



**University of Pretoria**  
*Department of Economics Working Paper Series*

**Social Determinants of Health Inequalities in South Africa: A Decomposition Analysis**

Kehinde O. Omotoso

University of Pretoria

Steven F. Koch

University of Pretoria

Working Paper: 2017-16

March 2017

---

Department of Economics  
University of Pretoria  
0002, Pretoria  
South Africa  
Tel: +27 12 420 2413

# Social Determinants of Health Inequalities in South Africa : A Decomposition Analysis\*

Kehinde O. Omotoso<sup>†</sup>

Steven F. Koch<sup>‡</sup>

## Abstract

This study uses information collected on social determinants of health (SDH) and on a variety of health indicators in the 2004 and 2014 questionnaires of the South African General Household Surveys (GHSs) to explain how changes in the SDH have impacted health inequalities over the last decade, the second since the end of Apartheid. Specifically, the Oaxaca-type decomposition of change in a concentration index is used to illustrate how changes in health inequalities over time are attributable to changes in inequality in the determinants of health, and changes in their elasticities. This study finds that rising inequalities in ill-health are largely explained by widening inequalities among those residing in the urban areas and in the relatively richer provinces. Meanwhile, rising inequality in medical aid coverage and utilisation of private health care are mainly attributable to inequalities in educational attainment and racial composition. However, changing elasticities in SDH, rather than rising inequalities, are found to be important factors in explaining inequality in the utilisation of public health care.

---

\*The authors would like to thank the World Health Organization for their support. All conclusions and discussions represent the views of the author, and not necessarily the WHO.

<sup>†</sup>Department of Economics, University of Pretoria, Private Bag X20, Hatfield 0028, Republic of South Africa. [kehinde.omotoso@up.ac.za](mailto:kehinde.omotoso@up.ac.za); [jewelslife2003.ko@gmail.com](mailto:jewelslife2003.ko@gmail.com)

<sup>‡</sup>Department of Economics, University of Pretoria, Pretoria, Republic of South Africa; (0) 27-12-420-5285, (F) 27-86-691-2749. [steve.koch@up.ac.za](mailto:steve.koch@up.ac.za)

# 1 Introduction

In the last two decades since the emergence of democracy in South Africa, considerable efforts have been towards redressing some of the damaging impacts of the Apartheid legacy, which was characterised by legislated inequality. Specifically, the South African government has embarked on a variety of policies and reforms toward reversing the discriminatory practices that pervaded all aspects of life before 1994 (Mayosi and Benatar, 2014). Policy interventions have targeted reductions in socio-economic inequalities in various capacities. By extension, these policies have also applied to the health care system; abolition of user fees at the primary health care (PHC) level in 1994, fiscal redistribution targeted at health, education, social protection sectors, extension of PHC policy to all users in relatively poorer households in 1996, introduction of Government Employees Medicalaid Schemes (GEMS) in 2006, and ongoing discussions related to universal health care coverage through a yet-to-be-fully-implemented national health insurance (NHI), among others. However, evidence suggests that decades of democracy have not really changed the picture. In particular, health inequalities linked to the social determinants of health (SDH) still persist. Hence, addressing health inequality entails an appropriate understanding and tackling of the channels through which SDH impact health inequality.

In South Africa, health inequality and its determinants have received considerable attention in the literature (Alaba and Chola, 2014; Ataguba et al., 2011, 2015; Booysen, 2003; Bradshaw, 2008; Bradshaw et al., 2000; Chopra et al., 2009; Coovadia et al., 2009; Harris et al., 2011; Silal et al., 2014; Zere and McIntyre, 2003). However, reviews of South Africa's health inequality literature suggests that there are gaps in the earlier studies, as they tend to focus only on limited number of health indicators, presents an incomplete outlook of multidimensional health inequality, mostly adopt a cross sectional design, and as such do not examine a change in health inequality over time (Alaba and Chola, 2014; Ataguba et al., 2011, 2015; Zere and McIntyre, 2003). For instance, Ataguba et al. (2011) employed concentration index regression model to examine the trend of socio-economic related inequality in ill-health and disability, and demonstrated the existence of socio-economic gradients in self-reported ill-health. In similar vein, Ataguba et al. (2015) decomposed the concentration index of self-assessed health (SAH) and found social protection, education and housing to be significant factors contributing to disparities in good SAH. However, the effects of changes in the SDH on multidimensional health inequalities over time are yet to be uncovered, thus it remains an unresolved question: how has

changes in inequalities in the SDH influenced health inequalities over the last decade, the second since the end of Apartheid?

In answering the above question, we make use of existing methodological developments in the literature to extend previous analyses of Ataguba et al. (2011) and (Ataguba et al., 2015), who only considered the subject matter from cross-sectional dimensions and limited methodological perspective. The information used in our analysis was gathered from the data collected post-Apartheid. The data are sourced from the 2004 and 2014 General Household Surveys (GHSs) data. Specifically, our empirical strategy adopts concentration index regression model, and the Oaxaca-type decomposition of change in the concentration index (Oaxaca, 1973; Wagstaff et al., 2003). The concentration index was employed to uncover the relative change in health inequalities over the studied periods, linking those changes to changes in the SDH. On the other hand, the Oaxaca-type decomposition of change in the concentration index explained how changes in health inequalities over time are attributable to changes in their social determinants. The method does not only allow us to explain how changes in health inequalities are due to changes in inequality in the SDH, but also to changes in their elasticities<sup>1</sup> over time. We were able to apply this method because relevant information required for the analysis are available in the datasets. We apply the method to a variety of health indicators which include ill-health, disability, medical aid coverage, public and private health care utilisation, in order to explain health inequality from multiple variables viewpoint. The initial year marks the recommendation of the implementation of National Health Insurance in South Africa (Govender et al., 2013), while the latter marks the more recent data, therefore, the analysis allows us to correlate some post-apartheid health policies, indirectly, with either a widening or narrowing of health inequality over time.

Although the decomposition method employed in this study has been used in other related studies (see Van Doorslaer et al., 2001; Wagstaff et al., 2003), we are not aware of it being applied to health inequality in the South African context. By applying this method, other dimensions to inequality in SDH, that drive changing inequalities in health and health care over time would be unraveled. Given South Africa's history of Apartheid and the efforts made so far in reducing health inequality, the findings would be of policy relevance in reducing health inequalities and inequities.

---

<sup>1</sup>Elasticity refers to the responsiveness of a dependent variable, e.g health variable, with respect to its determinants

The results suggest that considerable rise in ill-health inequality is largely attributable to rising inequalities among the white population group, those residing in the urban areas and in the relatively richer provinces. Meanwhile, widening inequalities among those within 18-45 years, those residing in the Eastern cape province and in social grant receipts matter more than changing elasticities in explaining rising disability inequality overtime. Changing elasticities, rather than rising inequalities, dominate as they appear to be important factors in explaining widening inequality in the utilisation of public health care. On the over all, taking the changes of all the determinants of the health variables into account, the bulk of the rise in inequalities in the utilisation of private health care is attributable to rising inequalities in its social determinants, while sizeable widening of inequalities in ill-health, medical aid coverage, disability and utilisation of public health care are attributable to changing elasticities with respect to the social determinants.

