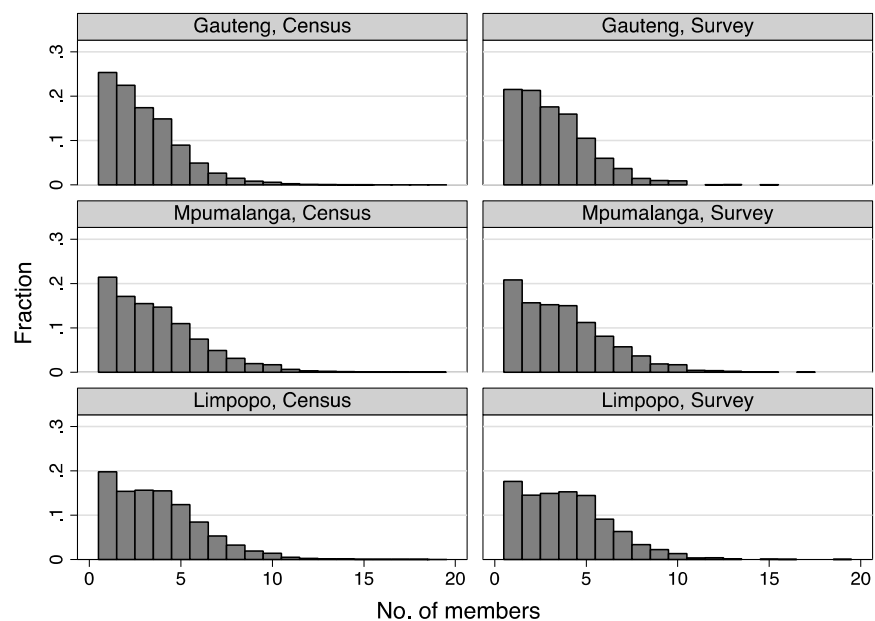


Figure A1: Household size distributions using 10 percent sample from Census 2011 and IES 2010/11 (2/2)



Appendix B: Models and Poverty Map Findings

Table B1: Beta model of per capita consumption aggregate (1/2)

Variable	Coefficient	Std. Err.	t	Prob> t
Intercept	9.03	0.16	56.11	0.000
No. of bedrooms in the dwelling	0.11	0.01	18.37	0.000
Dummy West Coast district	0.17	0.08	2.05	0.040
Dummy O.R. Tambo district	0.28	0.06	5.09	0.000
Dummy Alfred Nzo district	0.21	0.06	3.45	0.001
Dummy Xhariep district	0.29	0.10	2.89	0.004
Dummy Sisonke district	-0.36	0.07	-4.84	0.000
Dummy iLembe district	0.27	0.10	2.76	0.006
Dummy City of Johannesburg district	-0.21	0.04	-5.38	0.000
Dummy Gert Sibande district	-0.14	0.07	-2.13	0.033
Dummy Mopani district	-0.22	0.05	-4.67	0.000
Average of male household heads (MUN)	0.80	0.21	3.79	0.000
Average income 5-10K (MUN)	5.60	1.42	3.94	0.000
Dummy of income 5-10K	-0.33	0.03	-11.53	0.000
Dummy main dwelling is a cluster house	0.63	0.10	6.03	0.000
Dummy main dwelling is a flat	0.19	0.04	4.84	0.000
Dummy informal dwelling/shack in backyard	-0.21	0.03	-6.13	0.000
Dummy main dwelling is semi-detached	0.18	0.05	3.64	0.000
Dummy maximum education: Grade 11/standard/ntc iii (MUN)	3.58	0.71	5.05	0.000
Dummy maximum education: Bachelor Degree 3 years	0.69	0.06	12.11	0.000
Dummy maximum education: Bachelor Degree 4 years or more	0.74	0.05	14.38	0.000
Dummy maximum education: Honours Degree	0.76	0.09	8.69	0.000
Dummy maximum education: Grade 3/standard 1/abet 1	-0.27	0.04	-7.25	0.000
Dummy maximum education: Grade 4/standard 2	-0.30	0.04	-8.26	0.000
Dummy maximum education: Grade 5/standard 3/abet 2	-0.22	0.04	-5.70	0.000
Dummy maximum education: Grade 6/standard 4	-0.26	0.04	-6.83	0.000
Dummy maximum education: Grade 7/standard 5/abet 3	-0.21	0.03	-7.80	0.000
Average of motorcars (MUN)	2.20	0.36	6.14	0.000
Standard deviation of distance of small areas to the closest mun. (MUN)	-1.61	0.34	-4.68	0.000
Area ecoregion nama karoo over total area (MUN)	0.12	0.03	3.97	0.000
Area ecoregion north eastern highlands over total area (MUN)	-0.15	0.03	-5.13	0.000
Proportion of retired people in the household	0.01	0.00	17.54	0.000
Proportion of people attending private secondary	0.01	0.00	9.11	0.000
Dummy of household head Indian/Asian	0.35	0.05	6.79	0.000
Dummy roof of asbestos	-0.27	0.03	-8.18	0.000
Average of dwellings with roof of asbestos (MUN)	-0.89	0.13	-6.59	0.000
Average of dwellings with roof with tiles (MUN)	-1.11	0.21	-5.23	0.000
Dummy roof of iron/zinc	-0.44	0.02	-18.05	0.000
Sum of children between 0-5	-0.30	0.01	-25.79	0.000
Sum of adults between 16-25	-0.17	0.01	-22.99	0.000
Dummy of dwelling owned not fully paid	0.89	0.04	21.58	0.000
Dummy of pit toilet with ventilation (VIP)	-0.14	0.02	-6.55	0.000
Average of dwellings with pit toilet with ventilation (VIP)	0.66	0.12	5.57	0.000

Table B1: Beta model of per capita consumption aggregate (2/2)

Beta Model (Cont.)				
Variable	Coefficient	Std. Err.	t	IProb>t
Average of total no. of rooms (MUN)	-0.12	0.02	-5.06	0.000
Dummy of dwelling with walls of brick	0.15	0.02	6.37	0.000
Dummy of dwelling with walls of mud	-0.17	0.04	-4.38	0.000
Average of rural households in the municipality*dummy Free State province	-1.25	0.38	-3.27	0.001
Average household size (MUN)*Average of Income 77-154K	-0.70	0.30	-2.34	0.019
Average of Income 1-5K (MUN)*Dummy Northern Cape	5.27	2.29	2.30	0.021
Average of main dwelling is a cluster house (MUN)*Dummy North West province	-0.10	0.04	-2.85	0.004
Average of main dwelling is a hut house (MUN)*Dummy Mpumalanga province	1.72	0.45	3.81	0.000
Dummy maximum education: Honours Degree(0)*Dummy Gauteng province	-0.12	0.05	-2.54	0.011
Dummy maximum education: Honours Degree(1)*Dummy Limpopo province	0.45	0.20	2.28	0.023
Dummy maximum education: Grade 3/standard 1/abet 1(1)*Dummy Western Cape province	-0.33	0.12	-2.68	0.007
Dummy maximum education: Grade 4/standard 2(1)*Dummy Limpopo province	0.28	0.10	2.95	0.003
Dummy maximum education: Grade 6/standard 4(1)*Dummy Western Cape province	-0.28	0.10	-2.84	0.005
Dummy maximum education: Grade 6/standard 4(1)*Dummy Mpumalanga province	0.20	0.10	1.91	0.056
Dummy maximum education: Grade 6/standard 4(1)*Dummy Limpopo province	0.16	0.09	1.82	0.069
Average maximum education: Grade 6/standard 4 (MUN)*Dummy KwaZulu-Natal province	-6.21	1.66	-3.73	0.000
Standard deviation of distance of small areas to the closest mun. (MUN)*Dummy KwaZulu-Natal province	1.44	0.35	4.11	0.000
Average households with radio (MUN)*Dummy North Cape province	-0.75	0.15	-5.04	0.000
Dummy of roof of asbestos(1)*Dummy Western Cape province	-0.23	0.05	-4.81	0.000
Dummy of roof of asbestos(1)*Dummy Gauteng province	-0.36	0.07	-5.01	0.000
Dummy of roof of iron/zinc(0)*Dummy Eastern Cape province	-0.19	0.04	-4.61	0.000
Dummy of roof of iron/zinc(0)*Dummy KwaZulu-Natal province	-0.10	0.04	-2.38	0.018
Dummy of roof of iron/zinc(0)*Dummy Gauteng province	0.12	0.04	2.70	0.007
Dummy of roof of iron/zinc(1)*Dummy Western Cape province	0.19	0.05	4.11	0.000
Sum of children between 0-5*Dummy Eastern Cape province	0.10	0.02	4.36	0.000
Sum of children between 0-5*Dummy KwaZulu-Natal province	0.13	0.02	5.72	0.000
Sum of children between 0-5*Dummy Limpopo province	0.06	0.02	2.44	0.015
Sum of adults between 16-25*Dummy Gauteng province	-0.05	0.02	-2.73	0.006
Dummy of dwelling owned not fully paid(1)*Dummy Western Cape province	-0.41	0.06	-7.29	0.000
Dummy of dwelling owned not fully paid(1)*Dummy KwaZulu-Natal province	-0.27	0.08	-3.35	0.001
Dummy of dwelling owned not fully paid(1)*Dummy Gauteng province	-0.30	0.07	-4.55	0.000
Average of dwellings with septic tank (MUN)*Dummy KwaZulu-Natal province	1.16	0.54	2.16	0.031
Average of dwellings with septic tank (MUN)*Dummy Limpopo province	-6.99	1.38	-5.08	0.000
Dummy of dwelling with walls of brick (1)*Dummy Western Cape province	0.16	0.04	4.10	0.000
Dummy of dwelling with walls of brick (1)*Dummy Eastern Cape province	0.22	0.06	3.93	0.000
Dummy of dwelling with walls of brick (1)*Dummy KwaZulu-Natal province	0.33	0.06	5.92	0.000
Dummy of dwelling with walls of brick (1)*Dummy Gauteng province	0.18	0.05	3.94	0.000
Dummy of dwelling with walls of cement (0)*Dummy Eastern Cape province	-0.15	0.05	-3.11	0.002
Dummy of dwelling with walls of cement (0)*Dummy KwaZulu-Natal province	-0.22	0.05	-4.49	0.000
Dummy of dwelling with walls of cement (0)*Dummy Mpumalanga province	-0.19	0.04	-4.37	0.000
Dummy of dwelling with walls of mud (1)*Dummy Limpopo province	-0.46	0.10	-4.62	0.000

Observations 25,024, Number of Variables =84,
 RMSE=0.7224, F=451.4443, adjR2=0.599

Table B2: Alpha model of per capita consumption aggregate

Variable	Coefficient	Std. Err.	t	IProb>t
Intercept	-4.80	0.02	-217.29	0.000
Dummy Chris Hani district	-0.29	0.17	-1.73	0.084
Dummy Ukhahlamba district	0.39	0.23	1.73	0.084
Dummy Nelson Mandela Bay district	0.32	0.14	2.34	0.020
Dummy Ugu district	-0.44	0.18	-2.48	0.013
Dummy iLembe district	-0.79	0.31	-2.57	0.010

Observations 25,024, Number of Variables =6
 RMSE=2.2888, F=13.8836, adjR2=0.0026

Table B3: GLS model of per capita consumption aggregate (1/2)

Variable	Coefficient	Std. Err.	t	IProb>t
Intercept	9.11	0.19	48.81	0.000
No. of bedrooms in the dwelling	0.10	0.01	18.74	0.000
Dummy West Coast district	0.18	0.09	1.96	0.050
Dummy O.R. Tambo district	0.28	0.06	4.28	0.000
Dummy Alfred Nzo district	0.21	0.07	2.94	0.003
Dummy Xhariep district	0.30	0.11	2.78	0.006
Dummy Sisonke district	-0.39	0.08	-4.82	0.000
Dummy iLembe district	0.26	0.08	3.28	0.001
Dummy City of Johannesburg district	-0.22	0.08	-2.64	0.008
Dummy Gert Sibande district	-0.17	0.08	-2.02	0.043
Dummy Mopani district	-0.24	0.06	-4.08	0.000
Average of male household heads (MUN)	0.66	0.25	2.62	0.009
Average income 5-10K (MUN)	6.49	1.81	3.58	0.000
Dummy of income 5-10K	-0.32	0.03	-11.88	0.000
Dummy main dwelling is a cluster house	0.63	0.10	6.28	0.000
Dummy main dwelling is a flat	0.17	0.04	4.63	0.000
Dummy informal dwelling/shack in backyard	-0.21	0.03	-6.43	0.000
Dummy main dwelling is semi-detached	0.17	0.05	3.69	0.000
Dummy maximum education: Grade 11/standard/ntc iii (MUN)	4.10	0.88	4.67	0.000
Dummy maximum education: Bachelor Degree 3 years	0.70	0.05	12.69	0.000
Dummy maximum education: Bachelor Degree 4 years or more	0.74	0.05	14.82	0.000
Dummy maximum education: Honours Degree	0.76	0.09	8.94	0.000
Dummy maximum education: Grade 3/standard 1/abet 1	-0.26	0.03	-7.54	0.000
Dummy maximum education: Grade 4/standard 2	-0.30	0.03	-8.52	0.000
Dummy maximum education: Grade 5/standard 3/abet 2	-0.20	0.04	-5.35	0.000
Dummy maximum education: Grade 6/standard 4	-0.26	0.04	-7.07	0.000
Dummy maximum education: Grade 7/standard 5/abet 3	-0.21	0.03	-8.11	0.000
Average of motorcars (MUN)	2.14	0.42	5.05	0.000
Standard deviation of distance of small areas to the closest mun. (MUN)	-1.58	0.40	-3.90	0.000
Area ecoregion nama karoo over total area (MUN)	0.12	0.03	3.44	0.001
Area ecoregion north eastern highlands over total area (MUN)	-0.18	0.04	-4.08	0.000
Proportion of retired people in the household	0.01	0.00	18.09	0.000
Proportion of people attending private secondary	0.01	0.00	9.60	0.000
Dummy of household head Indian/Asian	0.35	0.05	7.26	0.000
Dummy roof of asbestos	-0.27	0.03	-8.49	0.000
Average of dwellings with roof of asbestos (MUN)	-0.83	0.17	-5.03	0.000
Average of dwellings with roof with tiles (MUN)	-1.23	0.27	-4.54	0.000
Dummy roof of iron/zinc	-0.44	0.02	-18.42	0.000
Sum of children between 0-5	-0.30	0.01	-26.80	0.000
Sum of adults between 16-25	-0.17	0.01	-24.05	0.000
Dummy of dwelling owned not fully paid	0.89	0.04	21.81	0.000
Dummy of pit toilet with ventilation (VIP)	-0.15	0.02	-7.06	0.000
Average of dwellings with pit toilet with ventilation (VIP)	0.64	0.13	4.87	0.000

