Financial Risk Protection, Decomposition and Inequality Analysis of Household Out-of-Pocket Health Payments

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This research examines equity trends in financing health care through out-of-pocket payments (OOP) using South African Income and Expenditure Surveys for the periods 1995, 2000, 2005-06 and 2010-11. South Africa is interesting to examine for a variety of reasons. In 1994, South Africa removed user charges at public health facilities (clinics) for children aged below six years, pregnant and nursing mothers and the elderly (as long as they were not covered by any medical aid scheme) with the aim of increasing access to public health care facilities. The policy was extended to the entire population in 1996. These initiatives, even though they were targeted at promoting access, were also an effort on the part of policy makers to cushion households against the financial costs associated with the consumption of medical care – something that is likely to influence the distribution of household OOP. Whether, this indeed has been the case remains relatively unknown. Within the scope of the investigation, this thesis tries to answer three broad questions: (i) What is the incidence of catastrophic health care expenditures (CHE) arising from OOP health care financing in South Africa from 1995 to 2011? (ii) What are the factors influencing the incidence of CHE among male and female headed households? and (iii) Who pays for health care in South Africa?

In investigating the incidence of catastrophic health expenditure, the research has employed two approaches, which are: the financial burden approach and the income approach – the income approach is derived from the equity measures of public finance where progressivity is the main concern, while the financial burden approach argues that the burden should be equally distributed across all households (see Carrin et al., 2009). Both approaches relate health payments incurred by households to households' capacity (ability) to pay and not to households' risks of illness, albeit with different definitions of the capacity (ability) to pay. The research has found that in 1995, around 0.03 percent of households incurred health expenses that are likely to force them to cut back on consumption of other basic needs, while for the years 2000, 2005-06 and 2010-11, the incidence is 0.06 percent, 0.09 percent and 0.07 percent, respectively. Given such a low incidence of CHE, the research evaluated the utilisation of health care facilities by households when confronted with illness. This was only done for the year 1995, as it is only year in which data was collected on the illness status of each household member, whether or not they consulted when ill and where they consulted. The results suggest that a negligible percentage of households did not seek treatment when ill. Of those who consulted, it was found that a relatively higher percentage sought treatment in public health care facilities (0.21 percent) than in private facilities (0.13 percent).

Having established the incidence of CHE, the second analysis examined the factors associated with CHE and then decomposed the difference between male-headed and female-headed households to establish whether the gap between the two groups had widened or narrowed. The results suggest that the gender gap in the incidence of CHE narrowed by 0.4 percent between 1995 and 2010-11. This reduction in the gender gap is attributable to education, access to piped water and residing in urban areas. Across the different surveys (as well as over the entire time

period) education, having access to piped water and residing in urban areas narrowed the gender gap. These results are consistent with existing evidence documenting the important role played by access to basic amenities, such as water and sanitation, as well as human capital (education), in explaining gendered inequalities in health care.

Finally, the research examined the distribution of health payments relative to income, focusing on who incurs OOP for their health care needs to establish OOP concentration and quantify its magnitude. The levels of concentation were compared over time, and decomposed to see if it was possible to attribute changes in social determinants of health to the level of concentration in OOP payments for health care. In general, health care payments are concentrated among non-poor households, suggesting that there is progressivity in health care financing, at least as it pertains to OOP. Such results are corroborated by the corresponding concentration indices. When the analysis occurs across the 15-year time period from 1995 to 2010-11, the research finds that changing inequalities across age groups, racial groups, education (particularly completion of secondary education), well-being quintiles and type of toilet used, as well as water source for drinking, explained changes in OOP concentration. It was also found that changing elasticities with respect to OOP payments also play a crucial role in explaining differences over time. Overall, most of the changes in OOP payment inequality are attributable to inequality in the social determinants.

To my family and friends, thank you for the support. I made it. To my supervisor, thank you for believing in me and giving me the confidence.

I, Naomi Setshegetso, declare that this thesis titled, “Financial Risk Protection, Decomposition and Inequality Analysis of Household Out-of-Pocket Health Payments" and the work presented in it are my own. I confirm that:

- This work was done wholly or mainly while in candidature for a research degree at this University.
- Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated.
- Where I have consulted the published work of others, this is always clearly attributed.
- Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work.
- I have acknowledged all main sources of help.
- Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself.

Signed:

Date:

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TABLE OF CONTENTS

List of Tables

List of Figures

CHAPTER 1

INTRODUCTION

1.1 Overview

The world over, OOP payments are considered an inequitable means of financing health care. This explains why after their implementation, most countries in the 90's reversed on their tracks and removed them Yates (see 2009) – who has documented a list of countries and when they removed user fees in public health facilities. While the story for South Africa stems from a slightly different perspective, the country's history of discrimination structured according to race, gender and age-based hierarchies greatly influenced the organisation of social life and access to health care, labour markets and education (Coovadia et al., 2009; African National Congress, 1994). In health care for instance, discrimination in South Africa meant that different population groups had their own health care departments (Ataguba, 2012; Coovadia et al., 2009). The black majority were forced to reside in rural areas where health systems were heavily underfunded, while high quality care was skewed towards health facilities serving the white minority in urban areas (McIntyre and Mooney, 2007). Consequently, this segregation not only resulted in different health outcomes observed by racial group but, also resulted in disparities observed among other characteristics such as gender and urban-rural place of residence. Segregation also impacted on employment, education as well as on OOP payments made for health care. Generally, individuals and households with low educational level, also have low income and unlike those with relatively high educational level and income, are more likely to incur catastrophic OOP health payments (Duan et al., 2019).

That is why post the apartheid era, South Africa undertook a number of key reforms[1] as efforts to reduce inequalities that were brought about by segregation. Key among the said reforms

[1]Health reforms date as far back as 1928 in South Africa, but the focus of our study is health reforms adopted post-apartheid era particularly, the 1994 and 1996 free health care reforms

was the implementation of the Reconstruction and Development Programme (RDP). Through this policy, the South African government reconstructed health care services to improve accessibility for the previously marginalised groups and, subsequently, the entire population. In 1994, South Africa abolished user fees in government clinics among the elderly, children below the age of six years, and pregnant and nursing mothers (as long as they were not covered by a medical aid scheme) (African National Congress, 1994). In 1996, the user fee abolition policy was further extended to the entire population, as long as they were not living in a household earning more than R100 000 per year in 1995 prices (Brink and Koch, 2015; Koch, 2015b; Morestein and Ridde, 2009; Leatt et al., 2006). With the abolition of user fees in South Africa, households and individuals could consult and obtain prescribed drugs and receive inpatient care without paying any fees at government clinics (Republic of South Africa, 1994b). In this way, health could be regarded as “free". The “free" health care policy initiatives were expected to increase access to and utilisation of public health care facilities. They were also expected to alleviate household budgets by reducing household burdens associated with out-of-pocket payments (OOP) for health care services.

Undoubtedly, the post-apartheid policies have resulted in changes in OOP health financing South Africa as well as on health outcomes (Brink and Koch, 2015; Koch and Racine, 2016; Koch, 2017). There is however, still a need to examine whether financial protection in South Africa was equally improved following user fee abolitions. The reason being, while improvements with regard to fiscal equity (as measured by the incidence of catastrophic costs) is reported to have been made between 1993 and 2008 in South Africa, households' complaints about lack of medicine, long queues and rude staff in public facilities (Burger et al., 2012; Mutyambizi et al., 2019), could reverse the progress made with regard to fiscal equity. This wont be surprising because, documented evidence in other developing countries suggest that the removal of financial barriers has been ineffective in protecting households from adverse health events due to unavailability of drugs and medical services, as well as poorer quality services at health facilities where user fees have been removed (see El-Khoury et al., 2012; Leone et al., 2012; Masiye et al., 2016; Ukwaja et al., 2013).

It is against this background, that this research aims to broaden our understanding of the equity aspects of OOP in a context where “free" health care prevails, to shed light on the extent to which such a policy has been (in)equitable in promoting financial risk protection. In some sense, one would expect that a nearly “free" health care system could offer the ultimate version of financial risk protection, even though it may contain other shortcomings. Drawing data from four nationally representative surveys, this research examines the equity aspects of OOP health care financing in South Africa. Within the scope of the investigation, the thesis tries to answer three broad questions. The first question is: what is the incidence of catastrophic health care expenditures (CHE) arising from OOP in South Africa from 1995 to 2011? To address this question, we follow standard convention in the literature, classifying households according

to their share of OOP relative to their capacity-to-pay. That literature posits that spending a fraction on health care (that is equal to or exceeds some arbitrary threshold of household income), represents an approximate income share at which households are likely to be forced to reallocate their resources by reducing non-health expenditures (Russell, 2004). We explore the effect of applying different definitions of capacity to pay. After establishing the incidence of CHE, we ask a second question: which socio-economic factors are associated with gender inequalities related to incurring CHE. Such factors are then decomposed to shed light on the contribution of each factor. The third question examined is: who pays for health care out-of-pocket in South Africa? Within this chapter, we establish OOP concentration, either as pro-poor or pro-rich, and quantify the magnitude of such concentration, which we also decompose over time. The data used in the thesis is sourced from four South African Income and Expenditure Surveys (IES) conducted in 1995, 2000, 2005-06 and 2010-11. As mentioned earlier, there are two “free" health care policies that were adopted in South Africa. We aim to examine the progress of these policies with regard to OOP payments. Therefore, our choice for IES data stems from the fact that unlike say the National Income Dynamics (NIDS) data which also collects information on household OOP to enable a similar study to the one we conducted in this thesis, one of the IES was collected in 1995 which is one year post the 1994 user fee removal while the 2000 IES was collected 4 years post the 1996 user fee removal and thus, 10years post the 1994 health care policy. This allows us to examine the progress made with regard to these “free" health care policies with regard to their influence on OOP payments. The first wave of the NIDS data was collected in 2008, 14 years post the 1994 user fee abolition policy as compared to the 1995 IES.

1.2 Purpose and Objectives of the Study

Since 1994, several social protection policies have been implemented in South Africa in order to redress the inherited inequities of apartheid. Therefore, the purpose of this research is to contribute to the broader literature on equity, using four South African household surveys that are nationally representative. Specifically, the research examines how equitable OOP payments are, within the context of “free" health care, and documented evidence of indirect costs that can deter households from accessing care where it is “free". Three main research questions are asked thereby, giving us the following objectives:

- To establish the incidence of CHE of catastrophic health expenditures incurred through financing health care out-of-pocket in South Africa.

- To conduct a gender gap analysis of the differences in the incidence of CHE between households headed by males and females over the period from 1995 to 2010-11 in South Africa.

- To assess who pays for health care OOP and establish the socio-economic determinants of paying for health care out-of-pocket in South Africa.

1.3 Incidence of Catastrophic Health Expenditures

1.3.1 Motivation and Contribution

Anlyses of how equitable OOP health care payments are, have extensively been documented. Mostly, the concerns addressed in these studies is with regard to“what ought to be" questions of fairness or equity in economic, political and social life so as to gauge political and policy priorities of a country (van der Berg, 2001b). Unlike other healthcare financing mechanisms, OOP payments are an inequitable means of financing health care. This is because of their potential unequal burdening of household budgets. That is, households or individuals with limited resources, like the poor, or relatively those with more healthcare need, like the elderly, will be unequally impacted (World Health Organisation, 2000). Also, the benefit derived from this form of payment is restricted to the individual served and the provider collecting the fee, while those without money to purchase health care may be denied access when they need it, leaving them vulnerable to more health problems (World Health Organisation, 2010). Documented evaluative evidence the world over suggests that the world’s 1.3 billion poor do not have proper access to health services, simply because they lack the funds to purchase it when they need it (World Health Organisation, 2000; Xu et al., 2007), which has encouraged the use of sub-standard medicines or partial doses for self-medication and self-treatment (Asenso-Okyere et al., 1998; Nyonator and Kutzin, 1999). For households that seek treatment from professional health facilities and incur substantial OOP, about 150 million people each year are confronted with “unreasonable" burdens on their income, resulting in financial difficulties, while about 100 million are pushed below the poverty line due to OOP (Xu et al., 2007).

In the short run, disruptions in household welfare and impoverishment may force households to cut back on current consumption of other basic needs such as education, shelter and clothing, while in the long run, it may trigger the sale of assets or use of savings to finance health care (Russell, 2004). In rural China, for instance, evidence suggests that with each 13.9 percent total per capita expenditure in the low-income group, increases in medical expenses result in a 4.1 and a 2.2 percentage point decline on the consumption of food and tuition, respectively (Wang et al., 2006). In Vietnam, households tend to reduce spending on food, but spend more on budget items related to the care of sick household members, such as housing and electricity used for heating (Wagstaff, 2007). As coping mechanisms, households could be forced to borrow in order to finance health care or sell assets in order to cope with the financial burden placed on them to consume health care. This has been the case in Iran, where 21.7 percent of households sell their jewellery, 15.9 percent use their savings from bank accounts, while 49.2 percent of households resort to borrowing from someone other than a friend or family member to finance health care

(Daneshkohan et al., 2011). When the impact of borrowing is severe, indebtedness may occur and subsequently push households into poverty. Balancing the split between direct payments and the relative contributions of pre-payment health financing mechanisms is therefore key, given that direct health payments provide the least equitable way of financing health care services.

