

# A Geographical Profile of Child Deprivation in South Africa

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**Abstract** This article describes the methodology employed to create an index of multiple deprivation for children in South Africa at small-area level and presents the picture of deprivation across the country exposed by the index. Making use of information from the 2001 Census, 14 child-focused indicators were arranged into five domains of deprivation—income, employment, education, living environment and adequate care—which were then combined with equal weights to form an overall index of multiple deprivation at municipality level. The patterns of deprivation across South Africa within each domain and on the overall index are examined at national, provincial and municipal level. The article ends with a discussion of some of the strengths and weaknesses of the index and suggestions for future work in this area.

**Keywords** Child poverty · Deprivation · South Africa · Index

## 1 Introduction

Governments worldwide, South Africa included, have committed themselves to eradicating child poverty. The Millennium Development Goals emanating from the

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Millennium Summit in 2000 (United Nations 2000) have a strong focus on children: two goals are to achieve universal primary education and to reduce child mortality, while others, such as eradicating extreme poverty and hunger, have a direct impact on the well being of children. In 2002, 190 states convening at the United Nations General Assembly's Special Session on Children pledged to accelerate progress on child development (UNICEF 2004).

Since the 1980s, rights-based monitoring of children has emerged in many countries, inspired by the *Convention on the Rights of the Child* (CRC) (United Nations 1990). By ratifying the CRC, states, including South Africa in 1995<sup>1</sup>, have committed themselves to protecting and advancing children's rights, to developing and undertaking all actions and policies in the light of the best interests of children, and they have agreed to hold themselves accountable for this commitment before the international community.

In South Africa, the children's rights movement developed in the 1980s, in opposition to state oppression and during a climate of extreme rights violations (Berry and Guthrie 2003). Several reports raised awareness of the situation of South Africa's children (Dawes and Donald 1994; NCRC and UNICEF 1993; Wilson and Ramphela 1989). The National Children's Rights Committee was formed in 1990 to advocate for the rights of children in policy. Since 1994 the government has been active in committing itself to the protection of child rights and reduction of child poverty. One of the first commitments was the National Programme of Action for Children (NPA). Set up in 1995, the NPA co-ordinated the protection of the rights of all children in South Africa and was key to informing government's child poverty alleviation strategy (Cassiem et al. 2000). An Office on the Rights of the Child was established in 1998 with the purpose of monitoring the advancement of children's rights.

Unique among nation states, in addition to the rights held by all citizens, Section 28 of the South African Constitution (Act 108 of 1996) makes provision for children's rights in line with the CRC. Every child (persons under 18 years) has the right, amongst others, to parental or to appropriate alternative care (when removed from the family for purposes of protection); to basic nutrition, shelter, basic health and social services; and to be protected from maltreatment, neglect, abuse or degradation. Children's legislation, the *Children's Act* (Act 38 of 2005) and the *Children's Amendment Act* (Act 41 of 2007), give effect to these constitutional rights.

Child poverty has enduring impacts on a range of child outcomes (Aber and Bennett 1997), and is a critical issue for South Africa where more than 60% of children are estimated to live in poverty (Meintjes et al. 2008).

Social assistance transfers are the main arm of the South African government's poverty alleviation programme. Three forms of means tested social assistance are available to children: the child support grant (CSG), the foster child grant and the

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<sup>1</sup> And also the *African Charter on the Rights and Welfare of the Child* (Organisation of African Unity 1999) in 1999.

care dependency grant.<sup>2</sup> Since its introduction in 1998, the CSG has been the government's central mechanism for the alleviation of child poverty (Triegaardt 2005). Currently over eight million children are in receipt of the grant (SASSA 2008). Take up<sup>3</sup> of the CSG in January 2005 was estimated to be 71%, an increase of seven percentage points from January 2004 when it was estimated to be 63% (Noble et al. 2005b).

However, despite this increase in access, eligible caregivers of approximately 2.16 million children were not claiming CSG, and such families were therefore experiencing levels of hardship unnecessarily (Noble et al. 2005b). A number of barriers to accessing the grant have been reported (Goldblatt et al. 2006). Furthermore, it has also been reported that the grant is insufficient to meet the needs of a child (Surender et al. 2007).

In 2007 the Department of Social Development, the South African Social Security Agency and UNICEF signed a partnership agreement. The partnership, falling within the framework of UNICEF's new country programme for 2007–2010, aims to develop a comprehensive package of services for children and to reduce child poverty. The budget vote speech delivered by Dr Zola Skweyiya, Minister for Social Development, in May 2007 called for 'a renewal of our pledge to a national partnership to fight child poverty, social exclusion and to promote social cohesion and improve service delivery' (Skweyiya 2007b).

As remarked by Skweyiya on the occasion of a symposium on tackling child poverty: 'despite Government's commitment to the long-term objective of transforming the country into a non-racial, non-sexist, democratic nation, children remain on the periphery of social transformation. Children continue to be hard hit by poverty in various parts of the country' (Skweyiya 2007a). Although rights for children are guaranteed by the Constitution and other legislation, in practice, widespread poverty among children and high rates of mortality and maltreatment suggest that these rights are not always realised (Dawes et al. 2007).

In order to realise the rights of children and tackle child poverty, robust sub-national measures that quantify the nature and extent of deprivation experienced by children are required. Heeding recent calls for child-focused research internationally and in South Africa (Coetzee and Streak 2004; Dawes et al. 2007; Guthrie et al. 2003; Noble et al. 2006b, 2007; Streak 2005), it is also essential that these measures focus specifically on children rather than simply treating children as elements of the household or family. This article describes the first attempt in South Africa to generate data of this nature, to map child deprivation at municipality level<sup>4</sup> and identify the areas of greatest need, in order to inform local level policy and intervention.<sup>5</sup>

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<sup>2</sup> The grant is a monthly payment to the primary caregiver of the child (in the case of the child support grant), foster parent (in the case of the foster child grant) or parent/guardian/foster parent (in the case of the care dependency grant).

