University of Pretoria
Department of Economics Working Paper Series

Gender Differentials in Health: A Differences-in-Decompositions Estimate

Kehinde O. Omotoso
University of Pretoria
Steven F. Koch
University of Pretoria
Working Paper: 2017-17
March 2017

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

Gender Differentials in Health: A Differences-in-Decompositions Estimate

Kehinde Omotoso* Steven F. Koch†

Abstract

We analyse changes in gendered health differentials between 2005 and 2014, using data from population-weighted General Household Surveys (GHS) in South Africa. We also assess the contribution of observed characteristics in explaining those differentials. We find that the gender gap in health narrowed by approximately 2% between 2005 and 2014, and the narrowing of that gap can be mainly attributed to changes in educational attainment and social grant receipt. Specifically, there has been a relative increase in receipt of formal education by women, which explains about 1.11% of the gap reduction, while the relative increase in social grant receipt by women explains approximately 28% of the reduction. Thus, improvements in gender equality, as it relates to health, are furthered by policies addressing inequality in educational attainment and social protection. However, about 76% of the reduction is explained by changes in returns to various male/female attributes.

*Department of Economics, University of Pretoria, Private Bag X20, Hatfield 0028, Republic of South Africa. kehinde.omotoso@up.ac.za; jewelslife2003.ko@gmail.com

†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

1 Introduction

Since the fall of Apartheid, a regime characterised primarily by racial inequality, a number of policies have targeted reductions in inequalities. Many of those policies have been directed towards tackling gender inequality (Mbeki, 2001). In spite of these policies, gender inequality persists (Kabeer, 2005), particularly in relation to health (Govender and Penn-Kekana, 2008; Kruger et al., 2012; Pillay and Kriel, 2006; Reddy et al., 2009; Statistics South Africa, 2012). Given the government's commitment to gender equality (African National Congress, 2012) and health for all her citizens (Booysen, 2003; South Africa Constitution, 1996), one would expect considerably smaller gender gaps in health today, relative to a decade ago. Nevertheless, observed health differences between males and females remain pervasive.

Previous literature has primarily analysed health inequality at a fairly aggregated level. A number of empirical studies (see Ataguba et al., 2011, 2015; Bradshaw, 2008; Burgard and Treiman, 2006; Christian, 2014; Gilson and McIntyre, 2007; Govender and Penn-Kekana, 2008; Harris et al., 2011; Harrison, 2012; Koch, 2009; Nteta et al., 2010; Omotoso and Koch, 2016) have examined issues of aggregate inequality and inequity in health. However, these studies have not identified the drivers of change at a disaggregate level, and, therefore, present an incomplete picture of health inequality.

Available evidence suggests that education and social grants are important determinants of gendered health inequality in South Africa (Aguero et al., 2006; Ataguba et al., 2015; Heinrich et al., 2012; UNICEF et al., 2014). Over the post-apartheid period, South Africa has maintained a reasonably equitable gender balance in education and social grant receipt (Chapman, 2006; Goldblatt, 2005; Patel, 2012). In particular, the non-contributory old age pension and child grant have a strong gender dimension, with a sizeable proportion of females as beneficiaries (Taylor Commission et al., 2002). It is claimed that over 70% of recipients of old-age pensions are females, while they are almost always the recipients, as care givers, of child support grants. Such grants are often used to purchase basic food items, and meet additional health care and educational costs (African National Congress, 2005; Burns et al., 2005; Goldblatt, 2005); see Table A.1 in the Appendix for a summary of social grants available in South Africa. Hence, social grants, which have greater numbers of females as recipients, are an important income source. Through these grants, severe poverty and risky health behaviours, such as persistent hunger and drug abuse can be reduced, especially among young people (UNICEF et al., 2014).

More specifically, household income in the form of pensions has been shown to be positively associated with changes in child health and educational status (Duflo 2000; Edmonds, 2004). Consequently, social grants, along with other socio-economic factors, are essential components of our analysis of gender differentials in health. Understanding their impact on narrowing gendered health differential over time, though, deserves further scrutiny.

Thus, the empirical contribution of this research is three-fold. Firstly, we establish the degree of gender inequality in health over a recent period. Secondly, we uncover the relative change in gender-based health (in)equality over that period. Thirdly, we examine the factors that have contributed to the change, and their relative importance. This research makes a further minor methodological contribution to the analysis of gender equality within health. Although the approach we follow has been employed in the analysis of gender equality in the labour market (see Kassenboehmer and Sinning, 2014; Wellington, 1993), we are not aware of it being applied to health inequality. Methodologically, we difference two separate Blinder-Oaxaca decompositions, which are also differences; thus, there is similarity between our differences-in-decompositions and differences-in-differences (Bertrand et al., 2004). The approach is applied to health in 2005 and 2014. The initial year marks the introduction of the Government Employees Medical Scheme (GEMS) (Govender et al., 2013), while the latter marks the most recent data that has become available. Because the standard decomposition partitions the gender gap (in any year) into differences in both observed and unobserved factors, the differences-in-decompositions method partitions the changes in the gender gap (across those two years) into changes in both observed and unobserved factors.[1]

We find that the gender gap in health differentials narrowed by about 2% between 2005 and 2014. Further investigation reveals that the narrowing of the gender gap is mainly attributable to changes in female receipt of social grants and the levels of educational attainment. This finding resonates with other research showing that education and social grant are important factors for reducing gendered health inequality.

[1] As with differences-in-differences, the order of differencing in the differences-in-decompositions does not matter. In other words, one could, instead, decompose health over time, separately, for men and women, and difference that across gender; the results would be identical.

2 Data, Trends and Descriptive Analysis

2.1 Data

We utilise data from the 2005 and 2014 General Household Surveys (GHS); each survey is nationally representative and contains information on health and other health-related behaviour, along with other socio-economic and demographic information.[2] In each survey, approximately 30,000 South African households are interviewed, and the survey, which started in 2002, is conducted yearly, but cannot be treated as either an individual- or household-level panel. To account for differences in survey designs, which cannot be entirely avoided, we employ the sampling weights provided in the datasets (Statistics South Africa, 2014).[3]

In our empirical analysis, health is measured by ill-health status, whether or not the respondent suffered from any illness or injury during the month preceding the survey; the binary response (suffered an illness=1) is our dependent variable. The samples were 107,857 and 92,445 in 2005 and 2014, respectively. The set of explanatory variables used in our analysis can be divided into eight categories: i) educational attainment (with categorical values: no schooling, less than diploma, diploma or certificate, university degree, and postgraduate degree); ii) race (with categories: African Black, Coloured, Asian or Indian and White); iii) marital status (with categories: married, widow or widower, divorced or separated and single); iv) employment status (whether or not the individual is employed); v) province (in which province the individual was residing at the time of the survey);[4] vi) metropolitan status (whether or not the individual lives in an urban area); vii) grant recipient status (whether or not the individual is a social grant recipient); and viii) Age (with categories: less than 6 years, 18-30 years, 31-45 years, 46-64 years and 65 years and beyond).

2.2 Trends in Health

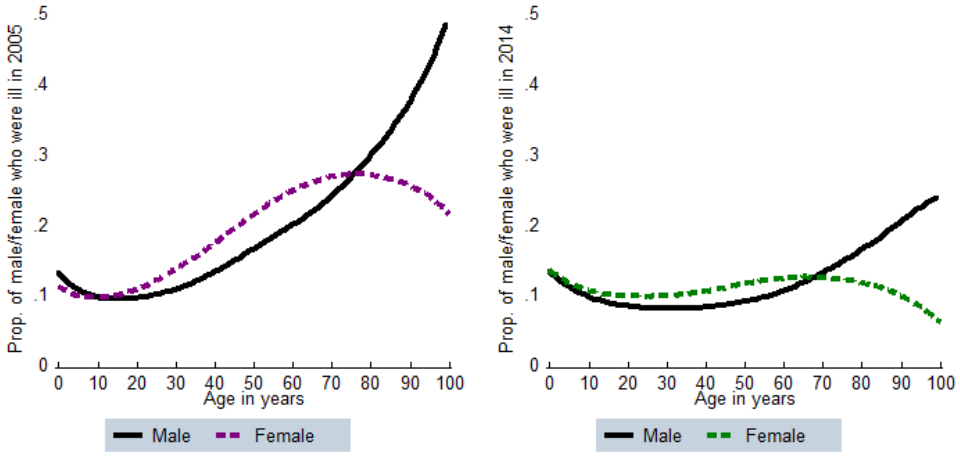
We begin our analysis with the age profile of illness for males and females in the two time periods. The left panel depicts the age profile of illness in 2005, while the right panel illustrates the age profile of illness in 2014. Comparing males and females in both time periods, we observe

[2]The GHS datasets are publicly available and can be accessed from `https://www.datafirst.uct.ac.za/dataportal/index.php/catalog/526/get_microdata`.