In this regard, as efforts to reduce reliance on OOP, South Africa in 1994 removed user charges at public health facilities for children aged below six years, pregnant and nursing mothers and the elderly, as long as they were not covered by any medical aid scheme, with the aim of increasing access to public health care facilities (African National Congress, 1994; Leatt et al., 2006). The policy was extended to the entire population in 1996. Both the 1994 and the 1996 “free" health care policies have received attention, albeit with contrasting results documented on the effect of the said policies on access and utilisation of health care facilities. Findings from McCoy and Khosa (1996); Wilkinson et al. (1997); Schneider et al. (1997); Schneider and Gilson (1999) suggest that the 1994 “free" health care policy resulted in substantial improvements in utilisation of preventive care and adult curative care in the period spanning from 1992 to 1998 (Wilkinson et al., 2001). Koch (2017), however, documents a minimal effect with regard to the 1994 “free" health care policy. The author’s findings suggest that the 1994 policy did not greatly affect use of curative public health care for children who should have benefited from the policy. More nuanced results are documented by Koch and Racine (2016), who find that the 1994 “free" health care reduced the probability of home care among children from less privileged households, the policy effect suggested a substitution of private health care by public health care among households from privileged households, and very little effect on children from households in the middle. Koch (2017); Koch and Racine (2016) in particular finds that public care utilisation increases associated with the 1994 policy were not large, and could not be precisely estimated. On the other hand, increases of 44.7 percent and 77 percent are seen in other areas of the literature (see McCoy and Khosa, 1996; Wilkinson et al., 1997). Mixed evidence is also documented with regard to the 1996 “free" health care policy. On the one hand, Wilkinson et al. (2001) documented an increase in utilisation of public health care facilities following the 1996 policy, while Schneider and Gilson (1999) observed decreases in utilisation, while Brink and Koch (2015) find little, if any, effect, especially amongst those expected to benefit from the revised policy. These initiatives, even though targeted at promoting access, were also an effort on the part of policy makers to cushion households against the financial costs associated with the consumption of medical care. To some degree, Koch and Racine (2016) find some evidence to suggest that the poor benefited from the policy. However, we are not aware of a wider analysis describing the financial protection benefits of this policy.

Koch and Racine (2016) and Koch (2017) use the 1995 October Household Survey to examine the effect of user fee abolition implemented in 1994 for uninsured children below the age of six; they are not able to consider the elderly and pregnant and nursing mothers, given their data. First, they examine policy implementation finding a reduction in payment for services between

9 percent and 41 percent fewer households made payments, although they are concerned that the survey question underpinning that analysis is less than perfect. We are able to complement that research. We focus primarily on OOP, which is more clearly a health care payment than what is recorded in the previous analysis. We can also tie those payments to illness status in the household, as well as ownership of the facility visited during illness to examine OOP health financing equity across facility ownership. The analysis provides us with more insight into financial protection in the public sector. Unfortunately, it is not possible to undertake a causal analysis of the policy, given that OOP data cannot be separated by illness incident, and, therefore, cannot be tied to the member of the household that was ill.

There is South African literature examining equity in health financing more broadly. Xu et al. (2003a), like us, use the 1995 Income and Expenditure Survey (IES) as well as data sets from other countries. They estimate the percentage of households facing CHE and the conditions under which such expenses are likely to occur. They define health care payments as being catastrophic if they exceed 40 percent of consumption expenditure after household subsistence needs have been met. The authors find a relatively low proportion of households facing catastrophic health payments and a rather low share of OOP payments in total health expenditure (in South Africa). Specifically, they find CHE to be 0.03 percent, while the share of OOP in total health expenditure is 9.7 percent and the proportion of households below the poverty line is 27.2 percent. Ataguba and McIntyre (2012); Ataguba and Akazili (2012); Mills et al. (2012b,a) use similar data, the 2005-06 South African Income and Expenditure Survey (SAIES), to examine OOP. They find that compared to the non-poor, the poor incur more OOP, although only 0.045 percent of households are pushed into poverty, due to OOP Mills et al. (2012a). Lamiraud et al. (2005) use the 2002 World Health Survey (WHS) data from South Africa to examine the impact of social protection on access to health care, health expenditures and the level of impoverishment. The authors compute the incidence of catastrophic spending due to OOP for insured and uninsured households among different wealth quintiles. They find that the level of CHE is 13 percent among the first quintile of uninsured households compared to 19 percent among their insured counterparts. At the fifth quantile, the incidence of catastrophe was 6 percent for uninsured households, and about 1 percent for insured households. They find that, at the national level, OOP impoverished 7.1 percent of households, while rural households were impoverished more (10 percent) than urban households (5.5 percent).

That a low proportion of households are impoverished due to OOP is not surprising, given South Africa's user fee abolition in the 1990s. In addition, public health care is financed from the general pool of taxes, which are centrally allocated and are argued to be progressive (see for instance Mills et al., 2012b; Macha et al., 2012). However, while the reported low value of CHE is good from a financial protection perspective, one question that is often not addressed in previous studies is the relationship between corresponding health facility utilisation and CHE. This shortfall limits our understanding. Is that low value driven by non-use, for example?

If so, that might imply poor health outcomes, and imply further policy revision. There is also a danger that OOP are burdening different social sub-groups, particularly vulnerable groups such as children, women, the poor, elderly or households with a high concentration of these vulnerable groups in South Africa. Prior to 1994, South African women did not have wide access to many amenities, such as education and health care compared to their male counterparts, which partly explains inequality observed in labour outcomes (Branson and Wittenberg, 2007; Wittenberg, 2002), wage earnings (Wittenberg, 2015) and also health outcomes (Booysen, 2010). There is limited evidence, however, to suggest that such inequities exist in the distribution of OOP by gender. Furthermore, “free" health care policy reforms have been geared towards elevating outcomes of the previous vulnerable groups to their relatively advantaged counterparts.[2]. Hence, where data permits, it is also of interest to examine whether the gap in inequality that may be observed between males and females has been closing over time. While the study by Burger et al. (2012) does not exclusively evaluate the incidence of catastrophe, they examine how health care access and health spending have progressed since the attainment of democracy in South Africa.

Studies assessing both equity in health care financing and the distribution of health care utilisation are in existence. In addition to estimating the incidence of CHE, (Chuma and Maina, 2012) estimates levels of self-reported illness. This latter information is important in that it examines whether or not there are disparities in self-reported illness and health-seeking behaviour, as captured by spending on outpatient and inpatient services. However, they are not able to show where consultation was sought – private or public health facilities. If it is the case that they are consulting more in public facilities, yet are observed to be paying OOP in the private health care sector, it could signal a number of things to policymakers. For example, it may suggest that there is poor quality care, or inadequate supply of care (possibly, limited drug availability) in the public health care sector. That information could assist in the design of UHC mechanisms that ensure access and financial risk protection against ill health, which most countries are striving to achieve. O’Donnell et al. (2008) captures the preceding limitation showing the distribution of health care utilisation. Particularly, O’Donnell et al. (2008) distinguishes between hospital inpatient and outpatient received by poor and non-poorer households to examine who pays and receives care using data from 13 Asian territories. We are not aware of similar information being available for South Africa. Burger et al. (2012) use several nationally representative household surveys to investigate whether public health spending and access in South Africa have become more equitable since the end of apartheid. The authors find that utilisation of government health facilities varies according to socioeconomic status. Particularly, they find that poorer households opt to use government health facilities than the relatively wealthy households. Between 1995 and 2008, they observe a decline in the utilisation share of government providers for the top two quintiles – a plausible reason being that, perhaps those without the fees are turned away from seeking care, or its because of low staff morale that has worsened due to the increase utilisation

[2]Yates (2009) documents evidence related to user fee removal across Sub-Saharan Africa

of government health facilities. Burger et al. (2012) also compute affordability ratios across quintiles so as to assess how they relate to CHE and shifts between payments made in public and private healthcare facilities. Affordability ratios are expressed as households health care payments as a share of their non-food expenditure. In our analysis, we have similarly computed affordability ratios but these in our case we have termed them, OOP shares. We computed OOP shares as OOP payments as a ratio of household expenditure adjusted for subsistence needs. However, complementing Burger et al. (2012), we provided a breakdown of OOP shares by gender of household head, place of residence of the household head, province, marital status, employment status as well as medical aid status (see Appendix A). With regards to gender, we find that in 1995, male-headed households incurred roughly three times the amount of OOP than female-headed households, but had a capacity to pay that was nearly four times as large; thus, OOP shares were relatively larger in female-headed households. We also find that in 1995, OOP shares for rural households are about the same as for their urban counterparts yet, the capacity to pay for rural households are twice less than that of urban households. From 2000 to 2010-11, the OOP shares for rural households are higher than those of urban households yet the capacity to pay is in some cases twice or triple less than that of urban households. These findings are contrary to documented literature for other countries which reports that rural areas as compared to urban areas, have lower health expenses but face a higher likelihood to incur catastrophic health expenditures (see for example, Ghiasvand et al., 2015; van Minh et al., 2013; O'Donnell et al., 2005; Rashad and Sharaf, 2015a,b). A plausible reason tied to this finding being that relatively, rural areas tend to have high poverty levels. Thus, with limited resources due to these already high levels of poverty, a health shock is likely to mess up spending of these households leading them to reduce consumption of some goods particularly food which tend to comprise a larger share of their budget, in favor of medicines. What we can make of the findings presented in Tables 3.1 to 3.4 is that, in South Africa, since female-headed households tend to be amongst the poorest and also, because during apartheid women were confined to the homelands which tended to be rural areas as compared to men, it can be inferred that the situation of higher OOP shares but lower capacity to pay by rural households, is that faced by women.

Furthermore, two methods dominate the health financing equity literature. The first, (see Xu, 2005) defines a household's capacity to pay as income remaining after a household has met basic needs. The second method, (see Wagstaff and van Doorslaer, 2003) defines household capacity to pay as its total consumption expenditure. Using one and not both of these methods limits comparisons that one can make across societies or countries, because most studies only use one or the other. Hence, we employ both approaches, like Kimani (2014), to allow for wider comparison. Furthermore, we conduct this analysis across a lengthy time period, whereas the preceding literature focuses on one cross-section, although might include a number of countries. Furthermore, these studies rarely offer deeper insight into OOP and area of health care where OOP is incurred across a range of socio-demographics. We are able to do so, although we present

that information in (Appendix A).

To summarize briefly, we find about 49 percent in 1995, 42 percent in 2000, 20 percent in 2005-06 and 21 percent of households in 2010-11 recorded zero OOP. Zero values are more likely to be recorded by households headed by either white or Asian males living in urban areas who are not in the poorest expenditure quintile. Zero values are less likely for households headed by employed individuals who have access to a medical aid. The incidence of CHE is low, as seen in related South African literature, and this is true regardless of the approach used to define capacity-to-pay. Focusing on the 40 percent (of the level of total consumption expenditure that has been adjusted for subsistence needs) threshold for CHE, we find approximately 0.03 percent incidence in 1995, and for the years 2000, 2005-06 and 2010-11, the incidence is 0.06 percent, 0.09 percent and 0.07 percent, respectively. Given such low incidence of CHE, we evaluated facility utilisation when confronted with illness; unfortunately, only possible for 1995, given the data. A negligible percentage of households did not seek treatment when ill. Of those who consulted, the poor consulted more in public facilities as compared to the most affluent households. This is welcome as it shows that the intended effect of removal of user fees is bearing fruit in that, those who are suppose to benefit from it, are indeed utilising facilities where such policy is applicable.

