

## **Racial Disparities in Access to Private Healthcare in South Africa**

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**ABSTRACT:** *The aim of this study was to estimate racial disparities in access to private healthcare in South Africa. Statistics South Africa 2013 General Household Survey data constituting a nationally representative sample (n= 93 450) was used for estimation. Using medical scheme membership status as a proxy of access to private healthcare, binary logistic regression was conducted to estimate the odds of access to private healthcare using Statistical Package for Social Sciences (SPSS) software. The estimated odds ratios show that the odds of access to private healthcare are higher among Whites, followed by Indians/Asians and Coloureds relative to Black African counterparts. Based on these results, racial disparities in access to healthcare can be addressed by implementing equitable healthcare funding mechanisms to attain the goal of universal health coverage.*

**KEYWORDS:** *racial disparities, access, private healthcare and medical scheme membership*

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### **I. INTRODUCTION**

Improved health conditions are an effective catalyst for improved economic productivity (Ganyaupfu, 2014). Access to private healthcare mainly through medical scheme membership has remained as the major channel through which risk pooling of health expenditure occurs in South Africa (McIntyre, 2010; Harris, Goudge, Ataguba, McIntyre, Nxumalo, Jikwana & Chersich, 2011; and Smith & Burger, 2013). The healthcare system in the country is dualistic in nature and comprises the public sector and private healthcare providers. In the private health sector, the key mechanisms through which healthcare is financed are medical schemes, direct out-of-pocket payments, other forms of health insurance and employer private streams (Council for Medical Schemes, 2011; and Competition Commission of South Africa, 2018). Over a period of 16 years between 2000 and 2016, the total number of registered medical schemes in South Africa declined by 43% from 144 medical schemes at the end of 2000 to 82 medical schemes in 2016 primarily as a result of amalgamations among smaller and less sustainable schemes (Alexander Forbes Health, 2017). Department of Health (2011) maintains that several medical schemes collapsed while some were merged mainly due to overpricing of healthcare.

In South Africa, medical schemes are regulated by the Medical Schemes Act (No 131 of 1998). The Council for Medical Schemes, in terms of section 7 of the Act, has the mandate to protect interests of members, and control and coordinate the functioning of medical schemes in a manner that is consistent with the national health policy (Medical Schemes Act, 1998). Membership to medical schemes is voluntary and dominated by a small proportion of the population segment in the highest income quintile, while about 84% of the population depend on healthcare funded from general tax revenues (McIntyre, Doherty & Ataguba, 2014). Contributions to medical schemes work on the concept of risk pooling (McIntyre, 2010), a major channel via which people have access to private healthcare (Harris, Goudge, Ataguba, McIntyre, Nxumalo, Jikwana & Chersich, 2011).

#### **1.2. Problem Statement**

The largest proportions of people in some racial groups have no access to private healthcare, while largest shares of counterparts in other population groups have access to private healthcare in South Africa.

#### **1.3. Research Objective**

The aim of this study was to assess racial disparities in access to private healthcare in South Africa.

#### **1.4. Research Question**

What are the magnitudes of racial disparities in access to private healthcare in South Africa?

#### **1.5. Research Hypothesis**

There are substantial racial disparities in access to private healthcare in South Africa.

### 1.6. Significance of the Study

Results from this study are intended to provide government with insights which can help in designing healthcare financing mechanisms that reduce disparities in access to healthcare by all citizens in the nation.

## II. LITERATURE REVIEW

Sustainable healthcare financing is an integral element of a well-functioning healthcare system, which enhances the wellbeing of individuals and socioeconomic development (Competition Commission of South Africa, 2018). The World Health Organisation (WHO, 2007) underscores that “a good health financing system raises adequate funds for health, in ways that ensure people can use needed services, and are protected from financial catastrophe associated with having to pay for them”. In South Africa, most people experience financial catastrophe and impoverishment as a result of out-of-pocket payments. Catastrophic expenditure occurs when out-of-pocket health payment exceeds 40% of a household’s non-subsistence outlay, while impoverishment measures the share of households pushed below the poverty line due to out-of-pocket payments (Xu, Saksena, Jowett, Indikadahena, Kutzin & Evans, 2010). Thus, a higher share of out-of-pocket payments in total health expenditure indicates a higher degree of household exposure to catastrophic expenditure and impoverishment.

