



saspri

Southern African Social Policy Research Institute
Southern African Social Policy Research Insights

Multiple Deprivation and Income Poverty at Small Area Level in South Africa in 2011

Michael Noble, Wanga Zembe, Gemma Wright and David
Avenell

2013

Suggested citation:

Noble, M., Zembe, W., Wright, G. , Avenell, D., (2013) *Multiple Deprivation and Income Poverty at Small Area Level in South Africa in 2011* Cape Town: SASPRI.

Disclaimer:

The facts presented and views expressed in this report are those of the authors. The Southern African Social Policy Research Institute and Southern African Social Policy Research Insights (collectively referred to as 'SASPRI') took care to ensure that the information in this report and the accompanying data are correct. However, no warranty, express or implied, is given as to its accuracy and SASPRI does not accept any liability for error or omission. SASPRI is not responsible for how the information is used, how it is interpreted or what reliance is placed on it. SASPRI does not guarantee that the information in this report or in the accompanying file is fit for any particular purpose. SASPRI does not accept responsibility for any alteration or manipulation of the report or the data once it has been released.

The authors:

Professor Michael Noble is emeritus Professor of Social Policy at the University of Oxford and Executive Director of both The Southern African Social Policy Research Institute and Southern African Social Policy Research Insights (collectively referred to as SASPRI)

Dr Wanga Zembe is a Research Fellow at SASPRI

Dr Gemma Wright is a Research Associate at SASPRI

David Avenell, is SASPRI's GIS expert

Acknowledgement:

The authors would like to acknowledge the support of Stefan Noble and in particular for his methodological suggestions.

Contents

1. Introduction	4
2. Background	5
3. The Importance of ward level measures of multiple deprivation	6
<i>What is multiple deprivation and how does it differ from poverty?</i>	6
4. Domains and indicators in the SAIMD 2011	8
<i>An introduction to the domains and indicators</i>	8
The model of multiple deprivation	8
Domains	8
Data source	9
Selection of indicators	9
5. Domains and component indicators	11
<i>Material Deprivation Domain</i>	11
Purpose of domain	11
Background	11
Indicators	11
Combining the indicators	12
<i>Employment Deprivation Domain</i>	12
Purpose of domain	12
Background	12
Indicators	12
Combining the indicators	13
<i>Education Deprivation Domain</i>	14
Purpose of domain	14
Background	14
Indicator	14
<i>Living Environment Deprivation Domain</i>	14
Purpose of domain	14
Background	15
Indicators	15
Combining the indicators	15

6. Methodology	16
<i>Use of the 2011 Census.....</i>	<i>16</i>
<i>Creating domain indices</i>	<i>16</i>
Dealing with small numbers.....	16
Combining indicators into domain indices.....	16
<i>Combining the four domain indices into the SAIMD 2011</i>	<i>17</i>
Standardisation and transformation.....	17
Weighting.....	18
7. The geography of multiple deprivation	19
<i>How to interpret the ward level results</i>	<i>19</i>
The four domain measures and ranks	19
The overall SAIMD 2011.....	19
<i>National and provincial results</i>	<i>20</i>
<i>Local Municipality Level Deprivation</i>	<i>23</i>
<i>Ward Level Deprivation</i>	<i>24</i>
<i>Former Homeland Analysis</i>	<i>29</i>
8. Income Poverty at Ward Level	31
<i>Background.....</i>	<i>31</i>
<i>Methodology.....</i>	<i>31</i>
<i>Results.....</i>	<i>32</i>

1. Introduction

This report presents a diagnostic analysis of poverty and multiple deprivation at small area level across South Africa utilising both the South African Index of Multiple Deprivation 2011 at ward level (SAIMD 2011) and an analysis of income poverty at ward level.

The SAIMD 2011 is a weighted aggregate of four domains or dimensions of deprivation. These are: material deprivation, employment deprivation, education deprivation and living environment deprivation.

Additionally, income poverty utilising two commonly used income poverty lines are also analysed at ward level across South Africa.

2. Background

Both the SAIMD 2011 at ward level and the income poverty measures at ward level have been developed by SASPRI to facilitate sub municipality analysis of multiple deprivation and its component domains.

The SAIMD 2011 is the latest in a series of indices of multiple deprivation for South and Southern Africa that have been developed using census data to describe multiple deprivation at sub municipality level. The original South African study for 2001 was at ward level (Noble *et al.*, 2006a and 2006b; Noble *et al.*, 2009b) and was followed by a series of further refinements to develop a very small area or datazone level index for 2001 (Noble *et al.*, 2009a; Noble and Wright, 2012), a series of child focused indices (Barnes *et al.*, 2007; Barnes *et al.*, 2009; Wright *et al.*, 2009a) and updates to 2007 at municipality level (Wright and Noble, 2009; Wright *et al.*, 2009b) together with a modelled SAIMD at datazone level for 2007 (Noble *et al.*, 2010a). Indices have also been produced for Namibia (Noble *et al.*, 2011). The ward and datazone level indices 2001 have been used in many ways by national and provincial government including targeting areas for the take-up of child support grant, prioritising wards for specific antipoverty interventions and in the case of the City of Johannesburg, as part of the mechanism to target its indigency policy. Specific reports utilising the indices have been developed for various provinces and also for the city of Johannesburg.

3. The Importance of ward level measures of multiple deprivation

Spatial patterns of poverty and multiple deprivation are not random. The spatial distribution reflects the outcome of a number of dynamic social processes and factors which include migration, availability and cost of living space, community preferences, current and historical policies. The latter is particularly important in South Africa where the spatial legacy of apartheid means that poor South Africans are concentrated spatially and tend to reside either in formerly racially segregated 'townships' around cities created or confirmed as a result of the Group Areas Acts 1950-1966, or in former homelands created in colonial times and further promulgated under the Bantu Authorities Act 1951 (Christopher, 1994). Within the urban townships the very poorest people tend to live in informal settlements.

By documenting this spatial distribution at small area level policymakers can effectively target resources and policies (Smith, 1999; Kleinman, 1999; Smith *et al.*, 2001) to complement mainstream services. This process can be further enhanced by analysing not only the overall index of multiple deprivation but also the component domains and so obtain a more nuanced picture.

What is multiple deprivation and how does it differ from poverty?

The definition of multiple deprivation adopted in this report follows that given by Townsend in 1987 who defined people as deprived if 'they lack the types of diet, clothing, housing, household facilities and fuel and environmental, educational, working and social conditions, activities and facilities which are customary' (Townsend, 1987: pp131 and 140). "Poverty" on the other hand, can be thought of as referring to the lack of resources which lead to deprivation. This is again consistent with Townsend who argued that people are poor if 'they lack the resources to obtain the types of diet, participate in the activities and have the living conditions and amenities which are customary, or at least widely encouraged or approved in the societies to which they belong' (Townsend, 1979: 31). 'Deprivation' thus refers to people's unmet needs, whereas 'poverty' refers to the lack of resources required to meet those needs. The model of multiple deprivation employed in this report flows from these definitions. Multiple deprivation is conceptualised as an accumulation of single dimensions or domains of deprivation (Townsend, 1987).

In this report, in addition to an analysis of multiple deprivation, a complementary analysis of income poverty at small area level using two commonly used poverty lines is also undertaken (see Section 8).

Dimensions of deprivation

As has been articulated elsewhere (e.g. Noble *at al.*, 2006a) the model of multiple deprivation which underpins the SAIMD 2011 requires the separate measurement of different dimensions (or domains) of deprivation, such as employment deprivation and education deprivation, which are then combined with appropriate weighting into a single measure of multiple deprivation. Each of the individual domains of deprivation are, however, also expressed as a domain specific index of deprivation. This is important as they may be used individually for specific policy purposes where an overall index of multiple deprivation might be less useful.

4. Domains and indicators in the SAIMD 2011

An introduction to the domains and indicators

The model of multiple deprivation

As we have indicated each domain of deprivation measures a specific type of deprivation. In some domains these are measured at the household level (for example, in the material deprivation domain), whereas in other domains these are measured at the individual level (for example, in the education domain). People (or households) may be counted as deprived in one or more of the domains, depending on the number of types of deprivation that are experienced. However, within each domain, there is no double counting. The overall SAIMD 2011 combines each of these individual domains of deprivation using equal weights.

Domains

The selection of the domains of deprivation for the SAIMD 2011 was strongly influenced by the domains selected in respect of the SAIMD 2001 in all its various configurations (in particular Noble *et al.*, 2006a and Noble *et al.*, 2009a). In the SAIMD 2001 there were five domains of deprivation identified that were constructed using the 2001 Census: Income and Material Deprivation, Employment Deprivation, Health Deprivation, Education Deprivation, and Living Environment Deprivation. Because the SAIMD 2011 has been constructed from published data, it was not possible to construct a health deprivation domain.

Furthermore, due to the nature of the Census data extraction tool (Superstar) it was not possible to construct a combined income and material deprivation domain following the same methodology as the SAIMD 2001. However, the material deprivation domain that was constructed for the SAIMD 2011 is, arguably, more consistent with the original Townsend definition of deprivation in that it does not mix deprivations with the lack of resources (i.e. income) which result in those deprivations. However, as has been indicated, two separate income poverty indices are also presented in Section 8.

The actual domains comprising the SAIMD 2011 are as follows:

- 1) material deprivation
- 2) employment deprivation
- 3) education deprivation
- 4) living environment deprivation

It is important to emphasise the integrity of the domains of deprivation. So, for example, the employment domain reflects exclusion from the world of work and not the lack of income such exclusion generates. Clearly the dimensions of deprivation are related and it is quite possible for the same person or household to be represented in more than one domain. So for example, employment deprivation is usually associated with low income and low income can lead to high levels of material deprivation. Similarly, education deprivation can result in employment deprivation. Nevertheless, the aggregate effects of different deprivations are also of interest and so an aggregate index of multiple deprivation is also generated.

It should also be emphasised that in any particular domain the proportion of people or households experiencing that particular deprivation in an area is measured, meaning that the ward domain score is an easy to interpret rate.

Data source

The SAIMD 2011 is derived entirely from the 2011 Census of Population carried out in October 2011. The data are derived from Statistics South Africa's data published through its Superstar tool.

Using this tool data were extracted for each domain index. The number of indicators per domain are indicated in the description of the domains that follows. Denominators were obtained in the same extraction process and relate to the numerator within each domain.

Selection of indicators

The selection of indicators for each domain were informed, wherever possible, by an earlier piece of research which sought the views of all South Africans on the necessities for an adequate standard of living (Noble *et al.*, 2007; Wright *et al.*, 2007; Wright *et al.*, 2010; Wright and Noble, 2013). The domains themselves were selected because they

were used in the SAIMD 2001 which, in turn, were selected after a stakeholder consultation process (Noble *et al.*, 2006a and 2006b).

As was the case for the SAIMD 2001, we endeavoured to include within each domain 'a parsimonious (i.e. economical in number) collection of indicators that comprehensively captured the deprivation for each domain, but within the constraints of the data available from the Census' (Noble *et al.*, 2006a). Three further criteria were kept in mind when selecting indicators:

- They should be 'domain specific' and appropriate for the purpose (as direct as possible measures of that form of deprivation);
- They should measure major features of that deprivation (not conditions just experienced by a very small number of people or areas);
- They should be statistically robust.

5. Domains and component indicators

Material Deprivation Domain

Purpose of domain

The purpose of this domain is to capture the proportion of households in a ward experiencing material deprivation.

Background

There are many items that could, theoretically, comprise a material deprivation domain. Given that the purpose of the SAIMD 2011 is to produce a small area (in this case electoral ward) measure, we are constrained by items that are measured within the 2011 Census.

However, notwithstanding the data constraint, we still need a rationale for selecting indicators from the 2011 Census. One of the most attractive rationales is to consider what South Africans regard as necessities for an acceptable standard of living. Following an international tradition of what is sometimes referred to as consensual poverty approaches, a study was undertaken in South Africa to derive a list of items considered to be “necessary” for an adequate standard of living (e.g. Wright *et al.*, 2010). The results of this study have informed the selection of indicators for both this domain and the living environment domain.

Indicators

- Number of households with no refrigerator; or
- Number of households with neither a landline phone nor a cell phone; or
- Number of households with neither a television nor a radio.

Ownership of a refrigerator is regarded as a basic asset for safe storage of food. Ownership of a radio or television represents an important mode of communication with the outside world and a means of accessing information critical to one’s life and livelihood. A cell phone (or a landline) is regarded as important at a number of levels – for those of working age and out of the labour market it is essential for accessing jobs, for older people it is a lifeline to relatives and social and health care services.

Combining the indicators

A simple proportion of households experiencing one or more of the deprivations was calculated (i.e. the number of households living in a household without a refrigerator, and/or with neither a television nor a radio, and/or with neither a cell phone nor a landline, divided by the total number of households).

Employment Deprivation Domain

Purpose of domain

This domain measures employment deprivation in terms of the expanded definition of unemployment for people of working age.

Background

In addition to the 'official' definition of the unemployed (which accords with the definition promulgated by the International Labour Organisation) we also consider those who are 'discouraged workers' as it is recommended that they should be included (e.g. Lloyd and Leibbrandt, 2013). This generates a measure that is sometimes regarded as the 'expanded' definition of unemployment.

Indicators

- Number of people aged 15 to 64 inclusive who are unemployed (using official definition); plus
- Number of people aged 15 to 64 inclusive who are discouraged workers.

Statistics South Africa (StatsSA) gives the official definition of the unemployed as ‘those people aged 15–65¹ years who:

- did not work during the 7 days prior to 10 October;
- want to work and are available to start work within a week of the interview; and
- have taken active steps to look for work or to start some form of self-employment in the 7 days prior to 10 October. (Statistics South Africa, 2012: 78).

‘Active steps to seek work’ are defined by StatsSA as: ‘Steps such as registration at unemployment exchange, applications to employers, checking at work sites or farms, placing or answering newspaper advertisements, seeking assistance of friends, etc.’ (Statistics South Africa, 2012: 6).

Discouraged Workers are those who

- did not work during the 7 days prior to 10 October;
- want to work and are available to start work within a week of the interview;
- Have not taken ‘active steps to seek work’
- Gave the reason for not working (P27) as ‘no jobs available’

Combining the indicators

By combining the numbers of ‘officially’ unemployed with the ‘discouraged workers’ we obtain the numerator for this domain which accords with the expanded definition of unemployment.

