The Individual Deprivation Measure South Africa Country Study Briefing Note No. 6

Overview of the South African Country Study and revised data analysis methods

HELEN SUICH, TRANG PHAM AND JANET HUNT

The Individual Deprivation Measure (IDM) is a gender-sensitive, individual measure of multidimensional poverty, which is assessed across 14 dimensions[1], making it possible to see who is poor, in what ways and to what extent.

The IDM has been under development since 2009. The aim of the first phase (2009–2013) was to formulate a just and justifiable measure of poverty, the design of which reflects and is grounded in the experiences and priorities of poor men and women, and which measures things that are known to be important to gender equity. A second phase of research commenced in 2016 to improve the pilot measure and test it in different contexts.[2]

The IDM South Africa Country Study was undertaken in 2019, and was one of two ANU-led country studies designed to test the revised measure during this phase of the research.

This Briefing Note acts as a companion to the others in this series. It gives an overview of the South African Country Study, summarises the 14 dimensions measured and reported, and briefly describes the scoring and aggregation procedures used in constructing the themes and dimensions, highlighting the changes made since the initial analysis (Suich et al. 2020c) was undertaken. The method of construction of the IDM Index Score is also described. Full details of the revised scoring and aggregation procedures are described in Suich et al. (2020b).

Briefing Notes 1 to 5 present, for the first time, the overall IDM Index Score for South Africa—the composite index constructed across the 14 dimensions measured—and the results of the data analyses based on these revised methods. They present the results for the overall sample (No. 1), and for comparisons based on gender (No. 2), age (No. 3), disability status (No. 4) and rural/urban locality (No. 5).

1   THE IDM SOUTH AFRICA COUNTRY STUDY

The South Africa Country Study was designed to have two samples—a national-level main sample, and a geographically restricted purposive sample of people with disabilities (and their adult household members), which was conducted in the provinces of Gauteng and Limpopo. The data for both samples was collected in 2019 by ikapadata. In both samples, the same dwelling, household and individual surveys were used for all respondents, and were undertaken in the preferred language of the respondent, who could choose any of the 11 official languages of South Africa.

1.1   The national-level main sample

The first stage of creating the sampling frame for the national-level study was to randomly select enumeration areas (EAs) across all nine provinces of the country, stratified by rural/urban locality and provincial population size (with a minimum provincial sample size of 800 individuals). Satellite imagery of the sampled EAs was then used to remote sense roofs, and the GPS point of each was listed to create the sampling frame of dwellings. The GPS points were randomly ordered and sequentially numbered, and the fieldwork teams followed the sequence of randomly selected dwellings until they had completed a minimum of 24 individual interviews in each EA (to achieve the predetermined provincial-level sample size). Final sample sizes by province are shown in Table 1.

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[1] The research team collected data on an additional dimension—violence—but due to lack of comparability between the types of violence experienced by men and women it is not reported.
[2] The early development process is described in Wisor et al. (2014), and its more recent development and refinement in Hunt et al. (2017) and with particular reference to South Africa in Suich et al. (2020c).

In each sampled dwelling, fieldworkers attempted to interview each eligible individual in each household living in that dwelling. Eligible individuals for the main sample were all dwelling residents aged 16 and older, who were able to communicate for themselves and who were competent to give informed and ongoing consent during the interview.

Table 1 Summary of the main sample, by province

PROVINCE	EAs	DWELLINGS	HOUSEHOLDS	INDIVIDUALS
Eastern Cape	34	346	370	872
Free State	34	468	511	869
Gauteng	54	500	557	1,438
KwaZulu Natal	42	345	374	1,107
Limpopo	34	342	342	846
Mpumalanga	34	365	395	867
North West	34	440	471	843
Northern Cape	34	385	388	866
Western Cape	34	326	403	944
Total	334	3,517	3,811	8,652

Source: Suich et al. (2020c).

1.2 Demographic characteristics

The average household size for the main sample was 5.2 people, with a median of 5, and a range of 1–29 individuals, and basic demographic characteristics of the sample are show in Table 2.