1.3.2 Past Empirical Literature Conducted in Other Countries

The focus of the literature reviewed in this section will be on studies that have analysed OOP payments regardless of the method used. A number of studies have examined equity surrounding OOP in both developed and developing countries in the context of “free" health care policies. The government of Kenya for example, has since independence, undertaken different policy initiatives with the aim of ensuring access to health care services as well as addressing affordability. Two years post-independence, Kenya in 1965, wiped off user fees in all public facilities among all citizens until in 1988 when the fees were reintroduced in 1989 (Government of Kenya, 2010). In 1990, the user fees were suspended but re-introduced in phases in 1991 (Chuma et al., 2009; Collins et al., 1996). The fees charged related to drugs, injections and laboratory services and not consultation as was previously the case (Chuma et al., 2009). Children below the age of 5 were exempted from paying user fees and there were fee waiving mechanisms for the poor. Despite these efforts, the waiving and exemption schemes failed to protect the poor due to complexities surrounding beneficiaries, the lack of knowledge about exemption schemes by those who are supposed to benefit, and the time-consuming nature for both patients and providers involved in acquiring a waiver (Chuma et al., 2009; Collins et al., 1996). For those who were not exempted from paying user fees, evidence also revealed that the user fees deterred access to health care among the poor. As such, there has been continued policy efforts among policy makers in Kenya, to address these challenges. In 2004, OOP payments were removed for services at dispensaries and health centres among all citizens and furthermore, removed for maternity services in public facilities in 2013 (Chuma and Maina, 2014). Despite these efforts, there

is still high reliance on OOP payments among households in Kenya. In 2009-10, OOP as a proportion of total health expenditure is 36.7 percent. Public expenditure as a proportion of total health expenditure is about 29 percent (Kiplagat et al., 2013; Chuma and Maina, 2014). Therefore, against the background of a country with significantly high private OOP and cost recovery strategies that affect access to health care, Kimani and Maina (2015) uses the 2007 Kenyan Household Health Expenditures and Utilization Survey (HHE&US) data to examine the burden of OOP, the incidence of CHE and impoverishment. They find that about 11.7 percent of households experience catastrophic health care expenditures and 4 percent are impoverished by health care payments. Furthermore, the authors find that before paying for health care, about 49.18 percent of individuals were living below the poverty line, but after paying for health care, the poverty headcount increased by 3.1 percent, suggesting that some 2.5 million individuals were being pushed into poverty due to OOP. Chuma and Maina (2012) has similar findings from analysing the burden of OOP in Kenya, the incidence and intensity of CHE, as well as the effect of health spending on national poverty estimates using the 2007 Kenyan HHE&US data. They further distinguish between OOP on inpatient and outpatient health care. Inpatient health care here, relates to hospitalization while outpatient refers to consultation and diagnosis, without the patient being hospitalised so as to consume health care at the health facility. Chuma and Maina (2012) find that 15.5 percent of households incur CHE at a 10 percent threshold, but 4.6 percent at the 40 percent threshold of total expenditure. When they define household income as total household consumption expenditure minus food spending, CHE occurs at a rate of 16 percent at the 25 percent threshold. Furthermore, 11.5 percent of households incur CHE spending from outpatient care as compared to inpatient care, which accounts for 5.4 percent. Earlier results of 5.8 percent and 6.1 percent CHE are available for 2003 (Xu et al., 2006a); however, the proportions are based on non-subsistence consumption expenditure. Although such estimates are not directly comparable, due to the different capacities used, they suggest an increase in OOP and CHE, which is supported by government reports. OOP as a share of total health care costs in Kenya accounted for 54 percent, 39.3 percent and 36.7 percent in 2001-02, 2005-06 and 2009-10, respectively (Government of Kenya, 2010).

Myanmar is another country with high OOP payments but a low proportion of the population (about 1 percent) protected by the Social Security Scheme (SSS) because of low capacity on the supply side (Myint et al., 2019). In 2015, OOP payments represented 74 percent of total health expenditures. Against this backdrop, Myint et al. (2019) assess the extent of financial protection in Myanmar by estimating the incidence of CHE and its association with the socio-demographic factors. Following the WHO method, the authors use estimate the incidence of CHE at the 40 percent threshold as well as at the 20 percent and 30 percent thresholds. Myint et al. (2019) find the incidence of CHE from OOP to be around 21 percent, 13 percent and 7 percent at the 20 percent, 30 percent and 40 percent thresholds in 2013, respectively. In 2015, the incidence of CHE from OOP reported by Myint et al. (2019) is 18 percent, 8 percent and 6 percent at the 20 percent,

30 percent and 40 percent thresholds, respectively. In Nigeria, OOP payments account for 90 percent of total expenditure on health, and unsurprisingly, like in Kenya, Onoka et al. (2010) find that 15 percent of households experience CHE from a survey of 1,128 households in two states of Nigeria over a period of one month using the diary method. Still in Nigeria, Aregbeshola and Khan (2018) evaluates the incidence of CHE from OOP at 5 percent, 10 percent, 15 percent, 25 percent, 30 percent and 40 percent threshold of both total consumption expenditure and non-food expenditure. They also assess the poverty headcount impoverished due to OOP payments for health care. At the 40 percent threshold of non-food expenditure, Aregbeshola and Khan (2018) find that 13.7 percent households incur CHE from OOP payments relative to 20.5 percent households, 18.6 percent households and 17.5 percent they found at the 5 percent threshold, 10 percent threshold and 15 percent threshold, respectively. Senegal is another country where OOP constitutes 95 percent of private expenditures and 55 percent of total health expenditures, and is a source of impoverishment (Sene and Cisse, 2015). In Botswana and Lesotho, Akinkugbe et al. (2012) find levels of financial catastrophe were 7 percent and 1.25 percent, respectively, while the share of OOP in total monthly expenditure is 0.93 percent and 1.34 percent. While the percentage of households incurring catastrophic health expenses in Botswana may seem relatively high, the share of OOP in total monthly expenditure is low. Possibly, this is because healthcare in Botswana is inexpensive in public facilities, where a nominal fee of US$0.70 is payable by nationals while foreigners pay US$4 and even without the fee, access is not denied (). if the disease recurs within a period of one month, the patient can go back to access services under the same fee.

In Namibia, the percentage of households facing catastrophic health spending is higher when payments are taken as a threshold share of non-food consumption expenditure (World Bank, 2012a). For example, at 5 and 10 percent thresholds of non-food consumption expenditure, about 35.4 and 31.6 percent (respectively) of households face catastrophic health spending, compared to about 16.6 and 11.1 percent of households, when the thresholds were taken as a share of total household consumption expenditure. The results also suggest that the poor are more likely to incur OOP in excess of the threshold. The concentration index of the incidence of catastrophic spending, is negative under both measurements of household consumption. Similar results are available for Zambia, as well (see World Bank, 2012b). Despite the removal of user fees at government health facilities, the poor still incur high CHE emanating mostly from transportation costs to access health care services (Masiye et al., 2016). Away from Africa, in Brazil, when the prevalence of catastrophe is evaluated in relation to capacity to pay, for instance, at the 20 percent threshold, about 5.9 percent and 8.3 percent of households incur expenses that compromised the consumption of other basic needs in 2002-03 and 2008-09, respectively. At the 40 percent threshold, a lower incidence, 0.7 percent and 1.4 percent is seen.

In Swaziland, a country where OOP account for 11.5 percent of total health expenditure as at 2012, Ngcamphalala and Ataguba (2018) analyses the incidence of CHE from OOP using

Swaziland Household Income and Expenditure Survey (SHIES) data for 2009-10. They analyse CHE of OOP in relation to both total household expenditure and non-food household expenditure. Their analysis is conducted at 5 percent, 10 percent, 20 percent, 20 percent and 40 percent thresholds of total household expenditure as well as at 5 percent, 10 percent, 25 percent and 40 percent thresholds of non-food household expenditure. At the 40 percent threshold of non-food household expenditure, the authors find that 2.7 percent of households incur CHE from OOP payments compared to 24.2 percent households, 15.8 percent and 5.9 percent at 5 percent, 10 percent and 25 percent thresholds respectively, of non-food household expenditure.

The limitation of existing studies on the incidence of CHE from OOP, and subsequent impoverishment is that, these studies have used either method of the two that exist in analysing CHE of OOP, and not both. In addition, while the selection of thresholds is arbitrary, most of these studies have used the 10 percent and 40 percent thresholds with a few providing evidence on other thresholds such as 5 percent, 15 percent, 25 percent in addition to the 10 percent and 40 percent thresholds. These deficiencies limit comparisons that one can make across countries and time at various thresholds. The two methods used to examine CHE associated with OOP payments comprise of: relating OOP to a household's capacity to pay as income remaining after a household has met basic needs (Xu, 2005) and; relating OOP to household capacity to pay as a household's total consumption expenditure (Wagstaff and van Doorslaer, 2003). While there is substantial literature conducted on the incidence of CHE associated with OOP payments, most studies have used either of the approaches and not both. While studies employing the two methods exist (see Kimani, 2014; Ngcamphalala and Ataguba, 2018; Aregbeshola and Khan, 2018), these studies have only focused on CHE for one year, thereby limiting one to observe how the dynamics in the incidence of CHE are portrayed over time. This thesis extends existing evidence on OOP payments using four nationally representative household surveys, to provide an in-depth analysis of changes in the incidence of CHE in South Africa.

1.4 Gender Differentials in the Incidence of CHE

1.4.1 Motivation and Contribution

The challenge of unemployment, poverty and inequality continues to affect women more than men (Mushongera et al., 2018; Republic of South Africa, 2015b). This implies that if gender is not mainstreamed in these programmes, these challenges are likely to persist, which will trap households in poverty and hamper the country from achieving some of the Sustainable Development Goals (SDGs) such as gender equality and eradication of poverty, amongst others. Recent literature suggests that education and receipt of social grants are key drivers in narrowing gendered inequality in ill health in South Africa (Omotoso, 2017). As far as we are aware, that is the only existing empirical study on gender inequality in health with a dynamic focus. Other research in this area is cross-sectional (see Babikir et al., 2018; Macha et al., 2012; Xu et al.,

2003a). Thus, there is room for additional research into the dynamics of gender inequality, and possible contributors to that inequality.

Against this background, this thesis includes a gender gap analysis to examine the differences in the incidence of CHE between households headed by males and females over the period from 1995 to 2010-11. We first established the extent of gender inequality in the incidence of CHE incurred through OOP payments between 1995 and 2010-11. From that point, we examined the relative change in gender-based inequality in the incidence of CHE over that time period. Finally, the factors that have contributed to the change in the incidence of CHE between male-headed households and female-headed households, and their relative importance, were assessed.

Some recent studies employ logit models when examining the factors of CHE associated with OOP (see Akinkugbe et al., 2012; Babikir et al., 2018; Buigut et al., 2015; Cleopatra and Eunice, 2018; Kien et al., 2016; Yazdi-Feyzabadi et al., 2018). This research, however, employed a differences-in-decompositions approach to assess the factors associated with households incurring CHE. The approach here is underpinned by Blinder-Oaxaca decompositions, which separately partitions the gender gap in 1995 and in 2010-11 into differences in both observed and unobserved factors. Subsequently, the research partitions the changes in the gender gap into changes in both observed and unobserved factors using the differences-in-decompositions method. In this way, the differences-in-decompositions approach has similarities with the difference-in-difference approach (Bertrand et al., 2004). Previous studies using the differences-in-decomposition approach analyse gender equality in health (Omotoso, 2017) and in the labour market (Kassenbohmer and Sinning, 2014). The results of the research suggest that the gender gap in the incidence of CHE narrowed by 0.4 percent between 1995 and 2010-11. This reduction in the gender gap is associated with education, access to piped water and residing in urban areas.

1.4.2 Previous related literature

Economic theory of health capital postulates that health investment is important in the effort to improve health outcomes. In the literature, one important measure of the level of health investment identified is the level of health expenditure in a country. The same can be argued at the micro-level through household incurring OOP payment for health. Households invest in themselves by purchasing prescribed medicine OOP for example, using prescriptions given to them in public facilities because they could not obtain the prescribed medicines in the facilities they consulted (and the drugs were to be provided for “free"), due to drug stock-outs. In instances where large OOP payments are incurred, or even small but frequent OOP are incurred when consuming health care, these have been shown to reduce consumption expenditure on other basic needs and consequently pushing households into poverty through catastrophic expenditure. Therefore, the use of health expenditure as an important measure of health investment stems from the fact that, like other health financing mechanisms, OOP payments can serve as an important tool to guide government in its provision and administration of health care services

(Arthur and Oaikhenan, 2017) so that policies that will ensure universal access and financial protection to its people, are implemented or strengthened. This is the true in South Africa where, in addition to the “free" health care policies adopted in 1994 and 1996 to increase access and ensure financial protection, the government has also partially implemented the National Health Insurance (NHI) whose motive amongst others, was guided by evidence on how OOP incurred by the people of South Africa, impacted on other outcomes such as poverty reduction efforts.

The health capital and demand for health theory is one of the approaches that have been adopted in studying the effect of health expenditure on health outcomes. Grossman for example, postulates that individuals engage in health producing activities with their own time and complements it with purchased medical inputs to improve health status (see for instance Grossman, 1972b,a, 1999, 2000). As Schultz (1999) has shown, better health enhances the effective and sustained use of knowledge and skills that individuals acquire through education. Individuals or households invest in themselves through education and health to increase their utility, which is underscored by increased earnings (Grossman, 2000). Schooling is also a key determinant of poor people’s ability to take advantage of income-generating opportunities (Haughton and Khandker, 2009). Empirical research suggests that households headed by individuals who are relatively educated tend to incur lower CHE compared to households headed by individuals with no education (see Zhou et al., 2016). According to theory, health can be generated at less cost for relatively higher educated people than for less educated people, resulting in more health capital (Grossman, 2000). More generally, the persistent association between education and health is well documented for a variety of health outcomes, as so is the influence of education on the incidence of CHE (see for instance Boing et al., 2014; Fazaeli et al., 2015; Li et al., 2012; O’Donnell et al., 2005; Shi et al., 2011; Xu et al., 2006a). While the analysis presented in this thesis does not evaluate the relationship between OOP health payments and health outcomes, it examines the social determinants of OOP payments since we believe the Grossman theory together with other theories such as the health production function approach, have enabled an understanding of the role played by variables such as education, health status, age and income in the production function of health through investments in health capital.