Table B3: GLS model of per capita consumption aggregate (2/2)

Beta Model (Cont.)				
Variable	Coefficient	Std. Err.	t	IProb>t
Average of total no. of rooms (MUN)	-0.12	0.03	-4.45	0.000
Dummy of dwelling with walls of brick	0.16	0.02	6.51	0.000
Dummy of dwelling with walls of mud	-0.17	0.04	-4.65	0.000
Average of rural households in the municipality*dummy Free State province	-1.26	0.42	-3.02	0.003
Average household size (MUN)*Average of Income 77-154K	-0.87	0.36	-2.40	0.016
Average of Income 1-5K (MUN)*Dummy Northern Cape	5.34	2.47	2.16	0.031
Average of main dwelling is a cluster house (MUN)*Dummy North West province	-0.08	0.04	-1.83	0.067
Average of main dwelling is a hut house (MUN)*Dummy Mpumalanga province	1.78	0.53	3.39	0.001
Dummy maximum education: Honours Degree(0)*Dummy Gauteng province	-0.12	0.06	-2.08	0.038
Dummy maximum education: Honours Degree(1)*Dummy Limpopo province	0.47	0.19	2.48	0.013
Dummy maximum education: Grade 3/standard 1/abet 1(1)*Dummy Western Cape province	-0.34	0.12	-2.85	0.004
Dummy maximum education: Grade 4/standard 2(1)*Dummy Limpopo province	0.28	0.09	3.02	0.003
Dummy maximum education: Grade 6/standard 4(1)*Dummy Western Cape province	-0.28	0.09	-2.98	0.003
Dummy maximum education: Grade 6/standard 4(1)*Dummy Mpumalanga province	0.20	0.10	2.04	0.041
Dummy maximum education: Grade 6/standard 4(1)*Dummy Limpopo province	0.16	0.08	1.97	0.049
Average maximum education: Grade 6/standard 4 (MUN)*Dummy KwaZulu-Natal province	-6.47	1.77	-3.66	0.000
Standard deviation of distance of small areas to the closest mun. (MUN)*Dummy KwaZulu-Natal province	1.49	0.40	3.75	0.000
Average households with radio (MUN)*Dummy North Cape province	-0.73	0.17	-4.32	0.000
Dummy of roof of asbestos(1)*Dummy Western Cape province	-0.23	0.05	-4.74	0.000
Dummy of roof of asbestos(1)*Dummy Gauteng province	-0.36	0.07	-5.19	0.000
Dummy of roof of iron/zinc(0)*Dummy Eastern Cape province	-0.24	0.04	-5.48	0.000
Dummy of roof of iron/zinc(0)*Dummy KwaZulu-Natal province	-0.11	0.04	-2.60	0.009
Dummy of roof of iron/zinc(0)*Dummy Gauteng province	0.12	0.04	2.72	0.007
Dummy of roof of iron/zinc(1)*Dummy Western Cape province	0.20	0.05	4.19	0.000
Sum of children between 0-5*Dummy Eastern Cape province	0.10	0.02	4.54	0.000
Sum of children between 0-5*Dummy KwaZulu-Natal province	0.14	0.02	6.29	0.000
Sum of children between 0-5*Dummy Limpopo province	0.07	0.02	2.78	0.005
Sum of adults between 16-25*Dummy Gauteng province	-0.06	0.02	-2.89	0.004
Dummy of dwelling owned not fully paid(1)*Dummy Western Cape province	-0.41	0.06	-7.31	0.000
Dummy of dwelling owned not fully paid(1)*Dummy KwaZulu-Natal province	-0.25	0.08	-3.27	0.001
Dummy of dwelling owned not fully paid(1)*Dummy Gauteng province	-0.29	0.06	-4.61	0.000
Average of dwellings with septic tank (MUN)*Dummy KwaZulu-Natal province	1.29	0.57	2.27	0.023
Average of dwellings with septic tank (MUN)*Dummy Limpopo province	-6.83	1.59	-4.29	0.000
Dummy of dwelling with walls of brick (1)*Dummy Western Cape province	0.16	0.04	3.95	0.000
Dummy of dwelling with walls of brick (1)*Dummy Eastern Cape province	0.22	0.06	4.07	0.000
Dummy of dwelling with walls of brick (1)*Dummy KwaZulu-Natal province	0.29	0.05	5.63	0.000
Dummy of dwelling with walls of brick (1)*Dummy Gauteng province	0.18	0.04	4.10	0.000
Dummy of dwelling with walls of cement (0)*Dummy Eastern Cape province	-0.15	0.05	-3.18	0.002
Dummy of dwelling with walls of cement (0)*Dummy KwaZulu-Natal province	-0.20	0.05	-4.47	0.000
Dummy of dwelling with walls of cement (0)*Dummy Mpumalanga province	-0.15	0.05	-3.19	0.001
Dummy of dwelling with walls of mud (1)*Dummy Limpopo province	-0.42	0.10	-4.34	0.000

Figure B1: Household poverty incidence by province (IES 2010/11 and Poverty Map 2011)

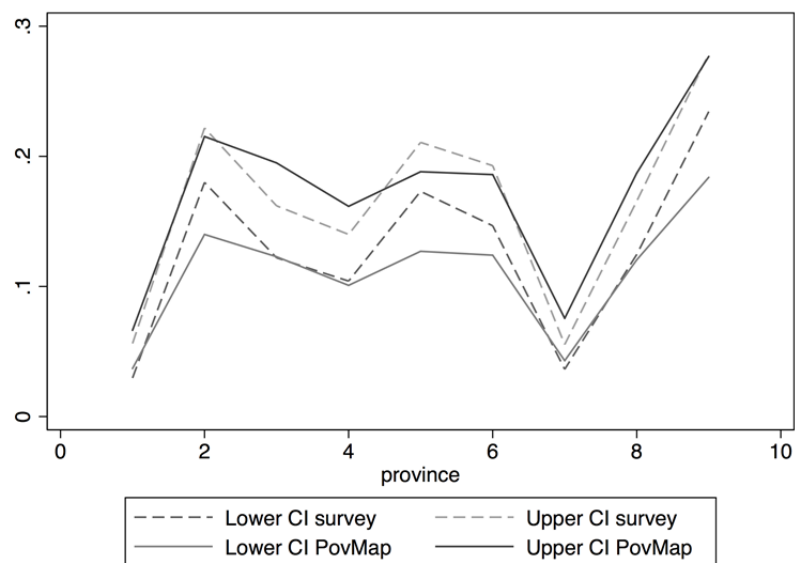


Figure B2: Individual poverty incidence by province (IES 2010/11 and Poverty Map 2011)

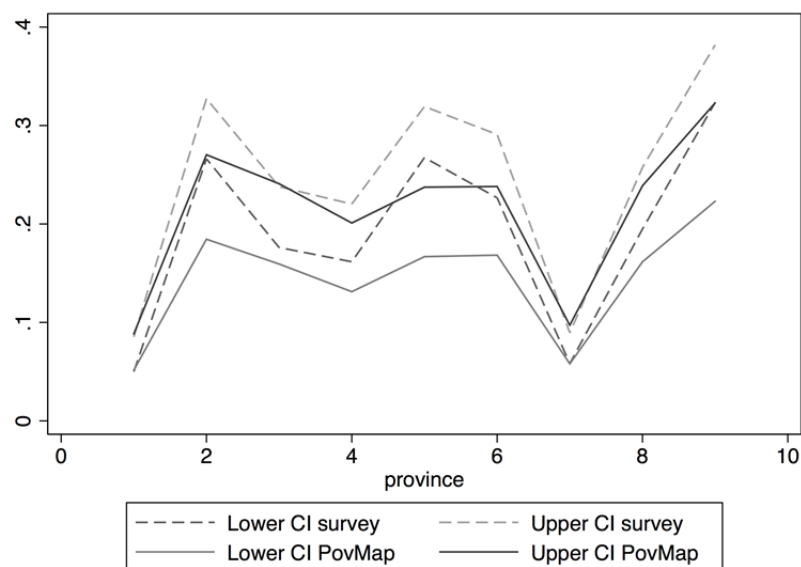


Table B4: Individual poverty incidence and Gini coefficients at the district level (Ten districts with the highest and lowest poverty)

Province	District	District Code	Total No. of inds. in dist.	FPL	LBPL	UBPL	Gini	Rankings		
								FPL	FPL num.	Gini
Ten districts with the highest poverty incidence										
KwaZulu-Natal	Sisonke	543	456,053	0.51	0.68	0.82	0.52	1	13	24
Limpopo	Mopani	933	1,120,515	0.32	0.51	0.70	0.50	2	4	30
Eastern Cape	Amathole	212	870,508	0.30	0.49	0.69	0.47	3	8	47
KwaZulu-Natal	Umkhanyakude	527	619,319	0.30	0.48	0.69	0.46	4	19	52
Eastern Cape	Alfred Nzo	244	792,284	0.29	0.48	0.68	0.46	5	14	49
North West	Dr Ruth Segomotsi Mompati	639	466,762	0.29	0.47	0.66	0.49	6	30	38
KwaZulu-Natal	Zululand	556	792,720	0.28	0.46	0.66	0.47	7	16	44
KwaZulu-Natal	Umkhanyathi	554	505,616	0.28	0.46	0.66	0.48	8	29	41
Mpumalanga	Ehlanzeni	832	1,711,675	0.28	0.44	0.63	0.53	9	1	22
Eastern Cape	Joe Gqabi	214	346,092	0.27	0.43	0.61	0.52	10	35	23
Ten districts with the lowest poverty incidence										
Province	District	District Code	Total No. of inds. in mun.	FPL	LBPL	UBPL	Gini	Rankings		
								FPL	FPL num.	Gini
Free State	Mangaung	499	725,358	0.10	0.21	0.37	0.56	43	41	7
Western Cape	Eden	104	570,249	0.10	0.20	0.36	0.52	44	45	26
Gauteng	Sedibeng	742	930,762	0.09	0.19	0.34	0.55	45	37	10
Western Cape	Cape Winelands	102	776,063	0.09	0.19	0.35	0.51	46	42	27
Gauteng	City of Johannesburg	798	4,491,228	0.08	0.17	0.30	0.60	47	2	1
Gauteng	West Rand	748	824,016	0.08	0.17	0.30	0.56	48	43	6
Western Cape	West Coast	101	378,805	0.07	0.16	0.30	0.50	49	48	33
Gauteng	Ekurhuleni	797	3,237,386	0.06	0.14	0.26	0.57	50	17	3
Western Cape	City of Cape Town	199	3,721,439	0.06	0.14	0.26	0.54	51	12	18
Gauteng	City of Tshwane	799	2,930,672	0.06	0.13	0.24	0.59	52	20	2

Table B5: Individual poverty incidence and Gini coefficients at the district level (All districts)