Table 2 Basic demographic characteristics, South African main sample

	MALE (%)	FEMALE (%)
AGE		
16–24	28.3	21.2
25–64	62.6	66.0
65$^+$	9.1	12.7
LANGUAGE SPOKEN MOST COMMONLY AT HOME		
Afrikaans	11.9	12.1
English	8.6	7.1
isiNdebele	1.0	1.2
isiXhosa	13.0	14.0
isiZulu	23.1	19.1
Sepedi	8.6	8.9
Sesotho	10.1	12.3
Setswana	13.6	14.2
SiSwati	2.4	3.5
TshiVenda	2.6	2.6
Xitsonga	4.3	4.1
Other	0.8	1.0

	MALE (%)	FEMALE (%)
RACE GROUP		
Black African	83.8	84.0
Coloured	12.9	13.0
Indian or Asian	1.2	1.0
White	2.2	2.0
DISABILITY STATUS (RELAXED CRITERIA)[3]		
With disabilities	26.5	42.3
Without disabilities	73.5	57.7
Total respondents	3,738	4,914

1.3   The purposive sample of people with disabilities

As part of the purposive sample, 826 individuals with disabilities were identified. They and other adult individuals in their households were interviewed, achieving a final sample size of 2,311 individuals. Eligible individuals for the purposive sample were all members of the purposively identified individual's household, aged 18 and older, who were able to communicate for themselves and were competent to give informed and ongoing consent during the interview.

The results of the initial analysis for this sample are presented in Suich et al. (2020c). Unfortunately, time constraints between the production of that report and the end of the current IDM program have meant that the results for this sample could not be revised and reported in this series of briefing notes. A great deal of further work is possible with this data, but the capacity to do additional analyses will depend on future funding.

2   THE DIMENSIONS OF THE IDM[4]

1 FOOD

The food dimension is measured using the Food and Agriculture Organisation's Food Insecurity Experience Scale. The questions ask about an individual's experience of compromising the quality and/or quantity of food eaten in the 30 days prior to the survey, due to a lack of financial or other resources.

2 WATER

The first two themes of this dimension measure access to sufficient quantity and quality of drinking water and domestic water (i.e. for purposes such as washing, bathing and cooking). The third theme assesses whether individuals responsible for collecting water from outside the dwelling face threats or hazards while doing so.

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[3] An individual is categorised here as with disabilities if they reported having 'some' or 'a lot of' difficulty in one of the six domains assessed in the Washington Group Short Set, or if they are unable to function at all in at least one of these domains (WGDS ud).
[4] These summaries are taken from the Executive Summary in Suich et al. (2020c). Full descriptions can be found in Section 3 of the same report.

3 SHELTER

The shelter dimension has three themes covering a wider range of topics than many standard assessments. These themes are: habitability of the dwelling (its construction materials, condition and crowding); ownership of essential household items (cooking utensils, tableware, bedding, and water storage vessels for those who require the latter); and security of tenure (eviction concern and rent or mortgage stress).

4 HEALTH

The health dimension has two themes: health status (physical health status and psycho-social health status, i.e. anxiety and depression); and health care access and quality, which assesses the quality of general health care and (where relevant) prenatal health care.

5 EDUCATION

The IDM assesses two themes in the education dimension: education level; and functional literacy and numeracy.

6 ENERGY/FUEL

The first three themes of the energy dimension determine the energy source for cooking, lighting and heating, and the reliability of supply for each of those sources. The fourth theme assesses whether individuals responsible for collecting energy from outside the dwelling face threats or hazards while doing so.

7 SANITATION

The sanitation dimension has three themes: toilet facilities (type of toilet facility—if any—and whether it is private, shared or public); washing facilities (access to handwashing facilities and to toiletries); and a place to change in privacy during menstruation.

8 RELATIONSHIPS

This social dimension has two themes: dependence and support; and participation in community events. The first theme determines whether respondents are dependent on people not living with them to help provide basic needs (because they could not provide these for themselves), how often they have enough of this support, and whether they are able to reciprocate (if requested). The second theme includes overall participation in community events and participation during menstruation. The latter assesses whether a menstruating woman missed any social activities, school or work because of a lack of sanitary products, or missed any events because of the stigma associated with menstruation.