Comparative to countries with universal health systems such as Australia, Germany, Canada, United Kingdom, Netherlands, Italy, France, Finland, Belgium, Sweden, Switzerland, and Norway, the key challenge in South Africa with regards to health financing is over-reliance on voluntary prepayments comparative to mandatory prepayment and out-of-pocket mechanisms (McIntyre, Doherty, and Ataguba, 2014). Econometric estimates on the determinants of health expenditure in South Africa in terms of health financing arrangements using WHO Global Health Observatory data show that voluntary health insurance had the largest positive contribution than government financing arrangements, while direct out-of-pocket payments had a diminishing contributing effect between 2000 and 2015 (Ganyaupfu, 2019). From the lens of sources of health expenditure funds, domestic private health expenditure had the largest contribution than domestic general government expenditure over the same period (Ganyaupfu, 2019). However, most people in the country have no access to private healthcare (Section 27), and inequality in access to private healthcare varies markedly by racial group.

Statistics South Africa (StatsSA) General Household Survey (2013) data show that merely about 15% of the population are covered by medical schemes. Nearly 44% of total health expenditure in the country comes from these medical schemes (McIntyre, 2010). In situations where certain medical services are not covered by medical scheme packages or when annual benefits are exhausted, medical scheme members make out-of-pocket payments in form of co-payments; which reveals that medical schemes in the country do not provide adequate financial protection for their members (McIntyre, 2010). In terms of population group, the share of individuals with access to private healthcare remains lowest among Blacks African, largely due to their poor socioeconomic position. The majority of Black Africans have poor-paying jobs that do not offer health benefits, which gives rise to lack of health protection and financial risk exposure, hence sustained inequalities in access to much needed healthcare (Harris, Goudge, Ataguba, McIntyre, Nxumalo, Jikwana & Chersich, 2011).

## III. METHODOLOGY AND PROCEDURE

### 3.1. Sample and Data

A nationally representative sample dataset consisting of ninety-three thousand four hundred and fifty (n = 93 450) respondents who participated in the General Household Survey (GHS) conducted by the Statistics South Africa (2013) was processed and used for analysis. The dataset was sourced from the University of Cape Town DataFirst online portal. Self-reported medical scheme membership status, for which responses were binary (no=0; or yes=1), was used as the proxy for access to private healthcare, while the population group was the covariate (Black African=1, Coloured=2, Indian/Asian=3 and White=4) in the estimated model.

### 3.2. Estimation Method

Statistical data analysis was conducted using the Statistical Package for Sciences (SPSS) software. Binary logistic regression analysis was conducted to estimate odds ratios (ORs) at 95% confidence interval level to assess the odds of access to private healthcare by racial groups based on the function in equation (1):

$$\pi = \Pr (Y_i = 1 | X_i = x_i) = \frac{\exp (\beta_0 + \beta_1 x_i)}{1 + \exp (\beta_0 + \beta_1 x_i)} \Rightarrow \text{logit} (\pi_i) = \log \left( \frac{\pi_i}{1 - \pi_i} \right) = \beta_0 + \beta_1 x_i \quad (1)$$

where Y represents the binary response variable (where  $Y_i=1$  denotes presence of access to private healthcare, and  $Y_i=0$  denotes absence of access private healthcare), and  $X_i$  designates the covariate ( $X_1 =$  Black African,  $X_2 =$

Coloured,  $X_3$ = Indian/Asian, and  $X_4$ = White; while  $x_i$  represents the observed value of the covariate for observation  $i$ ).

To determine the proportion of overall variation in access to private healthcare accounted for by race, the Cox & Snell Pseudo R-square and Nagelkerke R-square (Smith & McKenna, 2013; and Walker & Smith, 2016) tests statistics were computed based on the functional specifications:

$$\text{Cox \& Snell Pseudo } R^2 = 1 - \left( \frac{-2LL_{\text{null}}}{-2LL_k} \right)^{\frac{2}{n}}; \text{ and Nagelkerke } R^2 = \frac{\left( \frac{-2LL_{\text{null}}}{-2LL_k} \right)^{\frac{2}{n}}}{1 - \left( \frac{-2LL_{\text{null}}}{-2LL_k} \right)^{\frac{2}{n}}} \quad (2)$$

where  $-2LL_{\text{null}}$  symbolises the likelihood for the model with only an intercept; and  $-2LL_k$  represents the model with the predictor.