Province	District	District Code	Total No. of inds. in dist.	FPL	FPL_se	LBPL	LBPL_se	UBPL	UBPL_se	Gini	Gini_se	Rankings		
												FPL	FPL num.	Gini
Western Cape	West Coast	101	378,805	0.07	0.02	0.16	0.03	0.30	0.04	0.50	0.01	49	48	33
Western Cape	Cape Winelands	102	776,063	0.09	0.02	0.19	0.02	0.35	0.03	0.51	0.01	46	42	27
Western Cape	Overberg	103	255,069	0.10	0.01	0.21	0.02	0.37	0.03	0.51	0.01	42	49	28
Western Cape	Eden	104	570,249	0.10	0.01	0.20	0.02	0.36	0.03	0.52	0.01	44	45	26
Western Cape	Central Karoo	105	69,923	0.13	0.02	0.26	0.04	0.45	0.04	0.47	0.01	38	52	45
Western Cape	City of Cape Town	199	3,721,439	0.06	0.01	0.14	0.02	0.26	0.02	0.54	0.01	51	12	18
Eastern Cape	Cacadu	210	439,944	0.18	0.03	0.34	0.04	0.54	0.04	0.49	0.01	27	38	36
Eastern Cape	Amathole	212	870,508	0.30	0.03	0.49	0.03	0.69	0.03	0.47	0.01	3	8	47
Eastern Cape	Chris Hani	213	785,370	0.22	0.03	0.40	0.03	0.62	0.03	0.46	0.02	19	23	51
Eastern Cape	Joe Gqabi	214	346,092	0.27	0.03	0.43	0.03	0.61	0.03	0.52	0.03	10	35	23
Eastern Cape	O.R.Tambo	215	1,342,487	0.22	0.03	0.38	0.04	0.59	0.04	0.48	0.01	20	6	40
Eastern Cape	Alfred Nzo	244	792,284	0.29	0.04	0.48	0.04	0.68	0.04	0.46	0.01	5	14	49
Eastern Cape	Buffalo City	260	740,179	0.17	0.02	0.30	0.03	0.49	0.03	0.55	0.01	30	31	12
Eastern Cape	Nelson Mandela Bay	299	1,146,576	0.15	0.02	0.27	0.03	0.44	0.03	0.57	0.02	33	22	5
Northern Cape	Namakwa	306	120,071	0.14	0.02	0.28	0.04	0.48	0.04	0.46	0.01	36	51	48
Northern Cape	Pixley ka Seme	307	205,586	0.24	0.03	0.40	0.04	0.60	0.04	0.48	0.01	16	46	42
Northern Cape	Siyanda	308	257,378	0.13	0.02	0.26	0.03	0.45	0.04	0.49	0.01	39	47	39
Northern Cape	Frances Baard	309	432,077	0.21	0.03	0.35	0.04	0.54	0.04	0.53	0.01	24	36	20
Northern Cape	John Taolo Gaetsewe	345	226,072	0.25	0.03	0.41	0.03	0.59	0.03	0.54	0.01	15	44	16
Free State	Xhariep	416	142,166	0.15	0.03	0.29	0.05	0.48	0.05	0.47	0.00	34	50	46
Free State	Lejweleputswa	418	607,879	0.19	0.02	0.34	0.03	0.53	0.03	0.53	0.01	26	32	21
Free State	Thabo Mofutsanyane	419	736,173	0.21	0.02	0.37	0.03	0.57	0.03	0.50	0.00	23	25	34
Free State	Fezile Dabi	420	468,698	0.17	0.02	0.31	0.03	0.49	0.03	0.55	0.01	29	40	14
Free State	Mangaung	499	725,358	0.10	0.01	0.21	0.02	0.37	0.03	0.56	0.01	43	41	7
KwaZulu-Natal	Ugu	521	709,839	0.27	0.03	0.46	0.04	0.66	0.03	0.50	0.01	11	18	32
KwaZulu-Natal	UMgungundlovu	522	991,621	0.14	0.02	0.27	0.03	0.44	0.03	0.56	0.01	35	28	8
KwaZulu-Natal	Uthukela	523	660,297	0.24	0.03	0.40	0.03	0.60	0.03	0.50	0.01	17	26	35
KwaZulu-Natal	Umkhanyakude	527	619,319	0.30	0.03	0.48	0.04	0.69	0.04	0.46	0.01	4	19	52
KwaZulu-Natal	Uthungulu	528	891,007	0.27	0.03	0.43	0.03	0.61	0.03	0.55	0.01	13	11	9
KwaZulu-Natal	Sisonke	543	456,053	0.51	0.04	0.68	0.04	0.82	0.02	0.52	0.01	1	13	24
KwaZulu-Natal	Umkhanyakude	554	505,616	0.28	0.03	0.46	0.04	0.66	0.03	0.48	0.01	8	29	41
KwaZulu-Natal	Amajuba	555	492,143	0.20	0.02	0.35	0.03	0.54	0.03	0.50	0.01	25	34	29
KwaZulu-Natal	Zululand	556	792,720	0.28	0.03	0.46	0.03	0.66	0.03	0.47	0.01	7	16	44
KwaZulu-Natal	iLembe	559	601,799	0.13	0.04	0.30	0.05	0.53	0.05	0.47	0.02	40	39	43
KwaZulu-Natal	eThekweni	599	3,402,349	0.11	0.02	0.22	0.02	0.37	0.03	0.55	0.01	41	3	11
North West	Bojanala	637	1,475,757	0.17	0.02	0.31	0.03	0.50	0.03	0.54	0.01	28	10	17
North West	Ngaka Modiri Molema	638	841,379	0.27	0.03	0.44	0.03	0.63	0.03	0.52	0.01	12	15	25
North West	Dr Ruth Segomotsi Mompati	639	466,762	0.29	0.03	0.47	0.04	0.66	0.03	0.49	0.01	6	30	38
North West	Dr Kenneth Kaunda	640	700,847	0.16	0.02	0.29	0.03	0.47	0.03	0.54	0.01	32	33	15
Gauteng	Sedibeng	742	930,762	0.09	0.01	0.19	0.02	0.34	0.03	0.55	0.01	45	37	10
Gauteng	West Rand	748	824,016	0.08	0.01	0.17	0.02	0.30	0.03	0.56	0.01	48	43	6
Gauteng	Ekurhuleni	797	3,237,386	0.06	0.01	0.14	0.02	0.26	0.02	0.57	0.01	50	17	3
Gauteng	City of Johannesburg	798	4,491,228	0.08	0.02	0.17	0.02	0.30	0.03	0.60	0.01	47	2	1
Gauteng	City of Tshwane	799	2,930,672	0.06	0.01	0.13	0.02	0.24	0.03	0.59	0.01	52	20	2
Mpumalanga	Gert Sibande	830	1,002,080	0.17	0.03	0.30	0.04	0.49	0.04	0.54	0.01	31	24	19
Mpumalanga	Nkangala	831	1,308,417	0.14	0.02	0.25	0.02	0.42	0.03	0.57	0.01	37	21	4
Mpumalanga	Ehlanzeni	832	1,711,675	0.28	0.03	0.44	0.04	0.63	0.03	0.53	0.01	9	1	22
Limpopo	Mopani	933	1,120,515	0.32	0.04	0.51	0.04	0.70	0.03	0.50	0.01	2	4	30
Limpopo	Vhembe	934	1,338,172	0.25	0.03	0.43	0.04	0.63	0.04	0.49	0.01	14	5	37
Limpopo	Capricorn	935	1,298,920	0.22	0.02	0.38	0.03	0.57	0.03	0.55	0.01	21	7	13
Limpopo	Waterberg	936	684,784	0.22	0.03	0.38	0.04	0.58	0.04	0.50	0.01	22	27	31
Limpopo	Greater Sekhukhune	947	1,115,203	0.23	0.02	0.41	0.03	0.62	0.03	0.46	0.00	18	9	50

Table B6: Ten districts with the largest and smallest numbers of individuals living below the food poverty line

Province	District	District Code	Total No. of inds. in dist.	Percentage of Poor Individuals			Rankings		
				FPL	LBPL	UBPL	FPL	FPL num.	Gini
Ten districts with the largest number of poor individuals									
Mpumalanga	Ehlanzeni	832	1,711,675	0.056	0.051	0.046	9	1	22
Gauteng	City of Johannesburg	798	4,491,228	0.045	0.050	0.057	47	2	1
KwaZulu-Natal	eThekweni	599	3,402,349	0.044	0.049	0.053	41	3	11
Limpopo	Mopani	933	1,120,515	0.042	0.038	0.033	2	4	30
Limpopo	Vhembe	934	1,338,172	0.040	0.038	0.036	14	5	37
Eastern Cape	O.R.Tambo	215	1,342,487	0.035	0.034	0.033	20	6	40
Limpopo	Capricorn	935	1,298,920	0.033	0.033	0.031	21	7	13
Eastern Cape	Amathole	212	870,508	0.031	0.028	0.025	3	8	47
Limpopo	Greater Sekhukhune	947	1,115,203	0.031	0.030	0.029	18	9	50
North West	Bojanala	637	1,475,757	0.030	0.031	0.031	28	10	17
Ten districts with the smallest number of poor individuals									
Gauteng	West Rand	748	824,016	0.008	0.009	0.011	48	43	6
Northern Cape	John Taolo Gaetsewe	345	226,072	0.007	0.006	0.006	15	44	16
Western Cape	Eden	104	570,249	0.007	0.007	0.009	44	45	26
Northern Cape	Pixley ka Seme	307	205,586	0.006	0.006	0.005	16	46	42
Northern Cape	Siyanda	308	257,378	0.004	0.004	0.005	39	47	39
Western Cape	West Coast	101	378,805	0.003	0.004	0.005	49	48	33
Western Cape	Overberg	103	255,069	0.003	0.004	0.004	42	49	28
Free State	Xhariep	416	142,166	0.002	0.003	0.003	34	50	46
Northern Cape	Namakwa	306	120,071	0.002	0.002	0.002	36	51	48
Western Cape	Central Karoo	105	69,923	0.001	0.001	0.001	38	52	45

**Table B7: Individual poverty incidence and Gini coefficients at the municipal level
(Thirty municipalities with the highest and lowest poverty)**

Province	District	Mun. Name	District Code	Mun. Code	Total No. of inds. in mun.	FPL	LBPL	UBPL	Gini	Rankings		
										FPL	FPL num.	Gini
Thirty municipalities with the highest poverty incidence												
KwaZulu-Natal	Sisonke	Umzimkhulu	543	598	179,340	0.67	0.82	0.93	0.44	1	13	212
KwaZulu-Natal	Sisonke	Ingwe	543	594	100,006	0.56	0.74	0.88	0.45	2	47	196
KwaZulu-Natal	Sisonke	Ubuhlebezwe	543	597	100,583	0.49	0.67	0.83	0.46	3	55	166
KwaZulu-Natal	Ugu	Umzumbe	521	503	159,832	0.43	0.66	0.85	0.38	4	32	232
Mpumalanga	Ehlanzeni	Bushbuckridge	832	877	558,824	0.42	0.61	0.79	0.45	5	3	176
Limpopo	Mopani	Maruleng	933	964	96,407	0.42	0.61	0.79	0.46	6	72	151
KwaZulu-Natal	Zululand	Nongoma	556	580	192,934	0.40	0.59	0.77	0.45	7	23	180
KwaZulu-Natal	Umkhanyakude	Hlabisa	527	585	71,296	0.39	0.57	0.76	0.45	8	97	174
Northern Cape	John Taolo Gaetsewe	Joe Morolong	345	360	89,602	0.38	0.57	0.76	0.45	9	80	199
North West	Dr Ruth Segomotsi Mompati	Kagisano/Molopo	639	674	106,711	0.38	0.57	0.76	0.46	10	71	165
KwaZulu-Natal	Ugu	UMuziwabantu	521	504	96,127	0.38	0.60	0.80	0.43	11	76	224
Limpopo	Mopani	Greater Letaba	933	961	219,234	0.37	0.57	0.76	0.46	12	18	145
North West	Ngaka Modiri Molema	Ratlou	638	665	106,905	0.37	0.57	0.76	0.44	13	73	205
KwaZulu-Natal	Uthungulu	Nkandla	528	542	113,346	0.37	0.56	0.75	0.46	14	64	168
KwaZulu-Natal	Uthukela	Indaka	523	569	102,898	0.37	0.56	0.76	0.44	15	75	215
KwaZulu-Natal	Uthungulu	Ntambanana	528	588	74,033	0.37	0.56	0.76	0.44	16	98	219
Eastern Cape	Amathole	Mbhashe	212	270	248,950	0.36	0.56	0.75	0.45	17	15	191
KwaZulu-Natal	Uthungulu	Mfolozi	528	587	122,206	0.35	0.54	0.74	0.44	18	61	216
KwaZulu-Natal	Uthungulu	Mthonjaneni	528	590	47,579	0.35	0.54	0.73	0.46	19	126	154
Northern Cape	Frances Baard	Magareng	309	385	29,604	0.35	0.53	0.73	0.46	20	164	147
KwaZulu-Natal	Ugu	Vulamehlo	521	560	76,835	0.34	0.57	0.79	0.39	21	100	229
KwaZulu-Natal	Uthungulu	uMlalazi	528	589	212,559	0.34	0.53	0.72	0.48	22	26	112
KwaZulu-Natal	Zululand	Ulundi	556	581	185,743	0.34	0.53	0.73	0.46	23	36	157
KwaZulu-Natal	Umkhanyakude	Mtubatuba	527	586	173,322	0.34	0.53	0.72	0.48	24	42	106
KwaZulu-Natal	Umkhanyathi	Nqutu	554	575	164,821	0.34	0.53	0.73	0.44	25	48	203
Eastern Cape	Joe Gqabi	Elundini	214	286	137,035	0.33	0.50	0.68	0.51	26	60	55
Eastern Cape	Alfred Nzo	Ntabankulu	244	298	123,268	0.33	0.52	0.72	0.46	26	66	167
Eastern Cape	Chris Hani	Engcobo	213	284	153,406	0.33	0.54	0.76	0.42	28	53	225
Eastern Cape	Amathole	Mnquma	212	271	246,362	0.33	0.52	0.72	0.47	29	19	140
KwaZulu-Natal	Amajuba	Dannhauser	555	526	101,436	0.33	0.52	0.72	0.45	30	83	201
Thirty municipalities with the lowest poverty incidence												
Western Cape	Cape Winelands	Drakenstein	102	166	247,198	0.10	0.20	0.36	0.52	205	104	39
Northern Cape	Namakwa	Kh-j-Ma	306	368	13,339	0.09	0.21	0.39	0.43	206	233	223
North West	Dr Kenneth Kaunda	Tlokwe City Council	640	676	163,433	0.09	0.19	0.35	0.54	207	135	21
Western Cape	Eden	George	104	177	192,635	0.09	0.18	0.34	0.51	208	125	49
Limpopo	Vhembe	Musina	934	967	67,461	0.09	0.19	0.37	0.47	209	193	135
Western Cape	Overberg	Cape Agulhas	103	173	33,086	0.08	0.18	0.34	0.51	210	222	56
Western Cape	Eden	Mossel Bay	104	176	89,186	0.08	0.18	0.33	0.52	210	180	34
Gauteng	City of Johannesburg	City of Johannesburg	798	798	4,500,000	0.08	0.17	0.30	0.60	212	2	1
Western Cape	West Coast	Matzikama	101	160	66,420	0.08	0.18	0.34	0.47	213	195	137
Eastern Cape	Chris Hani	Inxuba Yethemba	213	278	64,658	0.07	0.18	0.37	0.45	214	204	198
Gauteng	Sedibeng	Lesedi	742	762	99,871	0.07	0.15	0.28	0.54	215	186	24
Gauteng	West Rand	Randfontein	748	764	151,571	0.07	0.14	0.27	0.54	216	165	18
KwaZulu-Natal	iLembe	KwaDukuza	559	592	228,674	0.07	0.18	0.37	0.50	217	134	70
Western Cape	Overberg	Overstrand	103	172	79,608	0.07	0.14	0.28	0.52	218	198	31
Western Cape	West Coast	Bergrivier	101	162	59,120	0.07	0.15	0.29	0.47	219	212	130
Gauteng	Ekurhuleni	Ekurhuleni	797	797	3,200,000	0.06	0.14	0.26	0.57	220	5	3
Western Cape	City of Cape Town	City of Cape Town	199	199	3,700,000	0.06	0.13	0.26	0.54	221	4	19
Free State	Fezile Dabi	Metsimaholo	420	478	143,354	0.06	0.14	0.28	0.54	222	171	22
Gauteng	West Rand	Mogale City	748	763	363,989	0.06	0.13	0.25	0.57	223	108	5
Northern Cape	John Taolo Gaetsewe	Gamagara	345	362	42,574	0.06	0.14	0.27	0.52	224	224	32
Gauteng	City of Tshwane	City of Tshwane	799	799	2,900,000	0.06	0.12	0.23	0.59	225	8	2
Western Cape	Eden	Bitou	104	179	48,502	0.06	0.13	0.27	0.52	226	221	44
Mpumalanga	Nkangala	Steve Tshwete	831	869	225,423	0.06	0.13	0.25	0.55	227	150	14
Mpumalanga	Nkangala	Emalahleni	831	868	393,791	0.05	0.12	0.25	0.55	228	111	11
Western Cape	Eden	Knysna	104	180	67,985	0.05	0.12	0.25	0.52	229	215	38
Western Cape	West Coast	Swartland	101	164	106,418	0.05	0.12	0.25	0.49	230	196	79
KwaZulu-Natal	UMgungundlovu	uMngeni	522	563	87,764	0.05	0.11	0.24	0.54	231	210	17
Western Cape	West Coast	Saldanha Bay	101	163	97,665	0.04	0.11	0.23	0.50	232	206	59
Western Cape	Cape Winelands	Stellenbosch	102	167	150,198	0.04	0.10	0.22	0.52	233	187	37
Gauteng	Sedibeng	Midvaal	742	761	95,749	0.04	0.09	0.18	0.56	234	214	9