9 CLOTHING

This dimension determines the level of deprivation in clothing and footwear using three themes: basic clothing and footwear; other clothing and footwear; and sanitary product use. The first theme has two indicators—basic clothing and footwear ownership and social acceptability and protection (e.g. from weather conditions). The second theme assesses other types of clothing and footwear—whether the respondent has enough clothing and footwear to wear to school or work (if necessary), whether it is socially acceptable and provides protection, and whether the respondent has enough formal clothing to meet their needs and whether this formal clothing is socially acceptable. The third theme, relevant only to menstruating women, is whether a woman has sufficient sanitary products to use during menstruation.

11 FAMILY PLANNING

This dimension consists of a single theme and single indicator: the unmet need for contraception of men and women. This assesses whether respondents want to use contraception to delay or avoid having children, and if so, whether they or their partner have access to modern contraceptive methods, are reliant on less effective traditional methods, or

12 ENVIRONMENT

The environment dimension consists of three themes: exposure to environmental problems; natural resource utilisation; and safe environment. This first theme assesses exposure to eight different types of problems (e.g. whether people live close to hazardous waste or waste disposal sites, or whether they are exposed to air, water or noise pollution). The second theme—natural resource utilisation—assesses whether users of wild resources and biomass fuel have enough to meet their needs. The third theme deals with the perceived safety of the respondent's living environment, while walking alone in their neighbourhood and while at

13 VOICE

The voice dimension consists of two themes: voice in the public domain; and personal control over decision-making. Voice in the public domain includes indicators relating to voting, participation in local decision-making and perception of raising concerns (locally). Personal control over decision-making assesses whether the respondent is prevented, by people living in the same dwelling, from doing certain activities (e.g. seeking work, education or training, or socialising).

14 TIME-USE

Time use is measured in one theme and one indicator: time burden, which measures both time burden and on-call time. Time burden includes time spent on work for pay, profit and production, unpaid and domestic care work, and other obligatory time commitments. It excludes time spent on leisure and social activities, personal care, resting and sleeping. On-call time is the proportion of the time burden that the individual is also responsible for the care of a child (under 13 years) and/or someone who is sick, disabled and/or elderly.

15 WORK

The work dimension covers topics that go beyond what many will typically associate with the title of the dimension, which have been included to improve understanding of the different types of work undertaken within and outside the home, and results are presented for the whole sample, not just for working age respondents. This dimension has three themes that address: work for pay, profit or own production (i.e. it generates income, food or other goods or services); unpaid domestic and care work; and the double labour burden. The separation of unpaid work from paid and subsistence activities and the consideration of the double labour burden are particularly important to gender sensitivity.

10 VIOLENCE

The individual survey asked questions about whether respondents had experienced violence in the 12 months prior to the survey. Discussion with gender violence experts in South Africa led to the decision not to construct or report a dimension score for violence, because it is not clear whether the same thing is being measured for men and women (for details, see Section 3.10 in Suich et al. 2020c).

3   THE MEASURE

The measure is based on data collected from the individual and household survey tools. Questions from these survey tools (the variables) are used, singly or in combination, to construct indicators. Indicators are aggregated to the theme level—with each theme measuring a single concept within the relevant dimension. Each dimension is then constructed by aggregating its constituent themes, as illustrated schematically in Figure 1. The IDM Index Score is then constructed by aggregating the 14 constituent dimensions.