While some existing evidence documents the beneficial effect of social grants in redressing gendered health inequalities, (Ataguba et al., 2015; Omotoso, 2017; UNICEF, 2014), Babikir et al. (2018) finds that social grants do not alleviate households from the burden of CHE; rather, the odds of households facing CHE are higher among the poorest households and households that have incurred spending on both hospitalisation (also known as inpatient care) and medical supplies. Specifically, the authors find CHE odds are 3.2 times higher among households that have incurred OOP on hospitalisation. They also find that the odds of facing CHE for medical supplies are two times higher compared to households that incurred expenditure for hospitalisation, and eight times higher compared to households that incurred expenses for health insurance and traditional healers. Macha et al. (2012) finds that poorer households did not benefit from or

access health care services to the same extent as non-poor households in Ghana, South Africa and Tanzania, due to affordability, availability and accessibility barriers. Thirty-one percent of those in the poorest quintile reported not seeking treatment, due to transport costs, compared to 6 percent of the wealthiest households. Negative staff attitudes (at the facilities) also deter public health care use. Similar results for South Africa were documented by Mills et al. (2012b). Burger and Christian (2018) examine the progress made in access to health care after more than two decades of democracy in South Africa. The authors use availability, affordability and acceptability to capture access to health care. Of relevance to this research is their use of affordability in assessing progress made in access to health care in South Africa. Burger and Christian (2018) designed an affordability indicator to capture unavoidable payments that add to the indirect cost of health care. They find that 23 percent of households face affordability constraints to accessing health care. About 73 percent of the affordability constraints are associated with travel costs and there is a large discrepancy in affordability between the poor (65 percent) and non-poor (84 percent). To complement Burger et al. (2012); Burger and Christian (2018), we show this affordability indicator (OOP shares) by gender. Burger et al. (2012) showed affordability by quintiles so as to provide another dimension which is important to policy. Our descriptive statistics suggest that, male-headed households incur larger amounts of OOP, but also have larger capacities to pay. In 2000, we find that even though the affordability indicator suggested females to still be incurring larger OOP shares as compared to males, the values have declined when compared to 1995. This could suggest that the 1994 and 1996 user fee removals in public health facilities, were starting to bear fruit. Hence, the policy efforts are commendable especially that this suggest the narrowing of gender inequities was being realised – something that the policies aimed to achieve.

Akinkugbe et al. (2012) address similar types of financial protection questions. They find that household size, the presence of a senior member and children aged five and below in the household, residing in a rural area and being unemployed increases the probability of incurring CHE. Even among households where older adults live and have health insurance coverage, there is a lack of protective effect against catastrophic health expenses (Adisa, 2015; Barros et al., 2011; Doubova et al., 2015; Wang et al., 2015). For the elderly, the frequent need for health care consumption could be due to chronic illnesses – a factor associated with higher catastrophic expenditures (see Brinda et al., 2015; Choi et al., 2015; Rahman et al., 2013; Su et al., 2006). Wang et al. (2015) examines the extent, associated factors and inequality in catastrophic health expenditures, focusing on elderly households with chronic disease patients, where an elderly household with a chronic disease patient has ≥ 1 chronic disease patients who are aged ≥ 45 years. They find the incidence and intensity of catastrophic health expenses to be higher among elderly households with chronic disease patients than those without. Factors associated with the likelihood of incurring CHE include: having members with ≥ 2 chronic diseases, the presence of household members aged 65 and above and elderly household members demonstrating health

care seeking behaviours. Also, among those with chronic illnesses, there is a higher likelihood of CHE, particularly due to the costliness of such diseases (see Choi et al., 2015; Daivadanam et al., 2012; Juyani et al., 2016; Kien et al., 2016; Saito et al., 2014). In some instances, chronic conditions are lifestyle diseases and, as such, tend to be prevalent among non-poorer households, hence increasing their likelihood of incurring CHE (Xu et al., 2015). In other research, the presence of a child under five years of age and an elderly household member are associated with a decrease in the odds of incurring CHE (Hatam et al., 2015; Kimani, 2014; Xu et al., 2006a), a results that is attributed to the existence of special government policies targeted at these (under-five and elderly) groups. These studies often acknowledge the fact that the effectiveness of these initiatives can be hindered by drug unavailability and informal payments at facilities, where fees are not supposed to be made for consuming health care.

Other factors associated with higher likelihood of incurring catastrophic health payments are hospitalisation (including number of previous hospitalisations), outpatient care, physician visits and dental care services (Buigut et al., 2015; Ghiasvand et al., 2015; Hamid et al., 2014; Somkotra and Lagrada, 2009; Pradhan and Prescott, 2002). In India, for example, the cost of hospitalisation leads to 15 percent of households incurring health payments at the 10 percent threshold of capacity to pay (Ranson, 2002), while in Iran, in addition to outpatient and inpatient care, payment for physician visits, disability, use of dental services and living in rural areas increases the incidence of households incurring catastrophic spending (Kavosi et al., 2014). The severity and occurrence of diseases represent another factor that is likely to increase the likelihood of catastrophe due to an increase in demand necessitated by these factors. Senegalese evidence suggests that the use of mosquito nets has a positive impact on health outcomes, which tends to reduce the occurrence and intensity of households incurring catastrophic health expenses (Sene and Cisse, 2015).

Although one expects actual health related decisions to affect OOP, and therefore, CHE, in many studies there are a number of socioeconomic factors that matter. Despite lower health expenses observed for households residing in rural areas versus those in urban areas, results suggest that rural households face a higher likelihood of incurring catastrophic health payments (Ghiasvand et al., 2015; van Minh et al., 2013; O'Donnell et al., 2005; Rashad and Sharaf, 2015a), probably because capacity to pay is much lower in rural areas, as we find, here. Larger households are also more likely to incur catastrophic health payments (Akinkugbe et al., 2012; Cheelo et al., 2010; Fazaeli et al., 2015; Kavosi et al., 2014; Yardim et al., 2009). O'Donnell et al. (2005), for example, find the incidence of catastrophe to be higher in rural areas, but not significantly so in two countries (Sri Lanka and Thailand), due to their wider geographic distribution of public health facilities. The authors also find that, with the exception of India and Sri Lanka, larger households are more likely to incur catastrophic health spending than households with fewer members. Additional socioeconomic factors include access to clean water and sanitation, which are likely to influence health in the household. Reduced incidence of catastrophe for clean living

conditions, suggests that public health interventions can offer health care financial risk protection to households. Dirty and contaminated water combined with poor sanitation contributes not only to malnutrition, but are also a leading cause of death in children, particularly those who are under five years (H Ghiasvand and H Shabaninejad and M Arab and A Rashidian, 2014). O'Donnell et al. (2005) also find that CHE incidence is lower in households with a sanitary toilet and safe drinking water.

Despite a wide variety of relatively consistent evidence, there are still gaps in the documented empirical evidence. First, available studies rarely examine gender differentials. Second, existing studies use cross-sectional survey data focusing on one-way decompositions to analyse health financing equity at a particular time period (*seeforinstance*; Akinkugbe et al., 2012; Macha et al., 2012; Xu et al., 2003a). Using a one-way decomposition strategy, however, fails to unearth any changes in the incidence of CHE. This thesis follows recent research by Omotoso (2017) and Kassenbohmer and Sinning (2014) to assess the key drivers of changes in gender inequality in health care financing, particularly with regard to the incidence CHE.

1.5 Progressivity of Out-of-Pocket Payments and Socio-Economic Determinants

Having looked at the incidence of CHE and the gender gap in that incidence as discussed in Sections 1.3 and 1.4, the focal point of the literature reviewed in this section (Section 1.5) relates to studies that have been conducted on progressivity of OOP health payments and the associated factors.

Evidence across the world finds large differences in the amounts that countries spend on health care. Despite these variations, the circumstances in which people are born, play and work do, to a large extent, affect health outcomes and explain the social gradients in health outcomes observed within and between countries (World Health Organization, 2008). According to World Health Organization (2008), the social determinants of health include 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 inequities in health care and health financing. This is also true for South Africa, whose past of racial discrimination by race and gender among others, in how access to services was made available to different groups, resulted in unfair outcomes in areas such as employment opportunities, earnings as well as education between males and females.

Studies evaluating OOP progressivity, are underpinned by ideas arising from public finance. In the tax literature, tax elasticity is always unity for proportional taxes (Kakwani, 1976). Therefore, the concept of tax progressivity (related to tax elasticity) shows a departure of a given tax system from proportionality. Graphically, this is derived by comparing the Lorenz curve of income to the concentration curve of taxes. Progressivity is defined as twice the area between

these curves, and is measured by the Kakwani index. Transferring this concept to the health care system, equity in health financing has been formulated as the extent to which all (or some) forms of contributions to the health care system relate to a household's ability to pay (Xu et al., 2003b). Therefore, examining equity in health financing underscores who pays for health care, the poor or non-poor, in order to assess health care financing equity. While the ability to pay can be conceived differently, the abilty to pay (ATP) principle requires that those with greater ATP contribute more to the health care system than those with less Wagstaff (2000); Xu et al. (2003b).

A concentration curve offers a view of inequality in OOP health care payments. If everyone, irrespective of their living standards, pays exactly the same proportion of their ability towards health care, the concentration curve will be a 45-degree line, referred to as line of equality. However, inequality against the poor exists if the curve for health care payments lies above the line of equality (45-degree line) and against the rich if the curve lies below the 45-degree line (O'Donnell et al., 2008). The magnitude of inequality is shown by the gap between the curve and the line of equality. Information portrayed by the concentration curve, however, does not convey the actual magnitude of inequality, although that can be obtained from a concentration (Kakwani) index, which is defined as twice the area between the concentration curve and the line of equality(Wagstaff, 2000).

Existing studies examine equity in OOP payments, and its implications on health care access and poverty (see Akazili et al., 2012; Ataguba and McIntyre, 2012; Cissé et al., 2007; Yu et al., 2008; Wagstaff et al., 1999), although there are many related analyses. Mills et al. (2012b,a) assesses progressivity of the overall health financing mechanisms in Ghana, Tanzania and South Africa and the progressivity of each component of health financing mechanisms. The authors find evidence of a progressive health financing system in all the three countries. However, when assessing the components individually, they find that OOP are regressive in all the countries. Similar results for these countries are available Macha et al. (2012), together, and separately for Ghana (Akazili et al., 2012), South Africa (Ataguba and McIntyre, 2012) and Tanzania Mtei et al. (2012). The regressivity of OOP payments is underscored by their relatively high contributions. They account for nearly half of all health care expenditure in these countries, although that is somewhat unexpected for South Africa, given its virtually "free" primary health care system.

Ataguba and McIntyre (2017) uses more recent South African household data to assess OOP progressivity and other health-financing mechanisms. They find that 20 percent of the poorest population pay a greater share of OOP than the richest 20 percent. In addition, the poorest 60 percent pay more as a proportion of their income through OOP than the average of all quintiles. Overall, the health care system is progressive, in other words, richer households or those with higher ability to pay are shouldering a larger burden of health care financing; however, that is not the case for OOP. Even though this research is recent and similar to our research, we believe that incorporating data going back is likely to help provide additional evidence, especially related to equity trends, like Almasiankia et al. (2015). They find OOP to be regressive among

both rural and urban households from 2001 to 2010. In 2001, for example, the Kakwani index for rural households was −0.168, but −0.197 in 2010, while it was −0.104 in 2001 and −0.156 among urban households. Tests show the OOP concentration curves dominating the lorenz curve in all the years among both rural and urban households. In Vietnam, a country where OOP payments constituted about 80 percent of health spending in 1998, Wagstaff and van Doorslaer (2001) and Wagstaff and van Doorslaer (2003) examine OOP concentration, based on total household consumption. They find that the incidence and intensity of CHE fell between 1993 and 1998, both in terms of pre-payment income and ATP, and it became less concentrated among the poor. In Malaysia, Yu et al. (2008) documents progressivity in the overall health system, but when assessing the sources individually, all but indirect taxes are progressive. Thus, indirect taxes (represented by sales tax) are borne more by the poor than the rich, because of the former's lower ATP. Cissé et al. (2007) examines OOP progressivity in four Francophone capital cities of West African countries: Abidjan, Bamako, Conakry and Dakar, finding that, the concentration curves for health payments in all cities lie above the Lorenz curve of income, suggesting that the lower income groups bear a higher burden of direct health payments. Munge and Briggs (2014) measures deviations from proportionality in the relationship between ability to pay and direct and indirect taxes, out-of-pocket payments, private insurance contributions and contributions to the National Hospital Insurance Fund (NHIF). The author's results suggest regressivity in financing health care directly through OOP. When financed through indirect means, the concentration curve for health care payments coincides with the line of equality, suggesting proportionality. For developing countries, given the substantial contribution of direct health care payments, as a share of total health care financing, the finding that OOP health is regressive is not surprising. If anything, such results underscore that any initiative aimed to improve the utilitisation of limited resources is an integral part of any future policy (Gwatkin, 2001).