[3]For details on the derivation of the GHS weights and other adjustments made in the datasets, see the respective survey metadata files and technical notes sections of the statistical releases `https://www.datafirst.uct.ac.za/dataportal/index.php/catalog`.

[4]We included the nine provinces which are Western Cape, Eastern Cape, Northern Cape, Free State, Kwazulu/Natal, North-West, Gauteng, Mpumalanga and Limpopo. For enhanced readability, only the two relatively rich provinces (Western cape and Gauteng) are reported in our results.

that while females follow an $S-$pattern, males follow the expected J, with troughs occurring around the age of 10 in 2005 and between ages 20 and 30 in 2014. We observe that females report ill-health more often than their male counterparts in 2005, except at around 80 years of age. In 2014, on the other hand, that break occurs around the age of 70. Notably, we observe improvement in our health measure for both males and females, when comparing the 2005 and 2014 age-illness profiles.



(a) Male/female differences in 2005 (b) Male/female differences in 2014

Figure 1: Age-illness profiles for men and women in GHS 2005, panel (a), and GHS 2014, panel (b). Illustrated proportions are for those reported being ill in the 30 days prior to the survey at any age. The illustrations are taken from lowess nonparametric regressions of illness on age in each of the survey years; thus, the pattern is smoothed.

2.3 Descriptive Analysis

2.3.1 Changes in Health Status and Explanatory Variables

Table 1 presents changes in the weighted means of the explanatory variables and the health status from 2005 to 2014 for both males and females. The changes[5] in (weighted) means suggest changes in the population over the time period. For example, the population is relatively older in 2014 than in 2005, and that is true for both males and females. The population is generally better educated, as there is a lower proportion of the population in the lower education ranks and a greater proportion within upper educational outcomes. Specifically, the percentage of males without formal education decreased from about 19% in 2005 to 14% in 2014, while that of females decreased from 20% in 2005 to about 15% in 2014.

[5]Table A.2 in the Appendix explicitly details the changes in the weighted means for all the variables for males and females in both time periods. A positive value connotes an increase in the mean over time

Table 1: Changes in the Weighted Means of the Variables between 2005-2014 for Males and Females

	Male		***Female***	
	Means	Standard errors	Means	Standard errors
Less than 6 yrs	−0.013***	(0.003)	−0.012***	(0.003)
6-17 yrs	−0.033***	(0.004)	−0.022***	(0.003)
18-30 yrs	−0.001	(0.004)	−0.012**	(0.004)
31-45 yrs	0.024***	(0.004)	0.013***	(0.003)
46-64 yrs	0.016***	(0.003)	0.020***	(0.003)
65 yrs +	0.006***	(0.001)	0.012***	(0.002)
Black African	0.018***	(0.004)	0.013***	(0.004)
Coloured	−0.002	(0.002)	−0.000	(0.002)
Indian/Asian	0.000	(0.002)	−0.000	(0.001)
White	−0.016***	(0.003)	−0.013***	(0.003)
Married	−0.001	(0.004)	0.001	(0.004)
Widowed	0.003**	(0.001)	0.000	(0.002)
Divorced	−0.002	(0.001)	−0.002	(0.001)
Single	−0.002	(0.004)	0.001	(0.004)
No schooling	−0.045***	(0.003)	−0.047***	(0.003)
Less than diploma	0.013***	(0.004)	0.009*	(0.004)
Diploma certificate	−0.004*	(0.002)	−0.000	(0.002)
Honours degree	0.015***	(0.002)	0.019***	(0.002)
Postgraduate degree	0.001	(0.001)	0.002***	(0.000)
Employed	0.296***	(0.003)	0.186***	(0.003)
Urban	0.013***	(0.004)	0.024***	(0.004)
Western Cape	0.003	(0.003)	0.009**	(0.003)
Gauteng	0.011*	(0.005)	0.022***	(0.004)
Grant recipients	0.211***	(0.003)	0.108***	(0.003)
Ill-health	−0.024***	(0.003)	−0.032***	(0.003)
No. of observation in 2005	50,536		57,321	
No. of observation in 2014	43,469		48,976	

Robust standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Similarly, the percentage of both males and females with an honours degree increased from about 2% in 2005 to approximately 4% in 2014 (see Table A.2 in the appendix for detailed breakdowns). There is also more observed employment in 2014 than in 2005, increases in grant receipt and urbanisation, as well as changes in the racial composition of the population. In like manner, the proportion of both male and female social grant beneficiaries increased over time;

the percentage of female grant recipients increased from 19% in 2005 to 30% in 2014, while the male percentage increased from 7% to 28% (see Table A.2). Finally, as expected from Figure 1, there has been an improvement in health, a reduction in reported ill-health for both males and females. While male average ill-health reports reduced by 2%, female average ill-health reports reduced by 3%, suggesting a 1% improvement for females relative to males (Table 1).

2.3.2 Gender Gap in Health

In furtherance of the first objective of this paper, we continue our analysis by estimating the gender gap in health over the studied two time periods. In order to do this, we employ a linear model while controlling for the aforementioned socio-demographic variables. Our approach is similar to differences-in-differences; we include a year effect (2005 is the base category), a gender effect (males are the base category) and a gender-year interaction effect (males in 2005 are the base category), the last of which provides information regarding the degree to which the health gender gap has improved or worsened from 2005 to 2014. We undertake the analysis using a Linear Probability Model (LPM), which is heteroskedastic (therefore, we apply robust standard errors), and weight it to the population.

$$H_{igt} = \alpha_g g + \lambda_t t + \tau D_{gt} + X_{gt}^{'}\delta + \upsilon_{igt} \tag{1}$$

In (1), H_{igt} is the health outcome of interest for individual i in gender g (base category = male) by year t (base year = 2005); α_g and β_t are the fixed effects for gender and year respectively. D_{gt} is the dummy for gender-year interaction, X_{gt} are control variables and υ_{igt} is an error term. τ measures how the gender gap in health has changed over the ten-year period. Both the control variables and the gender variable are assumed to be time-varying in their effects.

The results reported in Table 2 provide information on the determinants of ill-health status, along with the gender gap in ill-health, based on GHS 2005 and GHS 2014. From the results, we see a slight reduction in reported ill-health status through time. As expected, the gender gap narrowed by approximately 0.01 (1%), although not to a statistically significant degree, such that females were 1% less likely than males to report illness over time.

Table 2: Parameter Estimates of the Gender Gap in Health, 2005-2014.

	Coefficients	Standard errors
Year (Y_{2014}=1)	−0.0371***	(0.002)
Y_{2014}*female	−0.0081	(0.042)
Less than 6 yrs	0.0166	(0.012)
6 - 17 yrs	−0.0320**	(0.010)
18 - 30 yrs	−0.0398***	(0.010)
31 - 45 yrs	−0.0258*	(0.010)
46 - 64 yrs	−0.0130	(0.009)
Black African	0.0323**	(0.011)
Coloured	0.0294*	(0.012)
White	0.0611***	(0.013)
Married	0.0133	(0.037)
Widowed	0.0136	(0.037)
Divorced	0.0307	(0.039)
Single	0.0062	(0.036)
No schooling	0.0238	(0.015)
Less than Diploma	−0.0023	(0.013)
Diploma certificate	0.0054	(0.016)
Honours degree	0.0013	(0.018)
Postgraduate degree	−0.0058	(0.039)
Employment status	−0.0041	(0.005)
Metropolitan status (urban)	0.0242***	(0.004)
Grant recipient status	−0.0044	(0.005)
Western Cape	−0.0367***	(0.008)
Gauteng	0.0121	(0.009)
Constant	0.1248***	(0.001)
Observation	200,302	
R^2	0.007	

Robust standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

2.3.3 Effects of Explanatory Variables on the Health Outcomes in 2005 and 2014

The preceding set of results provide some evidence on the degree of gender inequality in health over the studied period. However, the analyses assumed that health determinant relationships were the same for males and females across the two surveys, which could be overly restrictive. Therefore, in order to uncover the relative change in gender-based health inequality over the

studied period, which is the second objective of this research, we relax that assumption. We allow for differential determinants for both men and women in each of the surveys. Results from that analysis, which are also based on linear probability models appropriately weighted to the population and robust to heteroskedasticity, are reported in Table 3.

