Progressivity of Out-of-Pocket Payments and its Determinants Decomposed Over Time*

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Abstract

This study estimates progressivity of out-of-pocket (OOP) health payments and their determinants using South African Income and Expenditure Surveys. Concentration is decomposed to examine the effect of household determinants on OOP inequality, shedding light on how progressivity/regressivity is related to changes in the concentration and elasticities of the determinants over time. Our results suggest that actual OOP health expenditures are concentrated among non-poor households, although less so now than in the recent past. When OOP health payments are viewed from the perspective of affordability, which instead focuses on the share of payments relative to capacity-to-pay, they are regressive; However, they have become less concentrated amongst poor households, although still regressive, recently. These results appear to be independent of the measure of socioeconomic status employed in the analysis. The results highlight large income and education related disparities and also suggest continued gender and ethnic differences that deserve further attention in policymaking.

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1 Introduction

When it comes to assessing health inequality and changes in it, a common approach is to follow the public finance literature, examining indexes of inequality, such as the Kakwani Index. Doing so requires tying a measure of health care (financing) to a measure of well-being. Early examples in the literature include Klavus (2001), who examines Finland from 1987 to 1996. He finds that out-of-pocket payments are regressive in both periods, while the changes in the level of regressivity was not statistically significant. The results did not incorporate decomposition, although more recent research has. For example, Ataguba (2016) assesses the progressivity of health care in South Africa using the 2005-06 and 2010-11 Income and Expenditure Surveys. He finds that the health care system is progressive, that health insurance is particularly so, while out-of-pocket payments (OOP) are regressive, having become more so. He further decomposes the changes in regressivity/progressivity into changes in the income distribution and changes in the health payments distribution. We complement that research by incorporating a wider range of controls and applying a different measure of concentration; we also find different results to what he presents.

A different, but related, strand of the literature examines the determinants of OOP. Hwang et al. (2001) assesses OOP comparing people with and without chronic conditions using 1996 US Medical Expenditure Panel Survey. They find personal medical care OOP rising with the number of chronic conditions, a result that persists after controlling for insurance status and other demographic determinants. They also find that health insurance matters. The uninsured have the highest OOP and are five times more likely to see a medical care provider in a given year. In a developing country setting with free public health care, such as Sri Lanka (Fernando 2000), Pallegedara and Grimm (2018) assess the effect of free public care on a range of OOP types. Their main concern is whether or not free care leads to rationing in the public sector and pushes patients towards the more expensive private sector. Although they find that increased income directly correlates with increased OOP, and this increase is driven mainly by private health care, they argue that this observation is related to poor quality in the public sector. Otherwise, they find little evidence to suggest more shifting from the public sector to the private sector. There are similar worries in South Africa, especially with regard to quality of care and queuing for services (Burger et al. 2012; Burger and Christian 2018).

Modelling OOP determinants tends to be based on regression. For example, Onwujekwe et al. (2010) employs logit regression to examine the socio-economic determinants of OOP payments for health care in South-East Nigeria. They find that females are less likely than men to incur OOP, but that OOP is associated with larger household sizes, transport costs and the head's education. Oyinpreye and Moses (2014) finds that age, household size and per capita consumption expenditure are major determinants of OOP payments in the

South-South geographical zone of Nigeria. You and Kobayashi (2011) examine OOP determinants in China using Heckman's sample selection model finding that self-reported health, age (especially for the elderly), education, residing in urban areas and perceived severity of illness all matter. On the other hand, Mwenge (2010) employs Tobit using Zambian data finding that households headed by individuals younger than 25 years had lower OOP payments compared to those aged 64 years and above. Also, households residing in urban areas, married households and male-headed households had higher OOP than their counterparts.

In summary, Ataguba (2016) and Klavus (2001) provide information on the degree of progressivity in OOP payments and whether or not progressivity has changed over time; however, they offer little evidence on the drivers of those changes. A larger literature, on the other hand, uncovers the socio-economic determinants of OOP payments (Hwang et al. 2001; Mwenge 2010; Onwujekwe et al. 2010; Oyinpreye and Moses 2014; Pallegedara and Grimm 2018; You and Kobayashi 2011), but does not consider changes and whether or not various determinants have become more or less important over time. Such information can be important. In a country like South Africa, which is working to overcome the inequality in health inherited from the apartheid regime, such information may point to successes, as well as areas in need of further scrutiny or support. Therefore, our primary contribution is to complement previous research. We assess social determinants of OOP, particularly over time, decomposing the changes in the factors explaining OOP inequality.

We make use of existing methodological developments; specifically, we employ concentration curves and indexes to examine OOP regressivity in South Africa. We further tie OOP inequality to its determinants, through regression and decomposition techniques, matching the relative change in OOP inequality to changes in the social determinants of health payments. We follow Wagstaff, Doorslaer, and Watanabe (2003), who outline an extension to Oaxaca (1973) decomposition, which attempts to map changes in a health variable's inequality to the inequalities and elasticities in the social determinants of that health variable – an elasticity is the percentage change in OOP or related measure arising from a percent change in the respective social determinant. Similar research focusing on ill health status, rather than OOP, is available for South Africa (Omotoso and Koch 2018); thus, we offer a different focus. Our analysis covers 2005-06 (Statistics South Africa 2008b), approximately one decade after the end of apartheid and user fee abolition to a select group of South Africans, to 2010-11 (Statistics South Africa 2012b), the last time an Income and Expenditure Survey was undertaken in South Africa.[1] Each is a nationally representative household survey collected by Statistics South Africa and were collected in the democratic era. Therefore, the analysis indirectly correlates post-apartheid policies with either a worsening, or not, of OOP-based health care inequality over time.

[1]In previous research, we had made use of 1995 IES data, which gives us a longer time frame for the analysis, but raises concerns over dynamic comparability, since the two surveys are collected with different methodologies. We thank a reviewer for stressing that concern.

Our results point to reduced inequality for all of our OOP measures over the time period. In some cases, payments that were concentrated among well-off households (progressive) in 2005-06 became less so by 2010-11, while in others, payments that were concentrated among the poorest households became less so. As might be expected, household demographic variables, such as household male headship, children and adults were all concentrated in relatively poorer households, while access to income, medical aid and advanced education was concentrated in the well-off households.[2] Despite those differences, the importance of those variables, as measured by their elasticities, did change, such that by 2010, a number of these determinants were less important in explaining the overall level of concentration. We do find that the minority white population, which was heavily advantaged under apartheid (and, therefore, are concentrated among the well-off), explains a similar proportion of the inequality in 2010-11 as in 2005-06, despite the fact that other variables also concentrated among the well-heeled were included in the analysis. Although such results are not surprising, given what we know about the South African income distribution, since the fall of apartheid (Leibbrandt, Levinsohn, and McCrary 2005; Leibbrandt et al. 2010; Leibbrandt and Levinsohn 2011), it does remind us that more needs to be done to improve the prospects, in this case, the OOP health care prospects, of the previously disadvantaged population groups.