The denominator is the labour force (sometimes referred to as the economically active population). This comprises the employed, the official unemployed, and the discouraged workers aged 15 – 64 inclusive.

¹ Although StatsSA used the definition 15-65 in the metadata, the actual data only has values for ages 15 to 64 inclusive and this latter age range is therefore used in the index.

Education Deprivation Domain

Purpose of domain

The purpose of this domain is to capture the extent of deprivation in terms of educational qualifications in a local area for adults aged 18 to 64 years inclusive.

Background

It is well documented that the level of education an individual has achieved determines both current income and savings potential and future opportunities for individuals and their dependents (e.g. Borat *et al.*, 2004).

Unfortunately there are no Census questions on educational attainment per se but there is information on the highest level of education reached and this will be a good proxy for educational attainment. Many of the disparities in educational achievement throughout the adult population are direct legacies of the apartheid education system and, in particular the Bantu Education Act 1953. Thus it is to be expected that these disparities in education will be spatially contoured.

Indicator

- Number of 18-64 year olds (inclusive) with no schooling at secondary level or above.

The denominator is the total number of 18-64 year olds (inclusive).

Living Environment Deprivation Domain

Purpose of domain

The purpose of this domain is to identify deprivation relating to the poor quality of the living environment.

Background

This domain considers different aspects of the immediate environment in which people live that impact on the quality of their day-to-day life. This covers issues which might be regarded as service delivery deprivations. This domain is measured at the individual level.

Indicators

- Number of people without an adequate water supply; or
- Number of people without access to an adequate toilet; or
- Number of people without use of electricity for lighting; or
- Number of people living in a house that is a shack

We define adequate water supply here as 'piped water inside dwelling', 'piped water inside the yard', 'piped water on community stand within 200 metres'. We define adequate toilet here as 'flush toilet connected to the sewerage', 'flush toilet connected to septic tank', and 'ventilated pit latrine'².

Combining the indicators

A simple proportion of households experiencing one or more of the deprivations was calculated (i.e. the number of households without an adequate water supply and/or without adequate toilet facilities and/or without electricity for lighting and/or a house that is a shack, divided by the total households).

² These were selected as standards commonly used by government .

6. Methodology

Use of the 2011 Census

The indicators and the denominators for the domains were extracted from the ward tables from 2011 Census using the Superstar tool. Data were exported in CSV format and imported into STATA for further analysis.

Creating domain indices

Dealing with small numbers

Each of the domain indices were created as simple rates. However, in line with good practice, statistical procedures were undertaken to deal with small numbers in the denominator in some wards. Such small numbers can result in relatively large standard errors which need to be addressed. It used to be argued that because Census data are, by definition, not samples but counts of the whole population then issues of standard error and procedures to deal with them are not relevant. However, current statistical practice is that a census is simply a sample from a 'super population' and it is entirely appropriate to take steps to measure and deal with standard error.

The technique employed is known as 'empirical Bayes shrinkage estimation' (Noble *et al.*, 2006c). Basically, the technique identifies wards with large standard errors and moves them towards a more reliable score – in this case the local municipality mean to an extent which depends on the size of the standard error and the level of heterogeneity in the local municipality in which the ward is located. If the scores are robust then movement is negligible. Sensitivity testing undertaken by the research team indicates that shrinkage estimation has very little impact on the overall domain scores. Nevertheless, it has been applied to accord with good practice.

Combining indicators into domain indices

For each domain of deprivation the aim is to obtain a single summary measure (or Domain Index) whose interpretation is straightforward in that it is expressed in meaningful units (e.g. proportions of people or of households experiencing that form of deprivation). The advantage of simple proportions is twofold – first they are easy to understand and second it is not necessary to combine the indicators in a domain using

complex statistical procedures such as factor analysis. There is no double counting of individuals within a domain. An individual may be captured in more than one domain but this is not double counting: it is simply identifying that they are deprived in more than one way.

Four domain indices were created which were then combined into the overall SAIMD 2011.

Combining the four domain indices into the SAIMD 2011

Standardisation and transformation

Each domain index is treated as a distinct measure of deprivation which can be combined into an overall index of multiple deprivation – the SAIMD.

In order to combine the domain indices it is important to first standardise them and then transform them to a common distribution. Standardisation is important as it puts each domain onto the same metric and gives each domain the same range. The standardisation is achieved by simply ranking the domain score. Thus for each domain the standardised score ranges from 1 to 4,277 (the number of wards in South Africa in 2011).

The ranked domain scores are then transformed in such a way that they can be combined with explicit weights and in such a way that deprivation on one domain is not cancelled out by lack of deprivation on another domain – in other words so that the deprivations are cumulative. The distribution selected for transformation is the exponential distribution.

The exponential distribution was selected for the following reasons. First, it transforms each domain so that they each have a common distribution, the same range and identical maximum/minimum value, so that when the domains are combined into a single index of multiple deprivation the (equal) weighting is explicit; that is there is no implicit weighting as a result of the underlying distributions of the data. Second, it is not affected by the size of the ward's population. Third, it effectively spreads out the part of the distribution in which there is most interest; that is the most deprived wards in each domain.

Each transformed domain has a range of 0 to 100, with a score of 100 for the most deprived ward. The exponential transformation that was selected for transforming the domains in the ward level SAIMD stretches out the most deprived 25% of wards in the country. The chosen exponential distribution is one of an infinite number of possible distributions.³

Weighting

There are many possible approaches to weighting each domain that contributes to the overall SAIMD. These include weighting driven by theoretical consideration; weighting that is empirically driven; weighting that is determined by policy relevance; weighting that is determined by consensus; and weighting that is arbitrary. For the SAIMD 2011 the same weights were adopted as were employed in the SAIMD 2001 - namely equal weights.⁴

³ See for further information Noble *et al.* (2006b).

⁴ For a full discussion see Noble *et al.* (2006b).

7. The geography of multiple deprivation

How to interpret the ward level results

There are five ward level measures: four domain measures (which were combined to make the overall SAIMD 2011) and one overall SAIMD 2011. These five measures are each assigned a rank. The most deprived ward for each measure is given a rank of 1. The ranks show how a ward compares to all the other wards in South Africa.

The four domain measures and ranks

Each domain or dimension of deprivation has a score which is the proportion of the population (or in the case of the material deprivation domain the proportion of households) experiencing each of the deprivations. These domain measures (which can be referred to as domain indices) are then ranked and can be used separately to describe patterns of each type of deprivation in the province.

Within a domain, the higher the score, the more deprived the ward. However, the scores should not be compared between domains as they have different ranges. To compare between domains, the ranks should be used. A rank of 1 is assigned to the most deprived ward.

The overall SAIMD 2011

The overall SAIMD 2011 describes a ward by combining information from all four domains: Material Deprivation, Employment Deprivation, Education Deprivation and Living Environment Deprivation. These are combined in three stages; first each domain is standardised by ranking; the ranks are then transformed to a standard distribution – the exponential distribution described above. Finally the domains are combined using equal weights. The final ward level SAIMD 2011 is then ranked with the most deprived ward given a rank of 1 and the least deprived ward a rank of 4,277.

The SAIMD 2011 at ward level can therefore be described as the combined sum of the weighted and exponentially transformed rank of all the domains scores. The larger the SAIMD score, the more deprived the ward. However, because of the way that the component domains scores have been transformed, the scores are not linear. Thus a ward with a score of 40 can be said to be more deprived than a ward with a score of 20 but cannot be regarded as twice as deprived.

National and provincial results

Because the overall SAIMD 2011 is a ward level measure, it is not possible to give direct national and provincial SAIMD scores. However, it is possible to summarise the ward level SAIMD at provincial level (and at other spatial scales such as district municipality and local municipality). There are a number of possibilities but the most meaningful is to calculate the population weighted average rank of the wards for each higher level geography (Noble *et al.*, 2000; Noble *et al.*, 2004).

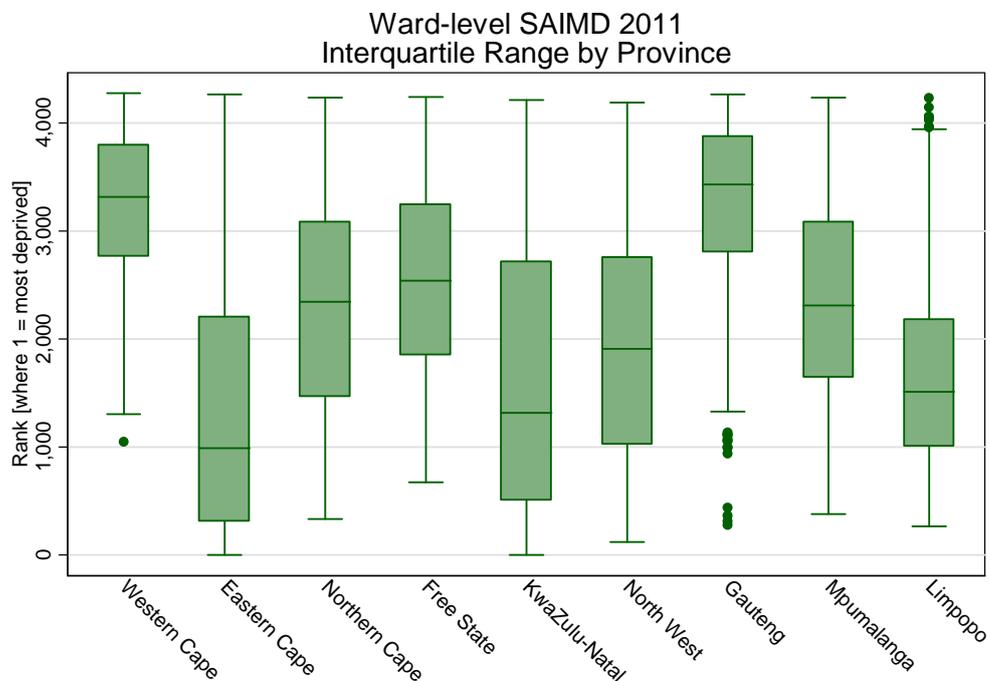
At province level the population weighted average rank for the wards in each province can be calculated. The lower the population weighted average rank of the wards in that province, the more overall multiple deprivation there is in the province. From the Table 1 below we can see that the Eastern Cape has a population weighted average rank of 1572 and is the most deprived province in South Africa on this measure. On the other hand, with a population weighted average rank of 3339, the Western Cape is the least deprived province in the country.

Table 1: Population weighted average ward rank of the SAIMD 2011 for each province in South Africa

Province Code	Province Name	Population weighted Average Rank	Rank Order where 1=most deprived
2	Eastern Cape	1572	1
9	Limpopo	1772	2
6	North West	2016	3
5	KwaZulu-Natal	2020	4
3	Northern Cape	2312	5
8	Mpumalanga	2318	6
4	Free State	2611	7
7	Gauteng	3275	8
1	Western Cape	3339	9

A more nuanced picture can be shown in the box plot below.

Figure 1



These box plots and those that follow should be interpreted as follows. The range of deprivation is illustrated by the vertical line (with outliers shown as dots). So, if we take the Eastern Cape as an example. The most deprived ward is ward No. 11 in Port St Johns local municipality and is ranked 1 in the country (where 1 = most deprived) – it is both the most deprived ward in the country and in the Eastern Cape. The Eastern Cape’s least deprived ward is ward No. 6 in Nelson Mandela Bay municipality and is ranked 4,256 (where 4,277 = least deprived). So the range of deprivation in wards in the Eastern Cape is very large.

The green box indicates the range of the middle 50 per cent of wards in the province (the interquartile range⁵) while the horizontal line in the box is the median ward’s rank. The boxes for the Western Cape, Gauteng and Limpopo are relatively short, indicating

⁵ The interquartile range (IQR) is ‘a measure of dispersion calculated by taking the difference between the first and third quartiles (that is, the 25th and 75th percentiles). In short, the IQR is the middle half of a distribution’ (Vogt, 1999: 143).

that these provinces' wards are concentrated in a fairly narrow range. For Limpopo, the box sits towards the bottom of the chart, which shows that deprivation in the province is concentrated in the most deprived part of the national distribution. However, for the Western Cape and Gauteng the boxes sit towards the top of the chart, which shows that deprivation in these provinces is concentrated in the least deprived part of the national distribution.

Although the overall SAIMD 2011 can only be expressed at higher spatial levels in terms of population weighted average ranks, the individual domains can be expressed as simple percentages. The following **Table 2** provides this information.

Table 2: Provincial rates of deprivation for the four domains of the SAIMD 2011

	Material Deprivation %	Employment Deprivation %	Education Deprivation %	Living Environment Deprivation %
Western Cape	24.8	25.1	16.8	19.1
Eastern Cape	52.0	47.3	28.5	59.6
Northern Cape	39.5	34.1	30.0	32.1
Free State	33.3	38.9	23.4	32.9
KwaZulu-Natal	43.0	42.3	23.4	55.3
North West	41.7	37.9	28.7	55.4
Gauteng	30.8	29.8	12.6	21.5
Mpumalanga	34.9	38.2	24.4	54.5
Limpopo	40.2	46.4	24.3	71.9
South Africa	37.1	36.0	20.9	43.8

While the rates of deprivation are below 40% for three of the domains at the national level, there is wide variation across the provinces for each domain. The Western Cape and Gauteng generally have the lowest rates of deprivation for each of the 4 domains, while Limpopo, the Eastern Cape, KwaZulu-Natal and North West have relatively higher rates of deprivation in each of the domains, than the other provinces.

Limpopo fares worst of all provinces in respect of the Living Environment domain with 72% of its population being deprived on this domain, followed by the Eastern Cape (60%). In terms of Employment Deprivation, Limpopo comes a close second (46%) to the

Eastern Cape (47%). On the Material Deprivation domain, Eastern Cape scores highest (52%), followed by KwaZulu-Natal (43%), then North West (42%) and Limpopo (40%). Education is the only domain where relatively low rates of deprivation can be observed across all provinces, with the Northern Cape scoring highest (30%), closely followed by the Eastern Cape (28.5%) and North West (28.7%), and Limpopo scoring 24%. However, relative to some of the other provinces the rates for these 4 provinces are still high, when compared to Gauteng and the Western Cape which have much lower rates (13% and 17% respectively).

Local Municipality Level Deprivation

Just as it is possible to compute the population weighted average rank of wards in a province, so it is possible to do this for each local municipality. The following two tables show the 10 most deprived local municipalities (**Table 3**) and the 10 least deprived local municipalities (**Table 4**) on this measure.