Table B8: Individual poverty incidence and Gini coefficients at the municipal level (1/3)

Province	District	Mun. Name	District Code	Mun. Code	Total No. of FPL inds. in mun.	FPL_se	LBPL	LBPL_se	UBPL	UBPL_se	Gini	Gini_se	Rankings		
													FPL	FPL num, Gini	
Western Cape	West Coast	Matzikama	101	160	66,420	0.08	0.02	0.18	0.03	0.34	0.05	0.47	0.01	213	195 137
Western Cape	West Coast	Cederberg	101	161	49,180	0.16	0.04	0.31	0.05	0.51	0.06	0.46	0.01	143	178 164
Western Cape	West Coast	Bergvriër	101	162	59,120	0.07	0.01	0.15	0.03	0.29	0.04	0.47	0.01	219	212 130
Western Cape	West Coast	Saldanha Bay	101	163	97,665	0.04	0.01	0.11	0.02	0.23	0.03	0.50	0.01	232	206 59
Western Cape	West Coast	Swartland	101	164	106,418	0.05	0.01	0.12	0.03	0.25	0.04	0.49	0.01	230	196 79
Western Cape	Cape Winelands	Witzenberg	102	165	116,628	0.11	0.02	0.23	0.03	0.41	0.04	0.47	0.01	196	146 136
Western Cape	Cape Winelands	Drakenstein	102	166	247,198	0.10	0.02	0.20	0.02	0.36	0.03	0.52	0.01	205	104 39
Western Cape	Cape Winelands	Stellenbosch	102	167	150,198	0.04	0.01	0.10	0.02	0.22	0.03	0.52	0.01	233	187 37
Western Cape	Cape Winelands	Breda Valley	102	168	164,379	0.10	0.02	0.20	0.03	0.37	0.03	0.48	0.01	204	129 101
Western Cape	Cape Winelands	Langeberg	102	169	97,658	0.13	0.02	0.25	0.03	0.44	0.04	0.47	0.01	174	153 121
Western Cape	Overberg	Swellendam	103	170	35,561	0.12	0.02	0.25	0.03	0.44	0.04	0.48	0.01	189	208 91
Western Cape	Overberg	Theewaterskloof	103	171	106,812	0.13	0.02	0.25	0.03	0.44	0.04	0.48	0.01	175	141 114
Western Cape	Overberg	Overstrand	103	172	79,608	0.07	0.01	0.14	0.02	0.28	0.03	0.52	0.01	218	198 31
Western Cape	Overberg	Cape Agulhas	103	173	33,086	0.08	0.02	0.18	0.03	0.34	0.04	0.51	0.01	210	222 56
Western Cape	Eden	Kannaland	104	174	24,669	0.17	0.03	0.31	0.04	0.50	0.04	0.47	0.01	141	209 133
Western Cape	Eden	Hessequa	104	175	52,265	0.12	0.02	0.24	0.03	0.42	0.04	0.48	0.01	187	189 98
Western Cape	Eden	Mossel Bay	104	176	89,186	0.08	0.01	0.18	0.02	0.33	0.03	0.52	0.01	210	180 34
Western Cape	Eden	George	104	177	192,635	0.09	0.01	0.18	0.02	0.34	0.03	0.51	0.01	208	125 49
Western Cape	Eden	Oudtshoorn	104	178	95,005	0.16	0.02	0.29	0.03	0.47	0.04	0.49	0.01	154	137 84
Western Cape	Eden	Blitsum	104	179	48,502	0.06	0.01	0.13	0.02	0.27	0.03	0.52	0.01	226	221 44
Western Cape	Eden	Kringsburg	104	180	67,985	0.05	0.01	0.12	0.02	0.25	0.03	0.52	0.01	229	215 38
Western Cape	Central Karoo	Laingsburg	105	181	8,007	0.16	0.02	0.29	0.03	0.49	0.04	0.46	0.01	158	234 144
Western Cape	Central Karoo	Prince Albert	105	182	13,075	0.20	0.03	0.36	0.04	0.55	0.04	0.49	0.01	116	223 87
Western Cape	Central Karoo	Beaufort West	105	183	48,840	0.11	0.02	0.23	0.03	0.41	0.04	0.46	0.01	192	194 143
Western Cape	City of Cape Town	City of Cape Town	199	199	3,700,000	0.06	0.01	0.13	0.02	0.26	0.02	0.54	0.01	221	4 19
Eastern Cape	Cacadu	Camdeboo	210	261	48,761	0.15	0.02	0.29	0.04	0.49	0.04	0.47	0.01	165	183 129
Eastern Cape	Cacadu	Blue Crane Route	210	262	35,518	0.21	0.03	0.38	0.04	0.59	0.04	0.45	0.01	108	181 175
Eastern Cape	Cacadu	Ikwezi	210	263	10,512	0.21	0.04	0.38	0.05	0.60	0.05	0.44	0.01	111	228 210
Eastern Cape	Cacadu	Makana	210	264	75,518	0.16	0.02	0.31	0.03	0.50	0.03	0.51	0.01	147	155 53
Eastern Cape	Cacadu	Ndlambe	210	265	60,650	0.28	0.04	0.46	0.04	0.66	0.04	0.49	0.01	58	124 76
Eastern Cape	Cacadu	Sundays River Valley	210	266	52,961	0.26	0.04	0.43	0.05	0.65	0.05	0.45	0.01	73	142 197
Eastern Cape	Cacadu	Baviaans	210	267	17,526	0.20	0.03	0.37	0.04	0.59	0.04	0.44	0.01	119	217 207
Eastern Cape	Cacadu	Kouga	210	268	97,739	0.14	0.02	0.27	0.03	0.46	0.03	0.51	0.01	172	143 50
Eastern Cape	Cacadu	Kou-Kamma	210	269	40,754	0.12	0.02	0.25	0.03	0.44	0.04	0.45	0.01	188	201 200
Eastern Cape	Amathole	Mbhashe	212	270	248,950	0.36	0.04	0.56	0.04	0.75	0.03	0.45	0.00	17	15 191
Eastern Cape	Amathole	Mquma	212	271	246,362	0.33	0.04	0.52	0.04	0.72	0.03	0.47	0.01	29	19 140
Eastern Cape	Amathole	Great Kei	212	272	38,345	0.21	0.03	0.38	0.04	0.58	0.04	0.48	0.01	105	177 114
Eastern Cape	Amathole	Amahlathi	212	273	121,224	0.24	0.03	0.42	0.04	0.63	0.03	0.46	0.01	83	92 158
Eastern Cape	Amathole	Nqushwa	212	274	71,438	0.23	0.03	0.40	0.03	0.62	0.03	0.44	0.01	96	130 218
Eastern Cape	Amathole	Nkonkobe	212	276	120,238	0.24	0.03	0.42	0.04	0.63	0.03	0.46	0.01	89	94 163
Eastern Cape	Amathole	Nxuba	212	277	23,949	0.16	0.03	0.30	0.04	0.50	0.04	0.46	0.01	150	213 141
Eastern Cape	Chris Hani	Inxuba Yethemba	213	278	64,658	0.07	0.02	0.18	0.03	0.37	0.04	0.45	0.02	214	204 198
Eastern Cape	Chris Hani	Tsolwana	213	279	33,170	0.15	0.03	0.32	0.04	0.55	0.05	0.40	0.02	162	200 228
Eastern Cape	Chris Hani	Inkwanca	213	280	21,797	0.16	0.03	0.33	0.04	0.56	0.04	0.43	0.02	145	216 222
Eastern Cape	Chris Hani	Lukanji	213	281	188,634	0.14	0.02	0.29	0.03	0.50	0.04	0.47	0.02	173	101 131
Eastern Cape	Chris Hani	Intsika Yethu	213	282	143,124	0.29	0.04	0.49	0.05	0.72	0.04	0.41	0.02	56	69 227
Eastern Cape	Chris Hani	Emalaheni	213	283	117,360	0.27	0.03	0.48	0.04	0.70	0.03	0.41	0.02	61	85 226
Eastern Cape	Chris Hani	Engcobo	213	284	153,406	0.33	0.04	0.54	0.04	0.76	0.04	0.42	0.02	28	53 225
Eastern Cape	Chris Hani	Sakhisizwe	213	285	63,216	0.20	0.03	0.38	0.04	0.60	0.04	0.44	0.02	117	151 213
Eastern Cape	Joe Gqabi	Elundini	214	286	137,035	0.33	0.04	0.50	0.03	0.68	0.03	0.51	0.03	26	60 55
Eastern Cape	Joe Gqabi	Senqu	214	287	132,024	0.27	0.03	0.42	0.03	0.61	0.03	0.51	0.03	63	78 57
Eastern Cape	Joe Gqabi	Maletswai	214	288	43,490	0.16	0.03	0.28	0.03	0.45	0.04	0.54	0.03	148	185 26
Eastern Cape	Joe Gqabi	Gariep	214	289	33,542	0.15	0.03	0.27	0.03	0.45	0.03	0.51	0.03	161	199 46
Eastern Cape	O.R.Tambo	Nguza Hill	215	290	276,129	0.26	0.04	0.44	0.04	0.64	0.04	0.46	0.01	69	28 159
Eastern Cape	O.R.Tambo	Port St Johns	215	291	154,910	0.30	0.04	0.49	0.04	0.69	0.04	0.45	0.01	49	58 173
Eastern Cape	O.R.Tambo	Nyandeni	215	292	286,794	0.21	0.03	0.37	0.04	0.58	0.04	0.45	0.01	109	39 180
Eastern Cape	O.R.Tambo	Mhlontlo	215	293	185,954	0.23	0.03	0.40	0.04	0.61	0.04	0.46	0.01	95	63 155
Eastern Cape	O.R.Tambo	King Sabata Dalindyebo	215	294	438,698	0.16	0.02	0.30	0.03	0.49	0.04	0.50	0.01	156	34 62
Eastern Cape	Allred Nzo	Matatiele	244	295	201,121	0.25	0.04	0.43	0.04	0.63	0.04	0.47	0.01	78	54 132
Eastern Cape	Allred Nzo	Umtzimvubu	244	296	188,457	0.25	0.03	0.43	0.04	0.64	0.04	0.45	0.01	76	56 186
Eastern Cape	Allred Nzo	Mbizana	244	297	279,437	0.32	0.04	0.51	0.04	0.71	0.03	0.45	0.00	32	16 171
Eastern Cape	Allred Nzo	Ntabankulu	244	298	123,268	0.33	0.04	0.52	0.05	0.72	0.04	0.46	0.01	26	66 167
Eastern Cape	Buffalo City	Buffalo City	260	260	740,179	0.17	0.02	0.30	0.03	0.49	0.03	0.55	0.01	140	12 13
Eastern Cape	Nelson Mandela Bay	Nelson Mandela Bay	299	299	1,100,000	0.16	0.02	0.28	0.03	0.44	0.03	0.57	0.02	157	6 6
Northern Cape	Namakwa	Richtersveld	306	363	12,192	0.19	0.05	0.34	0.07	0.55	0.08	0.45	0.01	127	227 182
Northern Cape	Namakwa	Nama Khoi	306	364	49,342	0.14	0.03	0.28	0.05	0.49	0.05	0.45	0.01	170	184 185
Northern Cape	Namakwa	Kamiesberg	306	365	10,905	0.23	0.04	0.40	0.06	0.62	0.06	0.43	0.01	98	226 221
Northern Cape	Namakwa	Hantam	306	366	22,000	0.11	0.03	0.23	0.04	0.42	0.05	0.48	0.01	194	225 111
Northern Cape	Namakwa	Karoo Hoogland	306	367	12,291	0.11	0.03	0.23	0.04	0.42	0.05	0.46	0.01	198	231 151
Northern Cape	Namakwa	Kh.I-Ma	306	368	13,339	0.09	0.02	0.21	0.03	0.39	0.05	0.43	0.01	206	233 223
Northern Cape	Pixley ka Seme	Ubuntou	307	369	19,592	0.31	0.05	0.50	0.06	0.70	0.05	0.45	0.01	40	191 193
Northern Cape	Pixley ka Seme	Umsobomvu	307	370	32,785	0.29	0.04	0.47	0.04	0.68	0.04	0.46	0.01	53	166 153
Northern Cape	Pixley ka Seme	Emthanjeni	307	371	46,654	0.27	0.04	0.45	0.05	0.64	0.04	0.4			