2 Data

Data for this analysis is obtained from two nationally representative cross-sectional Income and Expenditure Surveys (IES) collected in 2005-06 and 2010-11 among South African households (Statistics South Africa 2008b, 2012b). As needed for the analysis we consider here, the surveys collected information on household income and consumption expenditures. Each survey is based on a two-stage stratified random sample, so the data can be weighted to the population; weights were used throughout the analysis. In 2005-06, the statistical agency switched to a a rotating diary method, which was continued in 2010-11. Thus, each of the surveys used follows a similar data collection method. Although that does not guarantee the data can be compared over time, it does imply that making such a comparison is reasonable.

In each of the survey years, the sampling units were divided into quarterly allocations, such that an equal number was interviewed each month in an effort to maintain national representivity, while potentially covering seasonal purchases more accurately (Statistics South Africa 2008c, 2008a; Yu 2008). In 2005-06, that meant that the 3 000 primary sampling units (PSUs), which were was based on the 2001 population census areas, were split into 4 groups and one-third of each quarterly group was sampled in any one month (Statistics

[2]Medical aid in South Africa is similar to health insurance in much of the rest of the world. Individuals pay premiums, potentially funded by employers, and the medical aid scheme covers some portion of health care costs at the point-of-service.

South Africa 2008c). Thus, the survey was carried out over 12 months. A systematic sample of 8 dwelling units was drawn and interviewed, resulting in 24 000 dwelling units. In the end, 22 617 of the identified 25 192 households from the 24 000 dwelling units participated in the survey. Missing information across some of the relevant variables limited the analysis to 20 994 households.

A similar approach was followed in 2010-11, but there were 3 080 PSUs obtained from the master sample, as well as a supplement of 174 urban PSUs obtained from the PSU frame, instead. Although this master sample was also drawn from the 2001 population census, it had been revised from the frame used in the 2005-06 survey. From the 3 080 PSUs and 174 urban PSUs underpinning the 2010-11 frame, 31 007 and 412 dwelling units were sampled, respectively, yielding a total sample of 31 419 dwelling units (Statistics South Africa 2012a). However, data from only 25 328 households is available. As with the 2005-06 data, there was missing information for some of the relevant data, and, therefore, the analysis is based on 25 124 households.

In both surveys, respondents were asked to record their purchases (daily) for a month, while at the end of each week, a fieldworker collected the record from the respondents. One concern that does arise, when expenditure is recorded in a diary is that it does require households to vigilant. It is possible that small purchases will be missed, while other rare purchases might also not show up properly in the data (Yu 2008).

2.1 Definition of Variables

Total household OOP health payments included expenses on consultations, x-ray services, medicines, therapeutic appliances and equipment, dental services, hospital service fees, pharmacy fees, traditional healer fees, services received from medical auxiliaries and other related medical products and service fees (Xu 2005). Importantly, these expenditures do not include any reimbursements that patients expect to receive or have received from their medical aid schemes. As we are dealing with two different survey years, we used the health consumer price index (CPI) from each of the years (90.5 in March 2006 and 126.1 in March 2011) to deflate the nominal values to make them comparable.

In addition to OOP, data on household total consumption expenditure and income were also included. Further, we separated total consumption into food and nonfood expenditure and we calculated non-subsistence expenditure. As with health expenditures, food expenditure was deflated with the food CPI (76.8 in March 2006 and 115.0 in March 2011), while non-food expenditure was deflated using the total CPI (84.3 in 2006 and 115.3 in 2011). We followed Xu (2005) to develop non-subsistence expenditure (NSE), although we used a different equivalence scale – $(A + 0.5K)^{0.95}$ – which has been used widely in the South African literature (Leibbrandt and Woolard 1999; May, Carter, and Posel 1995). That same scale was used to adjust total

household income, total household consumption and nonfood expenditure to create: adult equivalent total income, adult equivalent total expenditure (AETE) and adult equivalent nonfood expenditure (AENFE).[3] OOP was divided by NSE, AETE and AENFE to get OOP shares. These shares give us a different vantage point to consider health care financing: for example ZAR100 out-of-pocket might seem small, but if it is spent from a discretionary budget of 100, it is no longer small.

According to the World Health Organization (2008), social determinants of health include the physical environment, access to health care, educational attainment, income level and age. These determinants are shaped by political, social and economic forces and are responsible for inequity in health care and health financing. Therefore, the choice of socio-economic determinants was based on these identified factors. However, in South Africa, prior to 1994, access to basic services such as to education, health care and employment were subject to legislated racial discrimination, while gender differences also existed (Omotoso and Koch 2018). Consequently, existing empirical literature has documented the important role of gender and ethnicity in influencing health care financing (Ataguba, Day, and McIntyre 2015; Oyinpreye and Moses 2014; Xu and Saskena 2011; You and Kobayashi 2011); therefore, we also include these variables.

The explanatory variables used in this analysis cover: (i) education of the household head, divided into no schooling, some schooling, completed primary, completed secondary and completed tertiary); (ii) ethnicity of the household head (black/African, mixed - denoted by coloured in our household surveys, Asian/Indian and White); (iii) age of the household head in years;[4] (iv) the total number of children as well as the number of children under the age of 5; (v) the total number of adults and elderly - over 60 - adults in the household; (vi) medical aid access in the household (whether or not someone in the household has access to a medical aid); (vii) whether the household has a flush-toilet on site; and residence, such as (viii) province (Western Cape, Eastern Cape, Northern Cape, Free State, KwaZulu-Natal, North-West, Gauteng, Mpumalanga and Limpopo) and (ix) urban locale.

[3] Althought Ataguba (2016) uses $AE = (A + 0.5K)^{0.75}$, Koch (2018) estimates a number of scales and notes that the choice of scale does not impact non-subsistence expenditure; its definition both multiplies and divides by that same scale during the calculation. However, it would be expected to affect adult equivalent total and nonfood expenditure, since the scale is only used in division in those calculations.

[4] In the 2005-06 survey, age is only available in 5 year bands, except for the '85+' group; thus, for all below the top group, the midpoint was used for the age. For those in the top group, 90 was used.