In order to assess the model’s predictive power, the area under the nonparametric Receiver Operating Characteristic (ROC) curve was computed. This curve, which is a graph of sensitivity versus 1 minus specificity, was derived at  $c = 0.5$  probability cut-off. Sensitivity shows the fraction of observed positive outcome cases that are correctly classified, and specificity shows the fraction of observed negative outcome cases that are correctly classified (Hanley & McNeil, 1982; Faraggi & Reiser, 2002; and Cook & Rajbhandari, 2018).

#### IV. RESULTS AND ANALYSIS

This section presents summary statistics of the participants’ demographic profiles by regional location across provinces, medical scheme membership status (proxy for access to private healthcare) and population group. The estimated results on the odds of access to private healthcare by each of the population categories are further presented, analysed and interpreted.

**Table 1: Summary statistics**

	n	(%)	Cum (%)
<b>Province</b>			
Western Cape	11102	11.9	11.9
Eastern Cape	11201	12.0	23.9
Northern Cape	5512	5.9	29.8
Free State	7676	8.2	38.0
KwaZulu-Natal	15512	16.6	54.6
North West	7603	8.1	62.7
Gauteng	14226	15.2	77.9
Mpumalanga	9404	10.1	88.0
Limpopo	11214	12.0	100.0
Total	93450	100.0	
<b>Race</b>			
Black African	74689	79.9	79.9
Coloured	10504	11.2	91.2
Indian/Asian	1709	1.8	93.0
White	6548	7.0	100.0
Total	93450	100.0	
<b>Active medical scheme membership</b>			
No	78060	83.5	83.5
Yes	15390	16.5	100.0
Total	93450	100.0	

Source: Author’s calculations using General Household Survey data, Statistics South Africa, 2013

From the total 93450 participants, 17% (n=15512) were from KwaZulu-Natal and 15% (n=14226) were from Gauteng. Northern Cape had the least proportion of 6% (n=5512) respondents, followed by North West and Free State with about 8% (n=7603) and 8% (n=7676); respectively. Based on race, 80% (n=74689) of the respondents were Black Africans, while Coloureds and Whites accounted for 11% (n=10504) and 7% (n=6548); respectively. Indians/Asians had the least share of about 2% (n=1709) respondents. Moreover, 83.5% (n=78060) reported that they had no active medical scheme memberships, while 16.5% (n=15390) reported that they had

active medical scheme memberships at the point in time the survey was conducted. The results suggest that the largest share of 83.5% of the population had no access to private healthcare.

**Table 2: Access to private healthcare according to province**

Province	Active medical scheme membership				Total	
	No		Yes			
	n	(%)	n	(%)	n	(%)
Western Cape	8182	8.76	2920	3.12	11102	11.88
Eastern Cape	9962	10.66	1239	1.33	11209	11.99
Northern Cape	4420	4.73	1092	1.17	5512	5.90
Free State	6441	6.89	1235	1.32	7676	8.21
KwaZulu Natal	13462	14.44	2050	2.19	15512	16.60
North West	6517	6.97	1086	1.16	7603	8.14
Gauteng	10636	11.38	3590	3.84	14226	15.22
Mpumalanga	8123	8.69	1281	1.37	9404	10.06
Limpopo	10317	11.04	897	0.96	11214	12.00
Total	78060	83.50	15390	16.50	93450	100.0

Source: Author's calculations using General Household Survey data, Statistics South Africa, 2013

Table 2 shows that from the 83.5% of the population who did not have access to private healthcare, the relative majority were in KwaZulu-Natal (14%), Gauteng (11%), Limpopo (11%) and Eastern Cape (11%). The provinces with the relatively largest proportions of people who had access to private healthcare are Gauteng (4%), Western Cape (3%) and KwaZulu-Natal (2%), the top three richest provinces in the country.