<sup>3</sup> The proportion of the eligible population (children in the case of the CSG) who actually receive the grant.

<sup>4</sup> Municipalities are the spatial units below the nine provinces. There are 262 municipalities in South Africa, of which 231 are local municipalities, 25 are District Management Areas and six are metropolitan municipalities. There are eight local municipalities and one metropolitan municipality which straddle province boundaries (Statistics South Africa 2004).

<sup>5</sup> See Barnes et al. (2007b) for a full report of the study.

## 2 Methodology

The methodology for the index of multiple deprivation described here was first developed in the UK, initially for England and subsequently applied to Scotland, Wales and Northern Ireland (Noble et al. 2000a, 2000b, 2001, 2003, 2004, 2005a, 2008). It has also been applied to South Africa (Noble et al. 2006a), but for the whole, rather than child, population. The conceptual model of the index of multiple deprivation is the idea of distinct domains of deprivation which can be recognised and measured separately. These are experienced by children living in an area (e.g. a municipality). Children may be counted as deprived on one or more of the domains, depending on the number of types of deprivation that they experience. The overall index of multiple deprivation is conceptualised as a *weighted area level aggregation* of these specific domains of deprivation.

The 2001 Census was chosen as the data source for the South African Index of Multiple Deprivation for Children (SAIMDC).<sup>6</sup> After discussion with experts a number of possible dimensions of child multiple deprivation were drawn up. Inevitably the actual choice of domains was determined by data availability. The Census had data for five possible domains: income and material deprivation; employment deprivation; child education deprivation; living environment deprivation and adequate care deprivation. No appropriate Census indicators were available for other domains identified such as health deprivation or living in a high crime area.

Each domain reflects a separate aspect of deprivation, thus avoiding the need to make judgments about the complex links between different types of deprivation, and enabling clear decisions to be made about the contribution that each domain should make to the overall index. It is possible, indeed likely, that the same child could be captured in more than one domain. If a child experiences more than one form of deprivation, this is worse than experiencing only one form. It is therefore desirable and appropriate to capture deprivation occurring in more than one domain. Furthermore, the domains can be used separately and it is therefore important to capture the full extent of deprivation in an area. There is no double counting of individuals within a domain however.<sup>7</sup>

The aim for each domain was to include a parsimonious collection of indicators that comprehensively captured the deprivation for each domain, within the constraints of the available data from the Census. Furthermore, indicators had to be ‘domain specific’ and appropriate for the purpose (as direct as possible measures of that form of deprivation); they had to measure major features of that deprivation (not conditions just experienced by a very small number of children or areas); and

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<sup>6</sup> A 10% sample of the 2001 Census is publicly available and robust at municipality level, but not below that (e.g. ward or enumeration area). It was not possible to obtain the necessary permissions to produce the SAIMDC below municipality level using the full Census, but this is recommended for future work, as discussed in the final section of this article.

<sup>7</sup> The data are at individual level and so it is possible to count a child as deprived if she experienced more than one form of deprivation in a particular domain. However, a specific child was only counted once for each domain, even if she experienced more than one form of deprivation within that domain.

they had to be statistically robust.<sup>8</sup> A total of 14 indicators were used in the SAIMDC and these are described below. With the exception of the education deprivation domain, all the domains were created as simple rates, which avoided the issue of weighting indicators within domains (i.e. attaching a degree of relative importance to each component in the overall composite domain measure).

### 2.1 Income and Material Deprivation Domain

The purpose of this domain was to capture the proportion of children experiencing income and/or material deprivation in an area. Children living in households with low income may suffer a number of other deprivations related to a lack of resources, and therefore such an indicator was included alongside two direct measures of material deprivation. There are no questions on child specific material goods in the Census, but it was felt that some general household material deprivations are relevant to children: lack of a refrigerator (for safe storage of food) and lack of a radio or television (for accessing information).

- Number of children living in a household<sup>9</sup> that has a household income (equivalised using the modified OECD equivalence scale) that is below 40% of the mean equivalent household income; or
- Number of children living in a household without a refrigerator; or
- Number of children living in a household with neither a television nor a radio.

A simple proportion of children living in households experiencing one or more of the deprivations was calculated (i.e. the number of children living in a household with low income and/or without a refrigerator and/or without a television and radio, divided by the total child population).

### 2.2 Employment Deprivation Domain

The purpose of this domain was to measure the proportion of children living in workless households in an area. The well-being of children is likely to be enhanced by the presence of employed adults in the household, as apart from the income they contribute, they are less likely to experience the demoralisation and deprivation associated with worklessness.

- Number of children living in households where no adults aged 18 or over are in employment.

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<sup>8</sup> It is not possible to report standard errors for a composite index (although work is currently being undertaken by the Office for National Statistics in the UK to test the validity of standard errors in a composite index; they are yet to report however). In this type of work, shrinkage estimation (i.e. empirical Bayesian estimation) has been used to deal with large standard errors on domain scores. In this instance, shrinkage made little difference to the overall ranking of municipalities on each domain as standard errors were small.

<sup>9</sup> The Census metadata defines a household as a group of persons who live together and provide themselves jointly with food and/or other essentials of living, or a single person who lives alone.