3 Theoretical Framework and Empirical Methods of Estimating Inequality in OOP Payments

3.1 Plotting a Concentration Curve and Estimating a Concentration Index

A concentration curve plots the cumulative shares of household OOP or OOP shares (On the $y-$axis) against the percentiles of socioeconomic status (on the $x-$axis) ranked by the cumulative percentage of the population. If everyone, irrespective of their living standards, pays exactly the same proportion of their income towards health care via OOP, the concentration curve will be a 45° line (showing equality) running from the bottom left-hand corner to the top right-hand corner. However, inequality against the poor exists, if the curve lies above the line of equality; it is against the rich if the curve lies below that line (O'Donnell et al. 2008). However, the concentration curve does not give information on the magnitude of inequality, which is provided by the concentration index or Kakwani index (Kakwani 1976). The concentration (Kakwani) index is directly related to the concentration curve and it quantifies the degree of socio-economic-related inequality in OOP payments (Kakwani 1976; Wagstaff 2000). OOP are progressive if the Kakwani index (C) takes a positive value, and regressive if negative. However, over time, progressivity (regressivity) of OOP payments can vary, implying a shift in concentration of OOP between poor households and non-poor households (Ataguba 2016). For this reason, after computing the C to quantify the degree of inequality in OOP, we examine the change and decompose the change.

The concentration index can be computed as the covariance between OOP health payments (H_i) and the weighted fractional rank in the distribution of socio-economic status (S_i) (O'Donnell et al. 2008); in summation format, this becomes:

$$C = \frac{2}{n\mu}\left[\sum_{i=1}^{n} H_i S_i\right] - 1, \tag{1}$$

where C is the concentration index, the measure of relative inequality. In other words, doubling everyone's health financing value leaves the C unchanged. H_i is household out-of-pocket health care payments or shares, S_i is the fractional rank of household i in the socio-economic status distribution and μ is the weighted mean of OOP (or its share). The C can either be positive or negative, suggesting the direction of the relationship between our health care payment measure and socio-economic status rank. Although conceptually clear, the rank of a household in the socioeconomic status distribution will depend on the measure of that status, although it doesn't depend on the variation in the living standards itself (Wagstaff 2000). In other words, by definition, a change in income inequality should not affect the C. For computation purposes, we estimate the C from the convenience regression version in equation(2).

$$2\sigma_s^2\left(\frac{H_i}{\mu}\right) = \alpha + \beta S_i + \varepsilon_i \tag{2}$$

In (2), σ_s^2 is the weighted variance of the weighted fractional rank, α is the intercept, β is an estimate of the concentration index and ε_i is the error term.

3.2 Decomposing a change in Concentration Index

We follow Wagstaff, Doorslaer, and Watanabe (2003) to decompose the changes in the concentration index into the contribution of individual factors to its inequality. Each contribution of the individual factor to inequality is a product of the sensitivity of the health financing variable with respect to that factor and the degree of inequality in that factor. Initially, we undertake an analysis within each year, to offer insight into the determinants of inequality in health care payments. However, we extend that to account for the changes over time.

Assuming a linear relationship between health care payments and the contributions of k determinants, X_k,

$$H_i = \alpha + \sum_k \beta_k X_{ik} + \epsilon_i, \tag{3}$$

where the X variables are described in the data section. Substituting equation (3) into equation (1) - results in a decomposition that assumes the overall concentration index (C) to be a linear combination of the concentration indexes of the determinants plus an error term:

$$C = \sum_k \left(\frac{\beta_k \overline{X}_k}{\mu}\right) C_k + \frac{GC_\epsilon}{\mu}, \tag{4}$$

where μ is the weighted mean of OOP; $\bar{X}_k$ is the weighted mean of each determinant, C_k is the concentration index for the k^{th} determinant calculated from a version of equation (1) that replaces H_i with X_{ik}; GC_ϵ is the generalized concentration index for the error term (ϵ), defined as

$$GC_\epsilon = \frac{2}{n}\sum_{i=n}^{n} \epsilon_i S_i, \tag{5}$$

As shown by Wagstaff, Doorslaer, and Watanabe (2003), the general approach to unravel the causes of changes in OOP payment inequality is to allow every component of the decomposition in equation (4) to

change over the time period of interest. That time difference yields:

$$\Delta C = \sum_k (\beta_{kt}\overline{X}_{kt})C_{kt} - \sum_k (\beta_{kt-1}\overline{X}_{kt-1})C_{kt-1} + \Delta(GC_{\epsilon t}/\mu_t) \tag{6}$$

However, they further argue that this approach is uninformative, since it does not allow one to estimate to what degree changes in inequality in OOP are attributable to changes in inequality in its determinants or elasticities of those determinants. Instead, Wagstaff, Doorslaer, and Watanabe (2003) propose an application of Oaxaca-type decomposition (Oaxaca 1973; Blinder 1973) to equation (4), which yields:

$$\Delta C = \sum_k \eta_{kt}\left(C_{kt} - C_{kt-1}\right) + \sum_k C_{kt-1}\left(\eta_{kt} - \eta_{kt-1}\right) + \Delta\left(\frac{GC_{vt}}{\mu_t}\right) \tag{7}$$

where t refers to time period and Δ denotes the first difference.

We undertake this analysis in R (R Core Team 2020). We have borrowed heavily from the source code for the IC2 package (Plat 2012), which was developed to estimate extended concentration curves (O'Donnell et al. 2008) and indexes, but does not incorporate the decomposition.[5]

4 Empirical Results

4.1 Data Summary

Table 1 presents descriptive statistics (weighted means) and 95% confidence intervals for our two survey years, 2005-06 and 2010-11. Although a somewhat conservative statistical test, any variables for which no overlap in the confidence intervals exists, does tell us whether or not the population mean for that variable has changed between 2005-06 and 2010-11. To oversimplify, that is true for a large number of the variables used in the analysis. In particular, there has been a change in the ethnic and urban composition of households; there has also been an increase in education completion over time, while fewer households are covered by a medical aid. We also find that there is limited evidence of improvement in the proportion of households with on-site access to a flush toilet. Despite the fact that the two tables compare real values of expenditure overall, on food and on health care OOP, we see large increases across the two surveys, although the OOP values are fairly similar.

[5]The analysis code is available from the authors upon request.