Table B8: Individual poverty incidence and Gini coefficients at the municipal level (2/3)

Province	District	Mun. Name	District Code	Mun. Code	Total No. of FPL inds. in mun.	FPL_se	LBPL	LBPL_se	UBPL	UBPL_se	Gini	Gini_se	Rankings			
													FPL	FPL num, Gini		
Northern Cape	John Taolo Gaetsewe	Gamagara	345	362	42,574	0,06	0,01	0,14	0,02	0,27	0,03	0,52	0,01	224	224	32
		Free State	416	460	36,676	0,12	0,03	0,25	0,05	0,44	0,06	0,46	0,01	179	205	162
		Free State	416	461	47,577	0,13	0,03	0,25	0,04	0,45	0,05	0,46	0,01	178	192	161
		Free State	416	462	33,595	0,18	0,04	0,33	0,05	0,53	0,06	0,48	0,01	130	190	109
		Free State	416	463	24,316	0,18	0,04	0,33	0,05	0,53	0,06	0,47	0,01	135	207	139
		Free State	418	464	59,030	0,24	0,03	0,41	0,03	0,62	0,03	0,47	0,01	82	139	134
Free State	Lejweleputswa	Tokologo	418	465	28,052	0,22	0,04	0,38	0,05	0,59	0,05	0,47	0,01	100	188	128
		Free State	418	466	47,162	0,33	0,04	0,51	0,04	0,71	0,04	0,47	0,01	31	133	126
		Free State	418	467	393,009	0,15	0,02	0,28	0,03	0,46	0,03	0,53	0,01	166	45	28
		Free State	418	468	80,625	0,29	0,03	0,47	0,04	0,67	0,04	0,48	0,01	52	105	102
		Free State	419	469	110,900	0,26	0,03	0,43	0,04	0,63	0,03	0,49	0,01	68	95	81
		Free State	419	470	125,268	0,15	0,02	0,29	0,03	0,48	0,04	0,52	0,01	160	119	40
Free State	Thabo Mofutsanyane	Diblabeng	419	471	59,753	0,24	0,03	0,40	0,04	0,61	0,04	0,48	0,01	91	140	103
		Free State	419	472	342,844	0,20	0,03	0,36	0,04	0,57	0,04	0,49	0,00	115	30	89
		Free State	419	473	47,244	0,25	0,04	0,42	0,05	0,62	0,05	0,47	0,01	81	158	138
		Free State	419	474	50,160	0,26	0,03	0,43	0,04	0,63	0,04	0,49	0,01	72	149	82
		Free State	420	475	149,197	0,21	0,03	0,37	0,04	0,57	0,04	0,50	0,01	106	87	66
		Free State	420	477	118,940	0,21	0,03	0,37	0,04	0,57	0,04	0,49	0,00	109	103	95
Free State	Fezile Dabi	Metsimaholo	420	478	143,354	0,06	0,01	0,14	0,02	0,28	0,03	0,54	0,01	222	171	22
		Free State	420	479	57,206	0,23	0,03	0,40	0,04	0,60	0,04	0,47	0,01	94	144	125
		Free State	420	479	725,358	0,10	0,01	0,21	0,02	0,37	0,03	0,56	0,01	202	25	8
		Free State	420	479	725,358	0,10	0,01	0,21	0,02	0,37	0,03	0,56	0,01	202	25	8
		Free State	420	479	725,358	0,10	0,01	0,21	0,02	0,37	0,03	0,56	0,01	202	25	8
		Free State	420	479	725,358	0,10	0,01	0,21	0,02	0,37	0,03	0,56	0,01	202	25	8
KwaZulu-Natal	Mangaung	Umuza	521	503	159,832	0,43	0,05	0,66	0,05	0,85	0,03	0,38	0,01	4	32	292
		Free State	521	504	96,127	0,38	0,05	0,60	0,05	0,80	0,03	0,43	0,01	11	76	224
		Free State	521	505	51,762	0,31	0,05	0,54	0,05	0,77	0,04	0,39	0,01	46	131	231
		Free State	521	506	249,308	0,13	0,02	0,27	0,04	0,48	0,04	0,49	0,01	176	86	90
		Free State	521	560	76,835	0,34	0,04	0,57	0,04	0,79	0,03	0,39	0,01	21	100	229
		Free State	521	561	75,973	0,16	0,02	0,31	0,03	0,51	0,04	0,49	0,01	151	157	78
KwaZulu-Natal	UMgungundlovu	uMshwathi	522	562	104,955	0,20	0,03	0,37	0,03	0,57	0,03	0,46	0,01	114	112	142
		Free State	522	563	87,764	0,05	0,01	0,11	0,02	0,24	0,04	0,54	0,01	231	210	17
		Free State	522	564	36,899	0,25	0,03	0,43	0,04	0,64	0,03	0,46	0,01	79	167	170
		Free State	522	565	33,029	0,32	0,04	0,51	0,05	0,71	0,04	0,45	0,01	34	160	202
		Free State	522	566	603,818	0,12	0,02	0,23	0,03	0,40	0,03	0,55	0,01	186	29	10
		Free State	522	567	61,644	0,17	0,02	0,33	0,03	0,54	0,04	0,46	0,01	136	161	150
KwaZulu-Natal	UMgungundlovu	Richmond	522	568	63,508	0,23	0,03	0,41	0,04	0,61	0,04	0,46	0,01	92	136	146
		Free State	523	514	233,642	0,18	0,02	0,33	0,03	0,52	0,03	0,51	0,01	133	65	54
		Free State	523	569	102,898	0,37	0,04	0,56	0,04	0,76	0,03	0,44	0,01	15	75	215
		Free State	523	570	82,233	0,16	0,02	0,30	0,03	0,49	0,04	0,50	0,01	153	148	58
		Free State	523	571	129,363	0,26	0,03	0,44	0,03	0,65	0,03	0,45	0,01	70	82	178
		Free State	523	573	112,158	0,27	0,04	0,45	0,04	0,66	0,04	0,44	0,01	64	91	211
KwaZulu-Natal	Umkhanyakude	Umhlabuyalingana	527	582	155,444	0,21	0,03	0,38	0,05	0,60	0,05	0,44	0,01	104	84	220
		Free State	527	583	185,123	0,31	0,04	0,50	0,04	0,71	0,04	0,44	0,01	43	44	214
		Free State	527	584	34,131	0,30	0,04	0,49	0,04	0,69	0,04	0,46	0,01	47	162	160
		Free State	527	585	71,296	0,39	0,04	0,57	0,04	0,76	0,03	0,45	0,01	8	97	174
		Free State	527	586	173,322	0,34	0,03	0,53	0,03	0,72	0,03	0,48	0,01	24	42	106
		Free State	528	538	321,282	0,11	0,02	0,21	0,02	0,38	0,03	0,54	0,01	200	81	20
KwaZulu-Natal	Uthungulu	Nkandla	528	542	113,346	0,37	0,04	0,56	0,04	0,75	0,03	0,46	0,01	14	64	168
		Free State	528	587	122,206	0,35	0,04	0,54	0,04	0,74	0,03	0,44	0,01	18	61	216
		Free State	528	588	74,033	0,37	0,03	0,56	0,04	0,76	0,03	0,44	0,01	16	98	219
		Free State	528	589	212,559	0,34	0,03	0,53	0,03	0,72	0,03	0,48	0,01	22	26	112
		Free State	528	590	47,579	0,35	0,03	0,54	0,03	0,73	0,03	0,46	0,01	19	126	154
		Free State	543	594	100,006	0,56	0,05	0,74	0,04	0,88	0,02	0,45	0,01	2	47	196
KwaZulu-Natal	Sisonke	Ingwe	543	595	12,156	0,16	0,04	0,31	0,06	0,51	0,06	0,48	0,01	146	229	99
		Free State	543	596	63,966	0,16	0,03	0,30	0,04	0,50	0,05	0,49	0,01	149	163	77
		Free State	543	597	100,583	0,49	0,04	0,67	0,04	0,83	0,03	0,46	0,01	3	55	166
		Free State	543	598	179,340	0,67	0,05	0,82	0,04	0,93	0,02	0,44	0,01	1	13	212
		Free State	554	574	62,283	0,14	0,02	0,27	0,03	0,45	0,03	0,51	0,01	169	170	45
		Free State	554	575	164,821	0,34	0,04	0,53	0,04	0,73	0,04	0,44	0,01	25	48	203
KwaZulu-Natal	Umzinyathi	Nqutu	554	576	177,354	0,30	0,04	0,49	0,05	0,70	0,04	0,44	0,01	48	49	206
		Free State	554	577	101,157	0,21	0,02	0,37	0,03	0,58	0,03	0,47	0,01	113	114	127
		Free State	555	524	357,516	0,15	0,02	0,29	0,03	0,48	0,03	0,50	0,01	164	50	68
		Free State	555	525	33,191	0,25	0,04	0,42	0,04	0,62	0,04	0,47	0,01	74	173	123
		Free State	555	526	101,436	0,33	0,04	0,52	0,04	0,72	0,04	0,45	0,01	30	83	201
		Free State	556	529	205,754	0,19	0,03	0,35	0,04	0,55	0,04	0,47	0,01	125	74	120
KwaZulu-Natal	Zululand	eDumbe	556	578	81,702	0,20	0,04	0,36	0,06	0,57	0,06	0,45	0,01	120	128	184
		Free State	556	579	126,585	0,24	0,03	0,42	0,04	0,63	0,04	0,44	0,01	85	89	204
		Free State	556	580	192,934	0,40	0,04	0,59	0,04	0,77	0,03	0,45	0,01	7	23	180
		Free State	556	581	185,743	0,34	0,04	0,53	0,04	0,73	0,03	0,46	0,01	23	36	157
		Free State	559	546	96,492	0,22	0,05	0,44	0,07	0,70	0,06	0,37	0,03	103	113	234
		Free State	559	591	136,643	0,11	0,04	0,28	0,05	0,53	0,06	0,39	0,03	191	132	230
KwaZulu-Natal	eThekweni	KwaDukuza	559	592	228,674	0,07	0,02	0,18	0,04	0,37	0,05	0,50	0,02	217	134	70
		Free State	559	593	139,988	0,21	0,05	0,42	0,06	0,68	0,06	0,37	0,03	107	93	233
		Free State	599	599	3,400,000	0,11	0,01	0,22	0,02	0,37	0,03	0,55	0,01	196	1	12
		Free State	637	660	184,183	0,25	0,03	0,43	0,04	0,64	0,04	0,44	0,00	77	59	209
		Free State	637	661	470,092	0,15	0,02	0,29	0,03	0,48	0,03	0,53	0,01	159	27	30

Table B8: Individual poverty incidence and Gini Coefficients at the municipal level (3/3)