Table 3: Estimated Effect of Explanatory Variables on the Health Outcomes of Male and Female (by years)

	Male				***Female***			
	2005		2014)		2005		2014	
6 - 17 yrs	-0.0388^{***}	(0.011)	-0.0390^{***}	(0.011)	-0.0349^{**}	(0.012)	-0.0473^{***}	(0.010)
18 -30 yrs	-0.0377^{***}	(0.011)	-0.0517^{***}	(0.012)	-0.0224	(0.012)	-0.0550^{***}	(0.011)
31- 45 yrs	0.0165	(0.013)	-0.0425^{***}	(0.012)	0.0383^{**}	(0.012)	-0.0407^{***}	(0.011)
46 - 64 yrs	0.0569^{***}	(0.014)	-0.0471^{***}	(0.012)	0.1211^{***}	(0.013)	-0.0274^{*}	(0.011)
65 yrs plus	0.0701^{***}	(0.019)	-0.0308^{*}	(0.014)	0.1367^{***}	(0.016)	-0.0146	(0.012)
Black African	-0.0111	(0.011)	-0.0325^{***}	(0.009)	0.0226	(0.012)	-0.0261^{**}	(0.009)
Coloured	-0.0144	(0.014)	-0.0244^{*}	(0.009)	0.0079	(0.014)	-0.0284^{**}	(0.010)
Indian/Asian	-0.0279	(0.016)	-0.0453^{***}	(0.013)	-0.0155	(0.017)	-0.0566^{***}	(0.014)
Married	-0.0041	(0.008)	0.0074	(0.006)	-0.0055	(0.007)	0.0075	(0.006)
Widow/widower	0.0181	(0.022)	0.0507^{**}	(0.016)	0.0162	(0.012)	0.0072	(0.008)
Divorced	0.0170	(0.020)	0.0399^{*}	(0.017)	0.0588^{**}	(0.019)	0.0218	(0.013)
Less than Diploma	-0.0327^{***}	(0.009)	-0.0371^{***}	(0.009)	-0.0230^{*}	(0.010)	-0.0270^{**}	(0.008)
Diploma certificate	-0.0287	(0.017)	-0.0300^{*}	(0.013)	0.0093	(0.016)	-0.0187	(0.012)
Honours degree	-0.0414^{*}	(0.021)	-0.0254	(0.015)	-0.0132	(0.024)	-0.0224	(0.014)
Postgraduate	-0.0746	(0.039)	-0.0351	(0.031)	-0.0464	(0.055)	-0.0293	(0.037)
Employment status	0.0134	(0.011)	0.0015	(0.005)	-0.0172^{*}	(0.008)	0.0029	(0.005)
Western Cape	0.0149	(0.011)	-0.0123	(0.008)	0.0398^{***}	(0.012)	-0.0139	(0.008)
Gauteng	-0.0007	(0.009)	0.0248^{***}	(0.007)	0.0178^{*}	(0.008)	0.0343^{***}	(0.008)
Metropolitan status	0.0081	(0.005)	0.0190^{***}	(0.004)	0.0086	(0.005)	0.0238^{***}	(0.004)
Grant recipients	0.0756^{***}	(0.010)	-0.0031	(0.006)	0.0387^{***}	(0.006)	-0.0051	(0.005)
Constant	0.1408^{***}	(0.014)	0.1637^{***}	(0.012)	0.0860^{***}	(0.013)	0.1583^{***}	(0.012)
R^2	0.027		0.015		0.043		0.015	

Robust standard errors are reported
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
No. of Obs. for male in 2005 and 2014 respectively: 50,237 and 42,261
No. of Obs. for female in 2005 and 2014 respectively: 56,031 and 47,892

The first conclusion to be drawn from the results is that, with the exception of low levels of education (either less than diploma/certificate or diploma/certificate), along with Gauteng and metropolitan status, there is little evidence to suggest that the relationships are both time-independent and gender neutral - see Table 3 - although, there is some evidence of gender neutrality within a survey, as well as time independence within genders. For example, having earned less than a diploma with a certificate is associated with an approximately 3% reduction

in reported illness for men and women and in both years. Living in Gauteng is associated with a 3% increase in reported illness for both males and females in 2014. In like manner, living in a metropolitan area implies a 1-2% increase in reported illness in 2014.

In addition to the above effects that are similar across surveys and gender, we find evidence of gender neutrality in 2005 and 2014 (meaning similar male and female estimates in that year) for age, along with gender neutrality in 2014 across race categories, honours and postgraduate degree receipt, employment status, grant receipt and living in the Western Cape. Generally, any formal education is better than no formal education, in the sense that formal education is for the most part associated with a reduction in ill-health. For the honours and postgraduate levels in 2014, that decrease is about 4-5%. For grant receipt and living in the Western Cape in 2014, the decrease is about 1%, but is statistically insignificant.

Time independence within genders (meaning similar estimates for males or females in both 2005 and 2014) is observed for all male marital status categories and most of the female marital status categories. In these cases, marital status other than single (the reference category) is associated with increased illness reports, from 1-5%, with larger estimates associated with divorce and separation. Finally, the observed $J-$shape in 2005 and $S-$patterns in 2014 for the age categories suggest a relative improvement from 2005 to 2014 in the health of both males and females.

To this point, we have seen that there are differences between men and women in the characteristics that we observe between the 2005 and 2014 surveys. Furthermore, we see that there are differences in the estimated determinants across survey years and gender, which provides impetus for a decomposition analysis.

3 Empirical Strategy

In order to examine the relative importance and contributions of changes in the socio-economic factors to the change in the health differential between males and females over time, our empirical analysis follows the developments underpinned by Blinder-Oaxaca decomposition, extended to deal with multiple changes.

3.1 Decomposing Health Differences Between Two Groups

To set the stage, we illustrate a typical Blinder-Oaxaca decomposition of the gender health gap. Thus, we decompose across two groups $g = \{f, m\}$. We denote health by H_{ig}, while X_{ig} is a set of health-related characteristics for each individual i in group g and the conditional expectation of H_{ig} is linear, such that health for individual i in group g follows:

$$E[H_{ig}|X_{ig}] = X'_{ig}\beta_g, \qquad g = \{f, m\}. \tag{2}$$

A Blinder-Oaxaca decomposition separates the gender health differential $\Delta H^{f,m}$ attributable to differences in observed characteristics and the returns to those endowments. The decomposition proposed by Blinder (1973) and Oaxaca (1973) and generalized by Oaxaca and Ransom (1994) can be expressed as:

$$\begin{aligned} \Delta H^{f,m} &= E(H_m) - E(H_f) = E(X_m)'\beta_m - E(X_f)'\beta_f \\ &= [E(X_m] - E(X_f)]'\beta^* + [E(X_m)'(\beta_m - \beta^*) + E(X_f)'(\beta^* - \beta_f)], \end{aligned} \tag{3}$$

The first term on the right hand side of (3) refers to the part of the health difference (or gap) that may be explained by group differences in observed characteristics, while the two remaining terms are attributable to differences in coefficients between the two groups, i.e., differences in the returns to individual attributes. In (3), the reference vector β^* is given by the linear combination of the estimates from (2):

$$\beta^* = \rho\beta_m + (1 - \rho)\beta_f. \tag{4}$$

The linear combination "weights" (ρ) can be chosen in a variety of ways. For example, setting $\rho = 1$ puts all the weight on men, while setting $\rho = 0$ places all the weight on women. If the chosen value of ρ places all the weight on one of the groups, however, the decomposition will be reference dependent. Based on theoretical derivations, Neumark (1988) and more recent studies (Fortin, 2008; Jann, 2008; Kassenboehmer and Sinning, 2014; Neumark, 1988) advocate the usage of the coefficients from a pooled regression over both groups as an estimate for parameter vector β^*. Thus, we employ this strategy in our subsequent empirical analysis (see (8)).

3.2 Differencing the Decomposition of the Gender Gap in Health Over Time

Our interest, however, is not in the canonical decomposition of the gender health gap; rather, it is in understanding whether the decomposition has remained constant over the past decade, and, if not, what might explain any observed deviation. In other words, our goal is to examine the relative importance of the determinants in explaining changes in the gender health gap over time. Although Oaxaca (1973) showed that the average gap (or difference) in an outcome could be decomposed into the differences in the endowments and the returns (including the constant term), that analysis, as implied by (3), allows for only one binary dimension for decomposition (e.g., two groups within one survey or one group across two surveys) rather than multiple dimensions, a point we discuss below. Thus, we need to extend the canonical decomposition structure.