Table 1: Summary Statistics of Analysis Data

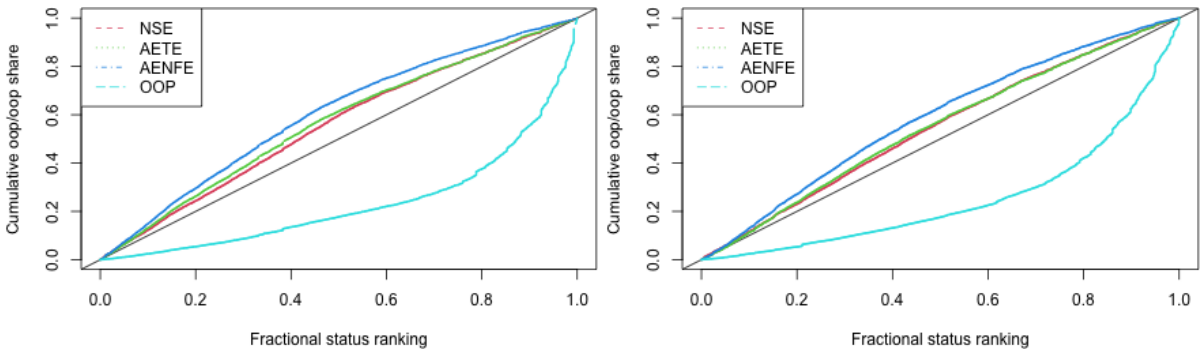
	IES 2005		IES 2010–11 3	
	Wtd Mean	95% Confidence	Wtd Mean	95% Confidence
Household (HH) head age	46.550	(46.34,46.76)	46.364	(46.17,46.55)
Household head is male	0.611	(0.60,0.62)	0.606	(0.60,0.61)
Number of children in HH	1.222	(1.20,1.24)	1.207	(1.19,1.22)
Children under 5 in HH	0.411	(0.40,0.42)	0.396	(0.39,0.40)
Number of adults in HH	2.579	(2.56,2.60)	2.637	(2.62,2.66)
Elderly adults in HH	0.294	(0.29,0.30)	0.294	(0.29,0.30)
Urban residence	0.651	(0.64,0.66)	0.673	(0.67,0.68)
Medical aid coverage	0.184	(0.18,0.19)	0.210	(0.21,0.22)
Flush toilet on site	0.569	(0.56,0.58)	0.608	(0.60,0.61)
HH head with no schooling	0.137	(0.13,0.14)	0.097	(0.09,0.10)
HH head with some primary school	0.268	(0.26,0.27)	0.244	(0.24,0.25)
HH head completed primary	0.324	(0.32,0.33)	0.348	(0.34,0.35)
HH head completed secondary	0.228	(0.22,0.23)	0.245	(0.24,0.25)
HH head completed tertiary	0.043	(0.04,0.05)	0.066	(0.06,0.07)
Household head is African	0.769	(0.76,0.77)	0.766	(0.76,0.77)
HH head is Coloured	0.078	(0.07,0.08)	0.085	(0.08,0.09)
HH head is Asian	0.025	(0.02,0.03)	0.025	(0.02,0.03)
HH head is White	0.128	(0.12,0.13)	0.124	(0.12,0.13)
HH from the Western Cape	0.102	(0.10,0.11)	0.108	(0.10,0.11)
HH from the Eastern Cape	0.139	(0.13,0.14)	0.127	(0.12,0.13)
HH from the Northern Cape	0.024	(0.02,0.03)	0.018	(0.02,0.02)
HH from the Free State	0.072	(0.07,0.08)	0.060	(0.06,0.06)
HH from KwaZulu-Natal	0.178	(0.17,0.18)	0.182	(0.18,0.19)
HH from the North West	0.073	(0.07,0.08)	0.076	(0.07,0.08)
HH from Gauteng	0.238	(0.23,0.24)	0.260	(0.25,0.27)
HH from Mpumalanga	0.071	(0.07,0.07)	0.065	(0.06,0.07)
HH from Limpopo	0.104	(0.10,0.11)	0.104	(0.10,0.11)
HH Assets (normalized)	5.74	(5.69,5.79)	5.48	(5.44,5.53)
HH out-of-pocket payments (ZAR)	85.59	(78.23,92.95)	89.89	(84.17,95.61)
WHO capacity-to-pay (ZAR)	4891.07	(4760.30,5021.84)	6250.92	(6108.97,6392.86)
Adult equivalent total expenditure (ZAR)	2560.55	(2495.07,2626.03)	3054.49	(2988.93,3120.05)
Adult equivalent nonfood expenditure (ZAR)	2354.06	(2286.26,2421.86)	2611.61	(2549.22,2674.00)
Total household expenditure (ZAR)	5703.63	(5568.18,5839.08)	7088.71	(6943.29,7234.14)
Total nonfood expenditure (ZAR)	5210.84	(5070.86,5350.81)	6040.86	(5901.61,6180.12)
Total income (ZAR)	7647.97	(7424.73,7871.22)	8910.83	(8729.38,9092.28)

Weighted means and 95% confidence intervals around those means. Data from the 2005-06 and 2010-11 South African Income and Expenditure Survey: Statistics South Africa (2008b), Statistics South Africa (2012b). The total number of observations for 2005-06 and 2010-11 are 20994 and 25124, respectively.

In addition to the means of the variables, we have plotted concentration curves for each of our measures of OOP health care payments: actual OOP along with three different OOP share measures. Figure 1 depicts those concentrations curves using household income per adult equivalent as the measure of socio-economic status.[6] Panel (a) illustrates 2005-06, while panel (b) covers 2010-11. Although comparing concentration using the figures is not perfect, the figures suggest that all of the concentration curves are closer to the line of equality in 2010-11 than in 2005-06, which implies that concentrations have become less unequal than they were.

[6]See Koch and Setshegetso (2020a) for more detail, including analysis based on assets.

The estimated concentration indexes are in Table 2, and the values back-up our suppositions from the figures. OOP, on its own, is the most progressive, and matches our expectations from a health system that has eliminated user fees for a wide swath of the population, including those with lower incomes (Brink and Koch 2015; Koch and Racine 2016). We find health care OOP to be progressive, although we document slightly lower levels of OOP progressivity compared to Ataguba and McIntyre (2012). We also find relatively more regressivity based on OOP shares, and our estimates are a bit larger (in absolute terms) than those presented by Ataguba (2016), who uses the same data, but rather different methods. The most regressive curve in the figure is the one associated with the share of OOP out of adult equivalent nonfood expenditure. As shown elsewhere, OOP shares are quite low in South Africa (Setshegetso 2020). Even though they are low, the results do suggest a positive change; the share of household non-subsistence spending devoted to health care OOP, among poorer households relative to richer households, has fallen.



(a) Concentration in 2005

(b) Concentration in 2010

Figure 1: Concentration Curves for out-of-pocket payment concentration and out-of-pocket payment as a share of the capacity-to-pay for the years 2005-06 and 2010. Note: Out-of-pocket payment share denominators are determined by different capacities to pay: adult equivalent total expenditure (AETE), adult equivalent nonfood expenditure (AENFE) and non-subsistence expenditure (NSE). Socioeconomic status is determined by household income per adult equivalent, and all data is weighted.

Table 2: Estimated concentration indexes and standard errors for out-of-pocket payments and shares relative to capacity-to-pay.