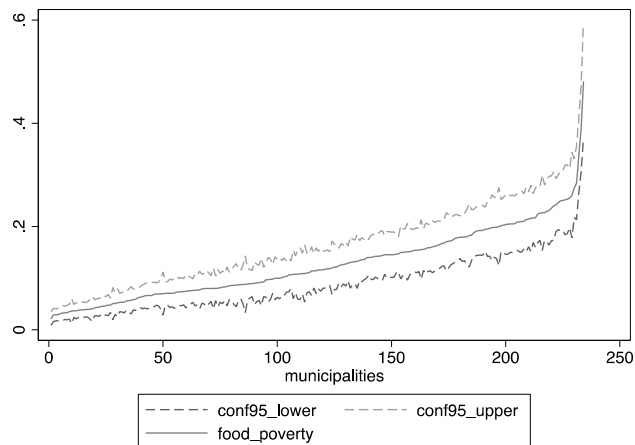
Province	District	Mun. Name	District Code	Mun. Code	Total No. of FPL inds. in mun.	FPL_se	LBPL	LBPL_se	UBPL	UBPL_se	Gini	Gini_se	Rankings			
													FPL	FPL_num	Gini	
North West	Dr Kenneth Kaunda	Maquassi Hills	640	678	79,552	0,29	0,04	0,47	0,04	0,67	0,04	0,48	0,01	50	106	107
Gauteng	Sedibeng	Emfuleni	742	760	735,141	0,10	0,02	0,20	0,02	0,36	0,03	0,54	0,01	203	24	25
Gauteng	Sedibeng	Midvaal	742	761	95,749	0,04	0,01	0,09	0,02	0,18	0,02	0,56	0,01	234	214	9
Gauteng	Sedibeng	Lesedi	742	762	99,871	0,07	0,01	0,15	0,02	0,28	0,03	0,54	0,01	215	186	24
Gauteng	West Rand	Mogale City	748	763	363,989	0,06	0,01	0,13	0,02	0,25	0,03	0,57	0,01	223	108	5
Gauteng	West Rand	Randfontein	748	764	151,571	0,07	0,01	0,14	0,02	0,27	0,03	0,54	0,01	216	165	18
Gauteng	West Rand	Westonaria	748	765	114,695	0,11	0,02	0,22	0,02	0,38	0,03	0,52	0,01	190	145	36
Gauteng	West Rand	Merafong City	748	766	193,760	0,11	0,02	0,22	0,02	0,38	0,03	0,52	0,01	195	110	43
Gauteng	Ekurhuleni	Ekurhuleni	797	797	3,200,000	0,06	0,01	0,14	0,02	0,26	0,03	0,57	0,01	220	5	3
Gauteng	City of Johannesburg	City of Johannesburg	798	798	4,500,000	0,08	0,02	0,17	0,02	0,30	0,03	0,60	0,01	212	2	1
Gauteng	City of Tshwane	City of Tshwane	799	799	2,900,000	0,06	0,01	0,12	0,02	0,23	0,02	0,59	0,01	225	8	2
Mpumalanga	Gert Sibande	Albert Luthuli	830	860	186,606	0,19	0,03	0,34	0,04	0,54	0,04	0,46	0,01	128	79	149
Mpumalanga	Gert Sibande	Msukaligwa	830	861	141,955	0,16	0,03	0,29	0,04	0,48	0,04	0,52	0,01	152	107	41
Mpumalanga	Gert Sibande	Mkhondo	830	862	145,749	0,21	0,04	0,36	0,06	0,55	0,06	0,49	0,01	111	90	83
Mpumalanga	Gert Sibande	Pixley Ka Seme	830	863	80,308	0,22	0,03	0,38	0,04	0,58	0,03	0,51	0,01	99	122	50
Mpumalanga	Gert Sibande	Lekwa	830	864	110,726	0,17	0,03	0,30	0,04	0,49	0,04	0,52	0,01	138	121	33
Mpumalanga	Gert Sibande	Dipaleseng	830	865	41,686	0,20	0,03	0,35	0,04	0,55	0,05	0,48	0,01	122	176	104
Mpumalanga	Gert Sibande	Govan Mbeki	830	866	295,048	0,12	0,03	0,23	0,04	0,39	0,05	0,57	0,01	185	77	4
Mpumalanga	Nkangala	Victor Khanye	831	867	73,101	0,11	0,02	0,23	0,03	0,41	0,03	0,52	0,01	193	174	42
Mpumalanga	Nkangala	Emalahleni	831	868	393,791	0,06	0,01	0,12	0,02	0,25	0,02	0,55	0,01	228	111	11
Mpumalanga	Nkangala	Steve Tshwete	831	869	225,423	0,06	0,01	0,13	0,02	0,25	0,03	0,55	0,01	227	150	14
Mpumalanga	Nkangala	Emakhazeni	831	870	44,485	0,12	0,02	0,24	0,03	0,42	0,04	0,49	0,01	184	197	88
Mpumalanga	Nkangala	Thembisile	831	871	315,262	0,20	0,03	0,36	0,04	0,57	0,04	0,46	0,00	123	38	148
Mpumalanga	Nkangala	Dr JS Moroka	831	872	256,353	0,26	0,03	0,44	0,04	0,65	0,03	0,46	0,00	65	35	169
Mpumalanga	Ehlanzeni	Thaba Chweu	832	873	93,327	0,12	0,02	0,24	0,04	0,43	0,04	0,50	0,01	180	159	72
Mpumalanga	Ehlanzeni	Mbombela	832	874	596,813	0,18	0,03	0,33	0,04	0,52	0,04	0,53	0,01	131	14	27
Mpumalanga	Ehlanzeni	Umgindi	832	875	62,963	0,13	0,02	0,25	0,03	0,43	0,04	0,51	0,01	177	179	48
Mpumalanga	Ehlanzeni	Nkomazi	832	876	399,746	0,31	0,03	0,49	0,04	0,69	0,03	0,47	0,00	40	10	118
Mpumalanga	Ehlanzeni	Bushbuckridge	832	877	558,824	0,42	0,05	0,61	0,05	0,79	0,03	0,45	0,00	5	3	176
Limpopo	Mopani	Greater Giyani	933	960	252,405	0,32	0,04	0,51	0,04	0,70	0,03	0,50	0,01	33	20	71
Limpopo	Mopani	Greater Letaba	933	961	219,234	0,37	0,04	0,57	0,04	0,76	0,03	0,46	0,01	12	18	145
Limpopo	Mopani	Greater Tzaneen	933	962	401,481	0,31	0,03	0,50	0,03	0,70	0,03	0,50	0,01	44	11	65
Limpopo	Mopani	Ba-Phalaborwa	933	963	150,986	0,18	0,02	0,34	0,03	0,54	0,03	0,51	0,01	129	96	47
Limpopo	Mopani	Maruleng	933	964	96,407	0,42	0,04	0,61	0,04	0,79	0,03	0,46	0,01	6	72	151
Limpopo	Vhembe	Mutale	934	965	95,734	0,19	0,03	0,35	0,04	0,56	0,04	0,48	0,01	124	120	108
Limpopo	Vhembe	Thulamela	934	966	643,083	0,28	0,03	0,46	0,03	0,66	0,03	0,49	0,01	60	7	89
Limpopo	Vhembe	Musina	934	967	67,461	0,09	0,02	0,19	0,04	0,37	0,05	0,47	0,01	209	193	135
Limpopo	Vhembe	Makhado	934	968	531,892	0,26	0,03	0,44	0,04	0,64	0,04	0,49	0,01	71	9	94
Limpopo	Capricorn	Blouberg	935	969	168,871	0,31	0,03	0,50	0,04	0,71	0,03	0,45	0,01	40	51	186
Limpopo	Capricorn	Aganang	935	970	136,577	0,31	0,03	0,50	0,03	0,71	0,03	0,44	0,01	45	62	207
Limpopo	Capricorn	Molemole	935	973	110,852	0,24	0,03	0,42	0,04	0,63	0,04	0,47	0,01	87	99	123
Limpopo	Capricorn	Polokwane	935	974	642,924	0,14	0,02	0,27	0,03	0,46	0,03	0,56	0,01	171	17	7
Limpopo	Capricorn	Lepale-Nkumpi	935	976	239,694	0,29	0,03	0,47	0,04	0,67	0,03	0,50	0,01	54	31	62
Limpopo	Waterberg	Thabazimbi	936	977	80,372	0,10	0,02	0,22	0,04	0,39	0,05	0,49	0,01	201	175	74
Limpopo	Waterberg	Lephalale	936	978	109,830	0,18	0,03	0,33	0,05	0,53	0,05	0,50	0,01	132	117	73
Limpopo	Waterberg	Mookgopong	936	979	36,181	0,20	0,03	0,36	0,05	0,57	0,05	0,49	0,01	121	182	93
Limpopo	Waterberg	Modimolle	936	980	71,208	0,28	0,05	0,46	0,06	0,66	0,05	0,50	0,01	59	116	69
Limpopo	Waterberg	Bela-Bela	936	981	66,607	0,26	0,06	0,43	0,07	0,63	0,06	0,50	0,01	66	123	61
Limpopo	Waterberg	Mogalakwena	936	982	320,584	0,24	0,03	0,42	0,03	0,63	0,03	0,49	0,01	88	22	86
Limpopo	Greater Sekhukhune	Ephraim Mogale	947	983	127,107	0,24	0,03	0,42	0,04	0,64	0,04	0,45	0,01	83	88	194
Limpopo	Greater Sekhukhune	Elias Motsoaledi	947	984	257,327	0,25	0,03	0,43	0,04	0,64	0,04	0,45	0,01	80	37	177
Limpopo	Greater Sekhukhune	Makhuduthamaga	947	985	285,694	0,28	0,03	0,47	0,04	0,68	0,04	0,45	0,00	57	21	190
Limpopo	Greater Sekhukhune	Fetakgomo	947	986	98,115	0,25	0,03	0,44	0,04	0,65	0,03	0,45	0,01	75	102	171
Limpopo	Greater Sekhukhune	Greater Tubatse	947	987	346,958	0,17	0,03	0,32	0,04	0,53	0,04	0,46	0,00	137	41	156

Table B9: Thirty municipalities with the largest and smallest numbers of individuals living below the food poverty line

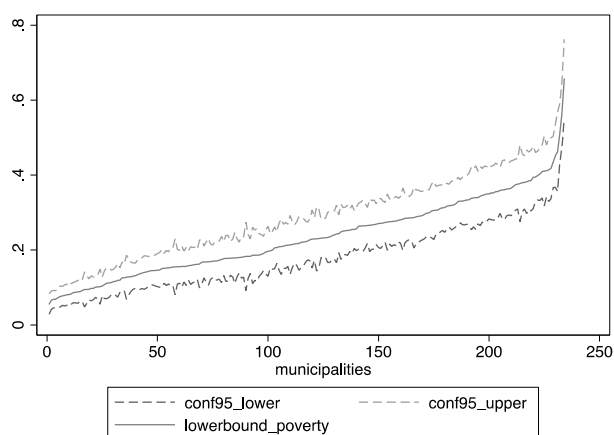
Province	District	Mun. Name	District Code	Mun. Code	Total No. of inds. in mun.	Percentage of Poor Individuals			Rankings		
						FPL	LBPL	UBPL	FPL	FPL num.	Gini
Thirty municipalities with the largest number of poor individuals											
KwaZulu-Natal	eThekweni	eThekweni	599	599	3,402,349	0,0449	0,0482	0,0537	196	1	12
Gauteng	City of Johannesburg	City of Johannesburg	798	798	4,491,228	0,0444	0,0500	0,0566	212	2	1
Mpumalanga	Ehlanzeni	Bushbuckridge	832	877	558,824	0,0274	0,0227	0,0186	5	3	176
Western Cape	City of Cape Town	City of Cape Town	199	199	3,721,439	0,0273	0,0333	0,0407	221	4	19
Gauteng	Ekurhuleni	Ekurhuleni	797	797	3,237,386	0,0246	0,0297	0,0359	220	5	3
Eastern Cape	Nelson Mandela Bay	Nelson Mandela Bay	299	299	1,146,576	0,0211	0,0211	0,0214	157	6	6
Limpopo	Vhembe	Thulamela	934	966	643,083	0,0211	0,0196	0,0179	60	7	89
Gauteng	City of Tshwane	City of Tshwane	799	799	2,930,672	0,0202	0,0241	0,0289	225	8	2
Limpopo	Vhembe	Makhado	934	968	531,892	0,0162	0,0155	0,0144	71	9	94
Mpumalanga	Ehlanzeni	Nkomazi	832	876	399,746	0,0147	0,0132	0,0117	40	10	118
Limpopo	Mopani	Greater Tzaneen	933	962	401,481	0,0147	0,0133	0,0118	44	11	65
Eastern Cape	Buffalo City	Buffalo City	260	260	740,179	0,0146	0,0151	0,0152	140	12	13
KwaZulu-Natal	Sisonke	Umkhulu	543	598	179,340	0,0141	0,0098	0,0070	1	13	212
Mpumalanga	Ehlanzeni	Mbombela	832	874	596,813	0,0127	0,0130	0,0130	131	14	27
Eastern Cape	Amathole	Mbashe	212	270	248,950	0,0107	0,0093	0,0079	17	15	191
Eastern Cape	Alfred Nzo	Mbizana	244	297	279,437	0,0106	0,0095	0,0084	32	16	171
Limpopo	Capricorn	Polokwane	935	974	642,924	0,0106	0,0117	0,0125	171	17	7
Limpopo	Mopani	Greater Letaba	933	961	219,234	0,0097	0,0083	0,0071	12	18	145
Eastern Cape	Amathole	Mnquma	212	271	246,362	0,0096	0,0086	0,0075	29	19	140
Limpopo	Mopani	Greater Giyani	933	960	252,405	0,0096	0,0086	0,0075	33	20	71
Limpopo	Greater Sekhukhune	Makhuduthamaga	947	985	285,694	0,0095	0,0089	0,0082	57	21	190
Limpopo	Waterberg	Mogalakwena	936	982	320,584	0,0092	0,0090	0,0085	88	22	86
KwaZulu-Natal	Zululand	Nongoma	556	580	192,934	0,0090	0,0076	0,0063	7	23	180
Gauteng	Sedibeng	Emfuleni	742	760	735,141	0,0088	0,0100	0,0113	203	24	25
Free State	Mangaung	Mangaung	499	499	725,358	0,0087	0,0101	0,0115	202	25	8
KwaZulu-Natal	Uthungulu	uMlalazi	528	589	212,559	0,0086	0,0075	0,0065	22	26	112
North West	Bojanala	Madibeng	637	661	470,092	0,0086	0,0091	0,0096	159	27	30
Eastern Cape	O.R.Tambo	Ngquana Hill	215	290	276,129	0,0085	0,0081	0,0075	69	28	159
KwaZulu-Natal	UMgungundlovu	The Msunduzi	522	566	603,818	0,0084	0,0093	0,0102	186	29	10
Free State	Thabo Mofutsanyane	Maluti a Phofung	419	472	342,844	0,0082	0,0083	0,0082	115	30	89
Thirty municipalities with the smallest number of poor individuals											
Free State	Xhariep	Letsemeng	416	460	36,676	0,0005	0,0006	0,0007	179	205	162
Western Cape	West Coast	Saldanha Bay	101	163	97,665	0,0005	0,0007	0,0009	232	206	59
Free State	Xhariep	Naledi	416	463	24,316	0,0005	0,0005	0,0005	135	207	139
Western Cape	Overberg	Swellendam	103	170	35,561	0,0005	0,0005	0,0006	189	208	91
Western Cape	Eden	Kannaland	104	174	24,669	0,0005	0,0005	0,0005	141	209	133
KwaZulu-Natal	UMgungundlovu	uMngeni	522	563	87,764	0,0005	0,0007	0,0009	231	210	17
Northern Cape	Pixley ka Seme	Siyathemba	307	375	23,132	0,0005	0,0005	0,0005	138	211	186
Western Cape	West Coast	Bergvliet	1,01E+02	1,62E+02	59,120	0,0005	0,0006	0,0007	219	212	130
Eastern Cape	Amathole	Nxuba	212	277	23,949	0,0005	0,0005	0,0005	150	213	141
Gauteng	Sedibeng	Midvaal	742	761	95,749	0,0004	0,0006	0,0007	234	214	38
Western Cape	Eden	Kynsna	104	180	67,985	0,0004	0,0006	0,0007	229	215	39
Eastern Cape	Chris Hani	Inkwanca	213	280	21,797	0,0004	0,0005	0,0005	145	216	222
Eastern Cape	Cacadu	Baviaans	210	267	17,526	0,0004	0,0004	0,0004	119	217	207
Northern Cape	Siyanda	Kgatelopele	308	382	20,636	0,0004	0,0004	0,0004	155	218	114
Northern Cape	Pixley ka Seme	Kareeberg	307	372	12,801	0,0004	0,0003	0,0003	93	219	183
Northern Cape	Pixley ka Seme	Thembellile	3,07E+02	3,74E+02	17,560	0,0003	0,0004	0,0004	144	220	67
Western Cape	Eden	Bitou	1,04E+02	1,79E+02	48,502	0,0003	0,0004	0,0006	226	221	44
Western Cape	Overberg	Cape Agulhas	103	173	33,086	0,0003	0,0004	0,0005	210	222	56
Western Cape	Central Karoo	Prince Albert	105	182	13,075	0,0003	0,0003	0,0003	116	223	87
Northern Cape	John Taolo Gaetsewe	Gamagara	345	362	42,574	0,0003	0,0004	0,0005	224	224	32
Northern Cape	Namakwa	Hantam	3,06E+02	3,66E+02	22,000	0,0003	0,0003	0,0004	194	225	111
Northern Cape	Namakwa	Kamiesberg	306	365	10,905	0,0003	0,0003	0,0003	98	226	221
Northern Cape	Namakwa	Richtersveld	306	363	12,192	0,0003	0,0003	0,0003	127	227	182
Eastern Cape	Cacadu	Ikwezi	210	263	10,512	0,0003	0,0003	0,0003	111	228	210
KwaZulu-Natal	Sisonke	Kwa Sani	543	595	12,156	0,0002	0,0002	0,0003	146	229	99
Northern Cape	Pixley ka Seme	Renosterberg	307	373	12,090	0,0002	0,0002	0,0002	168	230	192
Northern Cape	Namakwa	Karoo Hoogland	306	367	12,291	0,0002	0,0002	0,0002	198	231	151
Northern Cape	Siyanda	Mier	308	377	7,773	0,0002	0,0002	0,0002	142	232	179
Northern Cape	Namakwa	Kh. i-Ma	306	368	13,339	0,0001	0,0002	0,0002	206	233	223
Western Cape	Central Karoo	Laingsburg	105	181	8,007	0,0001	0,0002	0,0002	158	234	144