Figure 1 Schematic dimension construction, Individual Deprivation Measure
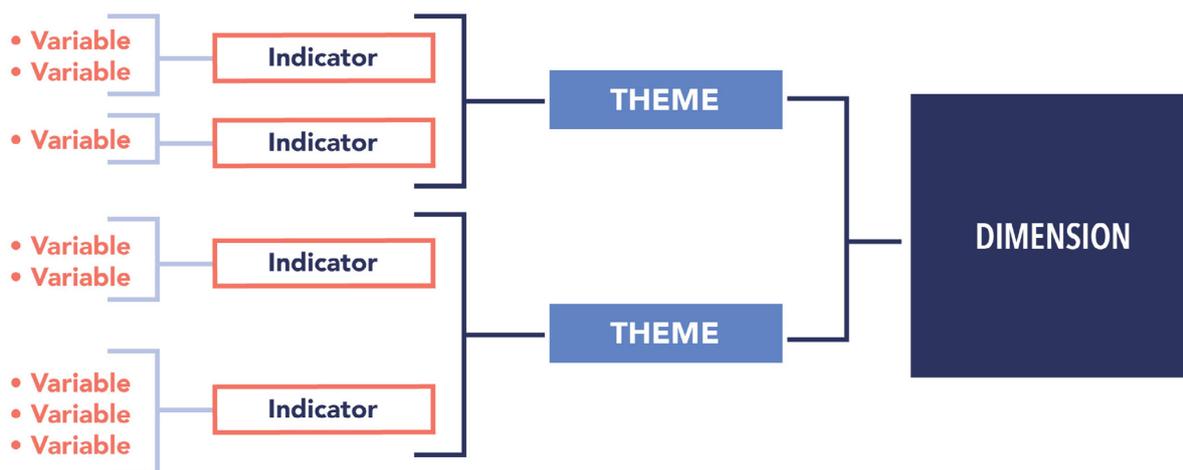
In the initial construction of the dimension-level results, equal weight arithmetic aggregation was used at the indicator to theme level, and the theme to dimension level, where there were two or more indicators or themes to be aggregated. This method was chosen as the initial approach to dimension construction because it is one of the more common methods used (OECD 2008). For the South Africa data, 53 indicators are used to construct 33 themes, which are used to construct the 14 dimensions. Many of these indicators are rarely, if ever, included in other poverty analyses, and the variables and indicators are often combined in novel ways. Thus, even where variable-level data is similar to that from other sources, the results presented may differ in important ways from other poverty assessments in South Africa.

The results presented at the indicator, theme and dimension level are grouped according to the depth of deprivation. These results are presented using four categories of deprivation—least deprived, somewhat deprived, deprived and most deprived. The scores for each dimension are normalised (i.e. put onto a scale of 0.01 to 1.00)[5]. The scores from 0.01 to 0.25 are categorised most deprived, between 0.251 and 0.5 are categorised as deprived, between 0.501 and 0.75 are categorised as somewhat deprived, and those above 0.75 are categorised as least deprived. The meaning of each of the four deprivation categories for each indicator (or single-indicator themes and single-indicator dimensions) is described in Suich et al. (2020a). The IDM does not measure the full extent of achievement, which means that being categorised as least deprived does not mean a person is not deprived at all—in many cases, the least deprived category indicates a relatively low level of attainment, such as in the clothing and footwear dimension.

3.1   Revisions to the measure since the initial analysis

A number of revisions to the measure have been made since the initial analysis was released. They are summarised below and described in detail in Suich et al. (2020b).

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[5] The minimum possible value of the normalised score is 0.01 (rather than zero) is necessary because of the adoption of geometric aggregation to construct themes and dimensions. Geometric aggregation multiplies component scores together, and raises the result to the factor of the number of components. Thus it is sensitive to its component score having the value of zero. Thus, if a theme or dimension has a component (an indicator or theme), with a score of zero, geometric aggregation will reduce the score of the given theme or dimension to the value of zero. To avoid this high level of punishment, scores of zero (0) are replaced by scores of 0.01 to ensure the deep deprivation is measured, but other information in the aggregation is not lost.

Revisions to the variable or indicator scoring procedures

The scoring for 22 indicators has been revised, and there were three main reasons for undertaking these revisions: (i) to simplify scoring and the interpretation of deprivation categories; (ii) to ensure a clear gap in the scoring occurs between those for whom an indicator is not relevant and those for whom it is relevant, and thus ensure allocation to different deprivation categories (or a combination of i and ii); and (iii) to more fully reflect the contribution of each variable to the indicator score in the allocation to deprivation categories. One indicator has been deleted, the recognition of ownership indicator in the security of tenure theme in the shelter dimension. In South Africa, this indicator did not measure the intended concept–formal or informal recognition of the ownership of the dwelling and its contribution to greater tenure security for individuals. It is recommended that the relevant survey question used is revised and cognitively tested if it is to be used in future.