Wagstaff et al. (1999) cover 10 OECD countries to analyse the equity of financing health through direct taxes, indirect taxes, general taxes, social insurance, private insurance and direct OOP payments)[3]. Their results suggest that total public health financing is regressive in Germany and the Netherlands, while regressive in France. In Portugal,it is proportional or mildly regressive, while in the privately financed countries of Switzerland and the USA, it is regressive. Crivelli and Salari (2014) also find that that health financing in Switzerland is regressive. Even though low-income earners receive public subsidies towards purchasing health insurance in Switzerland, plausibly, OOP financing in Switzerland is regressive, because the mandated benefit package is not comprehensive enough or the deductible too flexible.[4]

In addition to evidence on the progressivity/regressivity of health financing, some studies document the socio-economic determinants of health financing mechanisms, particularly OOP

[3]Payments through direct taxes, indirect taxes, general taxes and social insurance comprise total public health financing mechanisms, while private insurance and direct OOP payments constitute total private health financing mechanisms

[4]For the different cantonas, insurers can vary the deductible from a minimum of CHF 300 to a maximum of CHF2,500 (Crivelli and Salari, 2014).

payments. Hwang et al. (2001) assess OOP medical spending by people with and without chronic conditions finding that, on average, it rises as the number of chronic conditions increase. This linear relationship persists, even after controlling for insurance status and other demographic determinants. Hwang et al. (2001) also find that a lack of health insurance is another factor that influences high OOP. Among chronically ill individuals, the uninsured have the highest OOP and are five times more likely to see a medical care provider in a given year. In Sri Lanka, where there is “free" health care provision in the public sector (Fernando, 2000), Pallegedara and Grimm (2018) examines whether OOP had risen under “free" health care between 1990-91 and 2012-13. Overall, Pallegedara and Grimm (2018) finds income to be one of the key drivers of OOP, but as households get richer, they spend an increasing amount on private services. The author argues that the result suggests dissatisfaction with the quality of care offered by the public sector. Onwujekwe et al. (2010) finds that females are less likely than men to incur OOP payments when financing health care. They also find that being a household head, having more household members, having more schooling and transport costs have a positive influence on the use of OOP in South-East Nigeria. On the other hand, Oyinpreye and Moses (2014) suggests that age, household size and per capita consumption expenditure are the major determinants of OOP in the South-South geographical zone of Nigeria. You and Kobayashi (2011) controls for potential sample selection, finding that the most important determinants of OOP expenditures are self-reported health status, age, education, residing in urban areas and perceived severity of illness (in China). Mwenge (2010) examines the factors influencing OOP in Zambia finding that households headed by individuals younger than 25 years spent less OOP compared to those aged 64 years and above. Also, households residing in urban areas, married households and male-headed households spent more.

In South Africa, while considerable attention is paid to assessing health inequality and its social determinants (see for example Ataguba et al., 2015; Baker, 2010; Booysen, 2010; Omotoso, 2017), there is limited literature assessing the key drivers of OOP and the relative changes in those determinants over time. Although Ataguba (2016) examines progressivity in South Africa and whether there were any shifts in progressivity between 2005-06 and 2010-11, finding that OOP became more regressive between 2005-06 and 2010-11 – the Kakwani index of -0.002 in 2005-06 worsened to -0.029 in 2010-11. – he did not consider the link between socio-economic factors and health financing or the various changes therein. Thus there remain areas for us to complement existing knowledge. The challenge of unemployment, poverty and inequality persist in South Africa (Mushongera et al., 2018; Republic of South Africa, 2015b). Moreover, even with great strides having been made improving the proportion of people with access to water and basic sanitation, inequality of opportunity also persists (Republic of South Africa, nd, 1994a; World Bank, 2018). Despite that, we are left wondering whether any of the improvements in such socioeconomic factors have alleviated financial burdens associated with, for example, OOP. Although a causal analysis is not plausible here, associations can offer insight into these

questions, and therefore, we pursue those associations.

Against this background, this research makes use of existing methodological developments to contribute to the available literature. Specifically, the research employs concentration curves to examine the OOP distribution relative to that of well-being, and calculates the relevant indexes. Each of these is done over time to unearth the relative change in OOP inequality. We further link those changes to changes in the social determinants of health, relying on Oaxaca-type decompositions of change in the concentration index (see Wagstaff et al., 2003; Oaxaca, 1973). We made use of data obtained from the SAIES 1995, 2000, 2005-06 and 2010-11, which are nationally representative household surveys collected by Statistics South Africa and were collected in the democratic era. The year 1995 marks the first year after the introduction of “free" health care among targeted individual groups, while 2010-11 marks the most recent income and expenditure data. Therefore, the analysis indirectly allows for the correlation of some of the post-apartheid policies, with either a worsening, or not, of OOP inequality over time. Even though there is limited evidence on the socio-economic determinants of OOP using South African data, there is health inequality evidence (see for instance Omotoso, 2017). Thus, we also are able to complement that literature.

We find health care payment concentration among non-poor households, suggesting that there is progressivity in health care financing, at least as it pertains to OOP. As expected, such results are corroborated by the corresponding concentration indices. When the pattern is examined across the 15-year time period from 1995 to 2010-11, we observe that changing inequalities across age groups, racial groups, education (particularly completion of secondary education), well-being quintiles, type of toilet and water source for drinking provide an explanation for changes in OOP concentration. It was also found that changing elasticities with respect to OOP payments also play a crucial role in explaining differences over time, while changes in inequality in the determinants and changes in the elasticities seem to reinforce each other. Overall, between 1995 and 2010-11, most of the changes in OOP inequality are attributable to inequality in the social determinants.

South Africa has a history of implementing social protection policies from as way back as 1928, therefore, these results are not surprising. Rather, they show the effectiveness of some of these policies particularly, those implemented since 1994 which this study covers. In this regard, we underscore that there should be continued policy efforts so that the pattern of progressivity in OOP health care payments do not become regressive as this may have far-reaching consequences for the achievement of other social goals such as stalling poverty reduction initiatives.

Following the discussions presented above, the thesis proceed by interrogating further, the three research questions posed earlier in three separate chapters. In Chapter 2, we focus on the question: what is the incidence of catastrophic health care expenditures (CHE) arising from OOP in South Africa from 1995 to 2011?. This is followed by Chapter 3 which looks at the second question: which socio-economic factors are associated with gender inequalities related to

incurring CHE?. Chapter 4 addresses the third question: who pays for health care out-of-pocket in South Africa?. Chapter 5 concludes the thesis.

1.6 Policy Implications

The results presented in this thesis point to a number of policy implications. Since 1994, South Africa has undertaken quite a number of social protection policies and made great strides in terms of access to public services. We set out to examine the financial protection offered by the South African health care system through the assessment of OOP payments. To this end, we found that the incidence of CHE from OOP payments is low across time. In addition, we also found that the gender gap in the incidence of CHE from OOP payments has declined in favour of females. More generally, as it pertains to the factors that explain this decline, we found education as well as access to piped water to be key among those concerned factors. Particularly, we found that, with regard to access to water, piped water was responsible for increasing OOP payments as well as declining inequalities in CHE from OOP payments.

Therefore, from a policy perspective, our results suggest that public health interventions can offer health care financial risk protection to households. In this regard, we advocate for public sector policies to be furthered so that their positive effects can be sustained to ensure that there are no setbacks in the achievements of the Sustainable Development Goals (SDGs) which South Africa is a signatory to. These efforts should go hand in hand with the yet to be fully implemented NHI in the achievements of universal access while ensuring financial protection to the South African population.

CHAPTER 2

FINANCIAL RISK PROTECTION IN HEALTH CARE: ANALYSIS OF CATASTROPHIC HEALTH EXPENDITURES

2.1 Introduction

Prior to 1994, the South African government, through apartheid, developed political, land restriction and economic policies that structured society according to race, gender and age-based hierachies (Coovadia et al., 2009; African National Congress, 1994). These restrictions greatly influenced the organisation of social life, access to basic amenities, such as health care, labour markets and education (African National Congress, 1994). In health care, such discrimination meant that different population groups had their own health care departments (Ataguba, 2012; Coovadia et al., 2009) which made it easy to compute the financial costs of the services provided for the different racial groups (van der Berg, 2001b). The African majority were forced to reside in rural areas, where health systems were heavily underfunded, while high quality care was skewed towards the health facilities serving the white minority in urban areas (McIntyre and Mooney, 2007).

However, when the democratic government took power in 1994, considerable effort was invested in addressing the inherited inequities from the apartheid government. As such, several key domestic development programmes, such as the Reconstruction and Development Programme (RDP) and Growth, Employment and Redistribution (GEAR), were implemented with the aim of supporting redistribution measures, reducing poverty and reversing inequality (Republic of South Africa, 2015b; McIntyre et al., 2002). Through the RDP, the South African government reconstructed health care services in order to make it accessible to the marginalised groups and subsequently to the entire population. With regard to the health care system, the reforms adopted by the democratic South African government include the implementation of user fee

abolition in government clinics in 1994 among the elderly, children below the age of six, and pregnant and nursing mothers (as long as they were not covered by a medical aid scheme) (African National Congress, 1994). In 1996, the user fee abolition policy was further extended to the entire population, provided that they were not living in a household earning more than R100 000 per year in 1995 prices (Brink and Koch, 2015; Koch, 2015b; Morestein and Ridde, 2009; Leatt et al., 2006; van der Berg, 1997). With user fee abolition in South Africa, households and individuals obtain prescribed drugs and receive inpatient care, without paying any fees at government clinics (Republic of South Africa, 1994b). In this way, health can be regarded as “free". The “free" health care policy initiatives were expected to increase access to and utilisation of public health care facilities. They were also expected to alleviate household budgets by reducing household burdens associated with out-of-pocket payments (OOP) for health care services.

Consequently, evidence suggests that South African “free" health care policies resulted in substantial improvements in the utilisation of preventive care (McCoy and Khosa, 1996; Wilkinson et al., 1997), although curative care did not increase all that much (Brink and Koch, 2015; Koch, 2017). There also appears to have been some positive impact on the relatively worse-off in society (Koch and Racine, 2016). Evidence also exist to the extent that, while in 1997 most social programmes (especially social grants) benefitted the poor were, government spending on health was not well targeted (see van der Berg, 2001a). In 1993 for instance, health spending was reported to be 26.3 percent, 25.3 percent, 24 percent, 17.6 percent and 6.8 percent for quintiles 1 (poorest quintile), 2, 3, 4 and 5 (richest) respectively. The values for 1995 and 1997 are also in the similar range like those for 1993, across all the quintiles. This poor targeting of health spending raises hope on the initiatives aimed at improving access and financial protection that were adopted post-apartheid in that, they are likely to have improved targeting. While this evidence has been pertinent in guiding policy debates on reforming the South African health care system to achieve universal health coverage (UHC), there is meagre literature documenting whether financial protection improves following user fee abolition, despite evidence in some countries documenting that the removal of financial barriers has been ineffective in protecting households from adverse health events (Xu et al., 2006b; Leone et al., 2012; Masiye et al., 2016). More specifically, ineffectiveness appears to be tied to unavailability of drugs and medical services, as well as poorer quality services (El-Khoury et al., 2012; Leone et al., 2012; Masiye et al., 2016; Ukwaja et al., 2013; Chama-Chiliba and Koch, 2017) at health facilities where user fees have been removed. User fee abolition in South Africa entails receiving prescribed drugs for “free" in government clinics (Republic of South Africa, 1994b). It is therefore worth measuring financial protection in health care to examine whether or not such OOP payments are burdensome. Indirectly, this will shed light on whether or not the removal of financial barriers has been effective in protecting households from adverse health costs events.

Furthermore, while health care is “free" at government clinics, it is available at a fee that is income related, but based on a uniform patient fee schedule at government hospitals (UPFS). The

fee structure categorises patients either as full-paying patients, fully subsidised (H0) patients or partially subsidised (H1 and H2) patients (Republic of South Africa, 2009). Full-paying patients include (but are not limited to) patients who are either treated by a private practitioner, externally funded patients or certain categories of non-South African citizens. Fully subsidised patients, on the other hand, receive all services “free" of charge and comprise patients, who are referred to a hospital from primary health care services. Partially subsidised patients are those, whose health care costs are partially covered (Republic of South Africa, 2009). Children below the age of six, pregnant and nursing mothers and social grant beneficiaries are exempt from user charges in public hospitals. However, even when there is a waiver mechanism for households accessing health care at South African government facilities, evidence elsewhere suggests that waiving and exemption schemes have failed to protect the poor, due to the complexities surrounding decisions on who should benefit, the lack of knowledge about exemption schemes by those who are supposed to benefit, and the time involved for both patients and providers to acquire a waiver (Chuma et al., 2009; Collins et al., 1996). This, therefore, means that it is still possible for South African households to incur direct OOP health payments, which warrants further analysis. Private health care is financed by medical aid schemes for those who have enrolled on a voluntary basis. Often times, even the insured are subject to OOP, especially for co-payments and those who have exhausted their benefit packages.