	NSE	AETE	AENFE	OOP
Concentration in 2005	-0.1111	-0.1324	-0.2013	0.5355
	(0.007)	(0.008)	(0.008)	(0.025)
Concentrtation in 2010	-0.0887	-0.0941	-0.1667	0.4976
	(0.007)	(0.008)	(0.007)	(0.018)

Out-of-pocket payment share denominators are determined by different capacities to pay: adult equivalent total expenditure (AETE), adult equivalent nonfood expenditure (AENFE) and non-subsistence expenditure (NSE). Socioeconomic status is determined by household income per adult equivalent, and all data is weighted.

4.2 Decomposition within years

Tables 3 and 4 present the within-year decomposition of the OOP health payments concentration index. Each table contains 16 columns, four for each of the OOP health care finance payments. Within each set, we see the concentration index: the first row is the overall OOP health payment index, while the remaining rows cover the index for the rest of the factors.[7] We will briefly discuss the last four columns of each table, as there are far too many numbers to discuss succinctly.

[7] Yes, each factor's C is the same for each of the outcomes, because we use the same socioeconomic status measure.

Table 3: Concentration index decomposition (2005), where socioeconomic status is based on adult equivalent household income.

	NSE				AETE				AENFE				OOP			
	CI	η	Total	%	CI	η	Total	%	CI	η	Total	%	CI	η	Total	%
Health payment concentration	-0.111				-0.132				-0.201				0.536			
Adult Equivalent Income	0.691	-0.010	-0.007	6.08	0.691	0.002	0.001	-0.96	0.691	0.002	0.001	-0.57	0.691	0.278	0.192	35.89
Age of household (hh) head	-0.016	0.361	-0.006	5.06	-0.016	0.242	-0.004	2.85	-0.016	0.208	-0.003	1.61	-0.016	0.570	-0.009	-1.66
Male hh head	0.126	-0.072	-0.009	8.14	0.126	-0.057	-0.007	5.37	0.126	-0.045	-0.006	2.81	0.126	0.104	0.013	2.45
Kids in hh	-0.257	-0.015	0.004	-3.38	-0.257	0.146	-0.038	28.33	-0.257	0.162	-0.042	20.71	-0.257	0.206	-0.053	-9.87
Kids under 5 in hh	-0.264	0.060	-0.016	14.33	-0.264	0.060	-0.016	11.88	-0.264	0.067	-0.018	8.78	-0.264	-0.028	0.007	1.40
Adults in hh	-0.081	-0.137	0.011	-9.95	-0.081	0.582	-0.047	35.51	-0.081	0.558	-0.045	22.42	-0.081	0.033	-0.003	-0.50
Adults over 60 in hh	-0.058	0.044	-0.003	2.30	-0.058	0.055	-0.003	2.40	-0.058	0.050	-0.003	1.44	-0.058	0.073	-0.004	-0.79
Urban residence	0.166	-0.082	-0.014	12.31	0.166	-0.094	-0.016	11.83	0.166	-0.110	-0.018	9.07	0.166	-0.027	-0.005	-0.84
Access to medical aid	0.678	0.000	0.000	-0.13	0.678	0.029	0.019	-14.64	0.678	-0.000	-0.000	0.02	0.678	0.146	0.099	18.46
Flush toilet on-site	0.247	-0.128	-0.032	28.49	0.247	-0.055	-0.014	10.28	0.247	-0.103	-0.025	12.57	0.247	-0.030	-0.007	-1.39
HH head some schooling	-0.263	0.001	-0.000	0.19	-0.263	0.020	-0.005	3.92	-0.263	-0.011	0.003	-1.43	-0.263	0.065	-0.017	-3.19
HH head completed primary	-0.007	-0.022	0.000	-0.14	-0.007	0.023	-0.000	0.12	-0.007	-0.033	0.000	-0.12	-0.007	0.124	-0.001	-0.16
HH head completed secondary	0.406	-0.034	-0.014	12.48	0.406	0.010	0.004	-3.00	0.406	-0.035	-0.014	7.06	0.406	0.086	0.035	6.50
HH head completed tertiary	0.798	-0.003	-0.003	2.37	0.798	0.004	0.003	-2.63	0.798	-0.005	-0.004	1.86	0.798	0.128	0.102	19.03
HH head: mixed ethnicity	0.127	-0.008	-0.001	0.88	0.127	-0.015	-0.002	1.43	0.127	-0.013	-0.002	0.84	0.127	0.011	0.001	0.26
HH head: asian ethnicity	0.388	0.000	0.000	-0.02	0.388	0.003	0.001	-1.00	0.388	-0.001	-0.000	0.22	0.388	0.013	0.005	0.92
HH head: white ethnicity	0.748	0.008	0.006	-5.09	0.748	0.002	0.002	-1.27	0.748	-0.001	-0.000	0.22	0.748	0.217	0.162	30.27
Eastern Cape	-0.180	0.009	-0.002	1.52	-0.180	0.010	-0.002	1.30	-0.180	0.003	-0.001	0.31	-0.180	0.006	-0.001	-0.20
Northern Cape	-0.090	-0.000	0.000	-0.03	-0.090	0.002	-0.000	0.11	-0.090	-0.000	0.000	-0.01	-0.090	0.001	-0.000	-0.02
Free State	0.015	0.015	0.000	-0.20	0.015	0.023	0.000	-0.27	0.015	0.014	0.000	-0.10	0.015	0.042	0.001	0.12
KwaZulu-Natal	-0.105	0.069	-0.007	6.49	-0.105	0.067	-0.007	5.31	-0.105	0.064	-0.007	3.36	-0.105	0.031	-0.003	-0.61
North West	-0.034	-0.007	0.000	-0.22	-0.034	0.002	-0.000	0.06	-0.034	-0.006	0.000	-0.10	-0.034	0.009	-0.000	-0.06
Gauteng	0.215	-0.008	-0.002	1.49	0.215	-0.009	-0.002	1.44	0.215	-0.018	-0.004	1.98	0.215	0.091	0.020	3.66
Mpumalanga	-0.124	-0.002	0.000	-0.18	-0.124	0.000	-0.000	0.00	-0.124	-0.005	0.001	-0.30	-0.124	0.011	-0.001	-0.25
Limpopo	-0.225	-0.033	0.007	-6.61	-0.225	-0.028	0.006	-4.83	-0.225	-0.039	0.009	-4.37	-0.225	0.006	-0.001	-0.25
Residual			-0.026	23.83			-0.009	6.46			-0.024	11.73			0.004	0.82

Wagstaff and Doorslaer (2003) decompostion, where $\eta = \beta \bar{X}_k / \mu$ is the elasticity, Total is the contribuion to the index from that determinant and % is the percent of the total. NSE refers to non-subsistence expenditure, as defined by Xu (2005). In all cases out-of-pocket expenditure follows Xu (2005). AETE refers to adult equivalent total expenditure as defined by O'Donnell et al. (2008). AENFE refers to adult equivalent nonfood expenditure as defined by Wagstaff and Doorslaer (2003).