## **2 Methodology**

### **2.1 Data source**

Data used in this analysis was sourced from two waves of South African General Household Surveys (GHSs); one from 2004 and another from 2014. Although GHS data exist for 2002 and 2003, the 2004 survey is chosen because the structure of questions on the variables relevant to our analysis began being consistent from that year, while the 2014 data is a more recent data; in addition, the health data pertinent to our analysis were missing in the 2002 and 2003 surveys. The GHSs are repeated cross-sectional household surveys collected annually by the national statistical agency, Statistics South Africa (StatsSA), with new samples drawn each year. Each year, the sample includes approximately 30,000 households, and that sample follows a multi-stage stratified design, such that, each sample is representative at both the national and provincial levels within any year. The surveys collect a range of demographic and socio-economic information on households and individuals across the country's nine provinces. Survey questions relate to housing services, social services, socio-demographic information, labour markets, health and health care information, and household tourism activities. Population weights are available in the surveys for both households and individuals. To account for the different survey designs among the datasets used in this paper, we use the adjusted survey weights provided by StatsSA.

## 2.2 Variables definition and measurement

Health data include a short series of questions covering illnesses or injuries during the past 30 days prior to the survey, categories of disease/illness, dysfunctional disability lasting six months or more, categories of disabilities, whether an individual had access to a medical aid coverage and the type of health care facility (public or private) where care was sought in the event of illness, amongst others. To get a holistic outlook of multidimensional health inequality, information that are related to health and health care in the two surveys are considered in our analysis. These health information were categorised as measures of health outcome, health insurance coverage, and utilisation of health care, which constitute our dependent variables. Health outcome is measured by ill-health and disability. Ill-health status is based on whether or not the respondent suffered from any illness or injury during the past month. Illness was further investigated by asking those who reported to have suffered from an illness to specify what type of illness or disease they suffered; they were able to select from a set of binary-coded categories of diseases. In the same vein, disability was measured by asking the respondent whether he/she is limited in his/her daily activities, at home, at work or at school, because of a long-term physical, sensory, hearing, intellectual, or psychological condition, lasting six months or more?. To further confirm the extent of the disability, respondents were requested to list the difficulties by answering a series of binary – yes/no – questions related to the difficulties encountered that have lasted for at least 6 months.

Health insurance coverage was measured by asking respondents whether they were currently covered by a medical aid or benefit scheme or other private health insurance at the time of the survey. Those who answered in the affirmative are classified as medically insured, while those who responded in the negative were categorized as uninsured. Meanwhile, the utilisation of health care was measured by asking respondents if they sought treatment or consulted a health worker, e.g., a nurse, doctor or traditional healer, as a result of the illness. If treatment was sought, further probing occurred, as respondents were asked where the consultation took place; whether in private or public health facilities. Since this line of questioning was not consistent across the surveys, a different indicator of health care facility is examined, instead. Specifically, respondents (from 2004 - 2014 surveys) were asked if they get ill and decide to seek medical help, which health facility (public or private) do they usually go first?. Therefore, the analysis focuses on these preferences, given that this latter query was available for both years under consideration.

In capturing the independent variables which are the social determinants of health, our analysis focuses attention on WHO identified domains that influence pro-equity progress towards universal health care and health equality. Some of the domains include income and poverty, knowledge and education, housing and infrastructure, social protection, gender norms, discrimination amongst other, and other individual/household factors (Ataguba et al., 2015). Information collected in the GHS that is in line with the WHO identified domains on SDH, consistent in both surveys, and, therefore used in our analysis includes: employment status; social grant recipient status; highest level of education completed (no schooling, less than diploma, diploma/certificate, university degree, and postgraduate degree); province and urban/rural setting; age; gender; race (African Black, Coloured, Asian/Indian and White) and marital status (married, widow/widower, divorced/separated and single).

Even though the GHS data has some limitations, in that it does not contain explicit information on self assessed health, quality of health care and household income. There is however information on ill-health/injury which has been found to be an important predictor of morbidity or mortality. Moreover, the data include information on the ownership of household assets and services. We use the information to construct a wealth index which serves as a proxy for our measure of socio-economic status. A wealth index was constructed in each of the survey years using the method of factor analysis (FA)<sup>2</sup> on some set of twelve variables; type of residential dwelling, number of sleeping rooms in the house, ownership of own house, type of toilet in the house, source of drinking water, presence of electricity, land line, cellular phone, television set, radio, refrigerator and car. Thus, this limits us to wealth-related questions that were considered in both surveys.

### 3 Empirical Strategy

#### 3.1 Estimating a concentration index

As suggested earlier, the methodology adopts concentration index ( $CI$ ) and decomposition of change in the concentration index. The concentration index is employed because evidence has shown that  $CI$  presents an accurate picture of socioeconomic inequalities in health, and has been used in a number of related studies (Erreygers, 2009; Kakwani et al., 1997; Mackenbach and Kunst, 1997; Mackenbach et al., 2008; O’Donnell et al., 2008; Solmi et al., 2015; Wagstaff

---

<sup>2</sup>Factor analysis (FA) is a multivariate statistical technique used to reduce the number of variables in a data set into a smaller number of ‘dimensions’ (see Vyas and Kumaranayake, 2006; Wittenberg and Leibbrandt, 2015).

et al., 1991).

For empirical estimation, the concentration index is defined as twice the covariance between a health variable e.g ill-health ( $H$ ) and the ranking of the socio-economic status ( $S$ ) divided by the mean of the health variable,  $\mu$  (Kakwani et al., 1997; Wagstaff, 2005; Wagstaff et al., 1991):

$$CI = \frac{2}{\mu} cov(H_j, S_j) \quad (1)$$

It can also be written as :

$$CI = \frac{2}{n\mu} \left[ \sum_{j=1}^n H_j S_j \right] - 1 \quad (2)$$

Where  $\mu$  is the mean of  $H$ ;  $S_i$  is the fractional rank of the  $j$ th individual in the social economic groupings;  $CI$  is the concentration index which is the measure of the relative inequality, such as doubling the health variable leaves  $CI$  unchanged.  $CI$  takes a value of zero when a health variable takes the same value among the individuals irrespective of their socio-economic status;  $CI$  is negative when a health variable is more concentrated among the poor than the better-off, and vice versa.