We begin by extending the previous notation in (2). Specifically, we denote H_{igt} as the health outcome of interest for individual i in gender g (base category = male) by year t (base year = 2005) considered in our analysis. Similarly, X_{itg} is a set of health-related characteristics for each individual i in group g and time t. The conditional expectation of H_{itg} remains linear, such that health for individual i in group g and survey year t follows:

$$E[H_{igt}|X_{igt}] = X'_{igt}\beta_{tg}, \qquad g = \{f, m\}, \qquad t = \{2005, 2014\} \tag{5}$$

Within any survey year, a typical decomposition can be undertaken, yielding (6), which modifies (3).

$$\begin{aligned} \Delta H_t^{f,m} &= E(H_{tm}) - E(H_{tf}) = E(X_{tm})'\beta_{tm} - E(X_{tf})'\beta_{tf} \\ &= [E(X_{tm}] - E(X_{tf})]'\beta^* + [E(X_{tm})'(\beta_{tm} - \beta^*) + E(X_{tf})'(\beta^* - \beta_{tf})], \end{aligned} \tag{6}$$

Differencing the gender gap over time results in the following expression:

$$\begin{aligned} \Delta H_{2005,2014}^{f,m} &= \Delta H_{2014}^{f,m} - \Delta H_{2005}^{f,m} \\ &= (H_{m,2014} - H_{m,2005}) - \left(H_{f,2014} - H_{f,2005}\right) \\ &= [E(X_{2014,m}) - E(X_{2014,f})]'\beta^* - [E(X_{2005,m}) - E(X_{2005,f})]'\beta^* \\ &+ [E(X_{2014,m})'(\beta_{2014,m} - \beta^*) + E(X_{2014,f})'(\beta^* - \beta_{2014,f})] \\ &- [E(X_{2005,m})'(\beta_{2005,m} - \beta^*) + E(X_{2005,f})'(\beta^* - \beta_{2005,f})] \end{aligned} \tag{7}$$

Up to this point, we have assumed β^*, but not defined it. As noted by a number of authors (see Blinder, 1973; Cotton, 1988; Fortin et al., 2011; Fortin, 2008; Jann, 2008; Kassenboehmer and Sinning, 2014; Neumark, 1988; Oaxaca, 1973; Oaxaca and Ransom, 1994; Reimers, 1983; Wellington, 1993, amongst others), any single decomposition is not reference independent. Thus, there has been considerable discussion (see previous papers) regarding the choice of the weighting matrix and the resulting reference vector. Suggestions have been made in the literature to estimate the reference vector using a pooled linear regression model.

In the extended analysis, we consider four groups rather than two; thus, β^* must take that into account. We extend the linear combination in (4) to cover all four groups, such that:

$$\beta^* = \rho_{2005,m}\beta_{2005,m} + \rho_{2005,f}\beta_{2005,f} + \rho_{2014,m}\beta_{2014,m} + (1 - \rho_{2005,m} - \rho_{2005,f} - \rho_{2014,m})\beta_{2014,f}. \quad (8)$$

To understand the source of the health status differentials between male and female over time, we decompose the health differential into components describing the contribution of individual characteristics and the coefficients of the individual characteristics.

4 Decomposition Results

Table 4[6] contains the decomposition results for the health differential between females and males in 2014 (panel (A)) and 2005 (panel (B)). On average, the estimates in 2014 show a health differential of -0.0163, which is smaller than the average health differential of -0.0310 observed in 2005. These estimates suggest that the average gender gap in health narrowed considerably over time by 0.0147 in favour of females.

Furthermore, the within-period decomposition results in Table 4 indicate that a considerable part of the gender gap in health may be attributed to differences in age, marital status and grant recipient status of females and males. For the most part, the portions of the gender gap due to differences in age, marital status and grant recipient status are mostly positive for both time periods. On average, the portion of the gender gap in health attributable to age differences ranges from 1-6% in 2005 and 3-10% in 2014. Meanwhile, the gender gap due to differences in marital status is about 1-4% in 2005, and 1-7% in 2014. The proportion of the gender gap attributable to grant receipts is 14.4% in 2005 and 1.8% in 2014.

[6]See Table A.3 in the appendix for the estimates of the OLS regression decomposition of changes in the health differentials for females (panel (C)) and males (panel (D)) between 2005 and 2014.

Table 4: OLS Decomposition of the Gender Gap in the Health Differentials

	Changes due to Means		
Variables	Coefficient	Stand. error	% Explained *
(A) 2014[a]			
Raw Difference	−0.0163	(0.0020)	
6 - 17 yrs	−0.0014	(0.0002)	8.6
18 - 30 yrs	−0.0005	(0.0001)	2.8
31 - 45 yrs	0.0000	(0.0000)	0.2
46 - 64 yrs	−0.0015	(0.0002)	9.3
65 yrs plus	−0.0017	(0.0002)	10.3
Black African	−0.0002	(0.0001)	1.3
Coloured	0.0000	(0.0000)	0.0
White	0.0001	(0.0000)	−0.7
Married	−0.0002	(0.0003)	1.4
Widowed	−0.0009	(0.0015)	5.7
Divorced	−0.0003	(0.0002)	1.8
Single	−0.0011	(0.0014)	6.9
No schooling	−0.0002	(0.0001)	1.4
Less than Diploma	0.0001	(0.0001)	−0.4
Diploma certificate	−0.0002	(0.0001)	1.2
Honours degree	0.0000	(0.0000)	0.1
Postgraduate	0.0000	(0.0000)	−0.1
Employed	−0.0002	(0.0002)	1.3
Urban	0.0003	(0.0001)	−2.1
Western Cape	−0.0001	(0.0001)	0.4
Gauteng	−0.0001	(0.0000)	0.7
Grant recipients	−0.0003	(0.0001)	1.8
Unexplained	−0.0083	(0.0020)	51.0
(B) 2005[b]			
Raw Difference	−0.0310	(0.0021)	
6 - 17 yrs	−0.0020	(0.0002)	6.4
18 - 30 yrs	−0.0001	(0.0001)	0.5
31 - 45 yrs	−0.0002	(0.0001)	0.6
46 - 64 yrs	−0.0010	(0.0001)	3.3
65 yrs plus	−0.0013	(0.0002)	4.3
Black African	−0.0004	(0.0001)	1.3
Coloured	0.0001	(0.0000)	−0.2
White	0.0001	(0.0001)	−0.5
Married	−0.0002	(0.0002)	0.5
Widowed	−0.0009	(0.0015)	2.9
Divorced	−0.0003	(0.0002)	1.0
Single	−0.0012	(0.0014)	3.8
No schooling	−0.0004	(0.0001)	1.2
Less than diploma	0.0001	(0.0001)	−0.3
Diploma certificate	−0.0001	(0.0000)	0.4
Honours degree	0.0000	(0.0000)	−0.1
Postgraduate	0.0000	(0.0000)	0.0
Employed	0.0001	(0.0001)	−0.2
Urban	0.0004	(0.0001)	−1.3
Western Cape	−0.0002	(0.0001)	0.7
Gauteng	−0.0001	(0.0000)	0.4
Grant recipients	−0.0045	(0.0003)	14.4
Unexplained	−0.0196	(0.0020)	63.1

[a] Decomposition of health differential between females and males in 2014
[b] Decomposition of health differential between females and males in 2005
* – connotes deterioration in females' health relative to males and vice versa
Robust standard errors are reported in parentheses
Number of observations in 2014: 43,469 males and 48,976 females
Number of observations in 2005: 50,536 males and 57,321 females

In contrast, the portion of the gender gap in health attributable to residing in an urban area is largely negative. The negative contribution of urban residence is slightly larger in 2014 (2.1%) than in 2005 (1.3%), which is consistent with the relative increase in females' residence in the urban areas over time (see Table A.2). Though small, living in the Western Cape and Gauteng provinces contribute positively to the gender gap in health. Specifically, living in the Western Cape and Gauteng explains about 0.7% and 0.4% of the gender gap in 2005, and 0.4% and 0.7% in 2014, respectively. Only 1.3% of the gender gap is attributable to being employed in 2014. The part of the gender gap due to being employed is negative in 2005, suggesting that higher levels of employment among males in 2005 implies improved health for males relative to females in 2005. The positive contributions of having earned a diploma/certificate and an honours qualification to the gender gap are slightly higher in 2014 than in 2005, which could be associated with the relative increase in females' educational attainment over time (see Table A.2). We observe relatively stable contributions of racial differences to the gender health differential in both time periods. Precisely, being Black African contributes about 1.3% in both time periods. However, since our model focuses predominantly on socio-economic characteristics, a number of observable and unobservable factors are not captured in our model. As a result, about 51-63% of the average gender health differential remains unexplained.

We observe that females' relative health would not have improved without changes in the composition of some of the socio-economic factors, suggesting that the changing compositions are at least partly responsible for the relative improvement in their health. In Table 5, we present the decomposition results for the changes in the health gender gap over time (i.e, the differences between the values in panels (A) and (B) of Table 4), which are equal to the decomposition results of the gender differences in health differential (i.e, the differences between the values in panels (C) and (D) of Table A.3). As Table 5 indicates, the gender gap narrowed by 0.0147 (1.5%) between 2005 and 2014.