As can be seen from Table 3 five of the most deprived local municipalities are in KwaZulu-Natal and five are in the Eastern Cape.

Table 3: Population weighted average ward rank of the SAIMD 2011 for the most deprived 10 local municipalities in South Africa

Province	District	Local Municipality	Population weighted average rank of wards in the local municipality (where 1=most deprived)	National rank (where 1=most deprived)
KwaZulu-Natal	Umzinyathi	Msinga	176	1
Eastern Cape	Alfred Nzo	Ntabankulu	280	2
Eastern Cape	O.R.Tambo	Port St Johns	304	3
KwaZulu-Natal	Ugu	Vulamehlo	383	4
KwaZulu-Natal	iLembe	Maphumulo	388	5
Eastern Cape	Alfred Nzo	Mbizana	395	6
Eastern Cape	O.R.Tambo	Ngquza Hill	399	7
KwaZulu-Natal	Umkhanyakude	Umhlabuyalingana	400	8
Eastern Cape	Chris Hani	Engcobo	449	9
KwaZulu-Natal	Uthungulu	Nkandla	453	10

Table 4: Population weighted average ward rank of the SAIMD 2011 for the least deprived 10 local municipalities in South Africa

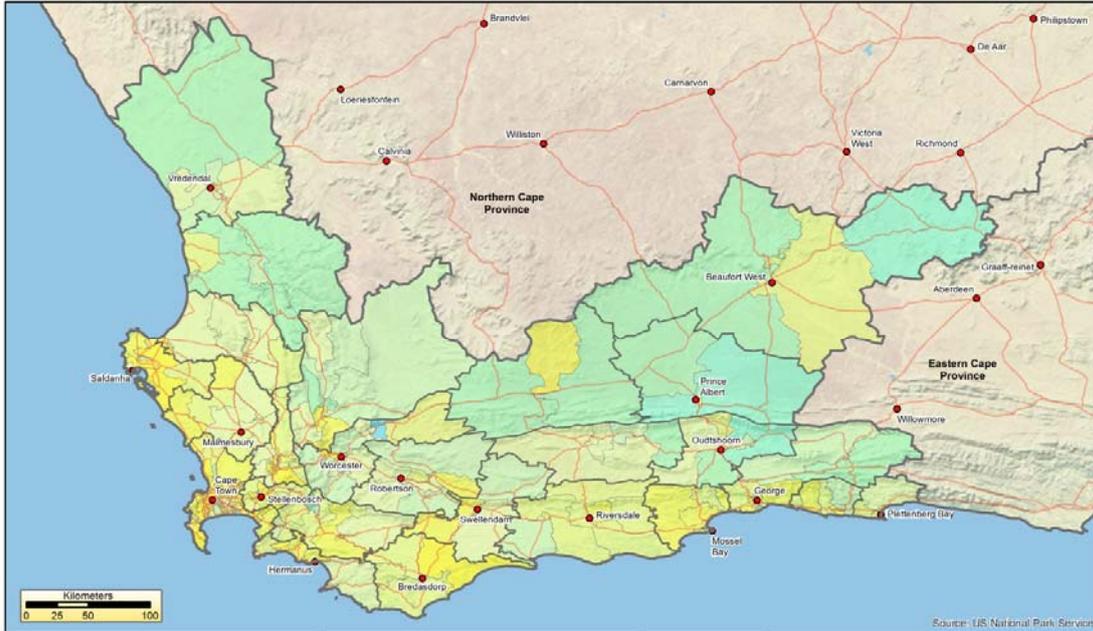
Province	District	Local Municipality	Population weighted average rank of wards in the local municipality (where 1=most deprived)	National rank (where 1=most deprived)
Northern Cape	Namakwa	Richtersveld	3285	225
Western Cape	Overberg	Overstrand	3297	226
Mpumalanga	Nkangala	Steve Tshwete	3306	227
Gauteng	City of Tshwane	City of Tshwane	3319	228
Western Cape	Eden	Mossel Bay	3350	229
Western Cape	Cape Winelands	Stellenbosch	3362	230
Western Cape	Cape Winelands	Drakenstein	3385	231
Western Cape	West Coast	Saldanha Bay	3406.7	232
Gauteng	City of Johannesburg	City of Johannesburg	3407.4	233
Western Cape	City of Cape Town	City of Cape Town	3482	234

Table 4 shows the least deprived 10 local municipalities on this measure. It is striking that five are in the Western Cape.

Ward Level Deprivation

The following maps show the overall ward level SAIMD for each province. All the wards in the country are divided into 10 equal groups (deciles) and mapped. The most deprived decile is shaded the deep blue whilst the least deprived decile is shaded bright yellow with a gradation in between as shown in the maps' legends. It is striking to note that within provinces such as the Eastern Cape, KwaZulu-Natal, North-West and Limpopo that have former homelands within them that wards in these former homelands are often in the most deprived decile of deprivation nationally.

**Ward-level SAIMD 2011
Western Cape Province**

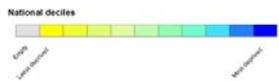
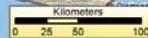
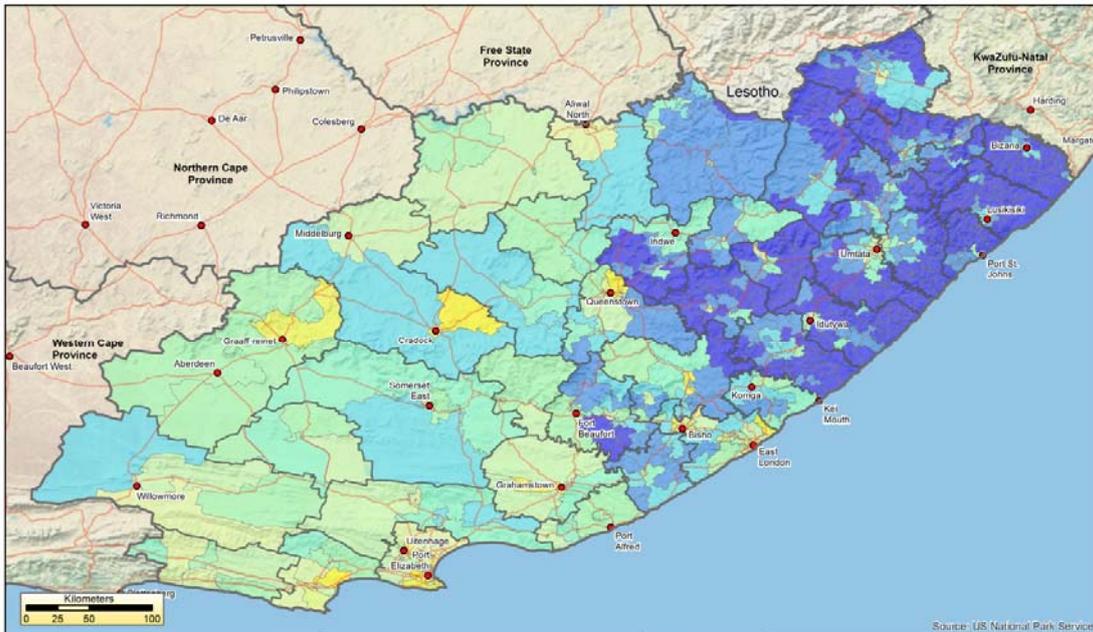


Source and copyright: Statistics South Africa
Produced by the Southern African Social Policy Research Insights
www.saspr.org, February 2014



Source: US National Park Service

**Ward-level SAIMD 2011
Eastern Cape Province**

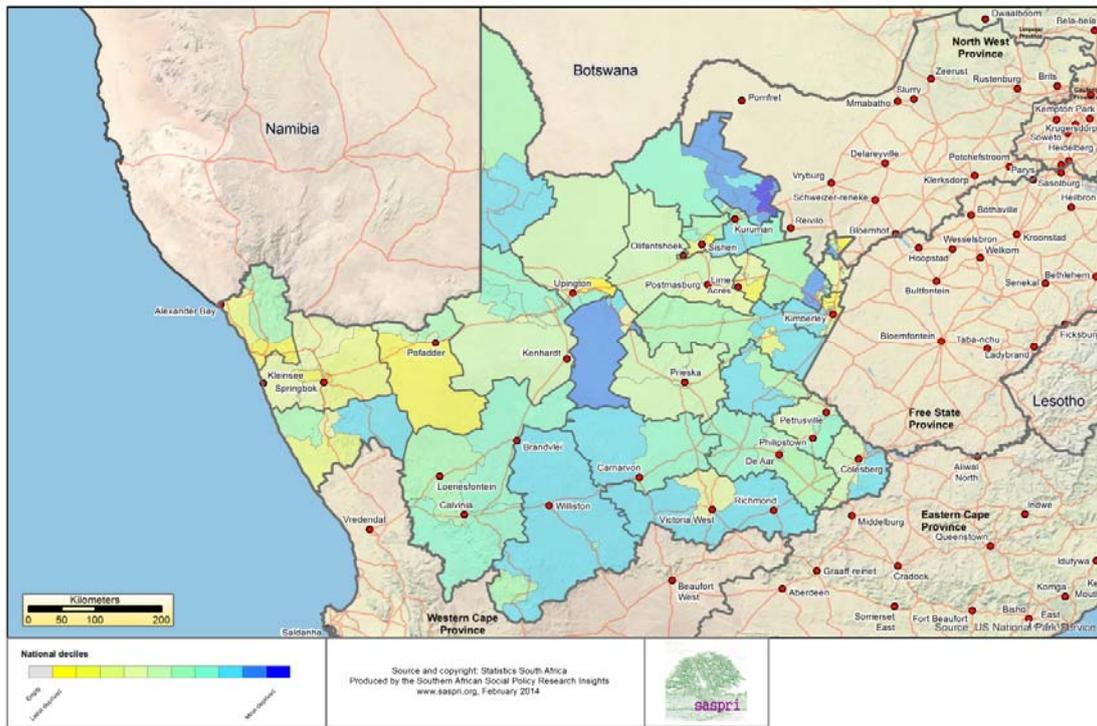


Source and copyright: Statistics South Africa
Produced by the Southern African Social Policy Research Insights
www.saspr.org, February 2014

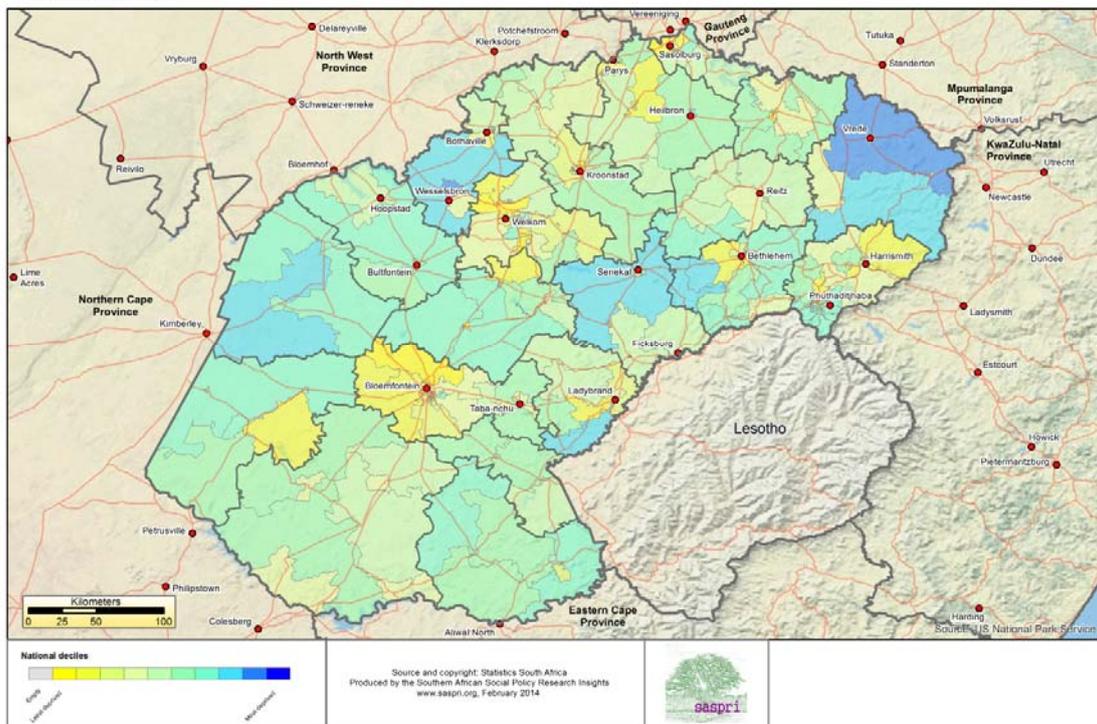


Source: US National Park Service

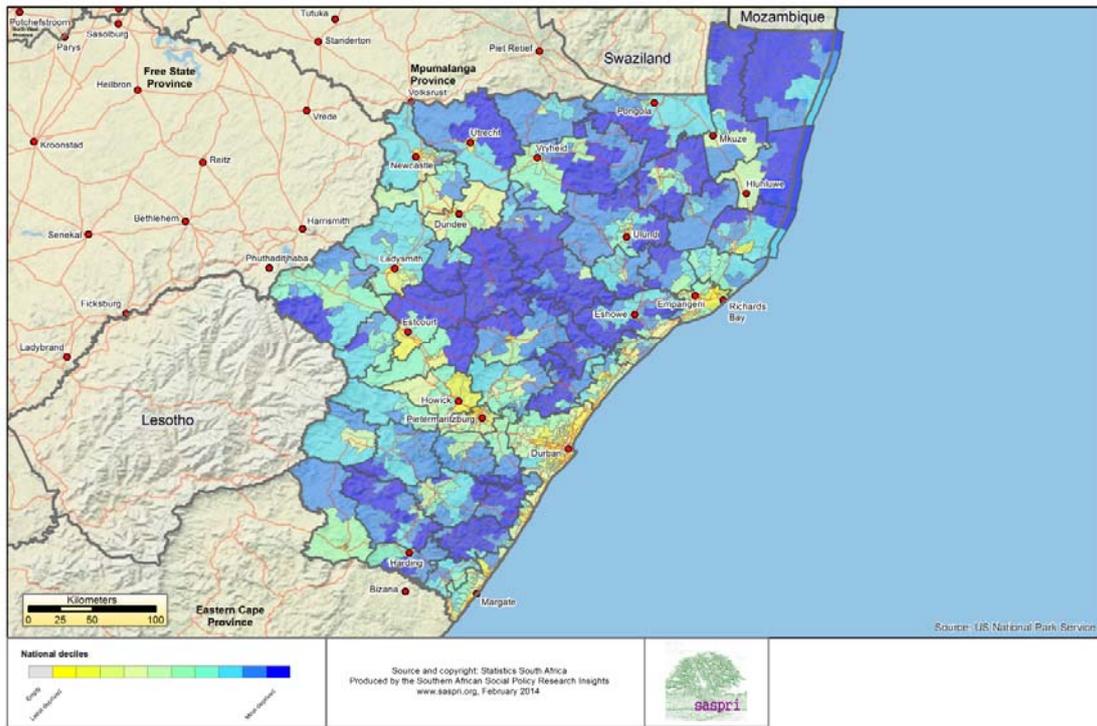
**Ward-level SAIMD 2011
Northern Cape Province**