**Table 3: Access to private healthcare according to race**

Race	Active medical scheme membership				Total	
	No		Yes			
	n	(%)	n	(%)	n	(%)
Black African	67134	71.8	7555	8.10	74689	79.9
Coloured	8382	9.0	2122	2.30	10504	11.2
Indian/Asian	971	1.0	738	0.80	1709	1.8
White	1573	1.7	4975	5.30	6548	7.0
Total	78060	83.5	15390	16.50	93450	100.0

Source: Author's calculations using General Household Survey data, Statistics South Africa, 2013

Table 3 shows that from about 80% total Black Africans, only 8% had access to private healthcare, while about 72% did not have access to private healthcare. From 11% Coloured respondents, about 9% did not have access to private healthcare, while about 2% did have access to private healthcare. Indian respondents were only 1.8%; out of which 0.8% reported that they had access to private healthcare, while 1% did not have access to private healthcare. Whites had the largest share amongst themselves which had access to private healthcare. From the total 7% of White respondents, about 5% of them had access to private health care, while nearly 2% indicated that they did not have access to private healthcare. Overall, results suggest that merely less than 17% of the population do have access to private healthcare. Relative to sub-population sizes, Black Africans had the largest proportion of people who did not have access to private healthcare in in the country.

**Table 4: Step 0 – Iteration history and classification summary<sup>a, b</sup>**

-2 Log likelihood		83611.753		
Observed	Active medical scheme membership	Predicted		Percentage Correct
		No	Yes	
		No	78060	0
Yes	15390	0	0.0	
Overall Percentage				83.5

a. Constant is included in the model,

b. The cut value is 0.5

Based on the base rates of the self-reported active medical scheme membership status outcomes with no other information, classification statistics (Table 4) show that it could be correct 83.5% (78060/93450) of the time that a selected person could not have access to private healthcare. In other words, 83.5% of respondents with no access to private healthcare were correctly classified. Inversely, 16.5% (15390/93450) of respondents who reported that they had active medical scheme memberships had access to private healthcare.

**Table 5: Variables in the equation<sup>c</sup>**

Constant	$\beta$	S.E.	Wald	df	Sig.	Exp( $\beta$ )
	-1.624	0.009	33894.672	1	0.000	0.197

c. The categorical independent variable (race) was not included in the equation

Given the intercept only with no other information, the exponentiated estimated coefficient (exp( $\beta$ )) yielded predicted odds equal to 0.197. The result shows that the predicted odds of a person having access to private healthcare at the point in time the survey was conducted was 0.197. In other words, since 78060 of the respondents reported that they had no access to private healthcare, while 15390 of respondents reported that they had access to private healthcare at the time the survey was conducted, the observed odds of not having access to private healthcare were 15390/78060 = 0.197.

**Table 6: Step 1 – Classification summary<sup>d</sup>**

Observed		Predicted		Percentage Correct
		Private healthcare insurance No	Yes	
Private healthcare insurance	No	76487	1573	97.9 <sup>e</sup>
	Yes	10415	4975	32.3 <sup>f</sup>
Overall Percentage				87.2

d. Constant is included in the model

e. Sensitivity at the cut value 0.5

f. Specificity at the cut value 0.5

Based on results in Table 6, the improvement in the overall percentage from 83.5% in Step 0 to 87.2% in Step 1 of correctly classified respondents with no access to private healthcare indicates significance of including “race” in the model as a predictor. Therefore, race is a significant predictor of access to private healthcare since inclusion of race to the model significantly increased the power to predict the outcome of access to private healthcare. Results on sensitivity indicate that 97.9% of respondents with no access to private health care were correctly classified. Specificity results reveal that 32.3% of respondents with access to private healthcare were correctly classified. The computed summary model fit statistics (Table 7) were given by the change in the -2 Log likelihood, Cox & Snell R-square and Nagelkerke R-square statistics.

**Table 7: Model summary<sup>g</sup>**

-2 Log likelihood	Cox & Snell R-square	Nagelkerke R-square
69066.138 <sup>g</sup>	0.144	0.244

g. Estimation terminated at iteration number 5 because parameter estimates changed by less than 0.001.

The decrease in -2 log likelihood from 83611.753 in Step 0 (Table 4) to 69066.138 in Step 1 (Table 7) shows improvement in the predictive power of the model. Based on the Cox & Snell R<sup>2</sup>, about 14.4% overall variation in access to private healthcare was accounted for by race. Alternatively, the Nagelkerke R<sup>2</sup> shows that about 24.4% overall variation in access to private healthcare was accounted for by race. The Omnibus test of model coefficients and Hosmer and Lameshow test were performed to evaluate model fit and significance.