We find that there is a significant contribution of educational attainment to the change in health differential. A breakdown of the education variable shows that changes in the average number of those without formal education (see Table A.2) significantly improved health differentials by 1.11%, in favour of females relative to males. This result underpins the importance of education in improving health outcomes and providing further evidence that education plays a significant role in narrowing the gender gap in health (Ataguba et al., 2015). Also, changes in social grant receipts explain about 28% of the differential.

Table 5: OLS Decomposition of Changes in the Health Differential between Females and Males

	$(A) - (B) = (C) - (D)$		
	Changes due to Means		
Variables	Coefficient	Standard error	% Explained *
Raw Difference	0.0147		
6 - 17 yrs	0.0006	(0.008)	3.89
18 - 30yrs	−0.0003	(0.009)	−2.15
31 - 45 yrs	0.0002	(0.010)	1.14
46 - 64 yrs	−0.0005	(0.012)	−3.38
65 yrs plus	−0.0003	(0.007)	−2.36
Black African	0.0002	(0.015)	1.39
Coloured	−0.0001	(0.016)	−0.42
White	0.0000	(0.017)	−0.25
Married	−0.0001	(0.101)	−0.52
Widowed	0.0000	(0.102)	−0.23
Divorced	0.0000	(0.102)	0.00
Single	0.0001	(0.101)	0.43
No schooling	0.0002	(0.018)	1.11
Less than Diploma	0.0000	(0.017)	−0.13
Diploma certificate	−0.0001	(0.019)	−0.50
Honours degree	0.0000	(0.022)	−0.23
Postgraduate	0.0000	(0.038)	−0.01
Employed	−0.0003	(0.006)	−1.89
Urban	0.0000	(0.005)	−0.29
Western Cape	0.0002	(0.011)	1.11
Grant recipients	0.0042	(0.005)	28.25
Total	0.0035		23.55
Unexplained	0.0113		76.45

Bootstrapped SEs using 1000 resamples are reported in parenthesis

Between 2004-2012, the education and housing amenities budget shares increased, while the social protection portion of the public budget decreased slightly (see Table 6). However, public budget allocations to education, health and social protection have been prioritised in recent years. For instance, in 2016, budget allocations to education, health and social protection ranked first, second and third respectively. In particular, the number of individuals receiving social grants has increased from about 4 million in 1994 to over 17 million in 2016 (Ferreira, 2017); social spending has also increased with the gradual amendments of age eligibility for old age pension and child support grant, and changes in the 'means test" threshold. In addition, education and social grants have a strong gender dimension (Burns et al., 2005; Goldblatt, 2005; Patel, 2012). For instance, the old age pension reaches significantly more females than males,

due to demographic considerations and the different age eligibility condition, which was upheld until recently (Department of Social Development, 2002; Taylor Commission et al., 2002). Although undertaken differently, our work is in agreement with other recent work, which suggest that social grant receipt is positively and significantly associated with improvement in child health status, particularly for female children living with pension-eligible maternal grandmothers (Case, 2004; Duflo, 2000; UNICEF et al., 2014). The gender of the social grant recipient is key, with evidence suggesting that female beneficiaries, more than their male counterparts, are likely to spend their unearned income on improving their health (Duflo, 2003). Social grants are thus an important income through which females can achieve improved health in South Africa, since grants are largely accessed by females. In order to ensure more rapid progress in addressing gendered health differential, further strengthening of "gender-friendly" policies relating to education and the core component of social safety may prove just as beneficial.

Table 6: Selected public expenditure as % share of total public expenditure, South Africa 1994-2012

	1994/95	***1999/2000***	***2004/05***	***2009/10***	***2011/12***
Education	21.6	21.3	19.7	20.2	21.5
Social protection	10.8	11.9	15.8	15.8	15.6
Health	10	11.4	11.3	11.4	12.3
Housing & community amenities	3.5	3.9	4.9	8.6	9.2

Source: (South African Reserve Bank, 2013)

Furthermore, we find that living in Western Cape also accounts for 1.11% of the change in the gender gap in health, while changes in the composition of those within the age brackets 6-17 years and 31-45 years explain about 4% and 1% of the differential, respectively. Changes in the composition of being single explain about 0.43% of the gender gap in health over time. We also observe that some proportion of the explained gap can be attributed to the racial composition of males and females, specifically being Black African (1.14%) (see Table A.4). However, we found changes in employment status to be less relevant in narrowing the gender gap in health differentials. Overall, the decomposition results show that changes in the levels of educational attainment, racial composition, residential location and changes in the receipt of social grants play significant roles in narrowing the gender gap in health, in favour of females relative to males.

However, 76% of the reduction is explained by changes in the returns to various male/female attributes, especially the returns to education, race, age and marital status, as depicted in Figure 2. In general, these results point to the relevance of socio-economic factors in narrowing the gender gap in health. From our analysis, changes in social grant receipts and in the average

number of those without formal education are relevant factors for narrowing the gender gap. Thus, improvements in gender equality, as it relates to health, could be furthered by policies addressing inequality in educational attainment and social protection programmes.

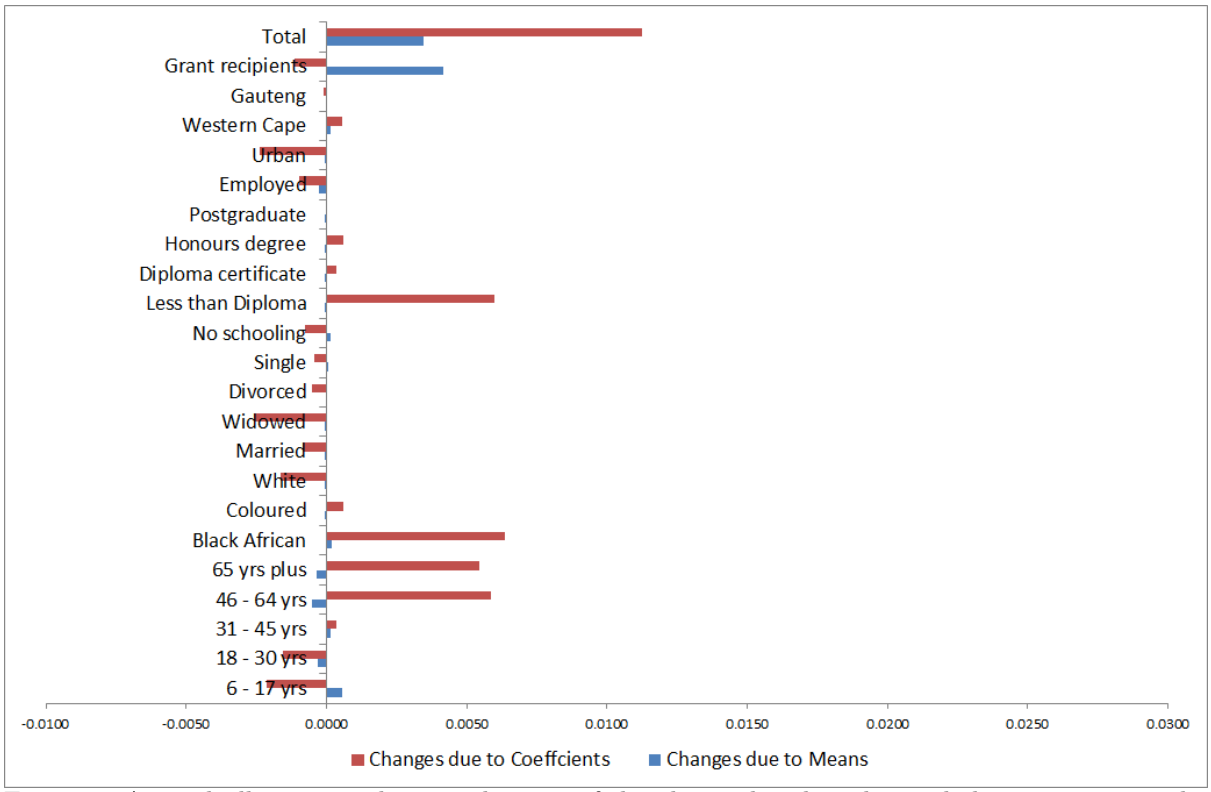


Figure 2: A graph illustrating the contributions of the observed and unobserved characteristics to the gender gap in the health differential over the time periods 2005-2014

5 Limitations of the study

Unfortunately, the health variable used for our analysis was constrained by the availability of data in the GHS. Preferably, the measure of health would be medically-certified or self-assessed general health. However, the GHSs do not contain such information; instead questions were limited to ill-health and disability. Thus, we consider the lack of information on general health status to be a key limitation. Consequently, our analysis is a limited assessment of health, though it is the best one available at this point. Although, the National Income Dynamics Study (NIDS) (Leibbrandt et al., 2009) contains self-assessed health (SAH), it does not cover the last decade considered, which we are able to do with the GHS.