For ease of computation and generation of standard errors from which statistical inferences can be made, the  $CI$  is expressed in terms of “convenient regression” specified as:

$$2\sigma_s^2 \left( \frac{H_j}{\mu} \right) = \alpha + \beta S_j + \sum_j \beta_j X_{ji} + \epsilon_j \quad (3)$$

Where  $\alpha$  is the intercept;  $\beta$  is the  $CI$ ;  $\beta_j$  are the parameter vectors of the determinants  $X_j$ ; and  $v_i$  is the error term.

### 3.2 Decomposing a change in concentration index

Wagstaff et al. (2003) showed that the concentration index of a health variable can be decomposed into the contributions of individual factors to its inequality, in which each contribution is the product of the sensitivity of the health variable with respect to that factor and the degree of inequality in that factor.

Given a linear relationship between a health variable of interest,  $H$ , and the contributions of the  $j$  determinants,  $X_j$ :

$$H_i = \alpha + \sum_j \beta_j X_{ji} + v_i \quad (4)$$

Where  $\beta_j$  are coefficients and  $v_i$  is an error term. By substituting from Eqn. 4 into Eqn. 2, the overall concentration index ( $CI$ ) can be rewritten as a linear combination of the concentration indices of the determinants, plus an error term, as expressed :

$$C = \sum_j \left( \frac{\beta_j \bar{X}_j}{\mu} \right) C_j + \frac{GC_v}{\mu} \quad (5)$$

Where  $\mu$  is the mean of health variable,  $H$ ;  $\bar{X}_j$  is the mean of each  $j$  determinant;  $C_j$  is the concentration index for the  $j$ th determinant calculated using Eqn. 2 by replacing the health variable ( $H_i$ ) with the determinant ( $X_j$ ) (defined analogously to  $C$ ); and  $GC_v$  is the generalised concentration index for the error term ( $v$ ). Eqn. 5 shows that  $C$  is made up of two components. The first is the explained component which is equal to a weighted sum of the concentration indices of the  $j$  regressors, where the weight for  $X_j$  is simply the elasticity of  $H$  with respect to  $X_j$  ( $\eta_j = \beta_j \frac{\bar{X}_j}{\mu}$ ). The second is the unexplained component, captured by the last term; it shows the inequality in health that can not be explained by systematic variation across income groups in the  $X_j$ .

As opposed to the cross-sectional decomposition stated above, Wagstaff et al. (2003) further proposed decomposing health inequalities over time, i.e unraveling causes of changes in health inequalities over time, by applying the Oaxaca-type decomposition (Oaxaca, 1973). The Oaxaca-type decomposition (Oaxaca, 1973) allow one to estimate how far changes in inequality in a health variable is attributable to changes in inequality in its determinants or elasticities. Applying Oaxaca-type decomposition method to Eqn. 5 gives the following:

$$\Delta C = \sum_j \eta_{jt} (C_{jt} - C_{jt-1}) + \sum_j C_{jt-1} (\eta_{jt} - \eta_{jt-1}) + \Delta \left( \frac{GC_{vt}}{\mu_t} \right) \quad (6)$$

Where  $t$  refers to time period and  $\Delta$  denotes first differences. In Eqn. 6, we weight the difference in concentration indices by the second period elasticity and weight the difference in elasticities by the first period concentration index. An alternative to Eqn. 6 would be to weight the difference in concentration indices by the first period elasticity and weight the difference in elasticities by the second period concentration index as expressed in Eqn. 7:

$$\Delta C = \sum_j \eta_{jt-1} (C_{jt} - C_{jt-1}) + \sum_j C_j (\eta_{jt} - \eta_{jt-1}) + \Delta \left( \frac{GC_{vt}}{\mu_t} \right) \quad (7)$$

As indicated earlier, this decomposition allows one to decompose change in SES-related

inequality in a health variable into changes in inequality in its determinants, on one hand, and changes in the elasticities of the health variable with respect to these determinants, on the other hand. Our empirical estimation follows this approach in explaining changes in SES-related inequalities in multidimensional health over time. Estimations were based on linear probability models (LPMs), which are appropriately weighted to the population and robust to heteroskedasticity. LPMs were employed due to the binary nature of the dependent health variables of interest.

Although a decomposition of change in a concentration index can be done using either panel or cross-section data, the latter are used in our analysis. Some of the key assumptions underlying the utilisation of decomposition of change in a concentration index is that there must be a measure of socio-economic status, and population must be observed at least in two different points in time. In our analysis, the measure of socio-economic status is wealth index while we apply the method using two different time periods; 2004 and 2014. Data were analysed using Stata 14 (StataCorp, 2015).

## 4 Results

### 4.1 Data summary

Table 1 presents the data summaries, differentiated by survey year. Compared with 2004 survey, the 2014 surveys contained fewer individuals within the age bracket 6-30 years, females, single individuals, widowed, divorced, coloured and white but more African/blacks, married, and individuals above 30 years of age. Notably, the 2014 survey had more educated individuals with less than diploma certificates, diploma certificates and honours degree; with fewer people having no formal education. In 2014, the data is less rural and fewer individuals are living in Eastern Cape, Northern Cape, Free State, KwazuluNatal, and Limpopo, while more individuals are living in the relatively richer provinces of Western Cape and Gauteng. Moreover, more individuals in 2014 are beneficiaries of social grants, while unemployed individuals are fewer in 2004 than in 2014. There are however exactly the same individuals who are Indians, who hold postgraduate degree, live in Northwest and Mpumalanga in 2004 and 2014 surveys.

Table 1: Descriptive statistics of the dependent and independent variables, GHS 2004 and 2014

Variable	2004		2014	
6 - 17 yrs	0.257	(0.002)	0.227	(0.002)
18 - 30 yrs	0.249	(0.002)	0.242	(0.002)
31 - 45 yrs	0.194	(0.002)	0.215	(0.002)
46 - 64 yrs	0.127	(0.001)	0.146	(0.001)
65 yrs +	0.043	(0.001)	0.053	(0.001)
Male	0.483	(0.002)	0.488	(0.002)
Female	0.517	(0.002)	0.512	(0.002)
African/Black	0.783	(0.002)	0.800	(0.002)
Coloured	0.091	(0.001)	0.090	(0.001)
Indian	0.025	(0.001)	0.025	(0.001)
White	0.101	(0.001)	0.085	(0.001)
Married	0.272	(0.002)	0.276	(0.002)
Widowed	0.047	(0.001)	0.046	(0.001)
Divorced	0.021	(0.001)	0.017	(0.001)
Single	0.661	(0.002)	0.660	(0.002)
No schooling	0.195	(0.002)	0.149	(0.001)
Less than diploma	0.740	(0.002)	0.746	(0.002)
Diploma/certificate	0.036	(0.001)	0.041	(0.001)
Honours degree	0.020	(0.001)	0.035	(0.001)
Postgraduate	0.004	(0.000)	0.004	(0.000)
Unemployed	0.692	(0.002)	0.694	(0.002)
Rural	0.437	(0.002)	0.362	(0.002)
Western Cape	0.107	(0.001)	0.114	(0.001)
Eastern Cape	0.135	(0.001)	0.124	(0.001)
Northern Cape	0.023	(0.000)	0.022	(0.000)
Free state	0.058	(0.001)	0.051	(0.001)
KwazuluNatal	0.202	(0.002)	0.197	(0.002)
Northwest	0.068	(0.001)	0.068	(0.001)
Gauteng	0.224	(0.002)	0.242	(0.002)
Mpumalanga	0.078	(0.001)	0.078	(0.001)
Limpopo	0.106	(0.001)	0.104	(0.001)
Grant recipients	0.098	(0.001)	0.290	(0.002)
Illness	0.113	(0.001)	0.097	(0.001)
Disability	0.026	(0.001)	0.031	(0.001)
Medical aid coverage	0.156	(0.002)	0.179	(0.002)
Public health facility	0.751	(0.002)	0.734	(0.002)
Private health facility	0.248	(0.002)	0.262	(0.002)
Observations	97,036		92, 445	