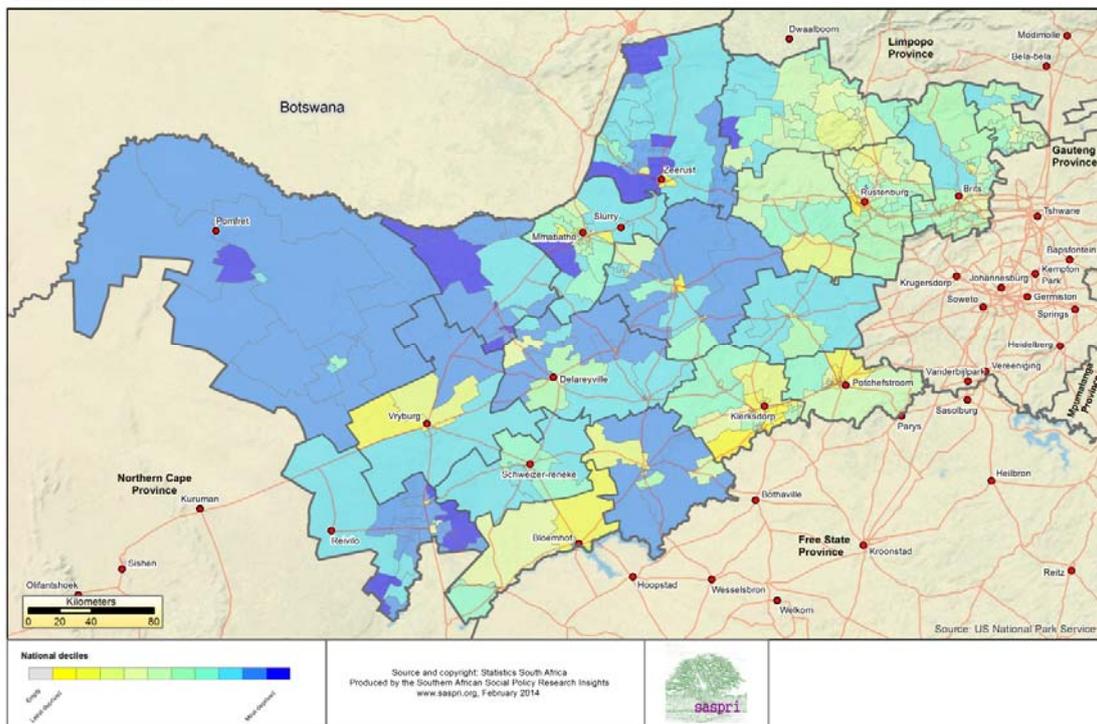
**Ward-level SAIMD 2011
Free State Province**



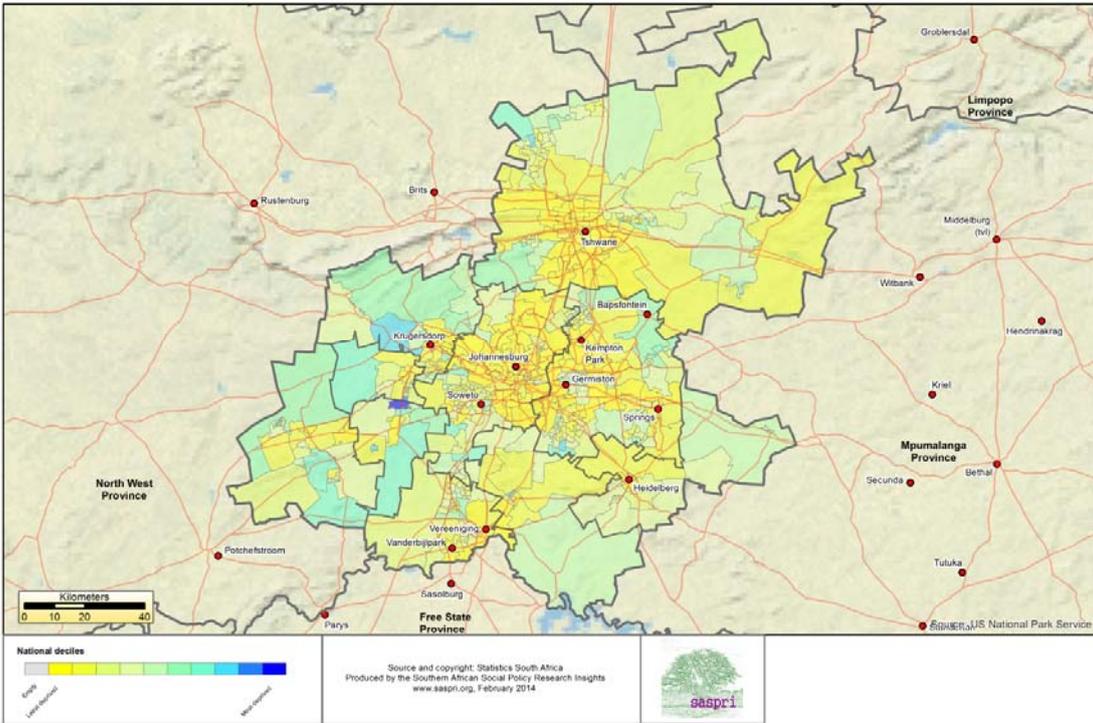
**Ward-level SAIMD 2011
KwaZulu-Natal Province**



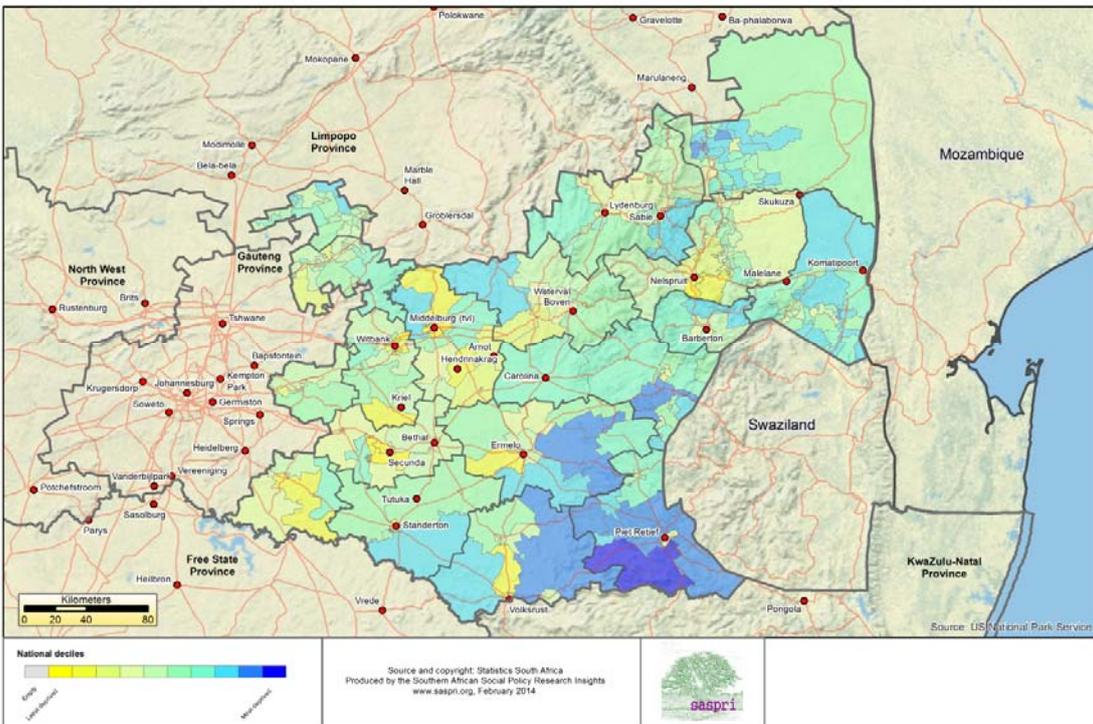
**Ward-level SAIMD 2011
North West Province**



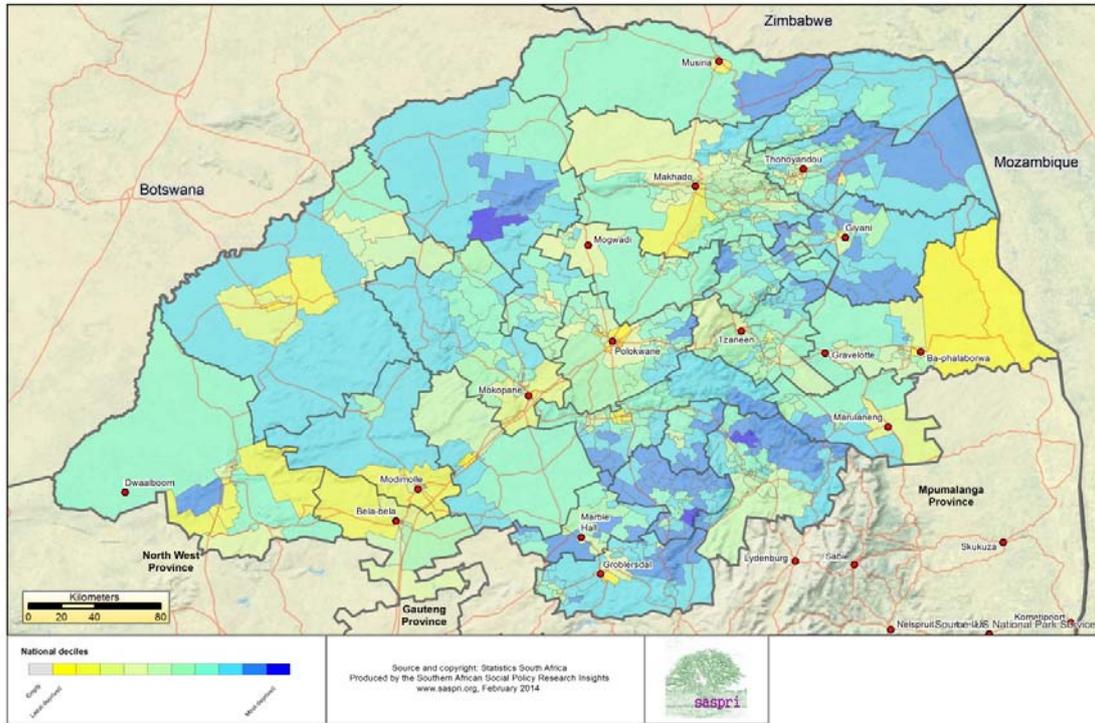
**Ward-level SAIMD 2011
Gauteng Province**



**Ward-level SAIMD 2011
Mpumalanga Province**



Ward-level SAIMD 2011
Limpopo Province



Given this prevalence of deprivation in the former homelands, the following section further analyses deprivation in these areas.

Former Homeland Analysis

The following table shows deprivation rates for the four domains in each of the former homelands as well as for 'all former homelands', 'the rest of South Africa' (i.e. all areas that are not former homelands), and 'all of South Africa' (which includes the former homelands).

Table 5: Deprivation in the former homelands in 2011

	Province containing greater part of former homeland	Material Deprivation %	Employment Deprivation %	Education Deprivation %	Living Environment Deprivation %
Former Bophuthatswana	North West	38.1	46.8	26.0	67.0
Former Ciskei	Eastern Cape	41.5	56.2	24.3	50.5
Former Gazankulu	Limpopo	36.9	58.3	28.9	77.6
Former KaNgwane	Mpumalanga	33.7	47.2	29.1	71.4
Former KwaNdebele	Mpumalanga	29.0	45.9	27.6	65.0
Former KwaZulu	KwaZulu-Natal	48.7	54.5	27.0	67.4
Former Lebowa	Limpopo	38.7	57.2	23.3	81.9
Former Qwa Qwa	Free State	36.8	56.0	22.8	61.4
Former Transkei	Eastern Cape	69.0	58.4	37.2	87.8
Former Venda	Limpopo	36.9	54.5	24.0	77.0
All former homelands		46.4	53.8	28.0	73.7
Rest of South Africa		33.0	30.1	17.9	27.6
All South Africa		37.1	36.0	20.9	43.8

This analysis shows that the former Transkei in the Eastern Cape has the highest rates of deprivation across the four domains. In addition to the former Transkei where nearly 88% of the population is living environment deprived, former homelands in Limpopo score very highly for this domain with 82% of the population in former Lebowa, 78% in former Gazankulu, and 77% in former Venda without electricity and/or water and/or sanitation and/or adequate housing.

When analysing the 'rest of South Africa' separately from the former homelands, deprivation rates drop dramatically, with only 28% deprived in the Living Environment domain, 18% in the Education domain, 30% in the Employment domain and 33% in Material deprivation domain. Former homelands, therefore, continue to carry most of the burden of multiple deprivation in South Africa.

This picture remains little changed from the position in 2001 (see Noble and Wright, 2013).

8. Income Poverty at Ward Level

Background

As has been indicated in section 3, deprivation is conceptualised as a lack of material possessions, social and human capital, decent housing and associated services. Poverty on the other hand can be regarded as the lack of resources to obtain such items or services people are deprived of. So, in addition to examining multiple deprivation at small area level it is also useful to look at income poverty.

Despite attempts by government to introduce an official income poverty line, no such poverty line has so far been adopted. Indeed, arguments have been made that a realistic poverty line must take into account the resources required for an “acceptable standard of living”. Such a poverty line would require at the very least consideration of a consensual measure of poverty (Wright et. al 2012) as well as detailed further work using the “budget standards approach” (see e.g. Hirsch 2013).