Table 4: Concentration index decomposition (2010), where socioeconomic status is based on adult equivalent household income.

	NSE				AETE				AENFE				OOP			
	CI	η	Total	%	CI	η	Total	%	CI	η	Total	%	CI	η	Total	%
Health payment concentration	-0.089				-0.094				-0.167				0.498			
Adult Equivalent Income	0.665	-0.057	-0.038	42.41	0.665	-0.038	-0.026	27.12	0.665	-0.031	-0.021	12.55	0.665	0.256	0.170	34.19
Age of household (hh) head	-0.001	0.186	-0.000	0.19	-0.001	0.114	-0.000	0.11	-0.001	0.060	-0.000	0.03	-0.001	-0.036	0.000	0.01
Male hh head	0.115	-0.037	-0.004	4.76	0.115	-0.017	-0.002	2.03	0.115	-0.027	-0.003	1.88	0.115	0.079	0.009	1.83
Kids in hh	-0.209	-0.009	0.002	-2.17	-0.209	0.153	-0.032	33.81	-0.209	0.180	-0.038	22.57	-0.209	0.029	-0.006	-1.21
Kids under 5 in hh	-0.223	0.034	-0.008	8.62	-0.223	0.039	-0.009	9.21	-0.223	0.034	-0.008	4.61	-0.223	0.085	-0.019	-3.81
Adults in hh	-0.058	-0.102	0.006	-6.64	-0.058	0.639	-0.037	39.26	-0.058	0.625	-0.036	21.67	-0.058	0.227	-0.013	-2.64
Adults over 60 in hh	0.029	0.017	0.001	-0.57	0.029	0.021	0.001	-0.66	0.029	0.020	0.001	-0.36	0.029	0.059	0.002	0.35
Urban residence	0.157	0.012	0.002	-2.09	0.157	-0.020	-0.003	3.35	0.157	-0.049	-0.008	4.63	0.157	-0.007	-0.001	-0.23
Access to medical aid	0.649	-0.026	-0.017	18.70	0.649	-0.014	-0.009	9.36	0.649	-0.038	-0.025	14.92	0.649	0.131	0.085	17.07
Flush toilet on-site	0.220	-0.179	-0.039	44.49	0.220	-0.100	-0.022	23.36	0.220	-0.159	-0.035	21.02	0.220	-0.082	-0.018	-3.64
HH head some schooling	-0.301	-0.001	0.000	-0.49	-0.301	-0.015	0.005	-4.92	-0.301	-0.025	0.008	-4.51	-0.301	0.005	-0.002	-0.30
HH head completed primary	-0.067	-0.051	0.003	-3.86	-0.067	-0.035	0.002	-2.46	-0.067	-0.074	0.005	-2.97	-0.067	0.028	-0.002	-0.38
HH head completed secondary	0.353	-0.057	-0.020	22.63	0.353	-0.036	-0.013	13.64	0.353	-0.073	-0.026	15.41	0.353	0.000	0.000	0.02
HH head completed tertiary	0.731	-0.011	-0.008	8.71	0.731	-0.005	-0.004	3.86	0.731	-0.015	-0.011	6.76	0.731	0.061	0.045	8.98
HH head: mixed ethnicity	0.153	0.001	0.000	-0.16	0.153	-0.000	-0.000	0.06	0.153	0.002	0.000	-0.16	0.153	0.019	0.003	0.57
HH head: asian ethnicity	0.484	-0.001	-0.001	0.78	0.484	0.001	0.000	-0.52	0.484	-0.003	-0.001	0.74	0.484	0.019	0.009	1.87
HH head: white ethnicity	0.699	0.039	0.027	-30.69	0.699	0.044	0.031	-32.61	0.699	0.033	0.023	-13.77	0.699	0.265	0.185	37.20
Eastern Cape	-0.224	-0.066	0.015	-16.77	-0.224	-0.067	0.015	-15.98	-0.224	-0.073	0.016	-9.82	-0.224	-0.081	0.018	3.65
Northern Cape	0.024	-0.008	-0.000	0.21	0.024	-0.008	-0.000	0.20	0.024	-0.008	-0.000	0.11	0.024	-0.011	-0.000	-0.05
Free State	-0.036	0.024	-0.001	0.98	-0.036	0.031	-0.001	1.17	-0.036	0.027	-0.001	0.58	-0.036	-0.007	0.000	0.05
KwaZulu-Natal	-0.089	0.007	-0.001	0.69	-0.089	0.007	-0.001	0.62	-0.089	0.005	-0.000	0.25	-0.089	-0.066	0.006	1.18
North West	-0.100	-0.031	0.003	-3.46	-0.100	-0.025	0.003	-2.68	-0.100	-0.032	0.003	-1.94	-0.100	-0.042	0.004	0.85
Gauteng	0.244	-0.020	-0.005	5.58	0.244	-0.006	-0.002	1.66	0.244	-0.022	-0.005	3.23	0.244	0.011	0.003	0.54
Mpumalanga	-0.067	0.006	-0.000	0.46	-0.067	0.010	-0.001	0.69	-0.067	0.004	-0.000	0.17	-0.067	-0.014	0.001	0.19
Limpopo	-0.279	-0.064	0.018	-20.25	-0.279	-0.063	0.017	-18.53	-0.279	-0.076	0.021	-12.63	-0.279	-0.059	0.016	3.31
Residual			-0.025	27.96			-0.008	8.85			-0.025	15.02			0.002	0.39

Wagstaff and Doorslaer (2003) decompostion, where $\eta = \beta \bar{X}_k / \mu$ is the elasticity, Total is the contribuion to the index from that determinant and % is the percent of the total. NSE refers to non-subsistence expenditure, as defined by Xu (2005). In all cases out-of-pocket expenditure follows Xu (2005). AETE refers to adult equivalent total expenditure as defined by O'Donnell et al. (2008). AENFE refers to adult equivalent nonfood expenditure as defined by Wagstaff and Doorslaer (2003).

In 2005-06, the largest elasticities (all positive, in this case) are for: age of the household head, adult equivalent income, white households and total children in the household. On the other hand, the concentration indexes were largest for variables that one would expect to see concentrated among the well-off: the completion of tertiary education by the household head, white households (given South Africa's apartheid history), adult equivalent income and access to a medical aid. Given the way the decomposition is determined, it is not surprising that adult equivalent income and white households are the largest contributors to inequality in OOP payments. On the other hand, the largest detractor from inequality is for the total number of children in the household, which are more concentrated among the poor and has a relatively high elasticity. In this case, since the inequality measure is pro-rich, and, therefore, OOP payments are progressive, a detractor reduces the degree of progressiveness in inequality, i.e., it pushes it towards greater equality.