Robust standard errors in parentheses

However, the estimates of some of the health variables of interest are not as one would expect. When compared with 2004, the 2014 estimates of the measures of health outcome suggest an improvement as fewer individuals reported ill-health, though there is a slight increase in disability reports. More individuals have medical aid coverage in 2014 than in 2004. However, fewer individuals are more likely to utilise public health care when ill, while more individuals would prefer private health care in 2014.

## **4.2 Results of Concentration Indices for the Health Variables in 2004 and 2014**

Table 2 presents the concentration indices for the health variables in 2004 and 2014. The results shows the relative change in health inequalities over the time periods considered, linking those changes to changes in the SDH. After controlling for the social determinants, the result suggests that ill-health and utilisation of public health care are concentrated among the poor in each year and an appreciable widening in inequality between 2004 and 2014; though the results for ill-health are not significant at conventional levels. On the contrary, disability, medical aid coverage and utilisation of private health care facility are more concentrated among the better off than the poor in both years. However, the result for disability is not significant at conventional level in 2004.

In addition, we find that adults within the age group 31-45 years, those with honours degree, and those residing in Western Cape, when compared with their respective reference categories, are less likely to report ill-health in both 2004 and 2014. Moreover, the African blacks are less likely to report illness in 2014 than in 2004. Contrary to expectations, those residing in the urban areas reported illness more often in both years than those residing in the rural areas. With respect to medical aid coverage, we find that married individuals, those with honours degree, the employed, those residing in Gauteng and in the urban areas, than their reference categories, are more likely to be covered by medical aid in 2004 and 2014, while the African blacks are less likely to have medical aid coverage in both years when compared to the White population group which is the reference category. Notably, we observe that those suffering from chronic diseases are more likely to have medical aid coverage and utilise public health care in 2014. Not too surprising, we also find that social grant recipients are more likely to suffer from disability but less likely to have medical aid coverage and utilise public health care when ill.

Table 2: Concentration Indices for the Health Variables in 2004 and 2014, GHS South Africa

	Ill-health status		Medical aid coverage		Disability		Public facility		Private facility	
	2004	2014	2004	2014	2004	2014	2004	2014	2004	2014
<i>CI</i>	-0.000 (0.009)	-0.011 (0.010)	0.278 <sup>+</sup> (0.006)	0.284 <sup>+</sup> (0.005)	0.009 (0.018)	0.027* (0.014)	-0.050 <sup>+</sup> (0.001)	-0.057 <sup>+</sup> (0.002)	0.149 <sup>+</sup> (0.004)	0.157 <sup>+</sup> (0.004)
Male*31-45 yrs	-0.125 <sup>+</sup> (0.019)	-0.067 <sup>+</sup> (0.017)	-0.005 (0.012)	-0.105 <sup>+</sup> (0.009)	0.387 <sup>+</sup> (0.046)	-0.273 <sup>+</sup> (0.041)	0.004 (0.003)	0.009 <sup>+</sup> (0.002)	-0.012 (0.008)	-0.026 <sup>+</sup> (0.006)
Female*31-45 yrs	-0.108 <sup>+</sup> (0.019)	-0.033* (0.017)	0.019** (0.011)	-0.101 <sup>+</sup> (0.009)	0.198 <sup>+</sup> (0.044)	-0.311 <sup>+</sup> (0.039)	0.010 <sup>+</sup> (0.002)	0.012 <sup>+</sup> (0.002)	-0.031 <sup>+</sup> (0.007)	-0.033 <sup>+</sup> (0.006)
African/Black	0.008 (0.010)	-0.054 <sup>+</sup> (0.011)	-0.447 <sup>+</sup> (0.008)	-0.366 <sup>+</sup> (0.007)	-0.069 <sup>+</sup> (0.015)	-0.036* (0.015)	0.060 <sup>+</sup> (0.002)	0.053 <sup>+</sup> (0.002)	-0.181 <sup>+</sup> (0.005)	-0.147 <sup>+</sup> (0.004)
Married	0.011** (0.007)	0.012** (0.007)	0.057 <sup>+</sup> (0.005)	0.071 <sup>+</sup> (0.004)	-0.201 <sup>+</sup> (0.016)	-0.060 <sup>+</sup> (0.009)	-0.007 <sup>+</sup> (0.001)	-0.007 <sup>+</sup> (0.001)	0.021 <sup>+</sup> (0.003)	0.020 <sup>+</sup> (0.003)
Honours/degree	-0.020 (0.020)	-0.037* (0.018)	0.318 <sup>+</sup> (0.018)	0.300 <sup>+</sup> (0.011)	-0.417 <sup>+</sup> (0.031)	-0.396 <sup>+</sup> (0.037)	-0.022 <sup>+</sup> (0.003)	-0.029 <sup>+</sup> (0.002)	0.068 <sup>+</sup> (0.010)	0.079 <sup>+</sup> (0.007)
Employment status	-0.004 (0.005)	0.004 (0.006)	0.082 <sup>+</sup> (0.004)	0.064 <sup>+</sup> (0.003)	-0.232 <sup>+</sup> (0.010)	-0.078 <sup>+</sup> (0.008)	-0.014 <sup>+</sup> (0.001)	-0.010 <sup>+</sup> (0.001)	0.043 <sup>+</sup> (0.002)	0.028 <sup>+</sup> (0.002)
Western Cape	-0.041 <sup>+</sup> (0.010)	-0.023* (0.009)	-0.028 <sup>+</sup> (0.007)	-0.024 <sup>+</sup> (0.006)	0.082 <sup>+</sup> (0.024)	0.039* (0.017)	-0.021 <sup>+</sup> (0.001)	-0.005 <sup>+</sup> (0.002)	0.063 <sup>+</sup> (0.004)	0.017 <sup>+</sup> (0.004)
Gauteng	0.007 (0.009)	0.051 <sup>+</sup> (0.009)	0.012* (0.005)	0.009** (0.005)	0.038* (0.015)	0.014 (0.014)	-0.013 <sup>+</sup> (0.001)	-0.005 <sup>+</sup> (0.001)	0.040 <sup>+</sup> (0.004)	0.016 <sup>+</sup> (0.004)
Urban	0.012* (0.005)	0.039 <sup>+</sup> (0.005)	0.029 <sup>+</sup> (0.003)	0.000 (0.003)	-0.002 (0.010)	0.009 (0.009)	-0.002 <sup>+</sup> (0.001)	-0.006 <sup>+</sup> (0.001)	0.006 <sup>+</sup> (0.002)	0.017 <sup>+</sup> (0.002)
Grant recipients	0.088 <sup>+</sup> (0.008)	-0.008 (0.007)	-0.044 <sup>+</sup> (0.004)	-0.163 <sup>+</sup> (0.004)	0.567 <sup>+</sup> (0.028)	0.270 <sup>+</sup> (0.014)	0.008 <sup>+</sup> (0.001)	0.021 <sup>+</sup> (0.001)	-0.023 <sup>+</sup> (0.003)	-0.057 <sup>+</sup> (0.003)
Chronic ailment				0.020 <sup>+</sup> (0.004)				0.003 <sup>+</sup> (0.001)		-0.010 <sup>+</sup> (0.003)
Illness							-0.009 <sup>+</sup> (0.001)	-0.010 <sup>+</sup> (0.001)	0.027 <sup>+</sup> (0.003)	0.030 <sup>+</sup> (0.003)
Disability							0.004* (0.002)	-0.002 (0.001)	-0.011* (0.006)	0.004 (0.004)
Medical aid coverage							-0.088 <sup>+</sup> (0.001)	-0.105 <sup>+</sup> (0.001)	0.268 <sup>+</sup> (0.004)	0.294 <sup>+</sup> (0.004)
Constant	0.288 <sup>+</sup> (0.022)	0.260 <sup>+</sup> (0.021)	0.331 <sup>+</sup> (0.014)	0.370 <sup>+</sup> (0.012)	0.442 <sup>+</sup> (0.053)	0.780 <sup>+</sup> (0.050)	0.168 <sup>+</sup> (0.003)	0.173 <sup>+</sup> (0.003)	0.165 <sup>+</sup> (0.010)	0.147 <sup>+</sup> (0.007)
<i>R</i> <sup>2</sup>	0.036	0.016	0.379	0.400	0.071	0.047	0.405	0.486	0.406	0.490