A simple proportion of children living in households experiencing this type of deprivation was calculated (i.e. the number of children living in a household with no employed adults divided by the total child population).

### 2.3 Education Deprivation Domain

The purpose of this domain was to capture the extent of children's educational deprivation in an area. There are few questions in the Census about education, but it was possible to construct two indicators which measure educational disadvantage: children who are one or more years behind at school<sup>10</sup> and actual attendance at an educational institution.

- Number of children (9–15 years inclusive) who are in the wrong grade for their age; or
- Number of children (7–15 years inclusive) who are not in school.

Because there were different denominators for the two indicators, a simple proportion of children of the relevant age experiencing the deprivation was calculated for each indicator (i.e. the proportion of 9–15 year olds in the wrong grade and the proportion of 7–15 year olds not in school). The indicators were then population weighted according to a ratio of indicator denominator to total denominator for the two indicators (i.e. wrong grade denominator + not in school denominator), and added together.

### 2.4 Living Environment Deprivation Domain

The purpose of this domain was to identify children living in poor quality environments. A range of indicators measuring aspects of the immediate environment which impact on the quality of children's daily existence were included, for example the quality of housing, amenities within the dwelling and access to adequate living space. With regard to the last aspect, research indicates that conditions associated with poverty, including overcrowding, contribute to the risk of maltreatment (Trocmé et al. 2005). There is no South African research evidence of an association between crowded housing and child abuse. However, in one study, rates of harsh punishment were found to be higher in poor communities where crowding is common (Dawes et al. 2004). Studies in other countries including the United States (Zuravin 1986), India (Hunter et al. 2000) and Egypt (Youssef et al. 1998), have demonstrated an association between risks for child maltreatment and overcrowding. These studies suggest the probability of increased risks in poor crowded households in South Africa.

- Number of children living in a household without piped water inside their dwelling or yard or within 200 metres; or

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<sup>10</sup> Reasons for children being behind in school include starting school late or being made to repeat a year for not reaching the necessary standard to progress to the next grade. The latter could be because of the quality of the education received, missing school through illness, or missing school for other reasons such as being unable to afford to pay for fees and uniform.

- Number of children living in a household without a pit latrine with ventilation or flush toilet; or
- Number of children living in a household without use of electricity for lighting; or
- Number of children living in a household without access to a telephone; or
- Number of children living in a household that is a shack; or
- Number of children living in a household that is crowded (taking into account the age and sex of household members).<sup>11</sup>

A simple proportion of children living in households experiencing one or more of the deprivations was calculated (i.e. the number of children living in a household without piped water and/or without adequate toilet and/or without electricity for lighting and/or without access to a telephone and/or that is a shack and/or that is crowded, divided by the total child population).

## 2.5 Adequate Care Deprivation Domain

The purpose of this domain was to capture children in an area who are at risk of lacking adequate care. There are no direct indicators in the Census which indicate whether the care children receive is 'adequate' or not. However, groups of children potentially at risk of inadequate care can be identified. Two such groups are children living in child-headed households with no adult to care for them and children who have neither of their biological parents living with them. In parts of South Africa there is high labour migration or parental loss due to HIV/AIDS and it is common for friends, relatives or other adults to look after children, either formally through fostering and adoption or through more informal arrangements. These children may be well looked after by foster or adoptive parents, friends or relatives (there is no way of determining this from the Census data), but they are more *at risk* of inadequate care. Furthermore, many will suffer periods of instability and will have to readjust to new arrangements, while for those children who have lost both parents, there is the additional trauma of bereavement (Henderson 2006; Parkes 1999).

- Number of children whose mother and father are no longer alive or not living in the household; or
- Number of children living in a child-headed household.<sup>12</sup>

A simple proportion of children experiencing either of the deprivations was calculated (i.e. the number of children whose mother and father are not present in the

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<sup>11</sup> The Canadian National Occupancy Standard was applied. This measures the bedroom requirements of a household by specifying that: there should be no more than two people per bedroom; children less than five years of age of different sexes may reasonably share a bedroom; children 5 years and over of the opposite sex should not share a bedroom; children less than 18 years of age and of the same sex may reasonably share a bedroom; and household members 18 years and over should have a separate bedroom, as should parents or couples.

<sup>12</sup> A child-headed household is a household where a person under the age of 18 is designated as the household head on the Census questionnaire in place of an adult, and where there are no other adults in the household.

household or the number of children living in a child-headed household, divided by the total population).

Following the construction of the domain indices, they were combined into an overall index.<sup>13</sup> In order to do this, the domain indices were standardised by ranking and then transformed to an exponential distribution. The exponential distribution was selected as it has a number of important properties (see Barnes et al. 2007b), in particular, when the domains are combined into a single index, there is no implicit weighting as a result of the underlying distributions; the exponential distribution is not affected by the size of the municipality's population; and it effectively spreads out the most deprived part of the distribution.<sup>14</sup>

Finally, the domains were combined together with equal weights, in the absence of evidence suggesting differential weights should be used (Dibben et al. 2007; Noble et al. 2004: 45–46). The final products were five domain measures and one overall index of multiple deprivation (the SAIMDC). The domain measures can be used to describe each type of deprivation and the SAIMDC measure can describe overall or multiple deprivation. In order to compare municipalities, they were ranked according to their domain and overall SAIMDC scores, with a rank of one assigned to the most deprived municipality.

### 3 The Geography of Deprivation

#### 3.1 National

Nationally, 81% of children experience income and material deprivation, 50% experience employment deprivation, 77% experience living environment deprivation and 25% experience adequate care deprivation.<sup>15</sup> It is only possible to look at the separate indicators for education deprivation as an overall rate was not calculated in the same way as for the other domains: 24% of children are in the wrong grade for their age and 6% are not in school.