In 2010-11, elasticities were the largest for white households, adult equivalent income, adults in the household and access to a medical aid. On the other hand, the concentration was largest (thus, concentrated among the well-off) for the completion of tertiary education by the head of the household, white households, adult equivalent income and medical aid status. Therefore, the largest contributors to inequality in OOP payments were white households, adult equivalent income, medical aid access and tertiary education. There was little in the way of inequality mitigation, although having a flush toilet on-site and young children in the household were associated with a small reduction in inequality. As with the 2005-06 OOP concentration index, since the inequality was progressive, the reduction in inequality made it slightly less progressive, and, therefore, more equal.

4.3 Decomposition across years

As outlined in the methods section, we decompose the changes in the health payments concentration index; see (7) for details. Our focus is on the extent to which changes in OOP payments inequality over time are due to changes in inequality in the factors that explain OOP and/or changes in their elasticities. We present results that use adult equivalent household income as the measure of socioeconomic status in Table 5.

As with the previously discussed tables, this table includes 16 columns, four for each of the four measures of OOP-related health care financing. Within each finance group, we provide two sets of decompositions, the first, $\eta\Delta C$ measures the effect of the change in the factor's concentration index, holding the elasticity at the 2005-06 value. The second, $C\Delta\eta$ accounts for the change in elasticity over time, but holds the concentration index at the 2010-11 value.[8]

[8] As suggested by O'Donnell et al. (2008), other weighting structures are possible. We present an alternative weighting structure and respective results in Koch and Setshegetso (2020a).

Table 5: Concentration index decomposition from 2005-06 to 2010, where socioeconomic status is based on a first principal component asset index.

	NSE				AETE				AENFE				OOP			
	$\eta\Delta C$	$C\Delta\eta$	Total	Percent	$\eta\Delta C$	$C\Delta\eta$	Total	Percent	$\eta\Delta C$	$C\Delta\eta$	Total	Percent	$\eta\Delta C$	$C\Delta\eta$	Total	Percent
Δ Concentration			0.022	100.0			0.038	100.0			0.035	100.0			-0.038	100.0
Adult Equivalent Income	0.001	-0.032	-0.031	-137.6	0.001	-0.028	-0.027	-69.9	0.001	-0.023	-0.022	-63.6	-0.007	-0.016	-0.022	58.2
Age of household (hh) head	0.003	0.003	0.005	24.3	0.002	0.002	0.004	9.6	0.001	0.002	0.003	9.2	-0.001	0.009	0.009	-23.5
Male hh head	0.000	0.004	0.005	21.5	0.000	0.005	0.005	13.6	0.000	0.002	0.003	7.3	-0.001	-0.003	-0.004	10.6
Kids in hh	-0.000	-0.001	-0.002	-8.2	0.007	-0.002	0.006	14.9	0.009	-0.005	0.004	11.8	0.001	0.045	0.047	-123.4
Kids under 5 in hh	0.001	0.007	0.008	36.9	0.002	0.005	0.007	18.4	0.001	0.009	0.010	28.8	0.004	-0.030	-0.026	69.7
Adults in hh	-0.002	-0.003	-0.005	-23.1	0.015	-0.005	0.010	26.3	0.014	-0.005	0.009	26.0	0.005	-0.016	-0.010	27.5
Adults over 60 in hh	0.002	0.002	0.003	13.6	0.002	0.002	0.004	9.9	0.002	0.002	0.004	10.1	0.005	0.001	0.006	-15.6
Urban residence	-0.000	0.016	0.016	69.3	0.000	0.012	0.013	32.7	0.000	0.010	0.011	30.4	0.000	0.003	0.003	-8.9
Access to medical aid	0.001	-0.017	-0.017	-74.6	0.000	-0.029	-0.028	-73.6	0.001	-0.026	-0.025	-71.6	-0.004	-0.010	-0.014	36.7
Flush toilet on-site	0.005	-0.013	-0.008	-34.8	0.003	-0.011	-0.008	-21.8	0.004	-0.014	-0.010	-28.1	0.002	-0.013	-0.011	28.0
HH head some schooling	0.000	0.001	0.001	2.8	0.001	0.009	0.010	25.6	0.001	0.004	0.005	13.4	-0.000	0.016	0.016	-41.0
HH head completed primary	0.003	0.000	0.003	14.6	0.002	0.000	0.002	6.5	0.004	0.000	0.005	13.6	-0.002	0.001	-0.001	2.7
HH head completed secondary	0.003	-0.009	-0.006	-27.7	0.002	-0.019	-0.017	-43.9	0.004	-0.015	-0.011	-33.1	-0.000	-0.035	-0.035	91.4
HH head completed tertiary	0.001	-0.006	-0.005	-22.7	0.000	-0.007	-0.007	-18.6	0.001	-0.009	-0.008	-21.7	-0.004	-0.053	-0.057	150.8
HH head: mixed ethnicity	0.000	0.001	0.001	5.0	-0.000	0.002	0.002	4.8	0.000	0.002	0.002	5.7	0.000	0.001	0.001	-3.8
HH head: asian ethnicity	-0.000	-0.001	-0.001	-3.2	0.000	-0.001	-0.001	-2.2	-0.000	-0.001	-0.001	-2.3	0.002	0.002	0.004	-11.5
HH head: white ethnicity	-0.002	0.023	0.022	96.2	-0.002	0.031	0.029	75.6	-0.002	0.025	0.023	67.4	-0.013	0.036	0.023	-60.6
Eastern Cape	0.003	0.014	0.017	73.9	0.003	0.014	0.017	43.7	0.003	0.014	0.017	48.9	0.004	0.016	0.019	-50.6
Northern Cape	-0.001	0.001	-0.000	-1.0	-0.001	0.001	-0.000	-0.1	-0.001	0.001	-0.000	-0.6	-0.001	0.001	-0.000	0.4
Free State	-0.001	0.000	-0.001	-4.9	-0.002	0.000	-0.001	-3.8	-0.001	0.000	-0.001	-3.4	0.000	-0.001	-0.000	1.0
KwaZulu-Natal	0.000	0.006	0.007	29.4	0.000	0.006	0.006	16.8	0.000	0.006	0.006	18.3	-0.001	0.010	0.009	-24.1
North West	0.002	0.001	0.003	12.6	0.002	0.001	0.003	6.8	0.002	0.001	0.003	8.7	0.003	0.002	0.005	-11.9
Gauteng	-0.001	-0.003	-0.003	-14.7	-0.000	0.001	0.000	0.9	-0.001	-0.001	-0.001	-4.1	0.000	-0.017	-0.017	44.7
Mpumalanga	0.000	-0.001	-0.001	-2.7	0.001	-0.001	-0.001	-1.7	0.000	-0.001	-0.001	-2.6	-0.001	0.003	0.002	-6.0
Limpopo	0.003	0.007	0.011	47.4	0.003	0.008	0.011	28.8	0.004	0.008	0.012	35.3	0.003	0.015	0.018	-46.9
Residual			0.002	7.5			0.000	0.6			-0.001	-4.1			-0.002	6.4

Wagstaff and Doorslaer (2003) decompostion, where $\eta = \beta\bar{X}_k/\mu$ is the elasticity, Total is the contribuion to the index from that determinant and % is the percent of the total. NSE refers to non-subsistence expenditure, as defined by Xu (2005). In all cases out-of-pocket expenditure follows Xu (2005). AETE refers to adult equivalent total expenditure as defined by O'Donnell et al. (2008). AENFE refers to adult equivalent nonfood expenditure as defined by Wagstaff and Doorslaer (2003).