Standard errors in parentheses

\*\*  $p < 0.10$ , \*  $p < 0.05$ , +  $p < 0.01$ *Note:* Number of observations for 2004 and 2014 are 96,532 and 90,153 respectively.

Moreover, young male and females, especially females in their reproductive ages are more likely to utilise public health care facility in both time periods than their older counterparts who are the references categories. In similar manner, the African Blacks, social grant recipients, those suffering from chronic diseases utilise public health care facility more often in both time periods than their reference categories. On the other hand, those who are married, educated, employed, those who reside in relatively richer provinces, urban areas and those who have

medical aid coverage are less likely to utilise public health care. As expected, the results for private health care utilisation appear to be opposite mirrors of the public health care utilisation.

### 4.3 Decomposition result

In Table A.2<sup>3</sup>, we present the Oaxaca-type decomposition result which shows the extent to which inequalities in the health indicators over time are due to changes in inequality in their social determinants and changes in their elasticities with respect to the social determinants. We observe that changes in inequalities in the determinants and changes in elasticities reinforce one another. The Oaxaca-type decomposition suggests that for ill-health, changing elasticities rather than rising inequalities account for the bulk of the rise in ill-health inequality associated with the observed changes in respect of age composition of those within 46-64 years, racial composition of the African/Blacks, single individual, those with formal education, and those residing in the Eastern Cape, Limpopo and Kwazulu-Natal provinces. Considerable rise in ill-health inequality is only attributable to rising inequalities among the white population group, those residing in the urban areas and in the Gauteng province. Also, we observe a pro-rich inequality over time in ill-health, which is in tandem with other similar studies (Ataguba et al., 2011, 2015; Zere and McIntyre, 2003).

Moreover, the result indicates that widening inequalities among those within 18-45 years, those residing in the Eastern cape province and in social grant receipts, matter more than changing elasticities in explaining rising disability inequality overtime. However, changing elasticities in respect of those within 46-64 years, racial composition of the African/Blacks, widowed, single individuals, those without formal education, those residing in Western Cape and Gauteng provinces account for a considerable rise in inequality in disability over time. We also observe that rising inequalities, as opposed to changing elasticities, in respect of those above 64 years, racial composition of the African/Blacks, and in educational attainment explain a considerable widening of inequality in medical aid coverage over time. On the other hand, changing elasticities only appear to be more important, than rising inequalities, in respect of those employed, those residing in urban areas, those residing in Western Cape and Gauteng provinces, those within 31-64 years, married individuals, racial composition of the coloured and white population groups.

---

<sup>3</sup>The decomposition results for the two time periods are reported in Table A.1.

Table 3: Oaxaca-type decomposition of change in the health variables inequalities, 2004-2016