Figure B3: FPL, LBPL and UBPL poverty rates at municipal level with 95 percent confidence intervals (Household level)

FPL Poverty Rates



LBPL Poverty Rates



UBPL Poverty Rates

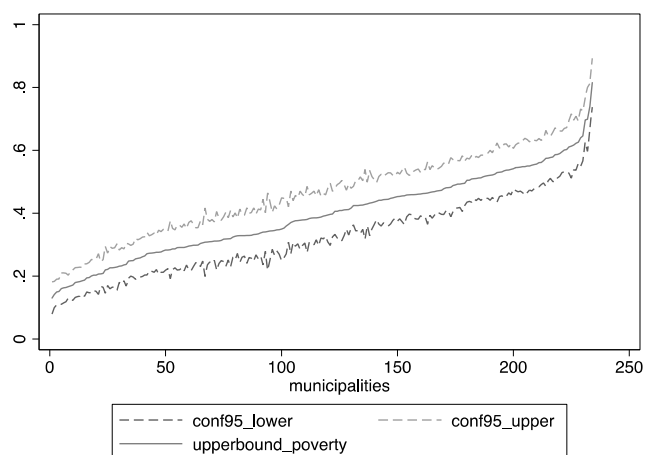
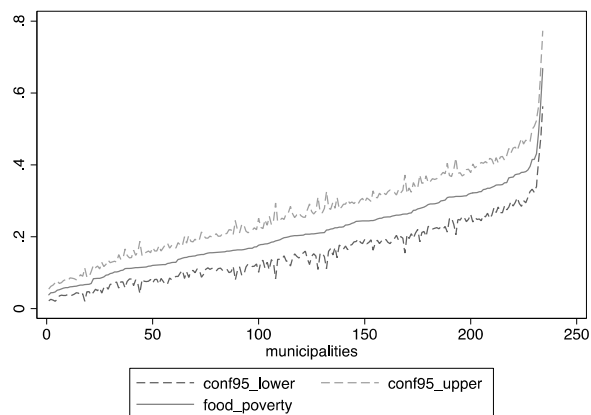
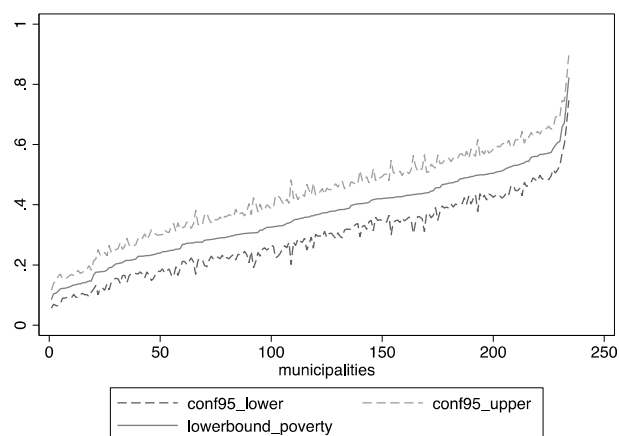


Figure B4: FPL, LBPL and UBPL poverty rates at municipal level with 95 percent confidence intervals (Individual Level)

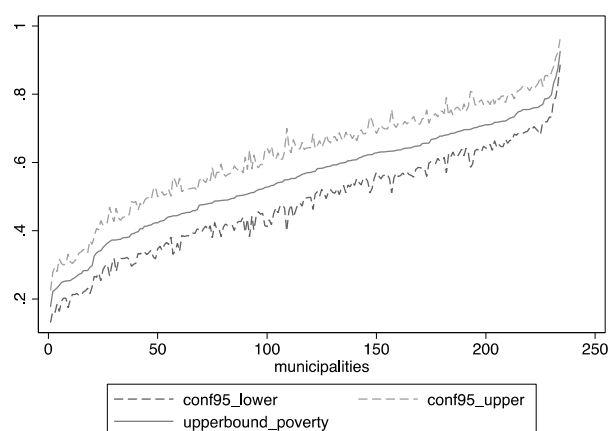
FPL Poverty Rates



LBPL Poverty Rates



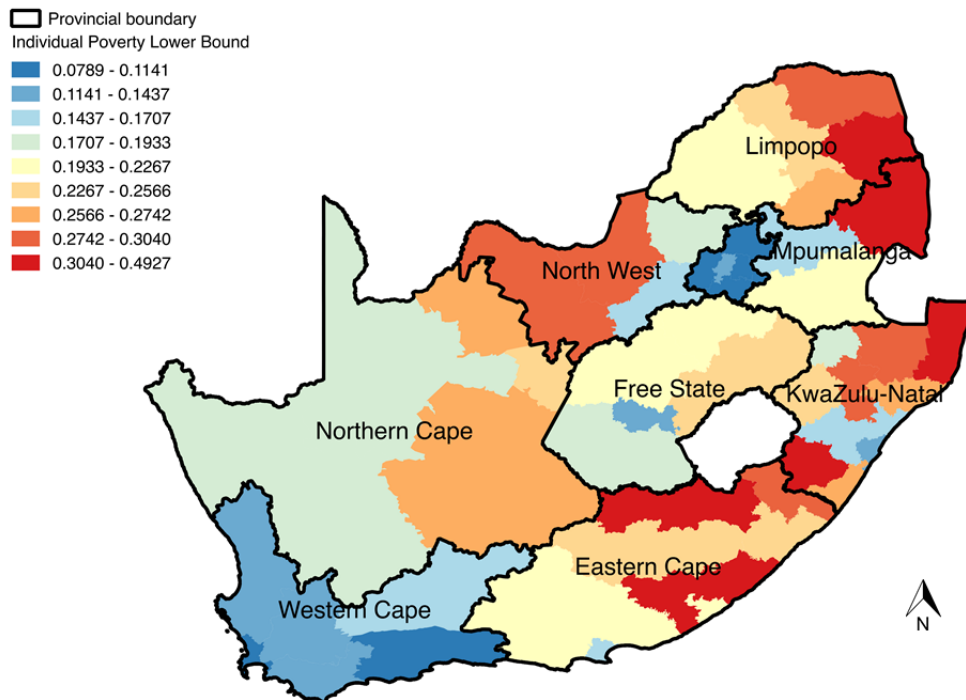
UBPL Poverty Rates



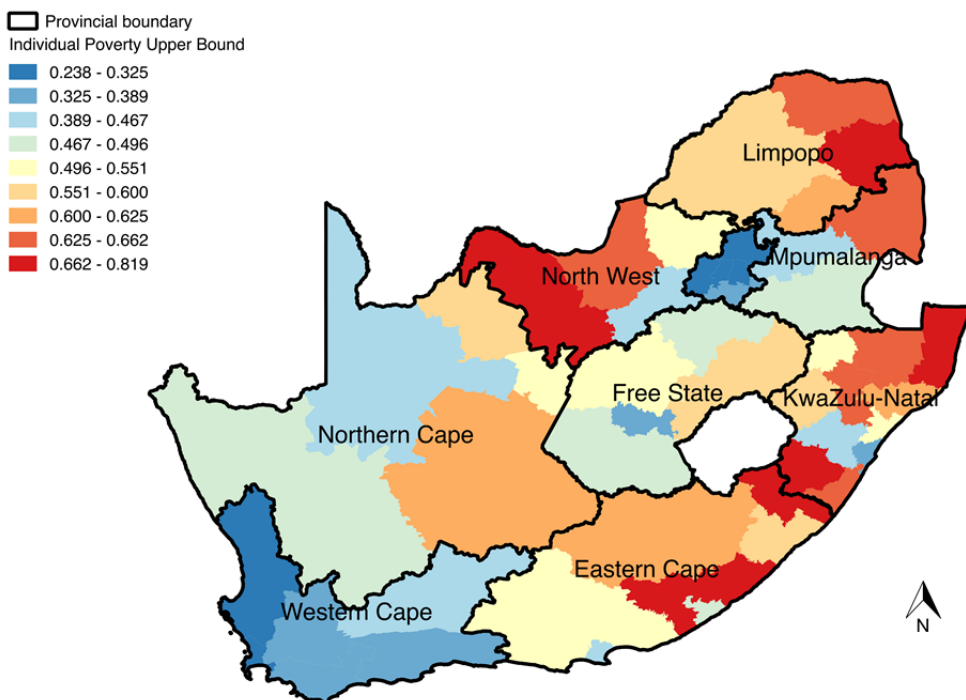
Appendix C: Complementary Maps

Map C1: Individual poverty rates (District level)