A number of income poverty lines have been used by analysts in South Africa over the years. A common one which has been used extensively by the NIDS team at the University of Cape Town is based on work undertaken by Hoogeveen and Ozler and published in 2006. They propose two poverty lines - a “lower bound” poverty line and an “upper bound” poverty line. These poverty lines are utilised for the analyses in this section. Inflating Hoogeveen and Ozler’s lines to 2011 prices using the published CPI results in two per capita poverty lines - a lower bound poverty line of R604 per capita per month and an upper bound poverty line of R1113 per capita per month.

Methodology

Almost all analyses of income poverty are undertaken using survey data to produce national/provincial measures of poverty or, occasionally, to produce measures of poverty relating to particular subgroups such as population groups or gender. Spatial analysis below province level is rare and is usually limited to distinctions between particular area types such as urban/rural.

The poverty measures used are usually expressed in terms of the headcount ratio (P0) which can be thought of as the proportion of the population in poverty. In addition poverty gap measures (p1 and p2) are usually given. In this analysis the intention is to produce the equivalent of a poverty headcount ratio at ward level. Put another way, the

resultant measure will describe the proportion of the population in a ward who are below either the lower bound or the upper bound poverty line.

In order to produce a ward level measure it is necessary to derive information from the 2011 census as no survey source is reliable for such small areas. Achieving this measure using census data obtained using superstar requires a number of complex data manipulations. In brief, the banded household income (which is itself a derived variable being the aggregate of individual banded income) needs to be translated into point income and a per capita income created. This can then be compared to each of the poverty lines and proportions of individuals falling below the lines for each ward computed. Necessarily there is some loss of information when the banded income is translated into point income. To do this the same procedure that Stats SA used when creating the banded household income from banded individual income is utilised. Basically, the logarithmic mean of the band was employed to specify the particular point income value for the band.

Results

Using this methodology, the poverty headcount ratios for South Africa as a whole in 2011 are, for the lower bound line 0.56 and for the upper bound line 0.65. It is notoriously difficult to compare poverty rates from different studies in South Africa as they typically use different poverty lines, different data sources and, in some cases, consumption rather than income. However these national figures compare reasonably well with the figures generated from the first wave of NIDS (see Argent *et al.*, 2009 and Leibbrandt *et al.*, 2010).

The following table presents the poverty rates calculated using the same methodology for the nine provinces.

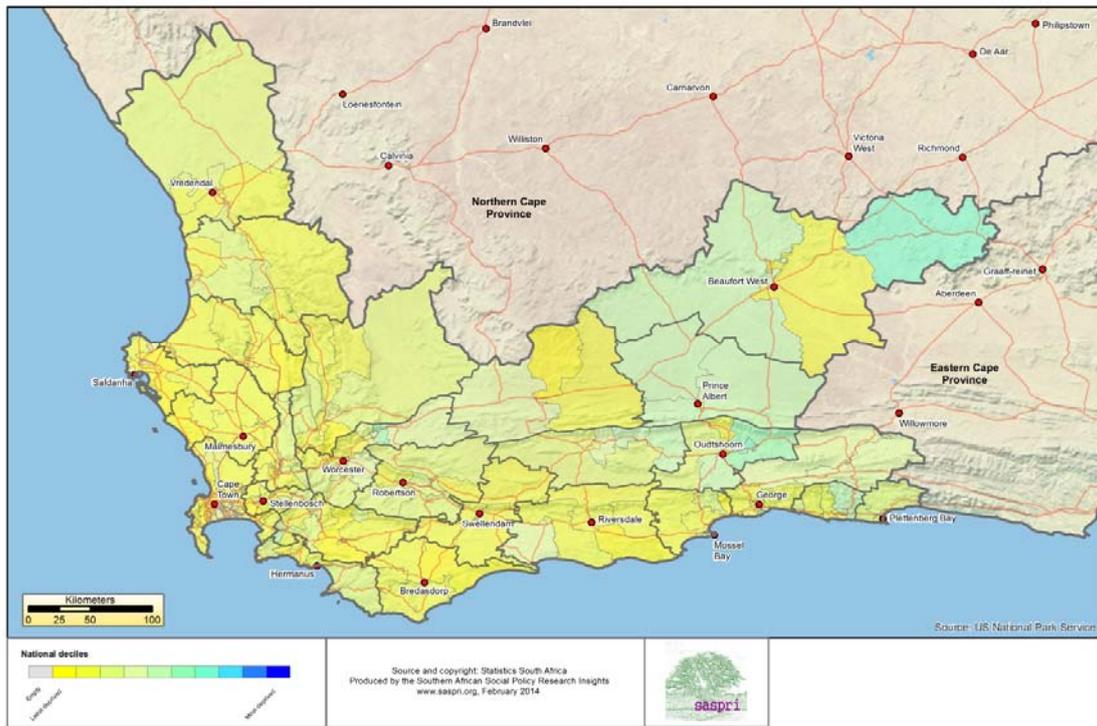
Table 6: Provincial Poverty Rates derived from Census 2011 using two poverty lines derived from Hoogeveen and Ozler (2006)

Province	Lower Bound (R604)	Upper bound (R1113)
Western Cape	40.1	51.6
Eastern Cape	69.0	76.9
Northern Cape	54.7	66.0
Free State	58.9	68.9
KwaZulu-Natal	62.7	71.1
North West	58.7	67.7
Gauteng	40.7	49.0
Mpumalanga	60.2	69.6
Limpopo	70.3	78.2
All South Africa	55.7	64.6

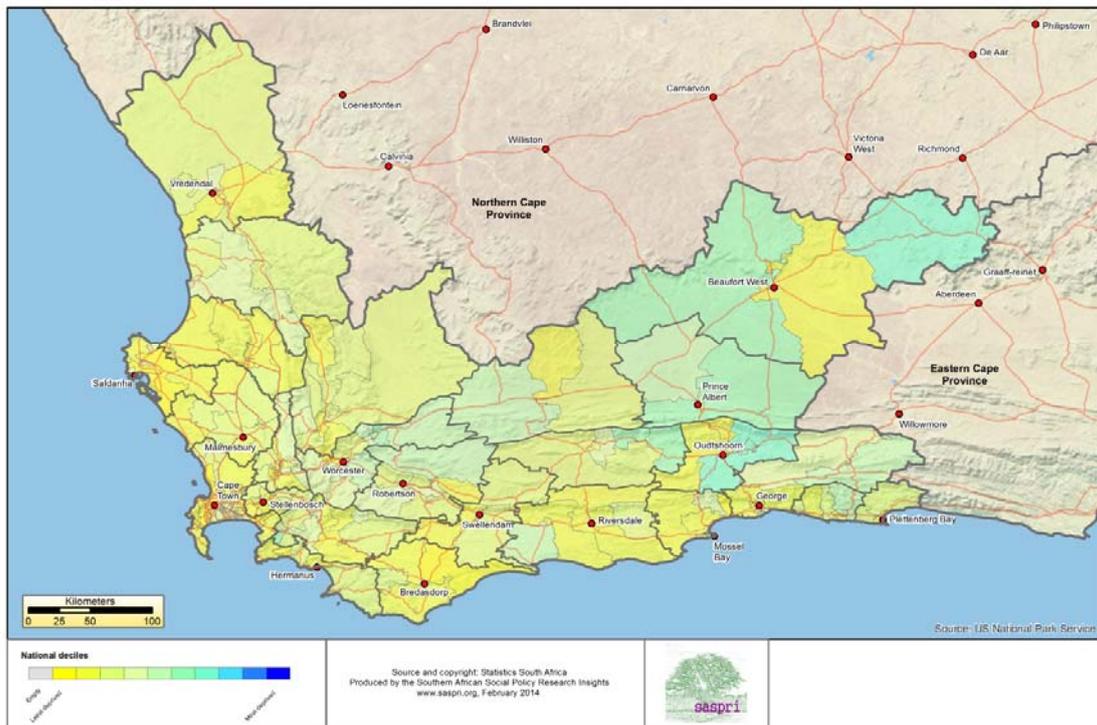
From this table it is clear that income poverty in provinces containing former homelands such as Limpopo, the Eastern Cape and KwaZulu-Natal have the highest provincial poverty rates, well above the national rates (whichever poverty line is used).

The following maps show the distribution at provincial level for both poverty lines. As with the other maps, all wards have been divided into deciles. The wards in the decile with the highest poverty rates are shaded deep blue while those with the lowest poverty rates are shaded yellow.

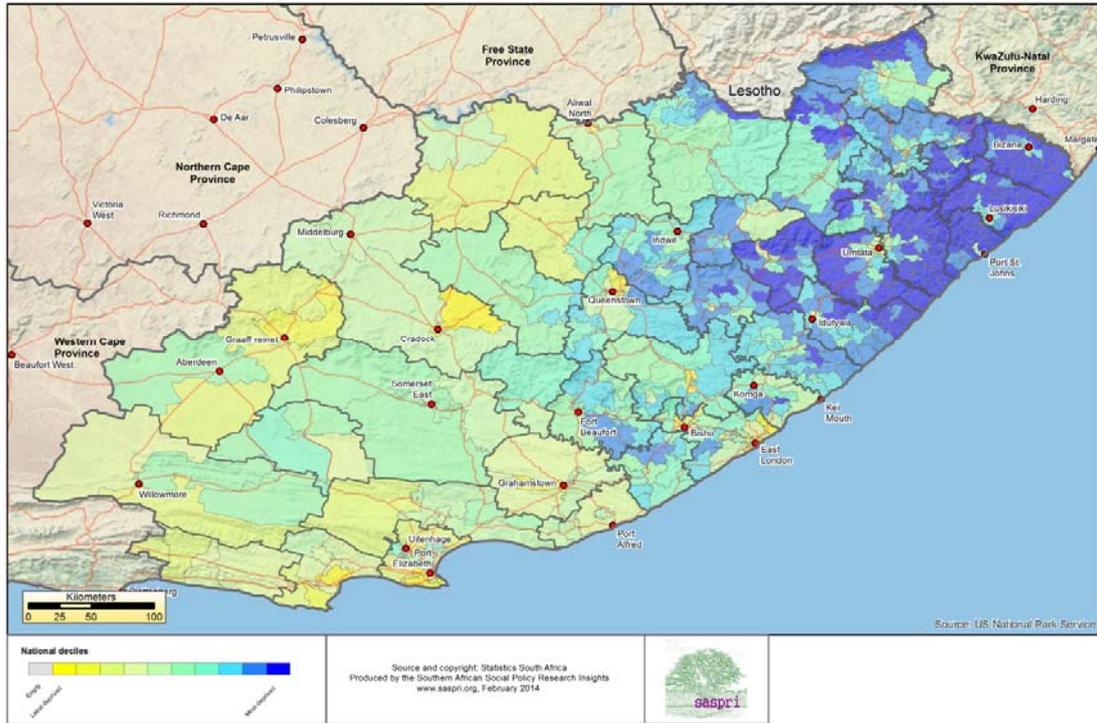
Ward level income poverty rates 2011 (poverty line R604 per capita pcm)
Western Cape Province



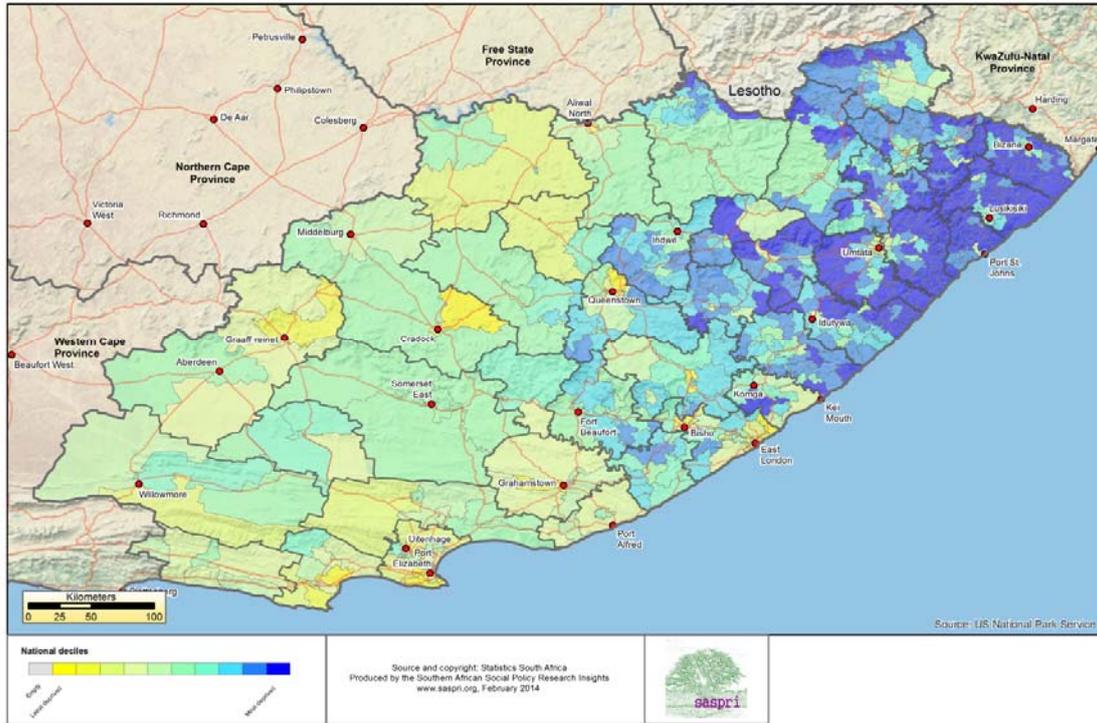
Ward level income poverty rates 2011 (poverty line R1113 per capita pcm)
Western Cape Province