	Ill-health status		Medical aid coverage		Disability		Public facility		Private facility	
	$\Delta C\eta$	$\Delta\eta C$	$\Delta C\eta$	$\Delta\eta C$	$\Delta C\eta$	$\Delta\eta C$	$\Delta C\eta$	$\Delta\eta C$	$\Delta C\eta$	$\Delta\eta C$
6-17 yrs	-0.001	-0.001	0.000	0.000	0.002	0.012	0.000	0.000	0.000	-0.001
18-30 yrs	0.004	0.000	0.008	0.003	-0.013	0.003	-0.002	-0.001	0.005	0.002
31-45 yrs	0.004	-0.004	0.012	-0.008	-0.023	-0.012	-0.003	0.002	0.008	-0.006
46-64 yrs	-0.002	-0.013	-0.004	-0.012	0.010	-0.031	0.001	0.003	-0.003	-0.009
65 yrs +	-0.001	-0.003	-0.002	0.000	0.015	0.005	0.000	0.000	-0.001	-0.001
African/Black	0.004	-0.040	-0.025	0.019	-0.002	-0.052	0.009	-0.014	-0.027	0.028
Coloured	0.000	0.007	-0.001	-0.007	0.000	0.001	0.000	0.001	-0.001	-0.003
White	-0.002	0.047	-0.004	-0.067	-0.001	0.025	0.001	0.011	-0.002	-0.036
Married	0.000	0.024	0.001	-0.003	0.000	0.260	0.000	0.007	0.000	-0.020
Widowed	0.001	-0.001	0.000	0.000	0.001	-0.017	0.000	0.000	0.000	0.001
Divorced	0.001	0.001	0.000	0.000	0.000	0.009	0.000	0.000	0.000	-0.001
Single	0.000	-0.023	0.000	0.005	-0.001	-0.226	0.000	-0.007	0.000	0.020
No schooling	0.001	0.005	-0.001	0.000	0.004	-0.045	0.000	0.000	0.000	0.004
Less than diploma	0.001	0.001	0.001	0.000	0.021	-0.005	0.000	0.000	0.000	0.001
Diploma certificate	0.000	-0.004	-0.006	0.000	0.006	0.028	0.002	-0.003	-0.005	0.003
Honours degree	0.000	-0.002	-0.005	0.018	0.003	0.011	0.001	-0.006	-0.003	0.013
Postgraduate degree	0.000	-0.002	-0.001	0.001	0.000	0.006	0.000	-0.001	0.000	0.001
Employed	0.000	0.001	-0.005	-0.008	0.007	0.037	0.001	0.002	-0.004	-0.007
Urban	-0.004	0.024	-0.006	-0.009	-0.002	0.012	0.003	-0.008	-0.007	0.020
Western Cape	0.001	0.007	0.001	-0.004	0.001	-0.018	0.000	0.001	0.000	-0.004
Eastern Cape	0.001	-0.016	-0.001	0.005	-0.003	0.014	0.001	0.002	-0.001	-0.006
Northern Cape	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Free State	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Kwazulu-Natal	0.001	-0.007	0.001	0.000	0.003	0.009	-0.001	0.000	0.002	-0.001
Gauteng	-0.001	0.022	0.000	-0.006	0.002	-0.024	0.000	-0.001	0.000	0.002
Mpumalanga	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.000	0.000
Limpopo	0.000	-0.003	0.000	0.002	0.002	0.005	0.000	0.001	0.000	-0.004
Grant recipient	0.001	0.009	0.018	0.039	-0.028	-0.025	-0.004	-0.010	0.012	0.026
Total	0.009	0.030	-0.021	-0.031	0.007	-0.013	0.009	-0.017	-0.027	0.025

*Note:* Number of observations for 2004 and 2014 are 96,532 and 90,153 respectively.

With respect to inequality in the utilisation of health care over time, changing elasticities in the observed SDH, rather than rising inequalities, dominate as they appear to be important factors in explaining widening inequality in the utilisation of public health care. Changing elasticities in respect of African/blacks, single individuals, those with formal education, those residing in the urban areas, those residing in the Gauteng province, and those that are in receipt of social grants account for more inequality in the utilisation of public health care over time.

By contrast, rising inequalities among the African/blacks, those in possession of diploma and honours degree and those residing in the urban areas, and those having formal education are crucial in explaining widening inequality in the utilisation of private health care over time.

On the over all, taking the changes of all the determinants of the health variables into account, the result suggest that the bulk of the rise in inequalities in the utilisation of private health care is largely attributable to rising inequalities in its social determinants, while considerable widening inequalities in ill-health, medical aid coverage, disability and utilisation of public health care are mainly attributable to changing elasticities with respect to their social determinants.

## 5 Discussion and Conclusion

Using nationally representative data from the 2004 and 2014 General Household Surveys (GHSs), this paper uncovers the relative change in multidimensional health inequalities over the second decade since the end of Apartheid in South Africa. It also provides an explanation on changes in the social determinants of health that largely account for disparities in health and health care over time. The health indicators considered in the preceding analysis include ill-health, disability, medical aid coverage, public and private health care utilisation. The concentration index regression model and the Oaxaca-type decomposition of change in the concentration index were employed to achieve the stated objectives. Specifically, the Oaxaca-type decomposition of change in a concentration index was used to explain how changes in health inequalities over time are attributable to changes in inequality in their social determinants, and changes in their elasticities.

From our empirical analysis, it was evident that there exist considerable levels of conventional social health gradients in most of the health indicators considered, which are consistent with previous similar studies (Ataguba et al., 2011, 2015; Zere and McIntyre, 2003); though, disability is found to be more concentrated among the better off than the poor. We found widening pro-rich inequalities in medical aid coverage and utilisation of private health care but a horizontal equity in the utilisation of public health care over time. Furthermore, the decomposition suggests that rising inequalities in ill-health are largely explained by widening inequalities among those residing in the urban areas and in the relatively richer provinces, while increasing inequalities in social grant receipts and among those residing in relatively poorer

provinces largely explain rising inequality in disability overtime. Meanwhile, rising inequality in medical aid coverage and utilisation of private health care are mainly attributable to inequalities in educational attainment and among the African/Blacks. However, changing elasticities in SDH, rather than rising inequalities, are found to be important factors in explaining widening inequality in the utilisation of public health care. According to the WHO, three key sectors (education, social protection, and urban development infrastructure) were highlighted as crucial for improving health outcomes and health equity. In our findings, aside the household and individual characteristics, these three key sectors were also identified as domains for further intersectoral action to reduce health inequalities in South Africa. Thus, we infer that more robust policy interventions in these key identified domain would lead to positive spill-over effects in the health domains.

In implementing national health goals such as National Health Insurance (NHI), the implication of this result is that the South African government need to improve efforts at reducing inequalities in health and health care by strengthening health promotion programmes, developing appropriate performance-based incentive structure, and greater demand of value for investment aimed at reducing incidences of chronic diseases from both the demand and supply sides of the health system. Specifically, to further reduce incidences of ill-health and chronic diseases which have been found to be a precursor of high mortality rate, there should be a proactive demand for “value for investment” in all the sectors of the economy, especially in cognate sectors such as food and beverages. As much as possible, industries which deal in products which could increase morbidity rates or trigger chronic disease should be heavily checked and, if necessary, taxed. For instance, the recent proposal to introduce sugar tax could be a great initiative in reducing incidences and burden of chronic diseases such as diabetes, high blood pressure and other chronic diseases. There is also the need to intensify health promotion and prevention programmes targeted at reducing incidences of diseases especially at the primary health care level.

Though evidence from our empirical analysis shows that there is a reduction in socio-economic inequalities in public health care utilisation, fewer individuals would likely patronise public health care as their first port of call when ill. Therefore, the government should target more efforts at increasing efficiency and quality in public health care facilities. This could be fast-tracked by putting in place appropriate performance-based incentive measures that would encourage hardwork and positive attitude among health services’ staff. Moreover, given the

ongoing national health project of moving toward the universal health care coverage system through the National Health Insurance, it is pertinent that the supply-side issues that are related to accessibility, quality of health care services, payment systems and incentive structures are well addressed, especially in the public health care system. Otherwise, the private health care facilities would be overstrained as our finding suggest that more individuals who have medical aid coverage and reported ill are more likely to utilise the private health care. Thus, complex intersectoral factors need to be addressed in an integrated and systematic manner within the health policy domain in order not to compromise the achievement of NHI which is aimed at improved health outcomes and equities.