More recently, South Africa has been striving to achieve universal health access to ensure financial risk protection, as is the case in many other countries. This is envisaged to be achieved through the yet to be fully implemented mandatory National Health Insurance Scheme (NHI) (see Republic of South Africa, 2011). The NHI proposes to offer access to a defined package of comprehensive and quality health care services to all South African citizens regardless of their employment status and ability to make direct monetary contributions to the NHI fund (Republic of South Africa, 2011). In essence, this implies that the financial barriers to accessing health care will be removed, making health care “free" to those who cannot afford to contribute to the NHI. Also, because NHI will be mandatory, the benefits of health insurance will be extended to everyone. As compared to OOP payments, contributory pre-payment mechanisms in the form of health insurance (or medical aid) guard against the unforeseen ill-health circumstances and therefore tend to be a fair or an equitable means of financing health care (Wagstaff, 2008). OOP payments, on the other hand, are not decoupled from health care utilisation (World Health Organisation, 2000), and should an individual fall ill requiring payment for consultation and prescribed drugs, such an individual is likely to be barred from consuming care if they lack funds. Evidence to this end explains why countries are moving away from user fees to expanding existing pre-payment health financing schemes. As noted above, the goal is to achieve universal access while ensuring financial risk protection against the detrimental effects of ill health (Adisa, 2015; Ataguba, 2016; Barros et al., 2011; Brinda et al., 2015; Choi et al., 2015; Doubova et al., 2015; Rahman et al., 2013; Su et al., 2006; Xu et al., 2007; Wagstaff, 2007; Wang et al., 2015).

This chapter aims to broaden the existing stock of knowledge on the equity aspects of OOP using South African household data.

A number of studies exist documenting the percentage of households incurring OOP payments that are deemed catastrophic (Akinkugbe et al., 2012; Adisa, 2015; Barros et al., 2011; Doubova et al., 2015; Wang et al., 2015; Buigut et al., 2015; Ghiasvand et al., 2015; Hamid et al., 2014; Somkotra and Lagrada, 2009). However, some research gaps still exist. In studies that have used South African data, the research does not examine the associated health facility utilised. As noted above, the cost implications of health facility choice are extensive in South Africa, and, thus, deserve some attention (*see* Ataguba and McIntyre, 2012; Ataguba and Akazili, 2012; Lamiraud et al., 2005; Mills et al., 2012b,a; Xu et al., 2003a). This shortfall limits our understanding of the relationship between health care decisions, OOP and CHE, if they arise. If, for example, fees deter households from using health facilities which in turn forces them to self-medicate, additional complications or worse health may result. In many developing countries, to a large extent, health care utilisation is contingent on payment-at-source, and, therefore, our analysis might have implications beyond South Africa. Although there are attempts to examine OOP and healthcare utilisation (see Chuma and Maina, 2012, for example), we are not aware of any previous attempts to split the analysis by facility ownership (public or private) and/or type of facility, which might matter, given the cost differences across these sectors in South Africa. If it is the case that consultations are occurring in public facilities where health care is “free", yet private sector OOP are observed, it could signal poor quality (plausibly, in the form of drug availability) in the public health care sector.

Furthermore, there are two methods used to examine CHE associated with OOP payments. The first is proposed by Xu (2005), who defines a household’s capacity to pay as income remaining after a household has met basic needs. The second method is proposed by Wagstaff and van Doorslaer (2003), who defines household capacity to pay as a household’s total consumption expenditure. Using either method, and not both, as is the case in most of the literature, limits comparisons that one can make across countries and time. However, while there is substantial literature conducted on the incidence of CHE associated with OOP payments, most studies have used either of the approaches and not both. While studies employing the two methods exist (see Kimani, 2014), these studies have only focused on CHE for one year, thereby limiting one to observe how the dynamics in the incidence of CHE are portrayed over time.

Against this background, our contribution to existing literature in this chapter is as follows. First, we extend the analysis that has been done on the incidence of CHE associated with OOP payments by examining where households purchased health care. Indirectly, this will assist us in explaining whether or not the magnitude of CHE incidence that we may observe is a result of financial protection offered by the “free" health care policies adopted by the South African government. We also employ both the income and burden approaches, when examining the incidence of CHE to allow for comparison. Also as expansion to existing studies, we provide a

breakdown of OOP health care payments by various socio-demographics to understand which households spend more on health care and on which components they are spending [see Appendix A]. Following this, we also examine the determinants of recording zero out-of-pocket health care payments – to give a more complete picture of the distribution of OOP.

2.2 Data

The analysis presented in this chapter is based on OOP health payments made by households, when consuming health care. For this reason, the research relies on data obtained from four nationally representative, cross-sectional South African Income and Expenditure Surveys (SAIES) conducted in the following timeframes: 1995, 2000, 2005-06 and 2010-11. The Income and Expenditure Surveys collect household income and consumption expenditures on items such as education, health care, housing, recreation, transport and communication, fuel used for heating, lighting and cooking, expenditure on durable goods and other miscellaneous expenditures. The advantage of the SAIES datasets is that they were collected by the same organisation, Statistics South Africa (StatsSA), and are publicly available online from DataFirst (www.datafirst.uct.ac.za). All the surveys followed a two-stage stratified design with sampling of primary sampling units in the first stage, and sampling of dwelling units in the next stage. In the 1995 SAIES, 2 000 enumerator areas (EA) were selected and within each selected EA, a systematic sample of 10 households was drawn and interviewed. The sample was stratified by race, province, urban and rural area, and the sample size was 29 595 households. The 1991 population census served as the basis in drawing the sample for this household survey (Statistics South Africa, 1997; Central Statistics Service, 1996); however, there were sample frame issues affecting that census, and subsequently the 1995 SAIES.

The 1991 population census was conducted under the apartheid regime, when the former “independent states" of Transkei, Bophuthatswana, Venda and Ciskei (TBVC) were not part of South Africa; thus, they were not included in the census and their size had to be estimated. However, only two of the states (Bophuthatswana and Venda) had district level information to allow such an estimation, necessitating the exclusion of the states lacking that type of data. In certain parts of the country, particularly rural areas in the former “self-governing territories", maps of enumeration areas were absent and households in these districts were not listed. Hence, it was difficult to include them in the census. Also, no attempt was made to incorporate new informal settlements, which were springing up all over the country. Since a newer census was not yet available, these problems carried over to the sampling frame for the household surveys conducted in 1995 and 1996 (Central Statistics Service, 1996). To address these problems, StatsSA has since recalculated the household weights for the 1995 SAIES, using the 1996 population census. These weights were used in the analysis. Fortunately, later survey frames were not similarly compromised, although sample weights from those surveys were also used to

be consistent. Despite the problems with the 1995 IES, it is possible to match it with the 1995 October Household Survey, which allows us to consider if and where households utilised health care.

The 2000 SAIES collected information from 26 238 households and its sample was drawn from the 1996 population and housing census. About 3 000 primary sampling units (PSUs) were drawn for the sample and these PSUs were explicitly stratified by province and area type (urban/rural). Within each explicit stratum, the PSUs were then implicitly stratified by district council (DC) and magisterial district (MD) and, within magisterial district, by average household income for formal urban areas and hostels or enumeration area (Statistics South Africa, 2001). Next, a systematic sample of 10 dwelling units was drawn from each PSU to be interviewed. For the 2005-06 SAIES, about 3 000 primary sampling units (PSUs) were drawn for the newly designed master sample, based on the 2001 population census enumeration areas. Those 3 000 PSUs were divided into four quarterly allocations of 750 each and within each quarterly allocation, a random sample of 250 PSUs were selected every month. Of these selected PSUs, eight dwelling units were systematically chosen for interview, resulting in a total of 24 000 dwelling units sampled for fieldwork (Statistics South Africa, 2008b). The sample for the 2010-11 SAIES comprised 3 080 PSUs obtained from the master sample and a supplement of 174 urban PSUs obtained from the PSU frame. From the sampled 3 080 PSUs, 31 007 dwelling units were sampled, while 412 dwelling units were sampled from the 174 urban PSUs, yielding a total of 31 419 dwelling units to be interviewed. All households were included, if there were multiple households at a sampled dwelling unit location (Statistics South Africa, 2012a).

Although there are some differences, given the preceding discussion, there is potential to examine the OOP payments across the four surveys. The differences that we note with the surveys is with regard to method used for collecting OOP payments. The 1995 and 2000 SAIES used the Standard Trade Classification for collecting expenditures including OOP payments. Essentially, households were required to recall the expenditures they made in the past 12 months or past month for some expenses. However, from 2005-06 and 2010-11, Statistics South Africa switched from the Standard Trade Classification used for collecting expenditures in the 1995 and 2000 SAIES, to using Classification of Individual Consumption According to Purpose (COICOP). Furthermore, in 2005-06, different households were surveyed at different points in time during a 12-month cycle. Households were given diaries to record their consumption expenditures, rather than providing recall information on expenditures from the past year (Statistics South Africa, 2012b; Yu et al., 2008). These differences in pre-COICOP IES data (1995 and 2000) OOP payments could be measured with error, based on recall. In particular, recall is likely to miss small payments, while the diary method (used in 2005-06 and 2010-11 SAIES) in a small window would rather, be unlikely to capture large OOP values. There are also inconsistencies in the data collection. The comparisons that cannot be made relate to disagregation of OOP by different services consumed, which is done in 2005-06 and 2010-11. However, despite these inconsistences,

the way OOP was measured across all the IES surveys, is enough to allow an analysis undertaken in this thesis which mainly is to relate OOP shares to household capacity to pay. Across all the surveys, OOP was defined as health payments made by each household at healthcare facilities.

2.2.1 Definition and Measurement of Variables

IES captures OOP health payments as a lump-sum figure for the household. Hence, OOP health payments are measured as expenditures that were incurred by the household as a whole. All the IES surveys collected information on household OOP payments, the difference was in the method used. In 1995 and 2000, the recall method was used while in 2005-06 and 2010-11, the diary method was used. From 1995 and 2000, these expenses are captured by purchases made for medicine (prescription and non-prescription), hospital and clinic services and expenses on therapeutic appliances. In 2005-06 and 2010-11, OOP are captured as medicines (with and without prescription), medical products (such as bandages and syringes) and therapeutic devices (including spectacles, hearing aids and braces), hospital expenses and outpatient services, which are classified into medical, dental and paramedical. In line with literature on health financing and OOP, expected and predictable costs were excluded, such as contributions to a medical aid scheme.

Despite consistency in OOP measurement between 1995 and 2000, as well as between 2005-06 and 2010-11, the potential for bias and measurement error cannot be ruled out. Households may not understand health expenditures to be what analysts understand them to be. For example, they may not record expenses on traditional (but private) practitioners, such as spiritual healers and sangomas, as health expenditures. It is also possible that households will not completely capture OOP expenses for all household members. While it is not possible to address these problems, we acknowledge that these problems are bound to limit the degree to which some conclusions can be drawn, when assessing equity in financing health care via OOP payments.

Apart from OOP payments, one variable of interest in the analysis is household economic welfare, which was computed from information that had been captured on total household consumption expenditure, comprising spending on new or used goods and services bought in the market place, own production and any in-kind payments made by or to a household through gifts or food to its employees or other household members (Statistics South Africa, 1995). Expenditure data is typically collected as monthly or yearly; all expenditures were converted to monthly values for analysis. Furthermore, for the COICOP surveys, data deflated to March (2006 and 2011) was used. To obtain a measure that reflects a household's economic welfare, monthly expenditures were aggregated to construct household total consumption expenditure, denoted as $tcexp_h$. The consumption aggregate includes both monetary and non-monetary expenses. Consumption expenditure was used, rather than income, to measure economic welfare, because it takes into account household coping mechanisms when their income is low (O'Donnell et al., 2008). In the short run, a household is able to "smooth" its consumption; hence it is reasonable to assume that

consumption will be more directly related to a household's current living standards than income, which is only received intermittently (Deaton, 1992; Deaton and Grosh, 2000; Deaton and Zaidi, 2002). Other variables used in the analysis comprised the following: (i) education of the household head (divided into: no schooling, some schooling, primary, secondary and tertiary); (ii) race of the household head (Black/African, Coloured, Asian/Indian and White); (iii) province (Western Cape, Eastern Cape, Northern Cape, Free State, KwaZulu-Natal, North-West, Gauteng, Mpumalanga and Limpopo); (iv) urban area (whether or not the household resides in the urban area); (v) employment status (whether or not the head of the household is employed); (vi) medical aid status (whether or not the household head has access to a medical aid); (vii) age (with categories 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84 and 85+).[1] According to the WHO report on the social determinants of health (World Health Organization, 2008); education,urban development infrastructure as well as social protection are highlighted as key factors in the improvement of health outcomes and equity. Evidence on the importance of these factors together with other factors has also been underscored by different researchers in different countries (amongst others, see Burger et al., 2012; Duan et al., 2019; Grossman, 1972b; Aregbeshola and Khan, 2018; Ngcamphalala, 2015; O'Donnell et al., 2008; Omotoso, 2017). Therefore, our choice of the variables used was guided by these existing studies and theory.