Correlations (Spearman rank) between the five domain scores and the SAIMDC scores are given in Table 1 below. Three domains correlate fairly highly with the overall SAIMDC: the income deprivation, employment deprivation and living environment deprivation domains all have a correlation of over 0.92. This suggests that these domains will show a very similar pattern of deprivation across the country to the overall SAIMDC, particularly the income deprivation domain which has the highest correlation with the overall SAIMDC (0.96). The income deprivation domain correlates highly with the living environment deprivation domain (0.92) and

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<sup>13</sup> District Management Areas (DMAs) - areas such as game reserves and mining complexes with small populations and special characteristics that produce anomalous results and are customarily excluded from small area analyses - and one municipality with a child population of less than 1,000 were omitted. The final number of municipalities included in the SAIMDC was 245 (municipalities that straddle provinces were counted as two separate municipalities each time).

<sup>14</sup> The most deprived 25% of municipalities in this instance.

<sup>15</sup> The results presented in this section refer to 2001.



**Table 1** Intra-domain and SAIMDC Spearman rank correlations (Barnes et al. 2007b)

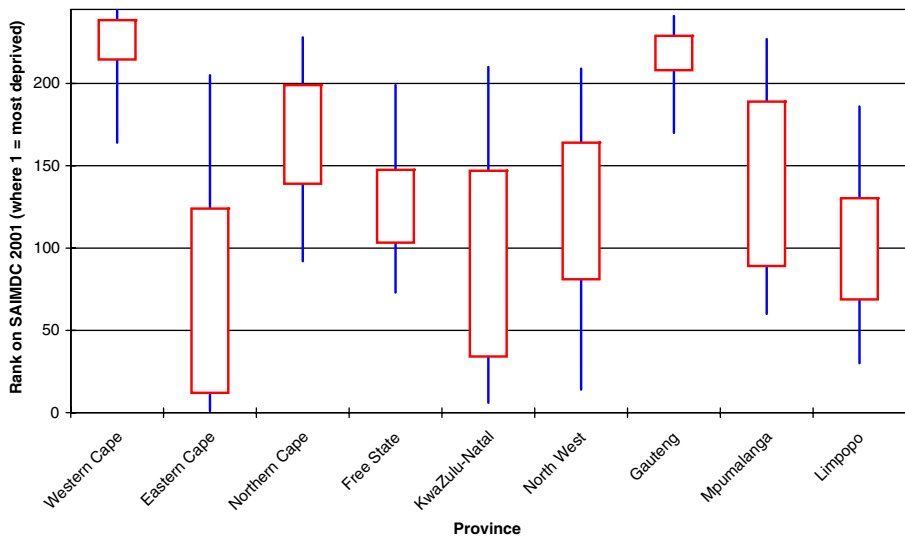
	SAIMDC	Income	Employment	Education	Living envt.	Adequate care
<b>SAIMDC</b>	1.0000					
<b>Income</b>	0.9646	1.0000				
<b>Employment</b>	0.9212	0.8936	1.0000			
<b>Education</b>	0.6803	0.5823	0.4513	1.0000		
<b>Living envt.</b>	0.9253	0.9236	0.8826	0.5228	1.0000	
<b>Adequate care</b>	0.8961	0.8455	0.8382	0.5066	0.7738	1.0000

*N*=245, all correlations are significant at the 0.001 level

the employment deprivation domain (0.89) and the three domains are therefore likely to exhibit a similar pattern of deprivation across the country. The education deprivation domain correlates the least well with the overall SAIMDC (0.68) and has the lowest correlation with the other domains (between 0.45 and 0.59). The pattern of deprivation will therefore be quite different for education compared to the other domains. This is likely to be because the indicators in the education domain are characteristics of the child, whereas in the other domains the indicators relate to the household in which the child lives (e.g. not having electricity for lighting in the case of the living environment domain) or other members of that household (e.g. unemployed adults in the case of the employment deprivation domain).

### 3.2 Provincial

Figure 1 shows the patterns of deprivation for children in each of the nine provinces in South Africa (shown on the X axis) for the SAIMDC. The range of deprivation is illustrated by the vertical line, based on the ranks of the municipalities (given on the

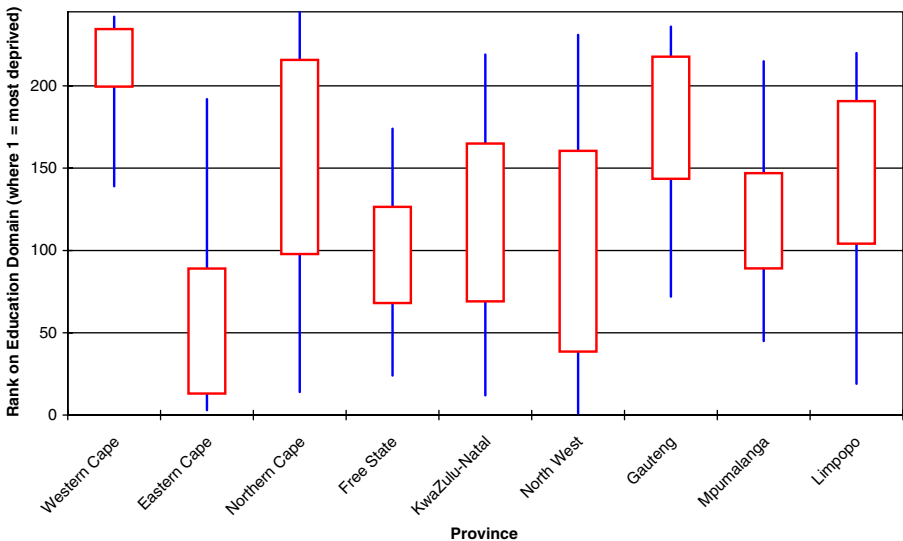


**Fig. 1** SAIMDC interquartile range (Barnes et al. 2007b)

Y axis). The box indicates the range of the middle 50% of municipalities in the province (the interquartile range). A relatively short box indicates that municipalities are concentrated in a narrow range. If this box sits towards the bottom of the chart it tells us that child deprivation in the province is concentrated in the most deprived part of the national distribution. If the box sits towards the top of the chart it tells us that deprivation is concentrated in the least deprived part of the national distribution.