LBPL Poverty Rates

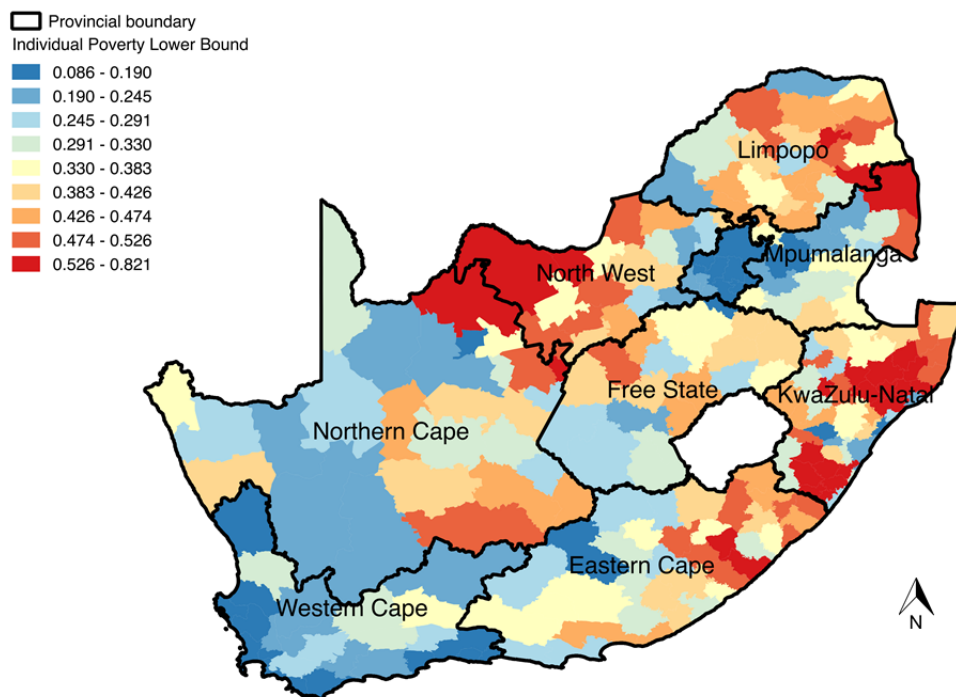


UBPL Poverty Rates

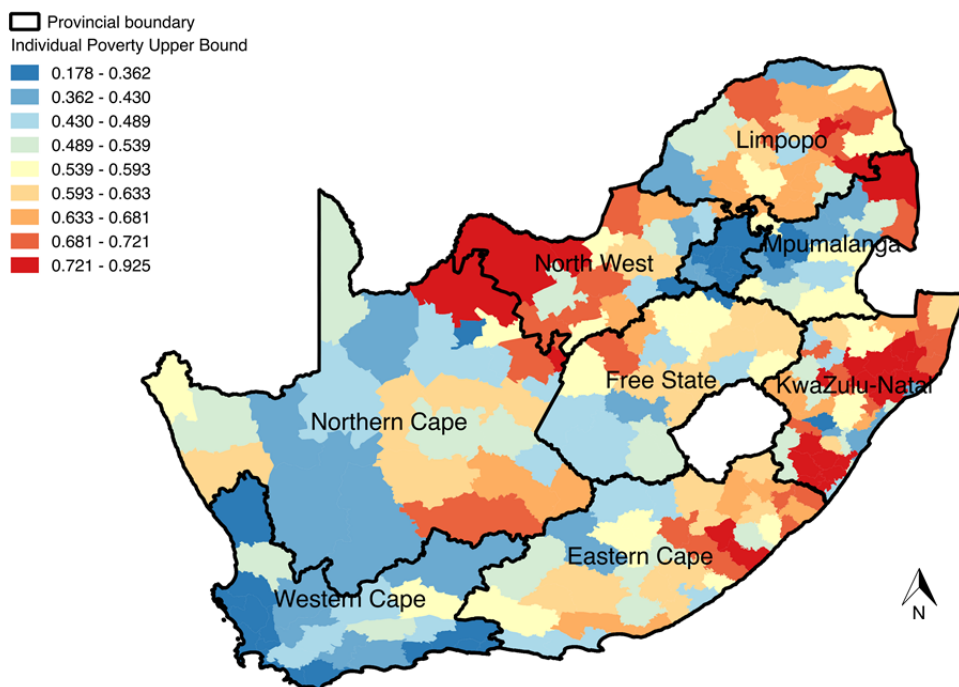


Map C2: Individual poverty rates (Municipal level)

LBPL Poverty Rates

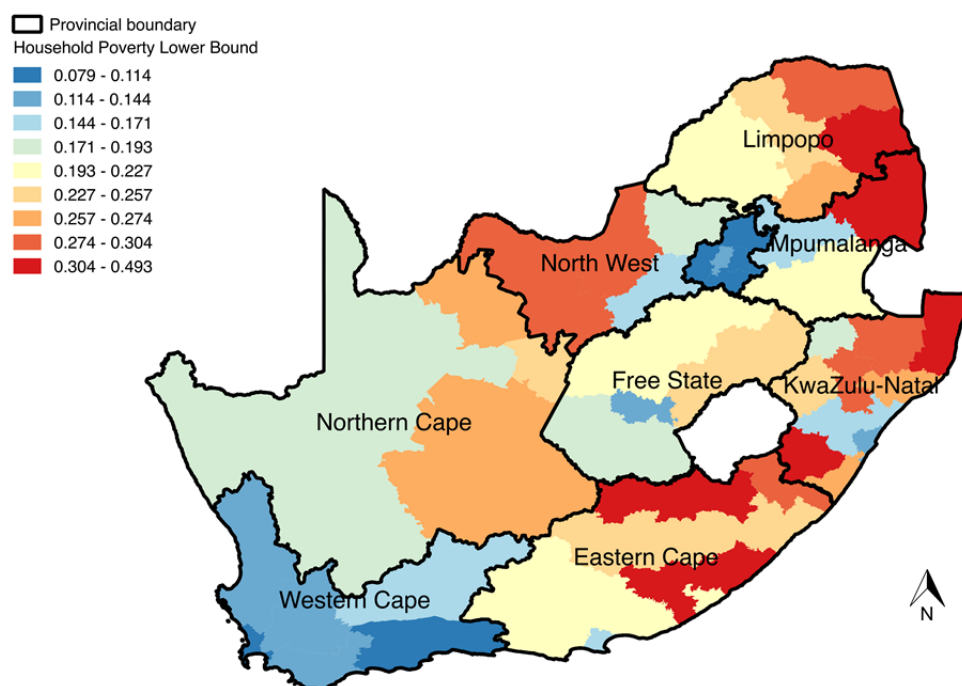


UBPL Poverty Rates

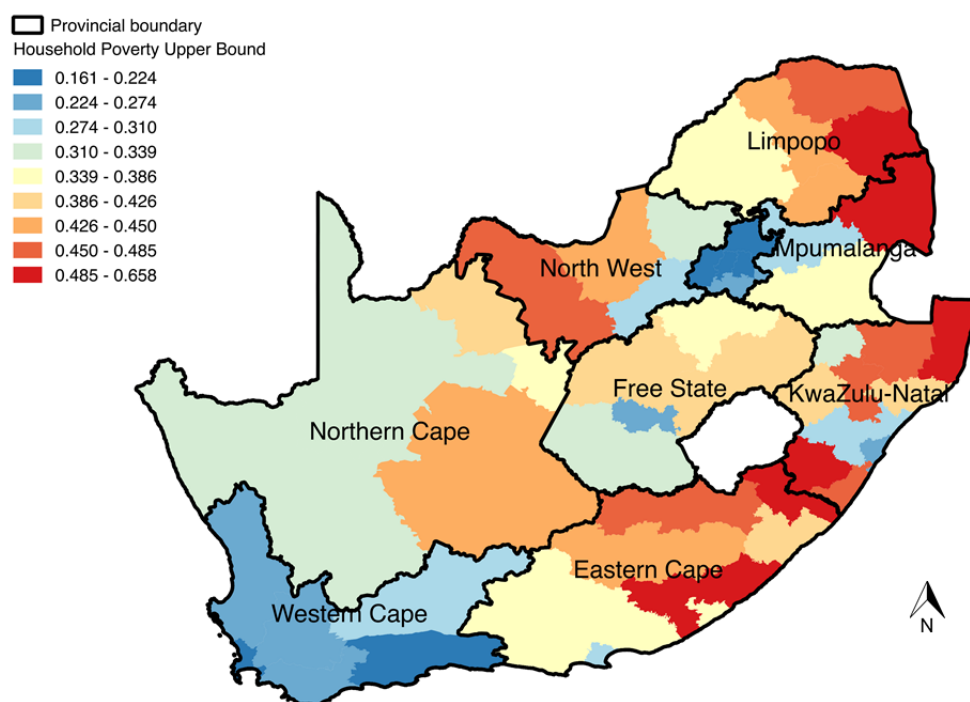


Map C3: Household poverty rates (District level)

LBPL Poverty Rates



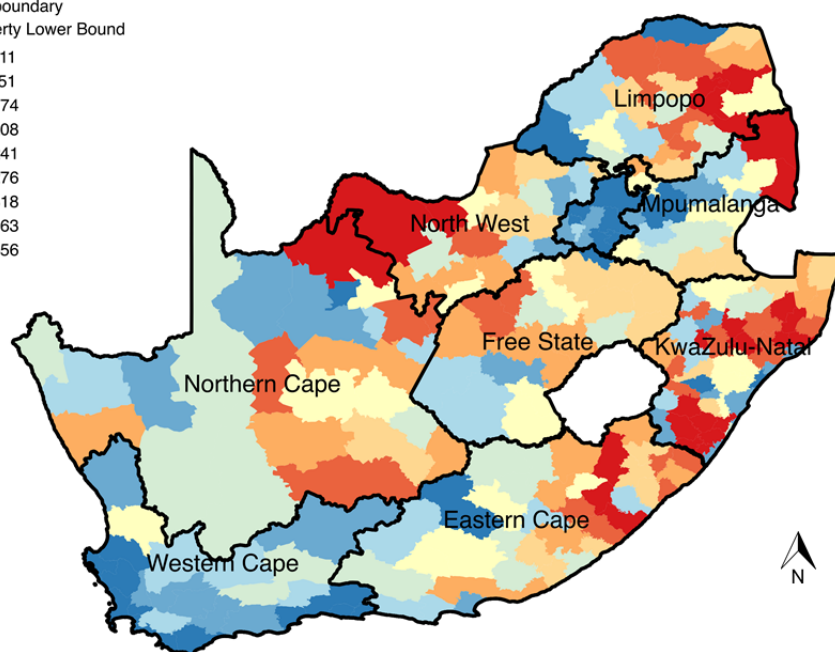
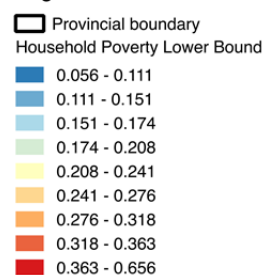
UBPL Poverty Rates



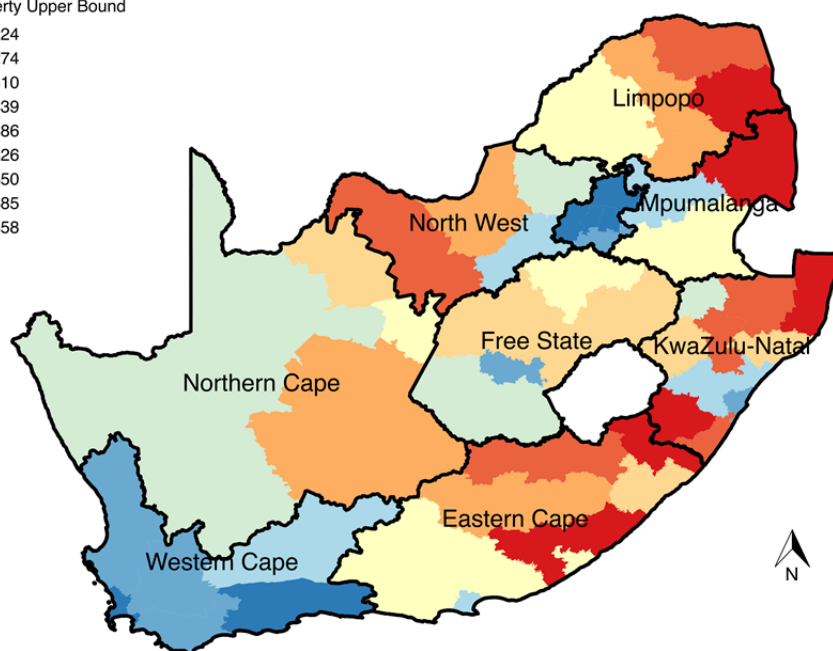
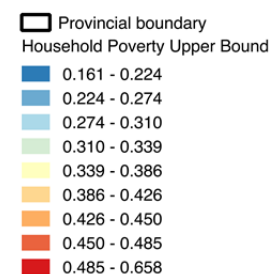
Map C4: Household poverty rates (Municipal level)

LBPL Poverty Rates

Legend

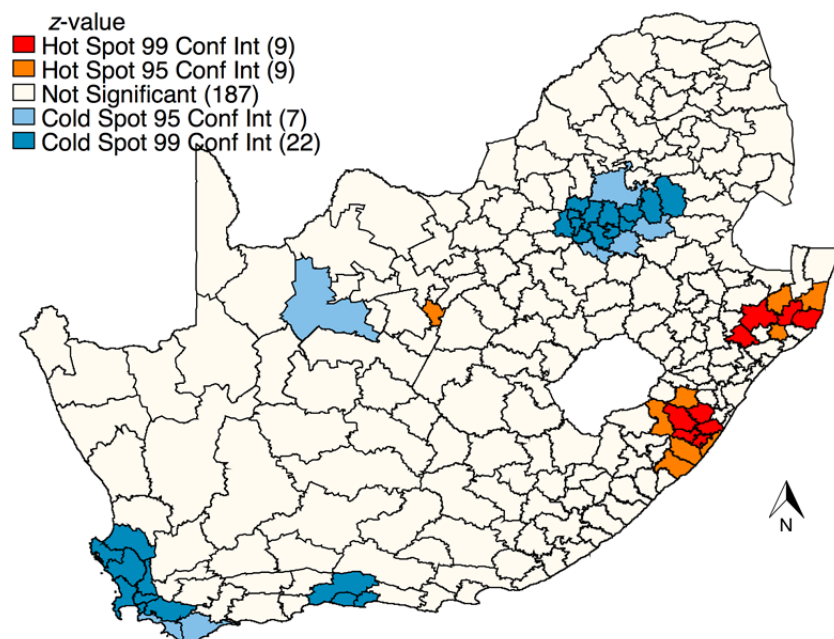


UBPL Poverty Rates



Map C5: Hot and Cold Spot Analysis of individual poverty rates at the municipal level (Poverty Map 2011)

LBPL Poverty Rates



UBPL Poverty Rates