Revision of the aggregation method used

As noted above, equal weight arithmetic aggregation was used in the initial analysis of the IDM South African country study data. It is one of the most commonly used methods (OECD 2008), and has the advantages of simplicity and ease of interpretation. However, the method treats indicators and themes as if they are compensable, or substitutable. That is, if an individual has a low score for an indicator (or theme), this can be offset by a higher score in other indicators (or themes) in the aggregation process, masking the level of deprivation that individual experiences. Arguably, many of the indicators, themes (and certainly dimensions) in the IDM are not compensable, or substitutable. This generates the necessity of testing alternative aggregation approaches to theme, dimension and index construction. However, it must be recognised that any choice about aggregation methods requires trade-offs to be made between conceptual clarity, the appropriateness of the method chosen and the ease of communication of the results–there is no single 'correct' aggregation method.

Geometric aggregation allows partial (though not full) compensability–a low score in one indicator (theme or dimension) cannot be completely compensated for by a high score in another indicator (theme or dimension). The revised results presented in this series of briefing notes apply geometric aggregations at each level–from indicator to theme and from theme to dimension, where there are two or more indicators or themes to aggregate. It is also used to aggregate the 14 dimension scores, creating the overall IDM Index Score.

Scores calculated using geometric aggregation are typically lower than for an arithmetic aggregation, and the effect of this has been a reduction in the proportions categorised as least deprived across many indicators, themes and dimensions compared to those in the initial analysis–though, naturally, the underlying data and survey responses remain unchanged.

The revised aggregation method retains the min–max normalisation (based on the range of possible scores) prior to aggregation. As noted in footnote 5, the minimum value of the normalised score is taken to be 0.01 (rather than zero). This is necessary because of the adoption of geometric aggregation to construct themes, dimensions and the IDM Index Score. The geometric approach is particularly sensitive to a component score having the value of zero, because part of the calculation is to multiply component scores together. Thus, if one component (an indicator or theme) has a score of zero, the value of the theme or dimension being calculated using geometric aggregation will also be zero. To avoid this loss of information of any non-zero components, scores of zero (0) are replaced by scores of 0.01, at the lowest possible level. This ensures that the deep deprivation is measured, but other information in the aggregation is not lost. There is no basis for changing the approach of applying equal weights at each level of aggregation, so they continue to be applied, including in the aggregation of the 14 dimension scores to the IDM Index Score.[6]

The IDM Index Score

The method used to calculate the IDM Index Score is to continue to apply geometric aggregation–the (equal weight) geometric mean of the 14 dimension scores is taken and normalised. The total score is then converted it to a score out of 100, which is done for reporting purposes and for ease of communication. For the IDM Index Score (as for lower level results), a lower score indicates more severe deprivation and a higher score indicates less severe deprivation. The results for the IDM Index Score are presented using four categories, but using different cut-offs to those used at the dimension, theme and indicator levels. For the IDM Index Score, the four categories are determined using quartiles. The scores of all individuals in the main sample are ranked from lowest to highest and the list is divided into four equal groupings (i.e. 25% of the whole main sample fits in to each of the four categories). These cut offs will vary with each dataset, and so are context specific. The quartiles start from the lowest scoring quartile through to the highest scoring quartile.

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[6] Note, however, that each respondent interviewed was asked at the end of their individual interview, to rank each of the 14 dimensions, and thus individual dimension weights could be applied in the construction of the IDM Index Score (i.e. from the dimension to IDM Index Score level).

SUPPORTING DOCUMENTS

This is one of a series of six IDM South Africa Briefing Notes. They provide a summary of the overall results, comparisons by gender, age, locality and disability status, and finally, this overview of the South African Country Study and revised data analysis methods. Two further documents have been produced to support this series of briefing notes:

1. The updated index construction and dimension scoring procedures for South Africa (v2), see Suich et al. (2020b).

2. The detailed tables of updated results for each of the indicators, themes and dimensions for the South African main sample, see Suich et al. (2020a). The differences in results arising from the use of the revised methods can be observed in detail by comparing them with the original results generated from the original methods, provided in Appendix A.2 of Suich et al. (2020c).

These can all be found at: **https://www.individualdeprivationmeasure.org**

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