The Eastern Cape and KwaZulu-Natal have the greatest range of child deprivation. Gauteng and the Western Cape have the smallest range of child deprivation, and municipalities in these two provinces are concentrated in a narrow range in the least deprived part of the national distribution. Municipalities in the Eastern Cape and KwaZulu-Natal are concentrated in the most deprived part of the distribution, but in a fairly broad range. The municipalities in the remaining five provinces are concentrated in the middle of the distribution. The Northern Cape lies towards the least deprived end of the distribution.

Similar box plots for other domains such as income and material deprivation and living environment deprivation give very similar patterns to that seen in Fig. 1. This is not altogether surprising given the correlations reported above. Figure 2 shows the pattern for the education deprivation domain, which is quite different to the SAIMDC. The Western Cape looks fairly similar, remaining at the least deprived end of the distribution, in a fairly narrow range. In fact, the province is fairly consistent across all domains. The Free State also looks quite similar, although is a little more deprived in terms of education deprivation. The Eastern Cape has a smaller interquartile range, indicating similar levels of education deprivation across the province. These are concentrated very much towards the deprived end of the distribution. The Eastern Cape is clearly the most education deprived in the country. KwaZulu-Natal performs better on the education deprivation domain with the middle 50% of municipalities sitting in the middle of the distribution. Limpopo also



**Fig. 2** Education deprivation domain interquartile range (Barnes et al. 2007b)

performs well on education with the middle 50% of municipalities in the middle to least deprived end of the distribution. North West on the other hand has moved from the middle towards the most deprived end of the distribution. Gauteng is perhaps the most striking as on the SAIMDC and income and material deprivation domain the municipalities are concentrated in a very narrow range at the least deprived end of the distribution. For education, it has a much larger range, both overall (its most deprived municipality ranks about 70th, compared to about 170th on the income and material deprivation domain) and in the middle 50%. Mpumalanga has a much tighter concentration of deprivation in the middle 50% than for the SAIMDC.

### 3.3 Municipal

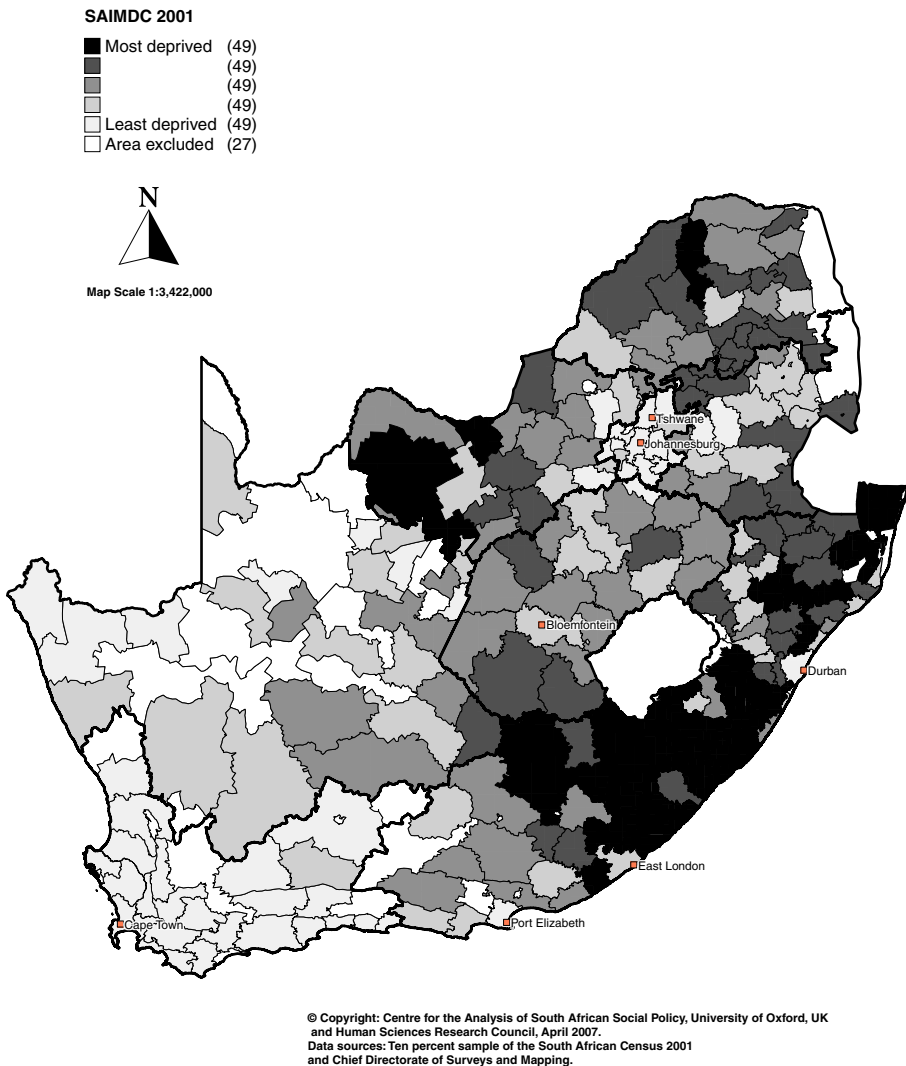
The above charts suggest that the Eastern Cape is the most deprived province in terms of child deprivation. Table 2 shows that the Eastern Cape has the greatest number of municipalities in the most deprived quintile of the SAIMDC (22), followed closely by KwaZulu-Natal (21). Despite the similar number, actually a far greater proportion of the Eastern Cape's municipalities are in the most deprived quintile (56% compared to 41%). The Western Cape and Gauteng feature prominently at the least deprived end: 24 out of 25 of the Western Cape's municipalities are in the least deprived quintile, while 10 out of 12 of Gauteng's municipalities are in this quintile.