## References

- Alaba, O. and Chola, L. (2014), ‘Socioeconomic inequalities in adult obesity prevalence in South Africa: A decomposition analysis’, *International Journal of Environmental Research and Public Health* **11**(3), 3387–3406.
- Ataguba, J. E., Akazili, J. and McIntyre, D. (2011), ‘Socioeconomic-related health inequality in South Africa: Evidence from General Household Surveys’, *International Journal for Equity in Health* **10**(48), 1–10.
- Ataguba, J. E.-O., Day, C. and McIntyre, D. (2015), ‘Explaining the role of the social determinants of health on health inequality in South Africa’, *Global Health Action* **8**.  
**URL:** <http://doi.org/10.3402/gha.v8.28865>
- Booyesen, F. (2003), ‘Urban–rural inequalities in health care delivery in South Africa’, *Development Southern Africa* **20**(5), 659–673.
- Bradshaw, D. (2008), ‘Determinants of health and their trends: Primary health care: in context’, *South African Health Review* **2008**(1), 51–69.
- Bradshaw, D., Masiteng, K. and Nannan, N. (2000), ‘Health status and determinants’, *South African Health Review* **2000**(1), 89–124.
- Chopra, M., Lawn, J. E., Sanders, D., Barron, P., Karim, S. S. A., Bradshaw, D., Jewkes, R., Karim, Q. A., Flisher, A. J., Mayosi, B. M. et al. (2009), ‘Achieving the health Millennium Development Goals for South Africa: Challenges and priorities’, *The Lancet* **374**(9694), 1023–1031.
- Coovadia, H., Jewkes, R., Barron, P., Sanders, D. and McIntyre, D. (2009), ‘The health and health system of South Africa: Historical roots of current public health challenges’, *The Lancet* **374**(9692), 817–834.
- Erreygers, G. (2009), ‘Correcting the concentration index’, *Journal of Health Economics* **28**(2), 504–515.
- Govender, V., Chersich, M. F., Harris, B., Alaba, O., Ataguba, J. E., Nxumalo, N. and Goudge, J. (2013), ‘Moving towards universal coverage in South Africa? Lessons from a voluntary

government insurance scheme’, *Global Health Action* **6**, 109–118.

**URL:** <http://hdl.handle.net/1854/LU-3162700>

Harris, B., Goudge, J., Ataguba, J. E., McIntyre, D., Nxumalo, N., Jikwana, S. and Chersich, M. (2011), ‘Inequities in access to health care in South Africa’, *Journal of Public Health Policy* **32**(1), 102–123.

Kakwani, N., Wagstaff, A. and Van Doorslaer, E. (1997), ‘Socioeconomic inequalities in health: Measurement, computation, and statistical inference’, *Journal of Econometrics* **77**(1), 87–103.

Mackenbach, J. P. and Kunst, A. E. (1997), ‘Measuring the magnitude of socio-economic inequalities in health: An overview of available measures illustrated with two examples from Europe’, *Social Science & Medicine* **44**(6), 757–771.

Mackenbach, J. P., Stirbu, I., Roskam, A.-J. R., Schaap, M. M., Menvielle, G., Leinsalu, M. and Kunst, A. E. (2008), ‘Socioeconomic inequalities in health in 22 European countries’, *New England Journal of Medicine* **358**(23), 2468–2481.

Mayosi, B. M. and Benatar, S. R. (2014), ‘Health and health care in South Africa—20 years after mandela’, *New England Journal of Medicine* **371**(14), 1344–1353.

Oaxaca, R. (1973), ‘Male-female wage differentials in urban labor markets’, *International Economic Review* **14**(3), 693–709.

O’Donnell, O. A., Wagstaff, A. et al. (2008), *Analyzing health equity using household survey data: A guide to techniques and their implementation*, World Bank Publications.

Silal, S. P., Penn-Kekana, L., Bärnighausen, T. and Schneider, H. (2014), ‘Local level inequalities in the use of hospital-based maternal delivery in rural South Africa’, *Globalization and Health* **1**(10), 1–7.

Solmi, F., Von Wagner, C., Kobayashi, L. C., Raine, R., Wardle, J. and Morris, S. (2015), ‘Decomposing socio-economic inequality in colorectal cancer screening uptake in England’, *Social Science & Medicine* **134**(7), 76–86.

StataCorp (2015), ‘Stata statistical software: Release 14’, College Station, TX StataCorp LP.

- Van Doorslaer, E., Watanabe, N. and Wagstaff, A. (2001), On decomposing the causes of health sector inequalities with an application to malnutrition inequalities in Vietnam, Technical report, World Bank, Washington, DC.
- Vyas, S. and Kumaranayake, L. (2006), ‘Constructing socio-economic status indices: How to use principal components analysis’, *Health Policy and Planning* **21**(6), 459–468.
- Wagstaff, A. (2005), ‘The bounds of the concentration index when the variable of interest is binary, with an application to immunization inequality’, *Health Economics* **14**(4), 429–432.
- Wagstaff, A., Paci, P. and Van Doorslaer, E. (1991), ‘On the measurement of inequalities in health’, *Social Science & Medicine* **33**(5), 545–557.
- Wagstaff, A., Van Doorslaer, E. and Watanabe, N. (2003), ‘On decomposing the causes of health sector inequalities with an application to malnutrition inequalities in Vietnam’, *Journal of Econometrics* **112**(1), 207–223.
- Wittenberg, M. and Leibbrandt, M. (2015), ‘Measuring inequality by asset indices: A general approach with application to South Africa’, Southern Africa Labour and Development Research Unit, University of Cape Town.
- Zere, E. and McIntyre, D. (2003), ‘Inequities in under-five child malnutrition in South Africa’, *International Journal for Equity in Health* **2**(7), 1–10.