To keep the discussion simple, we focus, as before, on only the last four columns, which are based on OOP health care financing, rather than OOP shares. Between 2005-06 and 2010-11, the concentration index decreased by approximately 4 points (out of 100), falling from 0.536 to 0.498; see the first row of the last four columns of Tables 3 and 4 to verify. The factors contributing most to this reduction were (which means that they are working in the same direction, i.e., a reduction in this case): households with a head that had completed ether tertiary or secondary education, children under 5 and adult equivalent income. Not all factors, however, contributed to the reduction. Some worked against, including: the total number of children in the household, white households and households, whose head had not completed any schooling.

5 Discussion of Results

We initially presented concentration curves and indexes for two survey years, 2005-06 and 2010-11. From these curves and indexes, we see that actual OOP payments are progressive, in agreement with Ataguba and McIntyre (2012); it is also to be expected, given the low rates of catastrophic health payments found by Koch and Setshegetso (2020b). For the various OOP share measures, the concentrations were closer to zero (in absolute terms), albeit providing evidence of share regressivity. Thus, in addition to agreeing with previous findings related to the low levels of catastrophic expenditure, we are also able to show that these shares are fairly equally distributed. Thus, in terms of affordability, there is some evidence to suggest that out-of-pocket health care financing, as a share of an individual's ability to pay, is nearly equitable. The reason for that, as we also show, is that actual OOP payments are progressive; it is the better-off households that make most of these or at least most of the larger payments. Although this could be good news, as it suggests that health care financing has become less reliant on OOP payments from poor households, it may also suggest that poorer households are simply less likely to make use of health care. Either way, the results do suggest that more work is needed to further offset the budgetary effects of out-of-pocket payments. No, they do not pay much out-of-pocket; however, given how little they have, any payment is more problematic for them than for others.

We extended the analysis to examine the socio-economic factors that contribute to OOP payment concentration, decomposing the effects of these factors on the overall picture within and across years, calculating the contribution of each factor to the overall level of concentration. Since actual OOP payments were concentrated pro-rich, factors that were also concentrated among the rich contributed to OOP payment inequality. For example, medical aid access and adult equivalent income are fairly concentrated among rich households and were found to contribute to (pro-rich) inequality in OOP health payments. Education, which is pro-rich, especially for high levels of education (completed secondary and completed tertiary), also explains OOP health

care payments inequalities; however, not nearly to the degree as adult equivalent income and medical aid access. Discouragingly, despite the fact that apartheid ended more than 15 years before the final data set was collected, white households are highly concentrated within the upper end of our measures of socio-economic status, and this has worsened. This small group of households, approximately 12.5% of the sample in either year, see Table 1, explains a large percent of the total level and the total change in OOP health payment inequality.

We included a range of additional controls in our analysis, such as: male-headship; age of the household head; young children and elderly adults in the household. We did so, because the theoretical and empirical literature finds that these variables are often related to health, and, therefore, could be expected to relate to health payments, whether or not they are OOP. With respect to theory, Grossman (1972) and Grossman (2000) highlight the importance of health capital depreciation, which worsens with age. There is extensive empirical evidence in support of increased OOP payments for the elderly and the young (Adisa 2015; Akinkugbe, Chama-Chiliba, and Tlotlego 2012; Barros, Bastos, and Damaso 2011; Brinda et al. 2015; Choi et al. 2015; Doubova et al. 2015; Ntuli et al. 2016; Rahman et al. 2013; Su, Kouyate, and Flessa 2006; Wang, Li, and Chen 2015). In our results, we did find some evidence that male-headship, as well as the age structure of the household offered some explanatory power in explaining OOP payment inequality and its change over this five-year period; however, the contribution of family structure was somewhat larger for children than for the elderly; furthermore, the decomposition effects and the change in decomposition effects did not generally work in the same direction for both young children and elderly adults in the household, as expected, given the literature.

Finally, we considered measures related to sanitation, such as a flush toilet, on-site, which is expected to matter for health, and, therefore, OOP health financing. For example, dirty and contaminated water combined with poor sanitation contributes to malnutrition and is also a leading cause of death in children, particularly those under five years of age (Ghiasvand et al. 2014). Furthermore, O'Donnell et al. (2005) find that catastrophic health expenditure incidence is lower in households with a sanitary toilet and safe drinking water. Those results suggest that clean living conditions may offer health care financial risk protection to households. We find some evidence that access to an on-site flush toilet matters for reducing the progressivity of OOP health financing; the within year effects are rather small.

6 Conclusion

This research has examined the distribution of OOP health care payments, which offers us a partial answer to who pays for health care out-of-pocket? However, the answer is not particularly short. We find that the households who are in a stronger socioeconomic position, either in terms of income or asset wealth, are more apt to incur OOP payments. For a country like South Africa, which has adopted a number of social protection policies, such as user fee abolition for those in poorer economic circumstances, it is not surprising that out-of-pocket payments are less concentrated among the poor households.

However, the distribution of the ratio of out-of-pocket payments to (adjusted) household expenditure falls on poorer households. Fortunately, from 2005-06 to 2010-11, out-of-pocket payments and payment shares have become less regressive. The clear decrease in regressivity, however, has been matched by increases in income inequality, medical aid access inequality and educational attainment inequality, each of which is more skewed towards the well-heeled in South Africa. Such results highlight the potential inequality reduction benefits of alternatives to OOP health financing.

For the most part, the increase in inequality in education, medical aid access, income and ethnicity have worked to make OOP health financing, either as shares or in total, more regressive over time, a potentially worrisome trend. Such results suggest that health care financing policy conducted in a vacuum could yield less fruitful gains than one that is part and parcel of an over-arching human capital policy. Health and education are co-determinants of human capital, as we have known for quite some time (Grossman 1972, 2000); therefore, improvements in both are necessary, especially if there are improvements among the poor.

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