As would be expected from the correlations between domains, the most highly deprived municipalities score as deprived on several of the domains. For example, the most deprived municipality on the overall SAIMDC, Engcobo (in the Eastern Cape), ranks 10th on income and material deprivation, 6th on employment deprivation, 3rd on education deprivation, 8th on living environment deprivation and 16th on adequate care deprivation (where a rank of one is the most deprived). For all types of deprivation therefore, Engcobo is in the most deprived quintile, and also the most deprived decile. As another example, of the 22 (out of 39) municipalities in the Eastern Cape in the most deprived quintile on the overall SAIMDC, 12 (55%) are in the most deprived quintile on all five domains.

A good way of presenting the municipal results is on a map. Figure 3 shows the overall SAIMDC by national quintiles (five equal groups). The lighter shades

**Table 2** Number of municipalities in each quintile of deprivation by province

Province	Quintile 1 (least deprived)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (most deprived)
<b>Western Cape</b>	24	1	0	0	0
<b>Eastern Cape</b>	1	5	7	4	22
<b>Northern Cape</b>	7	12	6	1	0
<b>Free state</b>	1	4	11	4	0
<b>KwaZulu-Natal</b>	1	11	4	14	21
<b>North West</b>	2	5	10	4	4
<b>Gauteng</b>	10	2	0	0	0
<b>Mpumalanga</b>	3	6	4	8	0
<b>Limpopo</b>	0	3	7	14	2



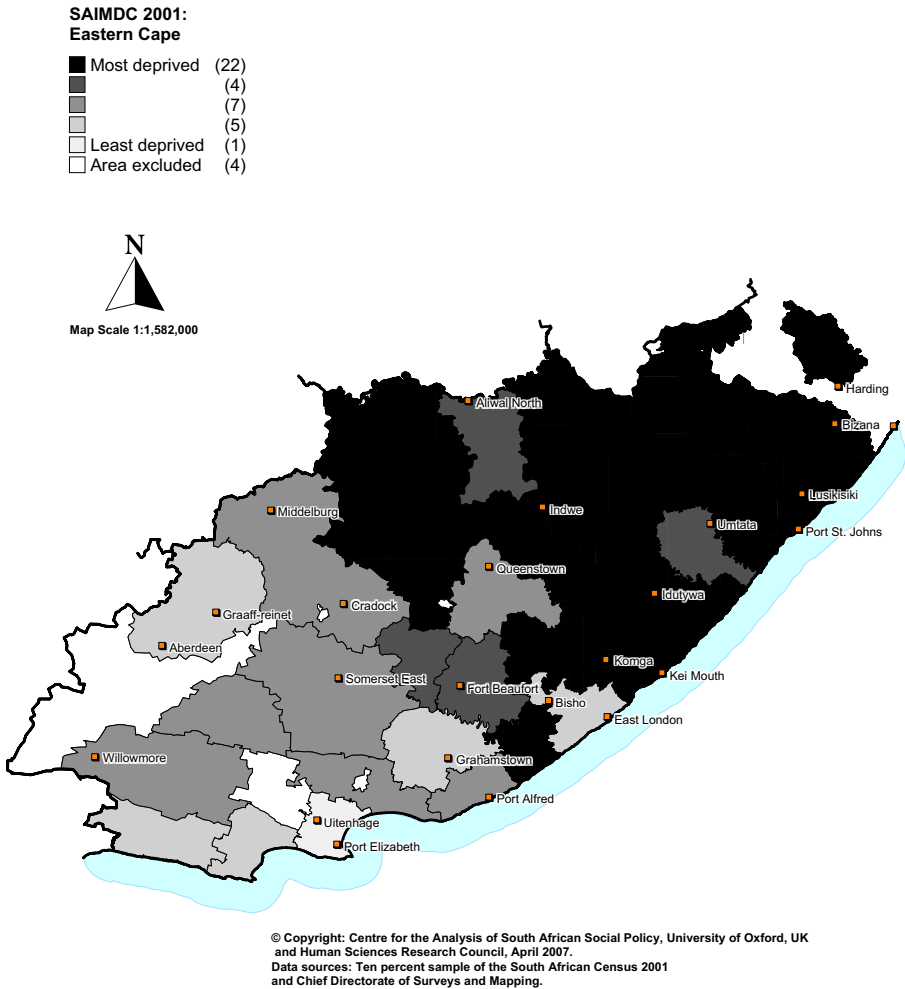
**Fig. 3** SAIMDC 2001 at municipality level (national quintiles of municipalities) (Barnes et al. 2007b)

represent relatively lower levels of deprivation, and the darker shades relatively higher levels. The provinces are designated by the thick black lines, and the municipalities by the thinner black lines.<sup>16</sup> The majority of municipalities in both the Western Cape<sup>17</sup> and Gauteng<sup>18</sup> are in the least deprived quintile, that is the least deprived 20% in terms of child deprivation (shaded in the lightest grey on the map).