6 Conclusion

In this research, we examined the gender gap in health, using population-weighted General Household Survey (GHS) data from 2005 and 2014. We extended the standard Blinder-Oaxaca decomposition to decompose health differentials between males and females. To assess the contributions of both observed and unobserved characteristics, and their relative importance in explaining the changes in health and the health gender gap over time, we differenced the Blinder-Oaxaca gender decompositions. We found that the gender gap in health narrowed by about 2% between 2005 and 2014. The results of the differences-in-decompositions analysis indicate that the narrowing of the gender gap in health is mainly attributable to changes in the levels of educational attainment, especially the reduction in those without formal education in favour of females relative to males. A considerable portion of the narrowing is also attributable to changes in female receipt of social grants. Furthermore, we have been able to provide some evidence that racial composition and residential location contributes significantly to narrowing the gender gap in health between males and females. Thus, we infer that policy interventions in these identified areas would lead to positive spillover effects in health. Specifically, in furtherance of achieving gender equality in health, policies could be reviewed to further strengthen gender equality in education and social protection programmes.

References

African National Congress (2005), Beijing + 10 - Ten years of progress, lessons and challenges, Government printer, Johannesburg, South Africa.

African National Congress (2012), Policy discussion document, Government printer, Johannesburg, South Africa.

Aguero, J., Carter, M. and Woolard, I. (2006), 'The impact of unconditional cash transfers on nutrition: The South African Child Support Grant', Washington, DC: Centre for Global Development.

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*

Bertrand, M., Duflo, E. and Mullainathan, S. (2004), 'How much should we trust Differences-in-Differences estimates?', *Quarterly Journal of Economics* **119**(1), 249–275.

Blinder, A. (1973), 'Wage discrimination: Reduced form and structural estimates', *Journal of Human Resources* **8**(4), 436–455.

Booysen, 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.

Burgard, S. A. and Treiman, D. J. (2006), 'Trends and racial differences in infant mortality in South Africa', *Social Science & Medicine* **62**(5), 1126–1137.

Burns, J., Keswell, M. and Leibbrandt, M. (2005), 'Social assistance, gender, and the aged in South Africa', *Feminist Economics* **11**(2), 103–115.

Case, A. (2004), Does money protect health status? Evidence from South African pensions, *in* 'Perspectives on the Economics of Aging', University of Chicago Press, University of Chicago, pp. 287–312.

Chapman, K. (2006), *Using social transfers to scale up equitable access to education and health services*, Department for International Development London.

Christian, C. S. (2014), 'Access in the South African public health system: Factors that influenced access to health care in the South African public sector during the last decade', University of Western Cape, South Africa.

Cotton, J. (1988), 'On the decomposition of wage differentials', *The Review of Economics and Statistics* **70**(2), 236–243.

Department of Social Development (2002), 'National report on the status of older persons: Report to the second world assembly on ageing', Discussion paper. Pretoria: Department of Social Development.

Duflo, E. (2000), 'Child health and household resources in South Africa: Evidence from the old age pension program', *The American Economic Review* **90**(2), 393–398.

Duflo, E. (2003), 'Grandmothers and granddaughters: Old-age pensions and intrahousehold allocation in South Africa', *The World Bank Economic Review* **17**(1), 1–25.

Ferreira, L. (2017), 'Factsheet: Social grants in south africa – separating myth from reality', Online Report @ Africa Check: Sorting facts from fiction. Available: https://africacheck.org/factsheets/separating-myth-from-reality-a-guide-to-social-grants-in-south-africa/.

Fortin, N., Lemieux, T. and Firpo, S. (2011), Decomposition methods in Economics, *in* A. Orley and C. David, eds, 'Handbook of Labor Economics', Elsevier, North Holland, Netherlands, chapter 1, pp. 1–102.

Fortin, N. M. (2008), 'The gender wage gap among young adults in the United States: The importance of money versus people', *Journal of Human Resources* **43**(4), 884–918.

Gilson, L. and McIntyre, D. (2007), 'Post-Apartheid challenges: Household access and use of health care in South Africa', *International Journal of Health Services* **37**(4), 673–691.

Goldblatt, B. (2005), 'Gender and social assistance in the first decade of democracy: A case study of South Africa's Child Support Grant', *Politikon: South African Journal of Political Studies* **32**(2), 239–257.

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*

Govender, V. and Penn-Kekana, L. (2008), 'Gender biases and discrimination: A review of health care interpersonal interactions', *Global Public Health* **3**(1), 90–103.

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.

Harrison, D. (2012), 'An overview of health and health care in South Africa 1994–2010: Priorities, progress and prospects for new gains; 2009', Washington, DC: Henry J Kaiser Family Foundation.

Heinrich, C., Hoddinott, J., Samson, M., Mac Quene, K., van Nikerk, I. and Renaud, B. (2012), The South African child support grant impact assessment, Technical report, Department of Social Development, South African Social Security Agency, UNICEF, South Africa.

Jann, B. (2008), 'The Blinder–Oaxaca decomposition for linear regression models', *Stata Journal* **8**(4), 453–479.

Kabeer, N. (2005), 'Gender equality and women's empowerment: A critical analysis of the third Millennium Development Goal 1', *Gender & Development* **13**(1), 13–24.

Kassenboehmer, S. C. and Sinning, M. G. (2014), 'Distributional changes in the gender wage gap', *Industrial & Labor Relations Review* **67**(2), 335–361.

Koch, S. F. (2009), 'Equity in private health insurance coverage in South Africa: 2002-2007', *University of Pretoria, Department of Economics Working Paper: 2009-16* pp. 1–26.

Kruger, A., Wissing, M. P., Towers, G. W. and Doak, C. M. (2012), 'Sex differences independent of other psycho-sociodemographic factors as a predictor of body mass index in black South African adults', *Journal of Health, Population and Nutrition* **30**(1), 56–65.

Leibbrandt, M., Woolard, I. and de Villiers, L. (2009), 'Methodology: Report on NIDS Wave 1', Technical Paper No. 1. Southern Africa Labour and Development Research Unit (SALDRU). Available at: http://www.nids.uct.ac.za/publications/technical-papers.

Mbeki, T. (2001), 'South Africa's National Policy Framework for women's empowerment and gender equality', *City Press Business* **19**(8), 2001.

Neumark, D. (1988), 'Employers' discriminatory behavior and the estimation of wage discrimination', *Journal of Human Resources* **23**(3), 279–295.

Nteta, T. P., Mokgatle-Nthabu, M. and Oguntibeju, O. O. (2010), 'Utilization of the primary health care services in the Tshwane region of Gauteng province, South Africa', *PloS One* **5**(11), 1–8.

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

Oaxaca, R. L. and Ransom, M. R. (1994), 'On discrimination and the decomposition of wage differentials', *Journal of Econometrics* **61**(1), 5–21.

Omotoso, K. O. and Koch, S. F. (2016), 'South African trends in health outcomes and health-related behaviour: Evidence from repeated cross-sectional surveys', *University of Pretoria, Department of Economics Working Paper: 2016-50* pp. 1–29.

Patel, L. (2012), 'Poverty, gender and social protection: Child support grants in Soweto, South Africa', *Journal of Policy Practice* **11**(1-2), 106–120.

Pillay, A. L. and Kriel, A. J. (2006), 'Mental health problems in women attending district-level services in South Africa', *Social Science & Medicine* **63**(3), 587–592.

Reddy, S., Resnicow, K., James, S., Kambaran, N., Omardien, R. and Mbewu, A. (2009), 'Underweight, overweight and obesity among South African adolescents: Results of the 2002 National Youth Risk Behaviour Survey', *Public Health Nutrition* **12**(02), 203–207.

Reimers, C. W. (1983), 'Labor market discrimination against Hispanic and Black men', *The Review of Economics and Statistics* **65**(4), 570–579.

South Africa Constitution (1996), Constitution of the Republic of South Africa Act, No. 108 of 1996, Government printer, South Africa, Pretoria.

South African Reserve Bank (2013), Government finance statistics of South Africa: 1994-2012, Supplement to the South African Reserve Bank Quarterly Bulletin, South African Reserve Bank, Pretoria.