2.2.2 Data Summary

In Table 2.1, summary statistics for the main variables used in the analysis are reported. These summary statistics cover data from SAIES 1995 to 2010-11 and are weighted. In general it was observed that the population was relatively educated as the percentage of those with some schooling, who had completed primary and secondary was higher than those without any formal schooling. The majority are not covered by a medical aid scheme, and the majority population group is made up of Black-Africans. Relatively, it was also observed that there are more observations in the age brackets 30-34, 35-39, 40-44 and 45-49 years. Majority of the population does not have a medical aid cover and it is also observed that a relatively large number of households are poor and belong to quintile 1.

Having looked at the aggregates in Table 2.1, Figures 2.1, 2.2 and Figures 2.3 provides a disaggregated picture of some of the variables looked at in Table 2.1. Particularly, we examine the distributions of quintiles, household size and share of vulnerable individuals by gender of household head. This distinction is vital as it lays foundation for Chapter 3, which looks at the gender gap in the incidence of CHE from OOP payments. In addition, we assess the share of public health facilities in total health care utilisation by quintile, so as to shed light on public-private mix in health care utilisation. This is an important aspect of universal health care access as it will aid in an understanding of whether or not, the wealthy (or the poor) are exiting the public

[1] In the 2005/06 survey, age was available only in these groups. To keep the analysis similar across surveys, we used the same age categories across all surveys.

health care and opting for private health care due to maybe, perceived low quality concerns in the public sector.

Table 2.1: Descriptive Statistics, from SAIES 1995 to 2010-11

	1995		2000		2005-06		2010-11	
	Obs.	%	Obs.	%	Obs.	%	Obs.	%
Age of HH Head								
HH Head 20-24yrs	806	2.82	910	4.05	952	4.53	954	3.95
HH Head 25-29yrs	2,061	7.21	1,778	7.91	2,017	9.59	2,157	8.93
HH Head 30-34yrs	3,161	11.06	2,555	11.37	2,680	12.75	2,829	11.71
HH Head 35-39yrs	3,606	12.61	2,942	13.09	2,417	11.50	3,281	13.58
HH Head 40-44yrs	3,548	12.41	2,688	11.96	2,249	10.70	2,702	11.18
HH Head 45-49yrs	3,118	10.91	2,497	11.11	2,332	11.10	2,523	10.45
HH Head 50-54yrs	2,788	9.75	2,073	9.22	1,955	9.30	2,449	10.14
HH Head 55-59yrs	2,348	8.22	1,628	7.24	1,623	7.72	2,000	8.28
HH Head 60-64yrs	2,097	7.33	1645	7.32	1,499	7.13	1,658	6.87
HH Head 65-69yrs	1,793	6.27	1,250	5.56	1,202	5.72	1,312	5.43
HH Head 70-74yrs	1,328	4.64	1,028	4.57	875	4.16	973	4.03
HH Head 75-79yrs	862	3.01	567	2.52	502	2.39	504	2.09
HH Head 80-84yrs	519	1.82	444	1.97	242	1.15	302	1.25
HH Head 85plus	305	1.07	222	0.99	218	1.04	238	1.25
Population group of HH Head								
HH Head Black	20,629	72.17	17,943	79.85	16,147	76.82	18,305	75.79
HH Head Coloured	2,824	9.88	1,783	7.94	1,634	7.77	2,110	8.74
HH Head Asian	827.5	2.89	545	2.43	526	2.50	635	2.63
HH Head White	4,724	16.53	2,198	9.78	2,685	12.78	3,103	12.85
Education level of HH Head								
No schooling	7,809	27.32	0.168	2,871	13.66	2,182	9.03	
Some schooling	7,822	27.36	6,958	30.97	5,620	26.74	5,747	23.79
Completed Primary	9,495	33.22	6,886	30.65	6,819	32.44	8,489	35.14
Completed Secondary	9,653	33.77	3,961	17.63	4,802	22.85	6,084	25.19
Completed Tertiary	1,489	5.21	884	3.94	907	4.32	1,651	6.84
Employment Status of HH Head								
Employed	21.138	73.95	1,879	8.36	12,998	61.84	15,021	62.19
Not employed					8,022	31.16	9,132	37.81
Medical aid								
Covered	7,642	26.73	3,444	15.33	3,887	18.45	4,146	17.16

Continued on next page...

Descriptive Statistics (*continued*)

	1995		2000		2005-06		2010-11	
	Obs.	%	Obs.	%	Obs.	%	Obs.	%
Urban-Rural								
Urban	15,832	55.38	14,536	64.69	13,688	65.12	16,790	69.52
Quintile 1	5,718	20.00	4,501	20.03	4,204	20.00	4,631	19.17
Quintile 2	5,716	20.00	4,501	20.03	4,204	20.00	4,725	19.56
Quintile 3	5,717	20.00	4,493	20.00	4,204	20.00	4,877	20.19
Quintile 4	5,717	20.00	4,499	20.02	4,204	20.00	4,929	20.41
Quintile 5	5,716	20.00	4,476	19.92	4,204	20.00	4,992	20.67
Province								
Western Cape	3,261	11.41	2,015	8.97	2,151	10.23	2,715	11.24
Eastern Cape	4,191	14.66	3,032	13.49	2,911	13.85	2,754	11.40
Northern Cape	710	2.48	393	1.75	493	2.35	440	1.82
Free State	2,135	7.47	1,418	6.31	1,519	7.23	1,504	6.22
KwaZulu Natal	5,044	17.65	4,253	18.93	3,738	17.78	4,291	17.77
North-West	2,526	8.84	1,674	7.45	1,525	7.25	1,894	7.84
Gauteng	5,908	20.67	6,152	27.38	5,005	23.81	6,471	26.79
Mpumalanga	1,681	5.88	1,305	5.81	1,481	7.05	1,593	6.60

Sample Households are 28,585 for 1995, 22,506 for 2000, 20,923 for 2005-06 and 25,124 for 2010-11

More detailed disaggregation across surveys is discussed in Appendix A. Although Koch (2015a) provides some information in the aforementioned appendix, it focuses only on the 2005-06 and 2010-11 IES data, and the World Health Organization (WHO) approach to OOP payments. We extend Koch (2015a) using data from the years 1995 and 2000, as well as 2005-06 and 2010-11 to provide descriptive statistics for a wide range of sub-samples of the data: urban and rural place of residence, gender, province, marital status, employment status and medical aid status.

Figure 2.1: Share of female-headed households in total per capita household expenditure quintiles, 1995 to 2010-11

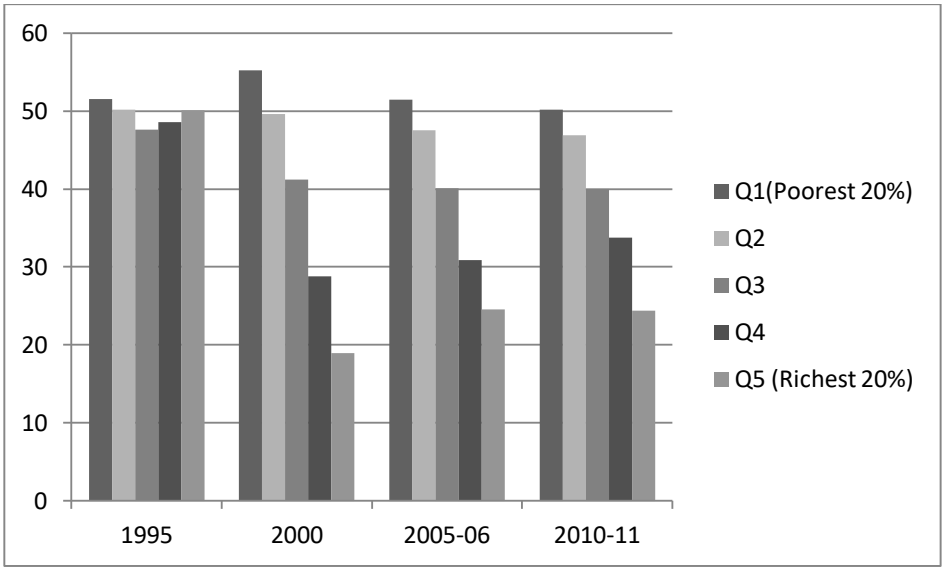


Figure 2.1 presents the share of female-headed households by household expenditure quintile adjusted for household subsistence needs[2]. In 1995, the share of female-headed households in quintile 1 (poorest 20%) is 52 percent compared to 48 percent male-headed households. When comparison is made across the other years, it is also evident that the share of female-headed households in quintile 1 is higher than that of male-headed households. In 2000, female-headed households make up 55 percent of households in the poorest 20 percent quintile, in 2005-06, the figure was 52 percent and in 2010-11, female-headed households in quintile 1 was 50 percent. For quintile 2, female-headed households constituted 50 percent in both 1995 and 2000 while in 2005-06, female-headed households constituted 48 percent but 47 percent in 2010-11, in comparison to their male-headed households counterparts. When focusing on the 20 percent most affluent quintile (quintile 5), it is observed that in 1995, the share of female-headed households constituted was equal to that of male-headed households. However, in 2000, the share of male-headed households was four times higher than that of female-headed households and, three times higher in both 2005-06 and 2010-11. Given this picture, we examined the distribution of household sizes by gender as well as the share of vulnerable individuals such as young children aged 4 and below, as well as the elderly (aged 60 and above) by household headship.

[2]A detailed discussion on how we adjusted household consumption expenditure for subsistence needs is provided in– 2.3.1.1

Figure 2.2: Distribution of Household Sizes by Gender (Female==1), 1995 to 2010-11

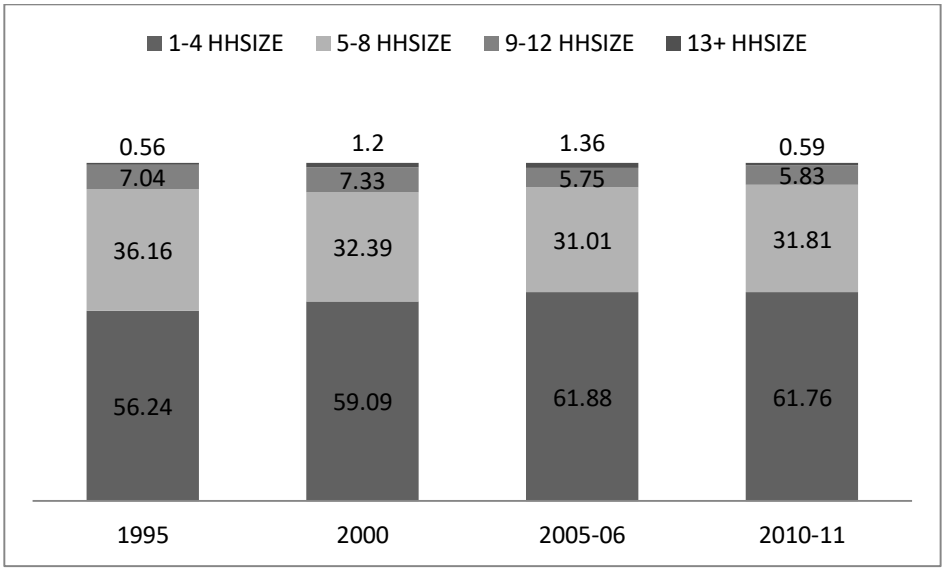
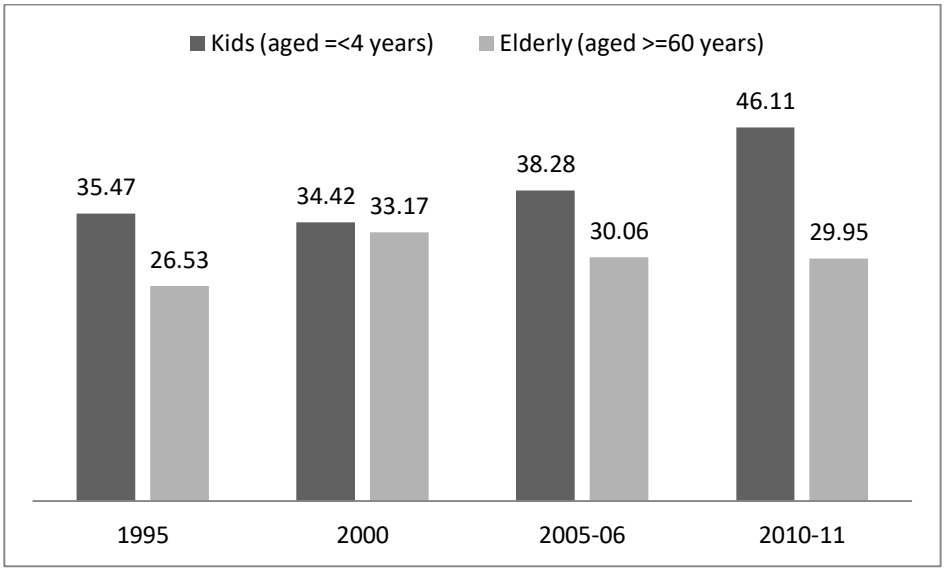