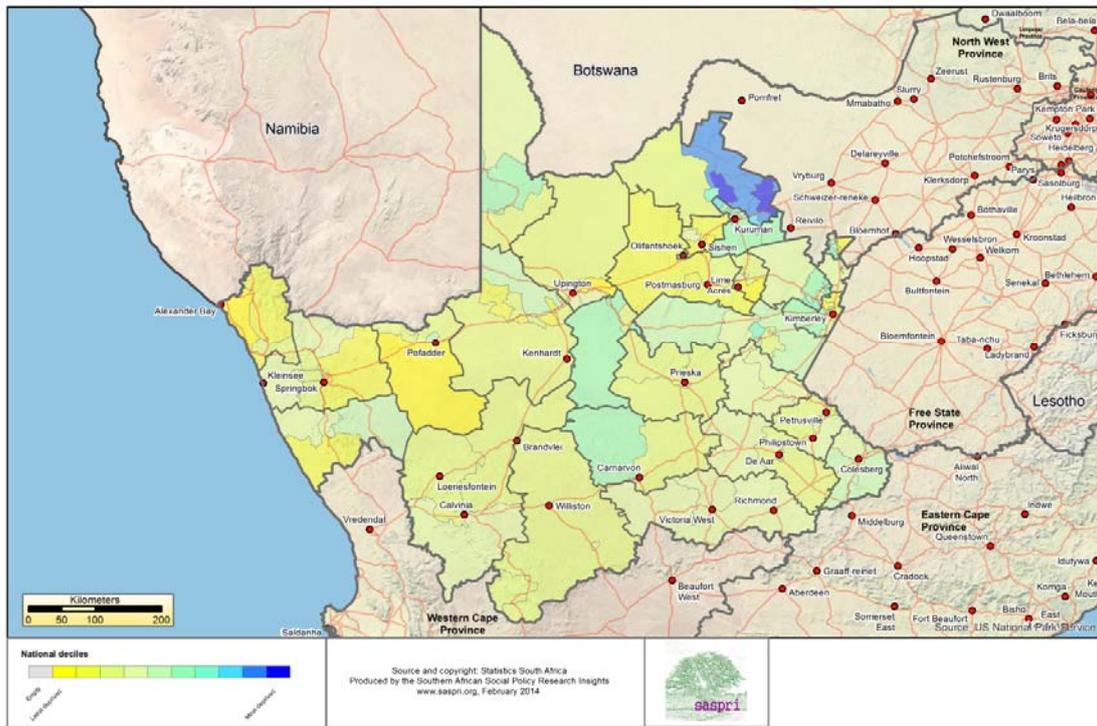
Ward level income poverty rates 2011 (poverty line R604 per capita pcm)
Eastern Cape Province



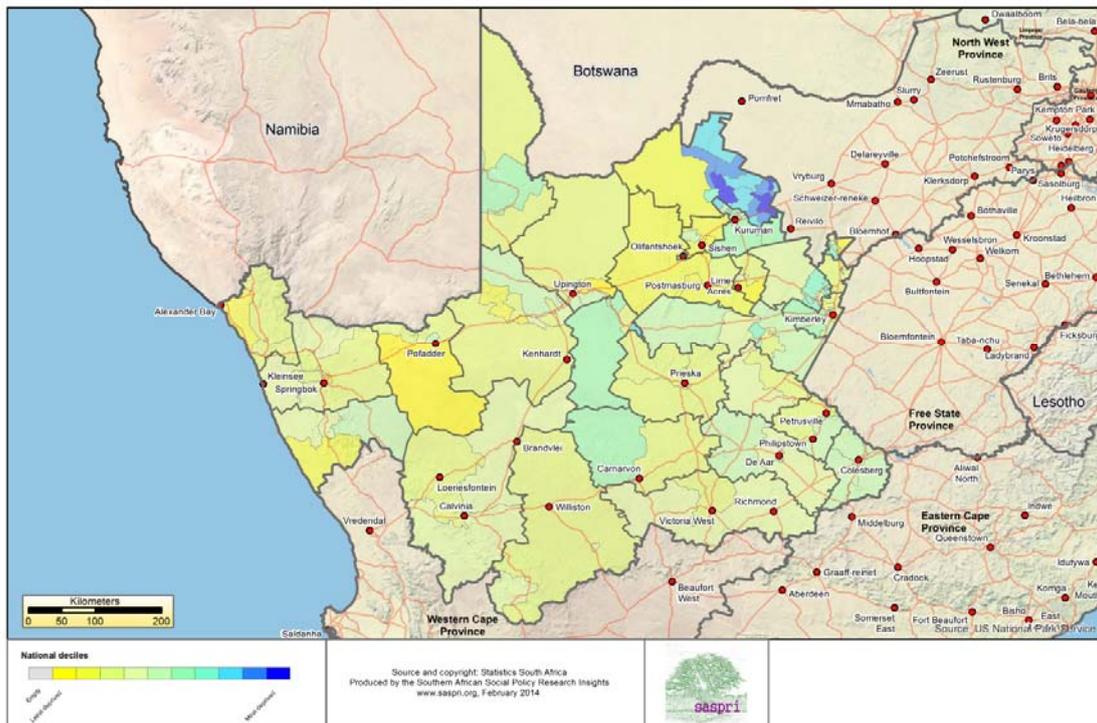
Ward level income poverty rates 2011 (poverty line R1113 per capita pcm)
Eastern Cape Province



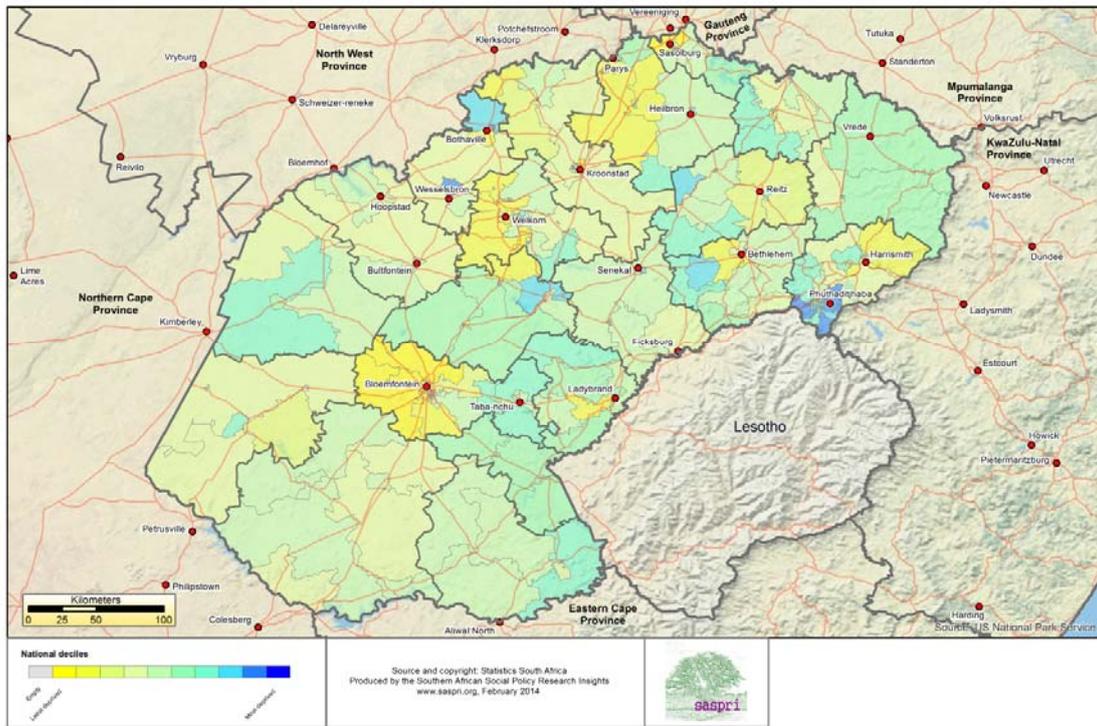
Ward level income poverty rates 2011 (poverty line R604 per capita pcm)
Northern Cape Province



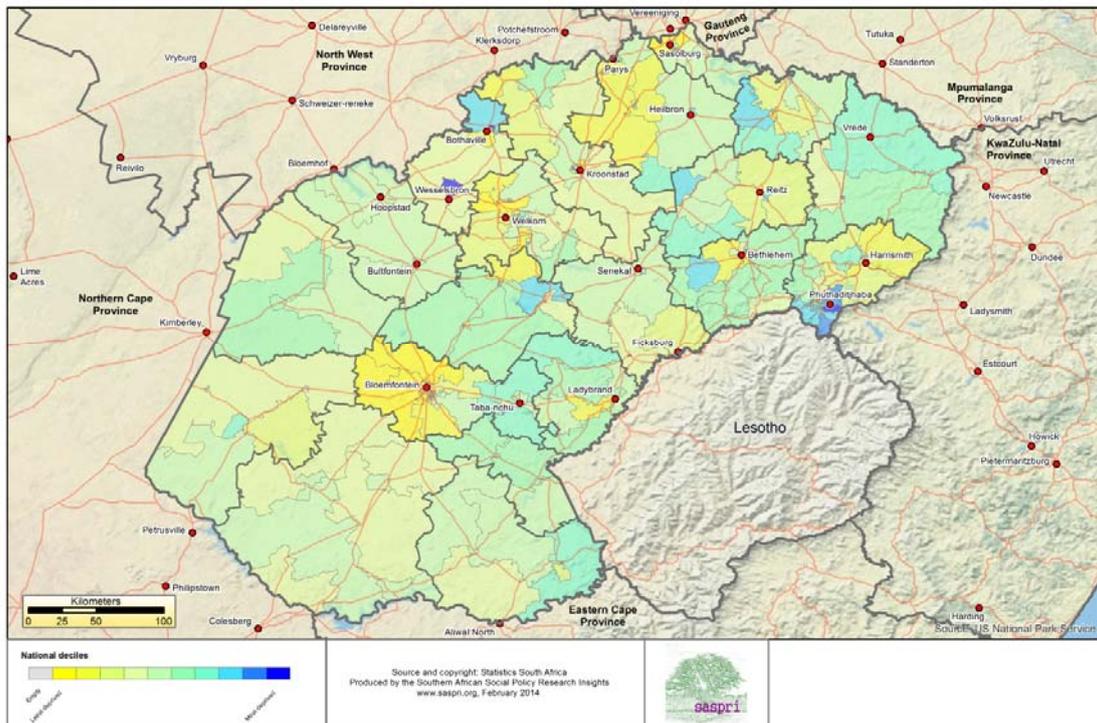
Ward level income poverty rates 2011 (poverty line R1113 per capita pcm)
Northern Cape Province



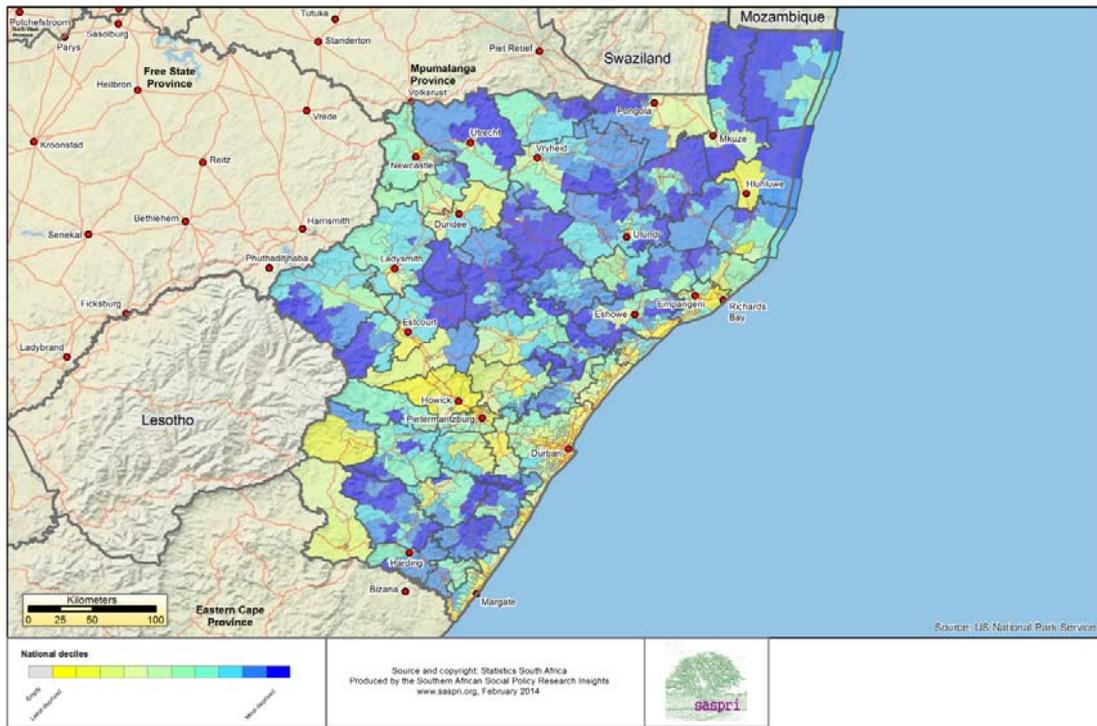
Ward level income poverty rates 2011 (poverty line R604 per capita pcm)
Free State Province



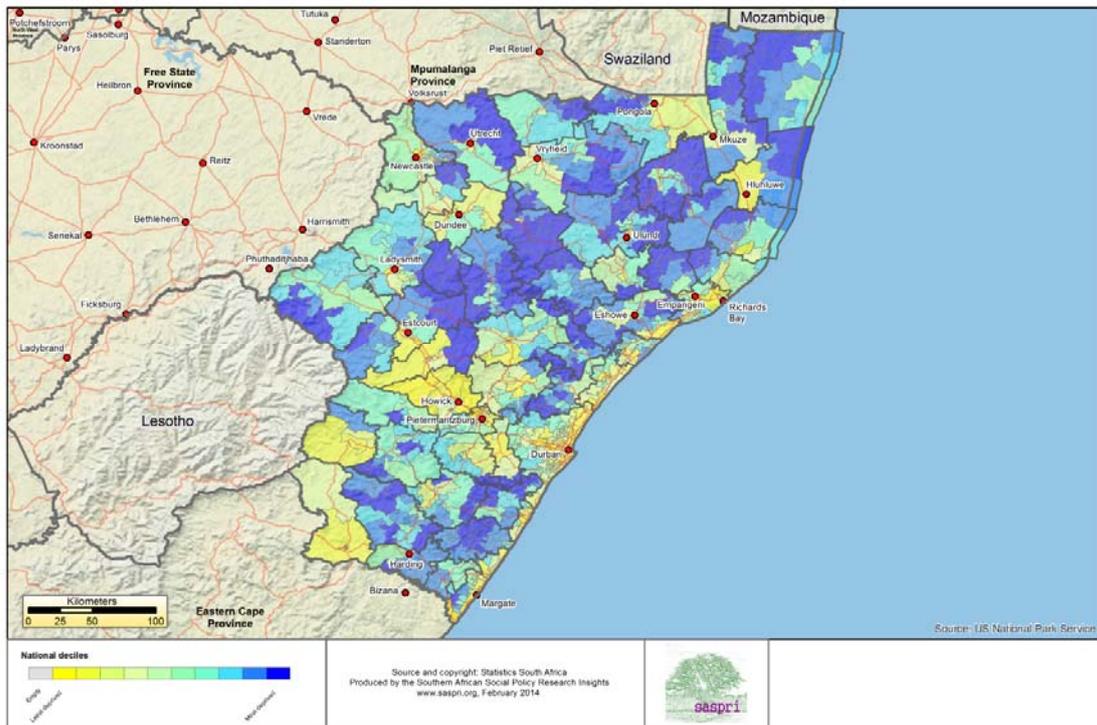
Ward level income poverty rates 2011 (poverty line R1113 per capita pcm)
Free State Province