Statistics South Africa (2012), 'Gender Statistics in South Africa', Pretoria: Statistics South Africa [producer], 2011. Pretoria: Statistics South Africa [distributor], 2012.

Statistics South Africa (2014), 'General Household Survey 2014 [Statistical Release P0318 2015]', Pretoria: Statistics South Africa [producer], 2015. Pretoria: South African Data Archive, National Research Foundation [distributor], 2015.

Taylor Commission et al. (2002), 'Report of the committee of inquiry into a comprehensive system of social security for South Africa', Pretoria: Department of Social Development.

UNICEF et al. (2014), The South African child support grant impact assessment: Evidence from a survey of children, adolescents and their households, Technical report, UNICEF South Africa, Pretoria.

Wellington, A. J. (1993), 'Changes in the male/female wage gap, 1976-85', *Journal of Human Resources* **28**(2), 383–411.

Appendix A Additional Tables

Table A.1: A Description of Social Grants in South Africa

Grant type (Approximated number of recipients at September 2015)	Values in rands (per month)	Eligibility
Grant for the Aged (3.1 million)	1,500	Previously paid to males aged 65 or older and females aged 60 and older. At present, both males and females aged 60 and older qualify
Child Support Grant (11.9 million)	350	paid to the main caregiver of a child 18 or younger. The applicant must meet up with the "means test" criterion
Disability Grant (1.1 million)	1,500	Paid to individuals 18 years and older who are unable to work because of disability. Recipients must submit a medical assessment or report no older than three months
War Veteran Grant (277)	1,520	Paid to those who are disabled or at least 60 years, and have served in the South African army during the Second World War or Korean War
Foster Child Grant (533,000)	890	Paid to foster parents in respect of children placed in their care through a court order
Grant-in-Aid (126,600)	320	Paid to individuals receiving the grant for older persons, disability or war veteran's grant, and who require full-time care because of physical or mental disability
Care Dependency Grant (129,000)	1,500	Paid to main caregiver of a child with a permanent, severe disability. The applicant must submit a medical assessment report on the child's behalf and meet up with the "means test" criterion
Social Relief of Distress		A temporary grant awardable to people in dire need. It may be paid out to people awaiting payment of an approved social grant or who have been affected by a disaster.

Adapted from Department of Social Development, South Africa

Table A.2: Weighted Means of the Explanatory Variables between 2005-2014

	Male			***Female***		
	2005	2014	Δ	2005	2014	Δ
6 - 17 yrs	0.267	0.234	−0.033	0.243	0.221	−0.022
18 - 30 yrs	0.250	0.250	−0.001	0.246	0.234	−0.012
31 - 45 yrs	0.195	0.219	0.024	0.197	0.210	0.013
46 - 64 yrs	0.121	0.138	0.016	0.134	0.154	0.020
65 yrs plus	0.033	0.039	0.006	0.054	0.066	0.012
Black African	0.782	0.800	0.018	0.786	0.800	0.013
Coloured	0.091	0.089	−0.002	0.091	0.090	0.000
Asian/Indian	0.026	0.026	0.000	0.024	0.024	0.000
White	0.101	0.085	−0.016	0.099	0.086	−0.013
Married	0.282	0.281	−0.001	0.270	0.271	0.001
Widowed	0.013	0.016	0.003	0.074	0.074	0.000
Divorced	0.013	0.012	−0.002	0.024	0.022	−0.002
Single	0.691	0.689	−0.002	0.630	0.631	0.001
No schooling	0.189	0.144	−0.045	0.201	0.154	−0.047
Less than diploma	0.740	0.753	0.013	0.731	0.740	0.009
Diploma certificate	0.041	0.036	−0.004	0.045	0.044	0.000
Honours degree	0.020	0.035	0.015	0.016	0.035	0.019
Postgraduate	0.004	0.005	0.001	0.001	0.003	0.002
Employed	0.057	0.352	0.296	0.077	0.262	0.186
Urban	0.633	0.647	0.013	0.605	0.629	0.024
Western cape	0.110	0.113	0.003	0.106	0.115	0.009
Gauteng	0.241	0.252	0.011	0.210	0.233	0.022
Grant recipients	0.070	0.281	0.211	0.190	0.299	0.108
Ill-health	0.112	0.088	−0.024	0.137	0.105	−0.032
No. of observation	50,536	43,469		57,321	48,976	

Table A.3: OLS Decomposition of the Health Differentials Over Time

	Changes due to Means			*Changes due to Coefficients*		
Variables	Coefficient	Stand. error	% Explained*	Coefficient	Stand. error	% Unexplained*
C. Female[c]						
Raw Difference	0.0406	0.0020				
6 - 17 yrs	−0.0015	0.0002	−3.8	−0.0008	0.0026	−1.9
18 - 30y rs	−0.0002	0.0001	−0.6	0.0045	0.0026	11.1
31 - 45 yrs	0.0001	0.0000	0.2	0.0135	0.0023	33.2
46 - 64 yrs	−0.0015	0.0002	−3.6	0.0233	0.0021	57.5
65 yrs plus	−0.0007	0.0001	−1.7	0.0118	0.0011	29.0
Black African	−0.0005	0.0001	−1.2	0.0033	0.0117	8.2
Coloured	0.0002	0.0001	0.5	−0.0038	0.0020	−9.2
White	−0.0001	0.0000	−0.1	−0.0049	0.0010	−11.9
Married	0.0000	0.0000	0.0	−0.0148	0.0235	−36.5
Widowed	−0.0001	0.0001	−0.2	−0.0038	0.0083	−9.4
Divorced	0.0000	0.0000	−0.1	−0.0011	0.0022	−2.7
Single	−0.0001	0.0001	−0.3	−0.0362	0.0600	−89.1
No schooling	0.0011	0.0003	2.8	0.0030	0.0054	7.4
Less than Diploma	0.0000	0.0000	0.0	0.0217	0.0189	53.5
Diploma certificate	−0.0001	0.0000	−0.3	0.0003	0.0010	0.8
Honours degree	−0.0002	0.0001	−0.6	0.0003	0.0005	0.8
Postgraduate	0.0000	0.0000	0.0	0.0000	0.0001	−0.1
Employed	0.0005	0.0004	1.2	−0.0016	0.0010	−4.0
Urban	−0.0013	0.0001	−3.2	−0.0060	0.0028	−14.9
Western Cape	0.0004	0.0001	1.0	−0.0004	0.0012	−0.9
Gauteng	0.0005	0.0002	1.3	−0.0060	0.0012	−14.7
Grant recipients	−0.0052	0.0003	−12.7	0.0149	0.0018	36.8
Total	−0.0103	0.0007	−25.4	0.0509	0.0021	125.4
D. Male[d]						
Raw Difference	0.0259	0.0020				
6 -17 yrs	−0.0021	0.0002	−8.2	0.0013	0.0032	5.2
18 - 30yrs	0.0001	0.0001	0.3	0.0061	0.0028	23.4
31 - 45 yrs	−0.0001	0.0000	−0.3	0.0131	0.0023	50.8
46 - 64 yrs	−0.0010	0.0001	−3.8	0.0175	0.0018	67.5
65 yrs plus	−0.0003	0.0001	−1.3	0.0064	0.0008	24.6
Black African	−0.0007	0.0001	−2.7	−0.0031	0.0110	−11.8
Coloured	0.0003	0.0001	1.0	−0.0044	0.0020	−16.8
White	0.0000	0.0000	−0.1	−0.0032	0.0011	−12.4
Married	0.0001	0.0001	0.2	−0.0140	0.0367	−54.0
Widowed	0.0000	0.0001	−0.2	−0.0013	0.0022	−5.0
Divorced	0.0000	0.0000	−0.1	−0.0006	0.0017	−2.2
Single	−0.0002	0.0002	−0.7	−0.0358	0.0999	−138.3
No schooling	0.0010	0.0002	3.7	0.0038	0.0044	14.6
Less than Diploma	0.0000	0.0000	0.1	0.0158	0.0165	60.9
Diploma certificate	0.0000	0.0000	−0.1	0.0000	0.0008	−0.1
Honours degree	−0.0002	0.0001	−0.8	−0.0003	0.0005	−1.1
Postgraduate	0.0000	0.0000	0.0	−0.0001	0.0001	−0.2
Employed	0.0008	0.0006	3.0	−0.0006	0.0012	−2.5
Urban	−0.0013	0.0001	−4.8	−0.0037	0.0029	−14.1
Western Cape	0.0003	0.0001	1.0	−0.0009	0.0012	−3.6
Gauteng	0.0005	0.0002	1.9	−0.0059	0.0013	−22.7
Grant recipients	−0.0093	0.0005	−36.1	0.0161	0.0016	62.1
Total	−0.0138	0.0010	−53.3	0.0397	0.0022	153.3