## Appendix A Appendix

Table A.1: Inequality decompositions for 2004 and 2014: Contributions to the Concentration Indices

	Ill-health status		Medical aid coverage		Disability		Public facility		Private facility	
	2004	2014	2004	2014	2004	2014	2004	2014	2004	2014
6-17 yrs	0.007	0.005	0.001	0.001	-0.030	-0.016	0.000	0.000	0.001	0.000
18-30 yrs	0.002	0.006	0.002	0.013	-0.011	-0.021	0.000	-0.003	0.001	0.008
31-45 yrs	-0.001	0.000	-0.004	-0.001	0.036	0.001	0.001	0.000	-0.002	0.000
46-64 yrs	0.005	-0.009	-0.007	-0.024	0.081	0.061	0.002	0.006	-0.005	-0.017
65 yrs +	0.001	-0.002	-0.002	-0.003	0.009	0.030	0.000	0.001	0.000	-0.002
African/Black	0.011	-0.025	0.149	0.143	0.065	0.011	-0.049	-0.053	0.149	0.150
Coloured	0.000	0.007	-0.017	-0.026	-0.001	0.000	0.007	0.009	-0.021	-0.025
White	-0.010	0.035	0.144	0.073	-0.012	0.012	-0.022	-0.010	0.066	0.028
Married	-0.019	0.005	0.016	0.013	-0.268	-0.009	-0.009	-0.002	0.026	0.007
Widowed	0.000	0.000	0.000	0.000	0.016	0.000	0.000	0.000	-0.001	0.000
Divorced	0.000	0.001	0.000	0.000	-0.009	0.000	0.000	0.000	0.001	0.000
Single	0.020	-0.003	-0.005	0.001	0.222	-0.005	0.006	-0.001	-0.019	0.002
No schooling	-0.011	-0.006	0.003	0.003	0.024	-0.017	-0.001	-0.001	-0.002	0.002
Less than diploma	-0.001	0.001	0.000	0.001	0.008	0.025	0.000	0.000	-0.001	0.000
Diploma certificate	0.006	0.001	0.031	0.025	-0.056	-0.022	-0.005	-0.006	0.020	0.018
Honours degree	0.003	0.001	0.030	0.042	-0.044	-0.029	-0.005	-0.009	0.017	0.027
Postgraduate degree	0.001	0.000	0.006	0.006	-0.011	-0.004	-0.001	-0.001	0.003	0.004
Employed	-0.002	0.000	0.024	0.011	-0.059	-0.015	-0.006	-0.003	0.019	0.008
Urban	0.009	0.029	0.060	0.045	0.001	0.012	-0.013	-0.018	0.040	0.052
Western Cape	-0.018	-0.010	-0.008	-0.011	0.005	-0.012	0.001	0.002	-0.003	-0.006
Gauteng	-0.015	0.006	0.002	-0.004	-0.008	-0.029	0.002	0.001	-0.006	-0.004
Grant recipient	-0.007	0.002	0.003	0.060	-0.041	-0.093	-0.001	-0.015	0.003	0.042

*Note:* Number of observations for 2004 and 2014 are 96,532 and 90,153 respectively.

Table A.2: Oaxaca-type decomposition of change in the health variables inequalities, 2004-2016

	Ill-health status		Medical aid coverage		Disability		Public facility		Private facility	
	$\Delta C\eta$	<i>se</i>	$\Delta C\eta$	<i>se</i>	$\Delta C\eta$	<i>se</i>	$\Delta C\eta$	<i>se</i>	$\Delta C\eta$	<i>se</i>
6-17 yrs	-0.001	(0.008)	0.000	(0.006)	0.002	(0.007)	0.000	(0.008)	0.000	(0.008)
18-30 yrs	0.004	(0.009)	0.008	(0.007)	-0.013	(0.007)	-0.002	(0.010)	0.005	(0.009)
31-45 yrs	0.004	(0.009)	0.012	(0.008)	-0.023	(0.007)	-0.003	(0.011)	0.008	(0.010)
46-64 yrs	-0.002	(0.010)	-0.004	(0.009)	0.010	(0.008)	0.001	(0.011)	-0.003	(0.011)
65 yrs +	-0.001	(0.012)	-0.002	(0.009)	0.015	(0.009)	0.000	(0.012)	-0.001	(0.012)
African/Black	0.004	(0.015)	-0.025	(0.028)	-0.002	(0.006)	0.009	(0.032)	-0.027	(0.031)
Coloured	0.000	(0.016)	-0.001	(0.030)	0.000	(0.006)	0.000	(0.035)	-0.001	(0.035)
White	-0.002	(0.016)	-0.004	(0.030)	-0.001	(0.006)	0.001	(0.033)	-0.002	(0.003)
Married	0.000	(0.230)	0.001	(0.113)	0.000	(0.237)	0.000	(0.120)	0.000	(0.117)
Widowed	0.001	(0.230)	0.000	(0.113)	0.001	(0.237)	0.000	(0.120)	0.000	(0.118)
Divorced	0.001	(0.231)	0.000	(0.113)	0.000	(0.236)	0.000	(0.121)	0.000	(0.117)
Single	0.000	(0.230)	0.000	(0.113)	-0.001	(0.237)	0.000	(0.120)	0.000	(0.117)
No schooling	0.001	(0.018)	-0.001	(0.018)	0.004	(0.017)	0.000	(0.023)	0.000	(0.021)
Less than diploma	0.001	(0.017)	0.001	(0.017)	0.021	(0.016)	0.000	(0.023)	0.000	(0.021)
Diploma certificate	0.000	(0.019)	-0.006	(0.022)	0.006	(0.017)	0.002	(0.026)	-0.005	(0.024)
Honours degree	0.000	(0.020)	-0.005	(0.024)	0.003	(0.017)	0.001	(0.028)	-0.003	(0.026)
Postgraduate degree	0.000	(0.038)	-0.001	(0.042)	0.000	(0.018)	0.000	(0.040)	0.000	(0.038)
Employed	0.000	(0.004)	-0.005	(0.005)	0.007	(0.002)	0.001	(0.006)	-0.004	(0.006)
Urban	-0.004	(0.005)	-0.006	(0.006)	-0.002	(0.002)	0.003	(0.009)	-0.007	(0.009)
Western Cape	0.001	(0.010)	0.001	(0.014)	0.001	(0.005)	0.000	(0.020)	0.000	(0.020)
Eastern Cape	0.001	(0.009)	-0.001	(0.009)	-0.003	(0.004)	0.001	(0.015)	-0.001	(0.015)
Northern Cape	0.000	(0.012)	0.000	(0.014)	0.000	(0.006)	0.000	(0.021)	0.000	(0.021)
Free State	0.000	(0.011)	0.000	(0.012)	0.000	(0.005)	0.000	(0.019)	0.000	(0.018)
Kwazulu-Natal	0.001	(0.008)	0.001	(0.009)	0.003	(0.004)	-0.001	(0.015)	0.002	(0.015)
Gauteng	-0.001	(0.010)	0.000	(0.011)	0.002	(0.004)	0.000	(0.017)	0.000	(0.017)
Mpumalanga	0.000	(0.010)	0.000	(0.011)	0.001	(0.004)	0.000	(0.017)	0.000	(0.018)
Limpopo	0.000	(0.010)	0.000	(0.009)	0.002	(0.004)	0.000	(0.015)	0.000	(0.015)
Grant recipient	0.001	(0.006)	0.018	(0.005)	-0.028	(0.004)	-0.004	(0.007)	0.012	(0.007)

*Note:* Number of observations for 2004 and 2014 are 96,532 and 90,153 respectively.

<sup>a</sup> Bootstrapped SEs using 1000 resamples are reported in parenthesis