<sup>16</sup> Areas left white are DMAs that were excluded.

<sup>17</sup> The province to the south-west of the country containing Cape Town (labelled on the map).

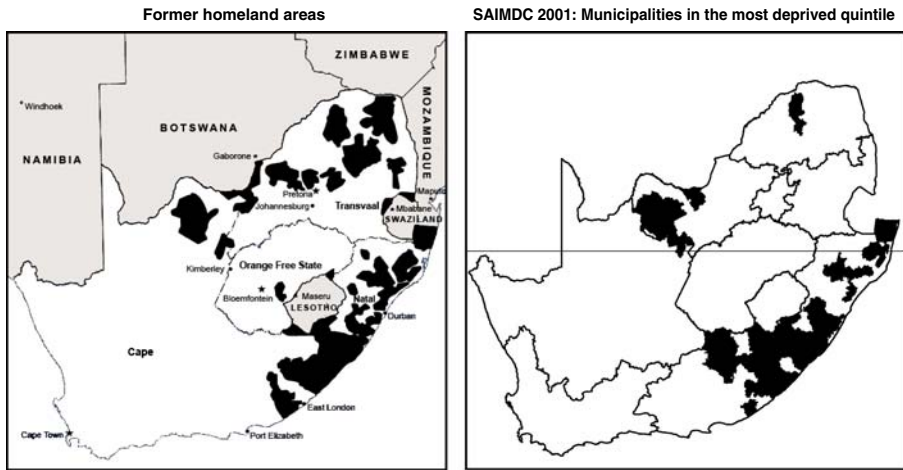
<sup>18</sup> The small (in size) province towards the north-east of the country containing Johannesburg and Tshwane (Pretoria) (both are labelled on the map).



**Fig. 4** SAIMDC 2001 at municipality level: Eastern Cape (national quintiles of municipalities) (Barnes et al. 2007b)

There is a more mixed picture in the other provinces. For example, in complete contrast to the Western Cape and Gauteng, in the Eastern Cape (shown by itself in Fig. 4), municipalities in the former Transkei<sup>19</sup> fall into the most deprived two quintiles, that is the most deprived 40% in terms of child deprivation (shaded darker grey on the map). The majority of municipalities are in the most deprived 20%. The

<sup>19</sup> During apartheid, ten bantustans or homelands were created in South Africa and many black African people were resettled in these territories. Four of these, including the Transkei and Ciskei in the now Eastern Cape, were independent.



Source: MATRIX, Michigan State University, 1984  
Adapted from <http://overcomingapartheid.msu.edu/image.php?id=257>

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University of Oxford, UK and Human Sciences Research Council,  
April 2007  
Data sources: Ten percent sample of the South African Census 2001  
and Chief Directorate of Surveys and Mapping

**Fig. 5** Comparison of former homeland areas and municipalities in the most deprived quintile of the SAIMDC 2001

former Ciskei area of the Eastern Cape has municipalities in each of the quintiles. Nelson Mandela municipality (the Port Elizabeth area) is in the least deprived 20%.

Interestingly, if a map of the former homelands is laid next to a map of the municipalities in the most deprived quintile, as in Fig. 5, the areas with the highest deprivation are strikingly similar to the former homeland areas (shaded on the first map). Although the Census was conducted seven years after the end of apartheid, the historical legacy is still starkly evident.

The least deprived of the Eastern Cape municipalities is Nelson Mandela which ranks 205th (out of 245, where a rank of one is the most deprived) and falls in the least deprived quintile. Nelson Mandela is a metropolitan municipality (a metro), one of six in South Africa.<sup>20</sup> Metros 'are conurbations featuring high population density; intense movement of people, goods and services; extensive development; and multiple business districts and industrial areas. Other features include a complex and diverse economy, a single area where integrated development is desirable, and strong interdependent social and economic linkages between its constituent units' (Statistics South Africa 2004). When compared to other metros, which makes sense as according to the above definition, metros are similar areas and quite different to other municipalities, Nelson Mandela is the second most deprived on the overall SAIMDC, behind that part of the City of Tshwane Metro which is in the North West, and is most deprived in terms of employment deprivation.

Furthermore, the *numbers* of children who are deprived on the various domains of deprivation is very high in the metros, which is perhaps to be expected given the high population density. Even where a municipality is not considered deprived, because of its large size, it may still contain higher numbers of deprived children

<sup>20</sup> The others are Cape Town, Ethekwini (Durban), Ekurhuleni (East Rand), Johannesburg, Nelson Mandela (Port Elizabeth) and Tshwane (Pretoria - split between Gauteng and North West provinces).

than in a smaller municipality that is classified as more deprived. For large municipalities with considerable heterogeneity, the SAIMDC is a coarse measure that masks intra-municipality differences. If measures to tackle deprivation only target the smaller, more homogeneously deprived areas, there is a danger that the larger areas, where the sheer number of children experiencing deprivation is greater, will be excluded. This important point is returned to in the discussion.

## 4 Discussion

This is the first attempt to produce an index of child deprivation at small area level in South Africa. It paints a very clear picture of deprivation affecting children at municipality level. High numbers of children were found to experience income and material, employment and living environment deprivation in particular (as defined in the SAIMDC), with not inconsiderable numbers experiencing adequate care and education deprivation also. Deprived municipalities, and therefore the children living in them, often experience more than one type of deprivation: they are multiply deprived. Child deprivation was shown to be particularly high in the Eastern Cape, and also in KwaZulu-Natal, two provinces with a high concentration of former homelands, areas which were found to correspond quite closely with the areas of highest deprivation.