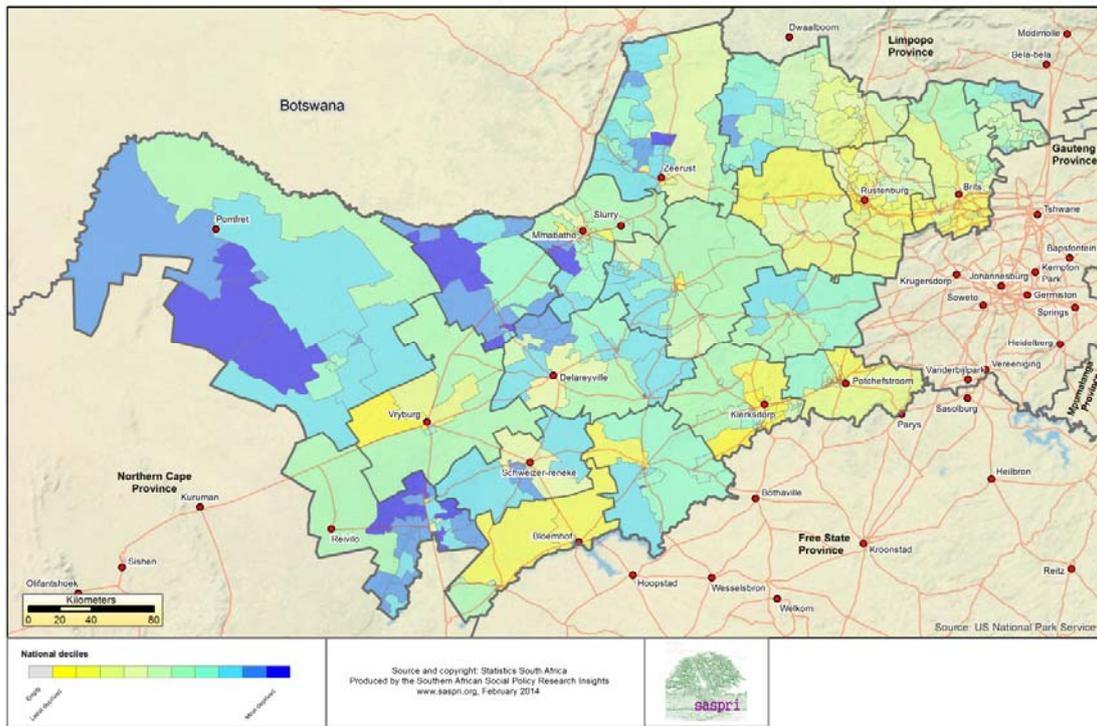
Ward level income poverty rates 2011 (poverty line R604 per capita pcm)
KwaZulu-Natal Province



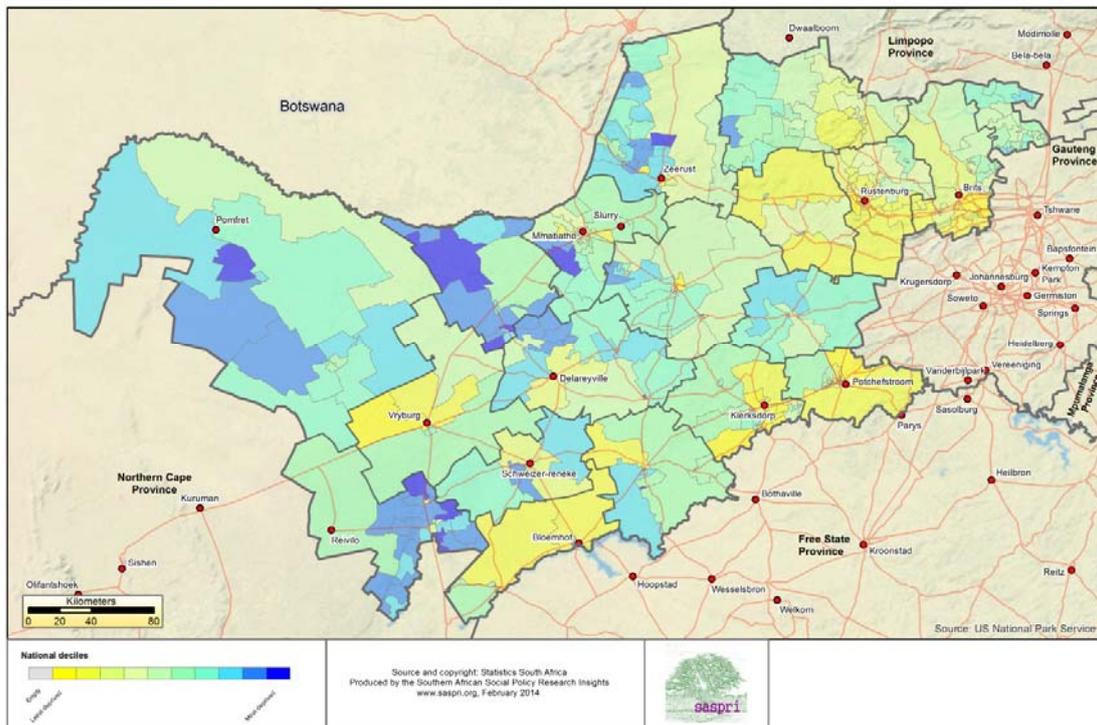
Ward level income poverty rates 2011 (poverty line R1113 per capita pcm)
KwaZulu-Natal Province



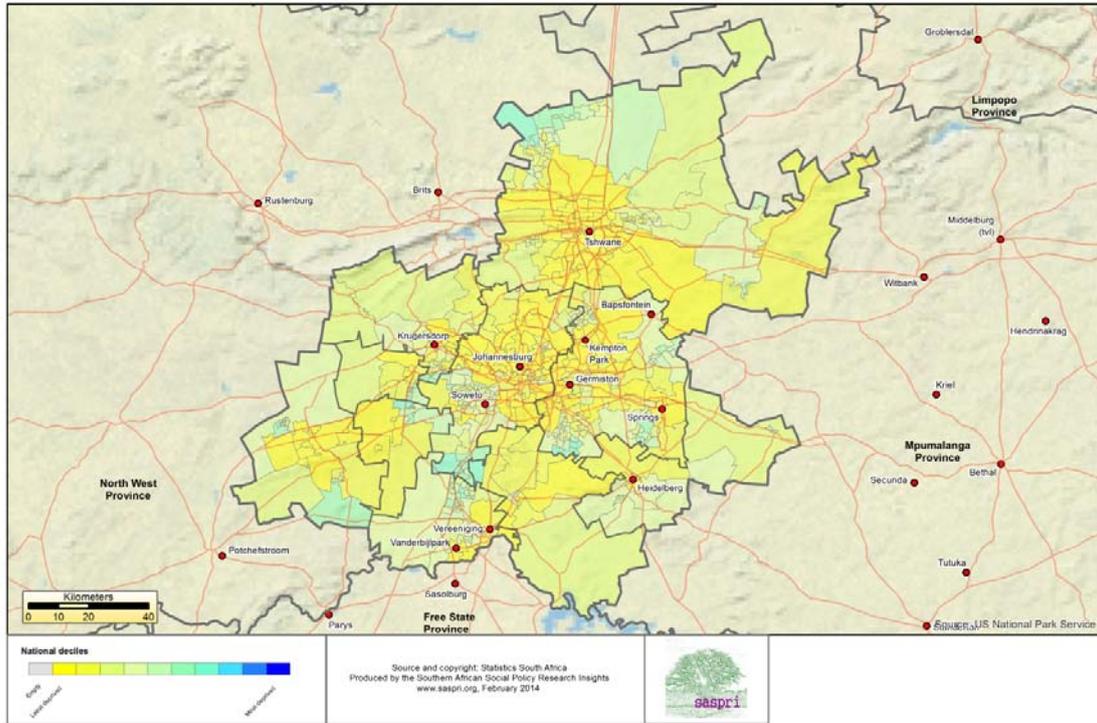
Ward level income poverty rates 2011 (poverty line R604 per capita pcm)
North West Province



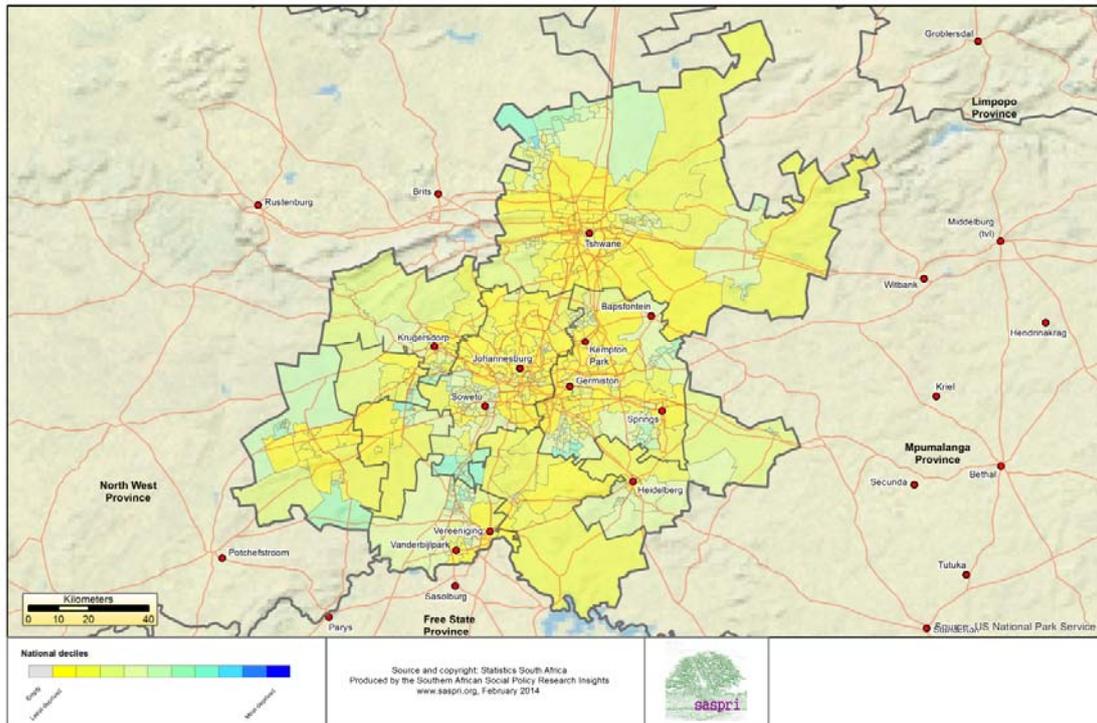
Ward level income poverty rates 2011 (poverty line R1113 per capita pcm)
North West Province



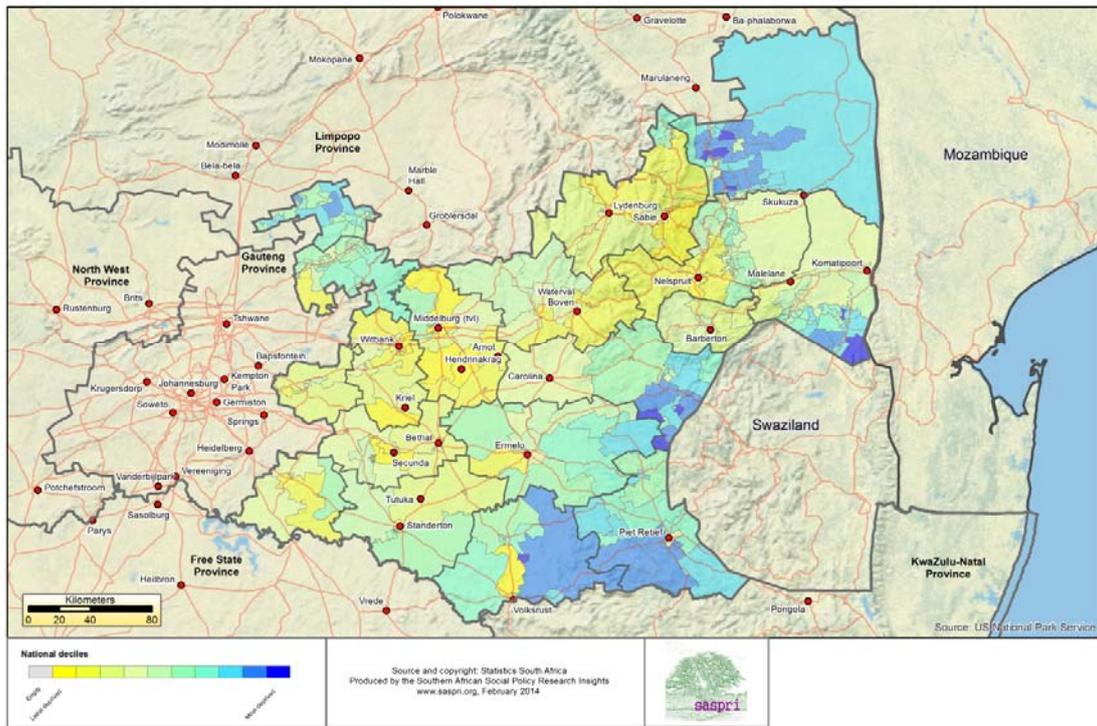
Ward level income poverty rates 2011 (poverty line R604 per capita pcm)
Gauteng Province