**Table 8: Statistical tests for model goodness of fit**

Test Statistic	Chi-square	df	Sig.
Omnibus test of model coefficients	14545.615	3	0.000
Hosmer and Lameshow test	0.000	1	1.000

Given the  $\chi^2 = 14545.615$  ( $83611.753 - 69066.138$ ) in the Omnibus test of model coefficients, the -2 log likelihood statistic for the null model with only a constant was  $83611.753$  ( $= 69066.138 + 14545.615$ ). Hence, the null hypothesis tested by the Omnibus test of model coefficients that adding race did not significantly increase the power to predict access to private healthcare status was rejected. Dividing the subjects into deciles based on the predicted probabilities, the Hosmer and Lemeshow  $\chi^2$  (1) statistic ( $= 0.000$ ;  $p > 0.05$ ) computed from the observed and expected frequencies shows that the model with a predictor provided a better fit than the null model. Therefore, non-rejection of the null hypothesis (based on the Hosmer and Lemeshow test) that predictions made by the model fit perfectly with observed group memberships confirm that race was indeed a significant predictor of access to private healthcare status up to the time the survey was conducted.

**Table 9: Odds ratios for access to private healthcare<sup>1</sup>**

Race	$\beta$	S.E.	Wald	df	Sig.	Exp( $\beta$ )	95% C.I. for Exp( $\beta$ )	
Coloured	0.811	0.027	890.902	1	0.000	2.250	2.133	2.373
Indian/Asian	1.910	0.050	1440.868	1	0.000	6.754	6.119	7.454
White	3.336	0.031	11309.425	1	0.000	28.104	26.428	29.886
Constant	-2.184	0.012	32405.364	1	0.000	0.113		

<sup>1</sup>. Black African population group was the reference category

The computed odds ratios (Table 9), computed by exponentiating the estimated beta coefficients are statistically significant at 5% level and lie within the respective 95% confidence intervals. The Black African population group was used as the reference category based on the rationale it is the racial group with the least proportion of people who had active medical scheme memberships relative to its population size. Results show that Coloureds had nearly twice the odds of having access to private healthcare than Black Africans; while the odds of having access to private healthcare were approximately 7 times higher among Indians/Asians than Black Africans. Concomitantly, the odds of having access to private healthcare were 28 times higher among Whites than Black Africans. The estimated results reveal strong empirical evidence of wide racial disparities in access to private healthcare; potentially due to differentials in socioeconomic status such as employment status and income earning levels across the respective population groups in the country.

**Table 5: Area under the Receiver Operating Characteristic (ROC) curve**

Area	Std. Error <sup>h</sup>	Asymptotic Sig. <sup>i</sup>	Asymptotic 95% Confidence Interval	
0.704	0.003	0.000	0.699	0.709

*h.* Under the nonparametric assumption

*i.* Null hypothesis: true area = 0.5

To examine the predictive ability of the model, the area under the ROC curve was produced. The area (= 0.704) under the curve (Appendix A) shows that the estimated model had good statistical predictive power.

## V. CONCLUSION AND RECOMMENDATIONS

### 5.1. Conclusions

Based on the status of access to private healthcare largely in form of medical scheme membership and contributions, the majority users of private healthcare services are Whites; while Black Africans are the majority users of public healthcare services in South Africa. From the universal healthcare coverage view, voluntary private medical schemes contributions dominate the healthcare financing system in South Africa. Coupled with lack of pooling of funds to guarantee risk cross-subsidisation and financial risk protection, some members of the highly fragmented medical schemes make co-payments and out-of-pocket payments for medical services not covered by their respective schemes while the poor suffer most from the potentially high costs of healthcare.

### 5.2. Recommendations

To address the existing dual challenge of racial inequalities regarding access to private healthcare and fragmentation in the health system, efficiently equitable healthcare funding mechanisms should be implemented if the goal of universal health coverage is to be achieved in the country. A robust risk-equalisation mechanism in private and general tax funding pools is required to ensure equity in financing and access to the much-needed good quality healthcare services by all population groups.

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Appendix A: Receiver Operating Characteristic (ROC) curve