The SAIMDC has been designed in such a manner that it can be updated in two main ways. First, it allows for the re-evaluation of the number and nature of the dimensions of deprivation (the domains). The SAIMDC was created using the 2001 Census and therefore the domains and indicators included were to a large extent dependent on the availability of data in the Census. Certain types of deprivation could not be incorporated due to a lack of data. For example, it was hoped that a domain measuring health deprivation could be included in the SAIMDC. Measures of child mortality—a good indicator of the overall health (and socio-economic) status of a population—were explored but no measure could be satisfactorily produced using the 10% sample of the 2001 Census at municipality level. Such an indicator could perhaps in future be measured using birth and death records. In the UK indices, including the recent child well-being index (Bradshaw et al. 2007), the health domain has included measures of physical morbidity. Unfortunately the Census does not provide suitable information on this aspect of health deprivation. Other health-related administrative sources could perhaps be used in future to construct indicators (see below). Other domains recognised as important include physical safety, abuse, social capital and access to services (Noble et al. 2006b), but again the Census lacks either any or satisfactory data on these aspects of deprivation.

Not only should new domains be considered, but existing indicators should be reviewed. The ‘not in school’ indicator only captured 6% of the child population aged 7–15 years. Given that one of the criteria for indicators was that they had to measure major features of that deprivation and not conditions just experienced by a very small number of children or areas, the proportion is perhaps too low. As it was combined with another indicator to make the education deprivation domain, this is unproblematic. However, it may be useful to re-evaluate this indicator in future.

This links to the second feature of the SAIMDC design, that it allows for new and more direct measures of the dimensions of deprivation to be incorporated (the indicators). The SAIMDC represents the picture as at 10 October 2001 (Census night). Inevitably, change will have occurred since then, although for most areas the relative position is likely not to have altered greatly. Change can be compared over time providing the next Census contains the same questions. However, given that South Africa has now moved to a decennial Census, it is important to explore ways to bring the measurement of multiple deprivation up to date, by exploring the availability of non-Census data sources. As has been done in the UK in the recent child well-being index, administrative data could be used to produce deprivation indicators at small area level.<sup>21</sup> This would enable a small area index of multiple deprivation for children to be created, which is both up to date and which can be updated more frequently. It may also be worth exploring synthetic estimation techniques, such as spatial microsimulation, which can be used to model survey data down to a small area level (for example Anderson 2007; Ballas et al. 2005).

Ideally, deprivation measures should (a) be constructed at the smallest possible spatial scale that is consistent with robust measurement; (b) have geographical units of more or less equal size in terms of population; and (c) have geographical units that are relatively homogenous in terms of deprivation. The SAIMDC fulfils the first criteria: the index was produced at municipality level, which Stats SA claim is the lowest level at which the 10% sample of the 2001 Census remains robust. Unfortunately, the second and third criteria are not adequately met. Municipalities vary considerably in population size (the smallest is approximately 50 children<sup>22</sup>, and the largest is over one million, with a mean of approximately 65,000) and, as we have seen, their large size means that pockets of deprivation in a municipality will be ‘diluted’ or hidden by relative non-deprivation in the vicinity. Although wards, used in the Provincial Indices of Multiple Deprivation (PIMD) (Noble et al. 2006a)<sup>23</sup>, provide a more nuanced picture of deprivation at a sub-provincial level than municipalities, even moving to wards can be problematic as they also vary considerably in population size, especially by province. Large wards will therefore tend to be under-represented in national indices of deprivation.

To address these issues, new small area units—datazones—have been constructed by the Centre for the Analysis of South African Social Policy, taking into account homogeneity and population size and using enumeration areas as building blocks. This exercise drew on work that has been carried out to create new small area geographies in the UK where similar problems were encountered and new statistical areas developed that would be of consistent size and whose boundaries would not change.<sup>24</sup> It is

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<sup>21</sup> See Barnes et al. (2007a) for a review of currently available administrative data sources.

<sup>22</sup> Although, as noted above, municipalities with less than 1,000 children were excluded.

<sup>23</sup> The index was produced using the full Census rather than the 10% sample and so could be presented at ward level.

<sup>24</sup> For more information please visit the following websites:

England and Wales - <http://www.statistics.gov.uk/geography/soa.asp>

Northern Ireland - <http://www.nisra.gov.uk/aboutus/default.asp90.htm>

Scotland - <http://www.scotland.gov.uk/Publications/2004/02/18917/33243>



important to emphasise that datazones would be *analytical* or *statistical* boundaries not political or administrative boundaries, generated solely to ensure equity and consistency in the geographical measurement of deprivation. Future work should therefore involve creating the SAIMDC at datazone level, first of all using the 2001 Census, and then using administrative data where possible.

The PIMD has been used by a number of organisations for spatial targeting. These include the African Peer Review Mechanism, the Department of Education in relation to its free education policy, the Department of Water Affairs and Forestry as an input for its planning, and the Department of Social Development as a tool for informing the Expanded Public Works Programme by examining existing rollout of the programme and identifying other neglected areas, and for targeting areas to improve take up of social grants. The indices have also been used as a planning tool at the municipal level. It is hoped that the SAIMDC will be used in similar ways, although with more of a focus on children. The larger geographical scale of the SAIMDC perhaps renders it less useful than the PIMD for very specific targeting, but the improvements suggested above should turn the SAIMDC into an even more useful tool for informing local level policy and intervention for children in South Africa.

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