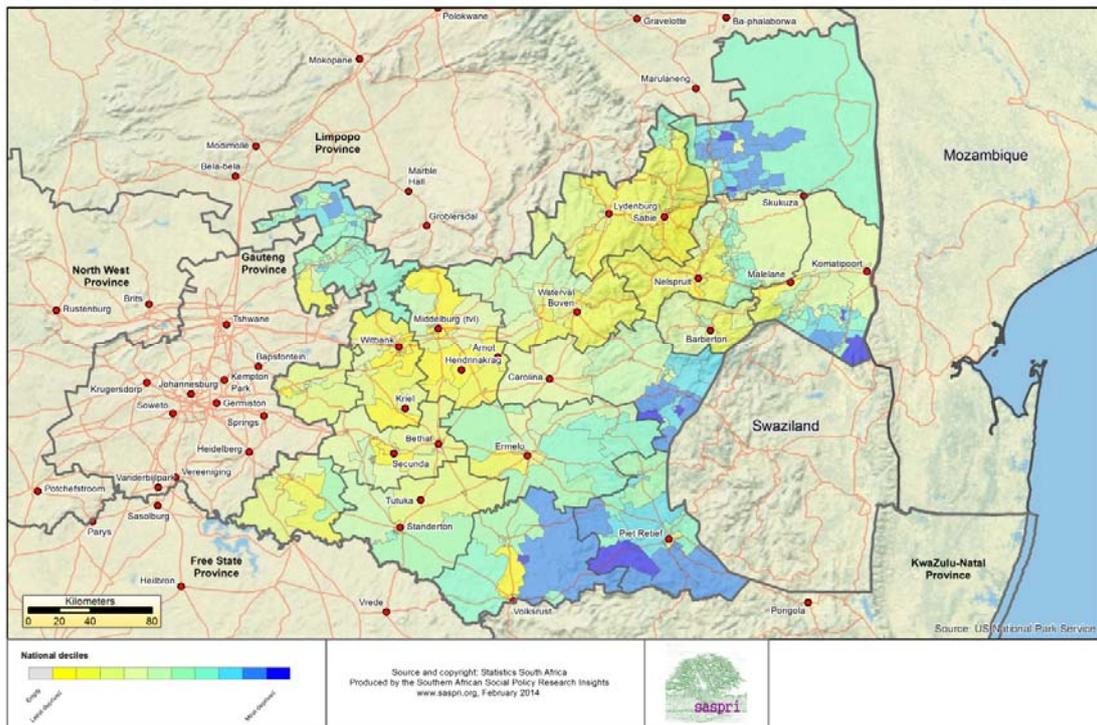
Ward level income poverty rates 2011 (poverty line R1113 per capita pcm)
Gauteng Province



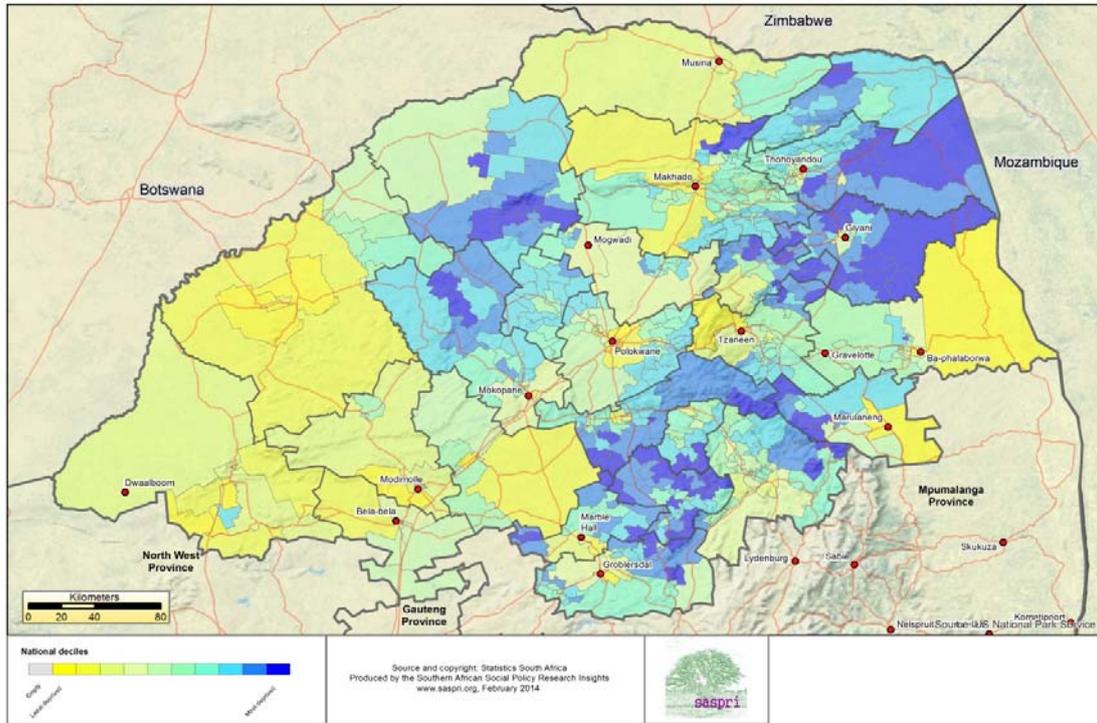
Ward level income poverty rates 2011 (poverty line R604 per capita pcm)
Mpumalanga Province



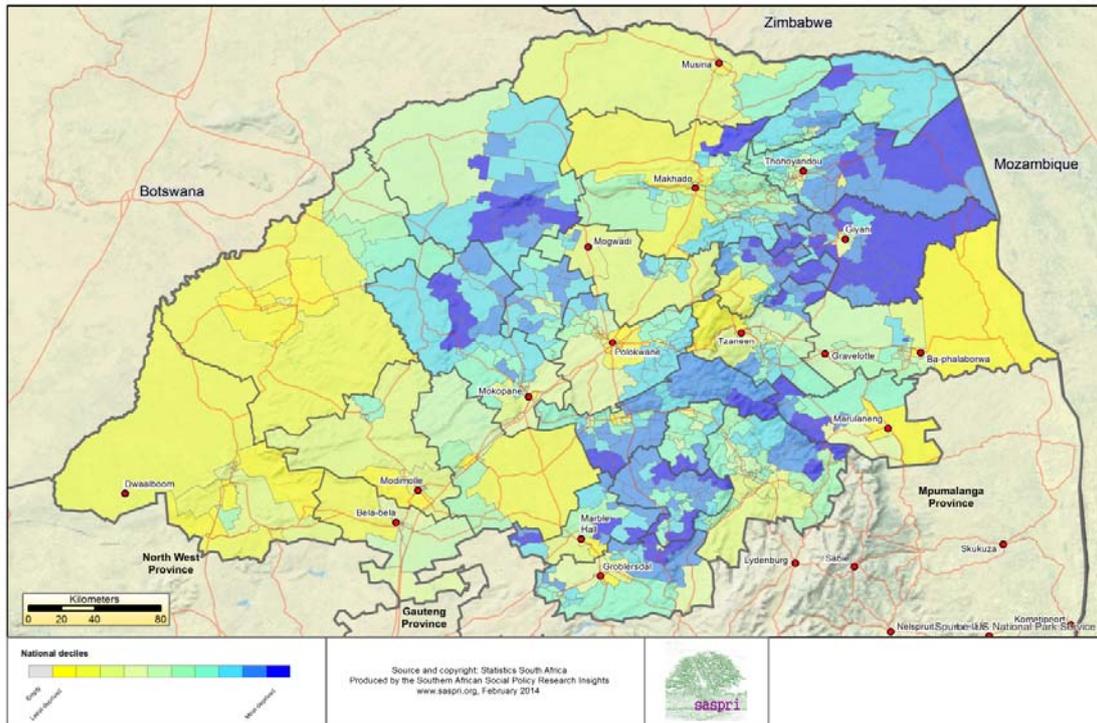
Ward level income poverty rates 2011 (poverty line R1113 per capita pcm)
Mpumalanga Province



Ward level income poverty rates 2011 (poverty line R604 per capita pcm)
Limpopo Province



Ward level income poverty rates 2011 (poverty line R1113 per capita pcm)
Limpopo Province



References

- Alderman, H., Babita, M., Demombynes, G., Makhatatha, N. and Ozler, B. (2003) 'How low can you go? Combining census and survey data for mapping poverty in South Africa', *Journal of African Economies*, 11(2): 169-200.
- Argent, J., Finn, A., Leibbrandt, M. and Woolard, I. (2009) *Poverty: Analysis of the NIDS Wave 1 Dataset, Discussion Paper no. 13*, Cape Town: SALDRU, University of Cape Town.
- Barnes, H., Noble, M., Wright, G. and Dawes, A. (2009) 'A Geographical Profile of Child Deprivation in South Africa', *Child Indicators Research*, 2(2):181-199.
- Barnes, H., Wright, G., Noble, M. and Dawes, A. (2007) *The South African Index of Multiple Deprivation for Children 2001*, Cape Town: Human Sciences Research Council Press.
- Bhorat, H., Poswell, L. and Naidoo, P. (2004) *Dimensions of Poverty in Post-Apartheid South Africa*, Cape Town: DPRU, University of Cape Town.
- Christopher, A. J. (1994) *The atlas of apartheid*. London: Routledge.
- Hirsch, D. (2013) *A Minimum Income Standard for the UK in 2013*. York: Joseph Rowntree Foundation.
- Hoogeveen, J. and Özler, B. (2006) 'Poverty and inequality in post-apartheid South Africa', in Bhorat and Kanbur (eds.), *Poverty and Policy in Post-Apartheid South Africa*, Pretoria: Human Sciences Research Council Press, pp. 59-94.
- Kleinman, M. (1999) 'There goes the neighbourhood: area policies and social exclusion', *New Economy*, 6: 188-192.
- Leibbrandt, M., Woolard, I., Finn, A., and Argent, J. (2010) *Trends in South African income distribution and poverty since the fall of apartheid*. OECD Social, Employment and Migration Working Paper No. 101, Paris: OECD Directorate for Employment, Labour and Social Affairs.
- Lloyd, N. and Leibbrandt, M. (2013) *New evidence on subjective wellbeing and the*

definition of unemployment in South Africa. A Southern Africa Labour and Development Research Unit Working Paper No. 94, Cape Town: SALDRU, University of Cape Town.

Noble, M., Smith, G.A.N., Penhale, B., Wright, G., Dibben, C., Owen, T. and Lloyd, M. (2000) *Measuring Multiple Deprivation at the Small Area Level: The Indices of Deprivation 2000*, London: Department of the Environment, Transport and the Regions.

Noble, M., Wright, G., Dibben, C., Smith, G.A.N., McLennan, D., Anttila, C., Barnes, H., Mokhtar, C., Noble, S., Gardner, J., Braswell, S., Covizzi, I. and Lloyd, M. (2004) *The English Indices of Deprivation 2004*, London: Office of the Deputy Prime Minister.

Noble, M., Babita, M., Barnes, H., Dibben, C., Magasela, W., Noble, S., Ntshongwana, P., Phillips, H., Rama, S., Roberts, B., Wright, G. and Zungu, S. (2006a) *The Provincial Indices of Multiple Deprivation for South Africa 2001*, Oxford: University of Oxford, UK.

Noble, M., Babita, M., Barnes, H., Dibben, C., Magasela, W., Noble, S., Ntshongwana, P., Phillips, H., Rama, S., Roberts, B., Wright, G. and Zungu, S. (2006b) *The Provincial Indices of Multiple Deprivation for South Africa 2001: Technical Report*, Oxford: University of Oxford, UK.

Noble, M., Barnes, H., Wright, G., McLennan, D., Avenell, D., Whitworth, A., and Roberts, B. (2009a) *The South African Index of Multiple Deprivation 2001 at Datazone Level*, Pretoria: Department of Social Development.

Noble, M., Barnes, H., Wright, G., and Roberts, B. (2009b) Small Area Indices of Multiple Deprivation in South Africa, *Social Indicators Research*, 95(2): 281-297.

Noble, M., Dibben, C. and Wright, G. (2010a) *The South African Index of Multiple Deprivation 2007 at Datazone Level (modelled)*, Pretoria: Department of Social Development.

Noble, M. and Wright, G. (2013) 'Using indicators of multiple deprivation to demonstrate the spatial legacy of apartheid in South Africa', *Social Indicators Research*, *Social Indicators Research*, 112(1): 187-201.

Noble, M., Wright, G., and Barnes, H. (2010b) *A profile of deprivation in Limpopo province using the datazone level South African Index of Multiple Deprivation 2001*, Oxford: CASASP, University of Oxford.

Noble, M., Wright, G., Davies, J., Barnes, H. and Ntshongwana, P. (2011) *Constituency-level Namibian Index of Multiple Deprivation 2001*, Report produced for UNDP Namibia.

Noble, M., Wright, G., Magasela, W. and Ratcliffe, R. (2007) 'Developing a Democratic Definition of Poverty in South Africa', *Journal of Poverty* 11(4): 117-141.

Noble, M., Wright, G., Smith, G. and Dibben, C. (2006c) 'Measuring multiple deprivation at the small-area level', *Environment and Planning A*, 38(1): 169 -185.

Smith, G.A.N., Noble, M. and Wright, G. (2001) 'Do we care about area effects?' *Environment and Planning A*, 33: 1341-1344.

Smith, G.R. (1999) *Area-based initiatives: the rationale and options for area targeting*, CASE Paper 25.

Statistics South Africa (2012) *Census 2011 Metadata*, Pretoria: Statistics South Africa.

Townsend, P. (1979) *Poverty in the United Kingdom*, Harmondsworth, Middlesex: Penguin Books.

Townsend, P. (1987) 'Deprivation', *Journal of Social Policy*, 16(2): 125-146.

Vogt, W. P. (1999) *Dictionary of Statistics and Methodology: A Nontechnical Guide for the Social Sciences*, Second edition, Thousand Oaks, CA: SAGE Publications.

Wright, G., Barnes, H., Noble, M., and Dawes, A. (2009a) *The South African Index of Multiple Deprivation for Children 2001 at Datazone Level*. Pretoria: Department of Social Development.

Wright, G., and Noble, M. (2009) *The South African Index of Multiple Deprivation 2007 at Municipality Level*, Pretoria: Department of Social Development.

Wright, G. and Noble, M. (2013) 'Does widespread lack undermine the socially perceived necessities approach to defining poverty? Evidence from South Africa', *Journal of Social Policy*, 42(1): 147-165.

Wright, G., Noble, M., Barnes, H. and Noble, S. (2009b) *The South African Index of Multiple Deprivation for Children 2007 at Municipality Level*, Pretoria: Department of Social Development.

Wright, G., Noble, M. and Magasela, W. (2010) 'Towards a democratic definition of poverty: socially perceived necessities in South Africa' in B. Roberts, M. wa Kivilu, and Y.D. Davids (eds.), *South African Social Attitudes 2nd Report: Reflections on the age of hope*, Cape Town: Human Sciences Research Council Press, pp.143-166.