[c]Decomposition of Health Differential between 2005 and 2014 for Females
[d]Decomposition of Health Differential between 2005 and 2014 for Males
* – connotes deterioration in females' health relative to males and vice versa
Robust standard errors are reported in parentheses
Number of observations in 2014: 43,469 males and 48,976 females
Number of observations in 2005: 50,536 males and 57,321 females

Table A.4: Decomposition of Gender Gap in the Health Differentials from 2005 to 2014

	Changes due to Means					***Changes due to Coefficients***				
	Female (A)		Male (B)			Female (C)		Male (D)		
	Coeff.	s.e	Coeff.	s.e	Δ	Coeff.	s.e	Coeff.	s.e	Δ
Raw Difference	0.0406^{+}	0.0020	0.0259^{+}	0.0020	0.0147					
6 - 17 yrs	-0.0015^{+}	0.0002	-0.0021^{+}	0.0002	0.0006	−0.0008	0.0026	0.0013	0.0032	−0.0021
18 - 30 yrs	-0.0002^{+}	0.0001	0.0001	0.0001	−0.0003	0.0045^{*}	0.0026	0.0061^{**}	0.0028	−0.0016
31- 45 yrs	0.0001^{**}	0.0000	-0.0001^{*}	0.0000	0.0002	0.0135^{+}	0.0023	0.0131^{+}	0.0023	0.0003
46 - 64 yrs	-0.0015^{+}	0.0002	-0.0010^{+}	0.0001	−0.0005	0.0233^{+}	0.0021	0.0175^{+}	0.0018	0.0059
65 yrs plus	-0.0007^{+}	0.0001	-0.0003^{+}	0.0001	−0.0003	0.0118^{+}	0.0011	0.0064^{+}	0.0008	0.0054
Black African	-0.0005^{+}	0.0001	-0.0007^{+}	0.0001	0.0002	0.0033	0.0117	−0.0031	0.0110	0.0064
Coloured	0.0002^{*}	0.0001	0.0003^{*}	0.0001	−0.0001	-0.0038^{*}	0.0020	-0.0044^{**}	0.0020	0.0006
White	−0.0001	0.0000	0.0000	0.0000	0.0000	-0.0049^{+}	0.0010	-0.0032^{+}	0.0011	−0.0016
Married	0.0000	0.0000	0.0001	0.0001	−0.0001	−0.0148	0.0235	−0.0140	0.0367	−0.0009
Widowed	−0.0001	0.0001	0.0000	0.0001	0.0000	−0.0038	0.0083	−0.0013	0.0022	−0.0025
Divorced	0.0000	0.0000	0.0000	0.0000	0.0000	−0.0011	0.0022	−0.0006	0.0017	−0.0005
Single	−0.0001	0.0001	−0.0002	0.0002	0.0001	−0.0362	0.0600	−0.0358	0.0999	−0.0004
No schooling	0.0011^{+}	0.0003	0.0010^{+}	0.0002	0.0002	0.0030	0.0054	0.0038	0.0044	−0.0008
Less than diploma	0.0000	0.0000	0.0000	0.0000	0.0000	0.0217	0.0189	0.0158	0.0165	0.0060
Diploma certificate	-0.0001^{**}	0.0000	0.0000	0.0000	−0.0001	0.0003	0.0010	0.0000	0.0008	0.0003
Honours degree	-0.0002^{*}	0.0001	-0.0002^{*}	0.0001	0.0000	0.0003	0.0005	−0.0003	0.0005	0.0006
Postgraduate	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	−0.0001	0.0001	0.0000
Employed	0.0005	0.0004	0.0008	0.0006	−0.0003	−0.0016	0.0010	−0.0006	0.0012	−0.0010
Urban	-0.0013^{+}	0.0001	-0.0013^{+}	0.0001	0.0000	-0.0060^{**}	0.0028	−0.0037	0.0029	−0.0024
Western Cape	0.0004^{+}	0.0001	0.0003^{+}	0.0001	0.0002	−0.0004	0.0012	−0.0009	0.0012	0.0006
Gauteng	0.0005^{+}	0.0002	0.0005^{+}	0.0002	0.0000	-0.0060^{+}	0.0012	-0.0059^{+}	0.0013	−0.0001
Grant recipients	-0.0052^{+}	0.0003	-0.0093^{+}	0.0005	0.0042	0.0149^{+}	0.0018	0.0161^{+}	0.0016	−0.0011
Total	-0.0103^{+}	0.0007	-0.0138^{+}	0.0010	0.0035	0.0509^{+}	0.0021	0.0397^{+}	0.0022	0.0113

Robust standard errors are reported
$^{+}$ $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A.5: Decomposition Result of the Changes in the Health Differentials between Male and Female Over Time

	Changes due to Means					***Changes due to Coefficients***				
	2014 (E)		2005 (F)			2014 (G)		2005 (H)		
	Coeff.	s.e	Coeff.	s.e	Δ	Coeff.	s.e	Coeff.	s.e	Δ
Raw Difference	−0.0163^{+}	0.0020	−0.0310^{+}	0.0021	0.0147					
6 - 17 yrs	−0.0014^{+}	0.0002	−0.0020^{+}	0.0002	0.0006	0.0013	0.0028	0.0035	0.0030	−0.0021
18 - 30 yrs	−0.0005^{+}	0.0001	−0.0001*	0.0001	−0.0003	−0.0003	0.0028	0.0012	0.0026	−0.0016
31 - 45 yrs	0.0000	0.0000	−0.0002**	0.0001	0.0002	−0.0012	0.0023	−0.0016	0.0022	0.0003
46 - 64 yrs	−0.0015^{+}	0.0002	−0.0010^{+}	0.0001	−0.0005	−0.0011	0.0021	−0.0069^{+}	0.0018	0.0059
65 yrs plus	−0.0017^{+}	0.0002	−0.0013^{+}	0.0002	−0.0003	0.0015*	0.0009	−0.0039^{+}	0.0009	0.0054
Black African	−0.0002*	0.0001	−0.0004^{+}	0.0001	0.0002	−0.0129	0.0104	−0.0192	0.0122	0.0064
Coloured	0.0000	0.0000	0.0001	0.0000	−0.0001	−0.0007	0.0017	−0.0013	0.0023	0.0006
White	0.0001*	0.0000	0.0001^{+}	0.0001	0.0000	−0.0006	0.0010	0.0010	0.0011	−0.0016
Married	−0.0002	0.0003	−0.0002	0.0002	−0.0001	−0.0033	0.0105	−0.0024	0.0423	−0.0009
Widowed	−0.0009	0.0015	−0.0009	0.0015	0.0000	−0.0003	0.0026	0.0023	0.0077	−0.0025
Divorced	−0.0003	0.0002	−0.0003	0.0002	0.0000	−0.0001	0.0008	0.0005	0.0026	−0.0005
Single	−0.0011	0.0014	−0.0012	0.0014	0.0001	−0.0091	0.0268	−0.0087	0.1135	−0.0004
No schooling	−0.0002*	0.0001	−0.0004^{+}	0.0001	0.0002	−0.0003	0.0025	0.0005	0.0065	−0.0008
Less than Diploma	0.0001	0.0001	0.0001	0.0001	0.0000	−0.0076	0.0092	−0.0136	0.0233	0.0060
Diploma Certificate	−0.0002**	0.0001	−0.0001**	0.0000	−0.0001	−0.0008	0.0006	−0.0011	0.0011	0.0003
Honours degree	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	−0.0006	0.0004	0.0006
Postgraduate	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	−0.0001	0.0001	0.0000
Employed	−0.0002	0.0002	0.0001	0.0001	−0.0003	0.0010	0.0015	0.0020**	0.0006	−0.0010
Urban	0.0003^{+}	0.0001	0.0004^{+}	0.0001	0.0000	−0.0020	0.0031	0.0004	0.0026	−0.0024
Western Cape	−0.0001	0.0001	−0.0002^{+}	0.0001	0.0002	0.0002	0.0012	−0.0004	0.0012	0.0006
Gauteng	−0.0001*	0.0000	−0.0001**	0.0000	0.0000	−0.0013	0.0014	−0.0012	0.0011	−0.0001
Grant recipients	−0.0003*	0.0001	−0.0045^{+}	0.0003	0.0042	0.0006	0.0021	0.0017	0.0011	−0.0011
Total	−0.0080^{+}	0.0005	−0.0115^{+}	0.0005	0.0035	−0.0083^{+}	0.0020	−0.0196^{+}	0.0020	0.0113

Robust standard errors are reported
$^{+}$ $p < 0.01$, ** $p < 0.05$, * $p < 0.1$