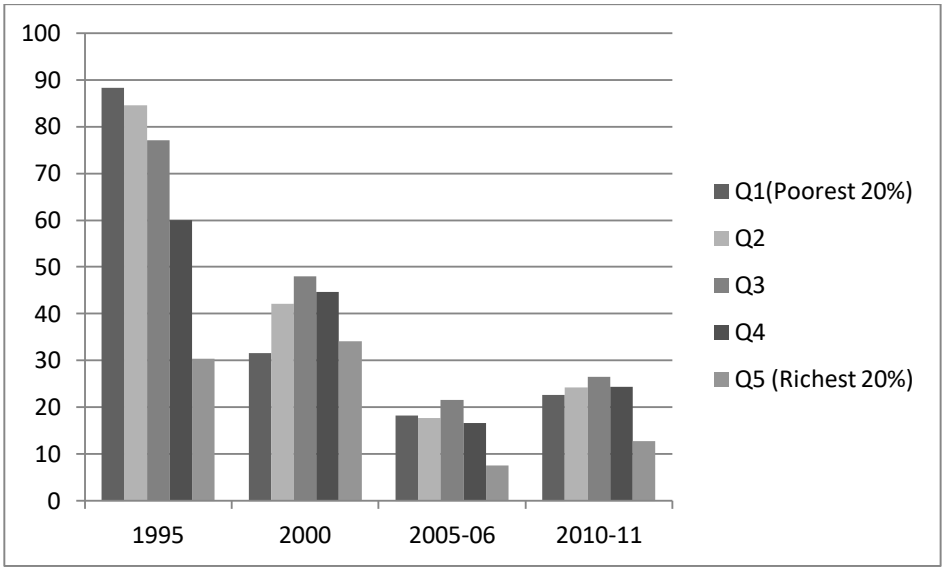
Figure 2.2 presents the distribution of household sizes by gender (female==1). The household sizes are broken down into four categories: (i) household size 1 is made up of between 1 and 4 household members; (ii) household size 2 comprise of between 5 and 8 members; (iii) household size 3 comprise of between 9 and 12 members while; (iv) comprise of 13 household members and above. What is evident is that across time, larger household sizes (of 9 and more members) are less pre-dominant among female-headed households compared to smaller household sizes comprising of 1 to 4 members. Household size that comprises of 1 to 4 members for female-headed households for instance, is about 56 percent is 1995, 59 percent in 2000 and 62 percent in both 2005-06 and 2010-11. Household size with members who are 13 and more is in the range of 0.56 percent and 1.3 percent. But when consideration is taken to assess the share of vulnerable individuals in these households by gender (see Figure 2.3), we find that across time, the percentage of vulnerable households in households headed by females is significant. In 1995 for instance, children aged 4 and below constituted 36 percent as a share of total household members in households headed by females when compared to about 30 percent in male-headed households. The elderly constituted 27 percent of members in female-headed households while in male-headed households, the figure was 22 percent. In 2000, children aged 4 and below accounted for 34 percent in female-headed households and 27 percent in male-headed households. The elderly accounted for 33 percent in female-headed households and 20 percent in male-headed households in 2000. In 2005-06, children aged 4 and below constituted for 38 percent in female-headed households and 28 percent in male-headed households while the elderly accounted for 30 percent in female-headed households but 20 percent in male-headed households. In 2010-11, children aged 4 and below accounted for 46 percent while the elderly accounted for 30 percent in female-headed households. Among male-headed households, the elderly accounted for 28 percent while children aged 4 and below accounted for 34 percent. Taking into consideration that female-headed households are relatively poor as compared to their male counterparts (Figure 2.1), stay in relatively households with large sizes (Figure 2.2) that comprises of significant proportions of individuals who are vulnerable (Figures 2.3) and have more health care needs, it is more likely that, female-headed households will incur catastrophic health payments than male-headed households. This aspect is interrogated in more detail in Chapter 3.

Figure 2.3: Share of children (aged 4 and below) and the elderly (aged 60 and above) in total household composition, by gender of household head, 1995 to 2010-11



Expanding on the discussions above, Figure 2.4 examines health facility utilisation across time. In 1995, there is a question in the October Household Survey (OHS) which asked households: “if someone in this household gets ill or injured and decides to seek medical help, where do they usually go first?". In answering this question, households indicated whether their first point of consultation is a public clinic, public hospital, other public, private clinic, private hospital or other private (e.g sangomas, faith healers etc). We used this question to estimate the share of public health care facilities in total health care utilisation to shed light on the private-public mix in health care utilisation by quintile. However, in the other years, there were no direct questions to households on their first point of consultation when ill or injured. There was evidence however, on OOP payments made by households in either public or private health care facilities or OOP incurred in both facilities. We used this information to assume that if a household recorded zero OOP in public facilities but there is OOP spending in private facilities, then such a household consulted in private health care facilities. If there is zero OOP in private facility but OOP spending in public health facility, then we assumed that the household consulted in private facility. There were also cases of households having OOP spending in both public and private health care facilities. In 2000 for example, about 15.33 percent had incurred OOP payments in both public and private facility, 14.13 percent in 2005-06 and 13.17 percent of households in 2010-11. Thus, we assumed these households consulted in both private and public. In examining the public-private mix, we only focused on those who consulted in either one, so that we can observe whether over time, there is a shift from public to private. This is presented in Figure 2.4.

Figure 2.4: share of public health facilities in total health care utilisation by quintile, 1995 to 2010-11



In 1995, about 88 percent of households from quintile 1 (poorest 20 percent) consulted in public facilities as compared to 30 percent from the most affluent (quintile 5). Despite the differences in adjusting household consumption expenditure for household size and composition, our results for 1995 are similar to those reported by (Burger et al., 2012). In 2000, we observe that 32 percent of households in quintile 1 consulted in public health care facilities as compared to those from the same quintile who consulted in private health care facilities. The values are relatively increasing from one quintile to the next in 2000. However, caution must be exercised when interpreting these results. As mentioned earlier, the assumption we made to come up with public facilities (private facility) utilisation graphs for 2000, 2005-06 and 2010-11 was that, where OOP was not zero in public (private) facilities, we approximated this to mean that the household consulted in the public (private) health care facility. So, a plausible reason to explain the values not adding up to 100 could be because there are some households who may have forgone health care due to lack of the fee and as such do not appear in the surveys or it could be due to other data challenges such as mis-understanding of the question such that responses given result in such households dropping off the survey. In 2005-06, we find that 18 percent of households from quintiles 1 and 2 consulted in public facilities, 22 percent from quintile 3 consulted in public facilities and 7.5 percent from quintile 5 consulted in public health care facilities. In 2010-11, 23 percent from quintile 1 consulted in public health care facilities, 24 percent from both quintile 2 and 4, 26 percent from quintile 3 and 13 percent from quintile 5. This picture over time suggest that there has been a decline in the poorest households consulting in public facilities but an increase in them consulting in private facilities. For quintile 5, although there is an observed decline across time in public health care facility utilisation, the picture for private health care utilisation is not clear. The figures are fluctuating over time. There is an observed decrease for instance, in private health care facilities utilisation between 1995 and 2000 among quintile 5 households but, an increase between 2000 and 2005-06 and thereafter, a decrerase between 2005-06 and 2010-11. Despite this, what is clear is that the poor tend to utilise public health facilities than private facilities. This is welcome as it shows that the intended effect of removal of user fees is bearing fruit in that, those who are suppose to benefit from it, are indeed utilising facilities where such policy is applicable.

We also interrogated OOP payments by different components just to get a feel of the data we will be analysing in the thesis. In Table 2.2, the descriptives presented are for physician visits as well as health facility visits. The physician visits comprise of nurse visits, doctor visits, dental visits, visits to pharmacists, traditional doctors and faith healers.

Table 2.2: Out-of-Pocket Payments for Physician Visits and Hospital Visits

	1995	2000	2005-06	2010-11
OOP Physicians	40.34	13.69	34.83	18.06
OOP Facility	32.68	2.74	2.83	24.10

From the results presented in Table 2.2, households spent about R40 in 1995 on physician visits and about R14 in 2000, R35 in 2005-06 and R18 in 2010-11. On facility visits, households spent R323 in 1995, R3 in 2000 and 2005-06 but, R24 in 2010-11. While the values spent in 1995 seem higher than those spent in other years, particularly to those in 2005-06 and 2010-11, a plausible reason behind these figures could be measurement error as alluded to earlier. In 1995 and 2000, recall method was used to collect expenditure data from households while in 2005-06 and 2010-11, diary method was used. The problem with recall method is that, households are likely to miss small payments that occur quite regugularly such as nurse visits, medicine expenses, doctor visits but recall large expenses that do not occur frequently. The diary method on the other hand, in a small window, is unlikely to capture large OOP values but rather small and frequently OOP payments. This seems to be the case for OOP payments presented in Table 2.2 whereby, we observe OOP for physician visits to be relatively larger in the recall method and OOP for facility usage (which one would assume would have been the one dominating), to be rather small. This means that, even though the diary method is an improvement to recall method, both methods have a limitation of resulting in under-reporting of the OOP expenses.

When evaluating health care components to assess which ones are relatively important, we find that, when evaluated by health insurance status or employment status, spending on hospital services is relatively lower than expenses on medical products and outpatient services. This is both in monetary values and as a share of total spending by category. In 2005-06 (Table 2.5) for instance, the percentage share of hospital services across urban and rural areas the values were 0.08 percent and 0.12 percent, and across insurance status, it ranged between 3.51 and 30.22. This is in contrast to the percentage share of medical products among same demographics. Among the insured households for instance, the percentage share of medical products was 0.72 percent; it was 0.81 percent for uninsured households. For outpatient services it was 0.82 percent for insured and 1.29 percent for uninsured households.

Table 2.3: Comparing 1995 Out-of-Pocket Payments by Insurance and Employment Status of Household Head

	All Households	HH Head Insured	HH Head Not Insured	HH Head Employed	HH Head Not Employed
Out-of-Pocket Payments (total)	27.33	46.50	18.13	30.02	21.12
	(0.90)	(1.81)	(1.01)	(1.21)	(1.04)
OOP Share (%)	0.97	0.74	1.08	0.78	1.40
	(0.02)	(0.03)	(0.02)	(0.02)	(0.04)
Capacity-to-Pay	2,954.69	5,900.99	1,541.83	3,568.74	1,540.51
	(45.32)	(117.40)	(27.89)	(62.40)	(35.16)
Sample Households	26,716	7,685	19,031	17,313	9,403

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table 2.4: Comparing 2000 Out-of-Pocket Payments by Insurance and Employment Status of Household Head

	All Households	HH Head Insured	HH Head Not Insured	HH Head Employed	HH Head Not Employed
Out-of-Pocket Payments (total)	17.74	23.36	16.72	10.04	18.44
	(0.76)	(2.76)	(0.75)	(1.93)	(0.81)
OOP Share (%)	1.04	0.32	1.17	0.93	1.05
	(0.02)	(0.02)	(0.03)	(0.06)	(0.02)
Capacity-to-Pay	2,779.25	9,416.73	1,572.84	1,239.47	2,919.04
	(59.90)	(274.68)	(36.34)	(52.66)	(64.90)
Sample Households	22,475	3,049	19,426	1,783	20,692

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Findings of relatively lower OOP health care payments among employed are also suggested in 2005-06 and 2010-11. Further disaggregated descriptives of OOP expenditure data are presented in Appendix A from Table A.3 through to Table A.16. The OOP expenditure descriptives are disaggregated by education of household head, racial group of household head, marital status of household head as well as province.

Table 2.5: Comparing 2005-06 Out-of-Pocket Payments across All Households headed by Insured, Uninsured, Employed and Unemployed Household Heads

	All Households	HH Head Insured	HH Head Not Insured	HH Head Employed	HH Head Not Employed
Out-of-Pocket Payments (total)	77.43	252.08	37.92	90.86	55.66
	(5.58)	(28.35)	(2.11)	(8.16)	(6.25)
OOP Share (%)	2.10	1.76	2.17	1.80	2.57
	(0.03)	(0.09)	(0.03)	(0.04)	(0.06)
Medical Products	29.24	95.02	14.36	35.64	18.86
	(1.33)	(6.37)	(0.67)	(2.01)	(1.22)
Product Share (%)	0.79	0.72	0.81	0.71	0.92
	(0.01)	(0.03)	(0.01)	(0.02)	(0.02)
Outpatient Services	39.76	126.84	20.06	48.61	25.41
	(4.35)	(23.26)	(0.59)	(6.92)	(1.98)
OPD Share(%)	1.20	0.82	1.29	1.00	1.53
	(0.02)	(0.07)	(0.03)	(0.03)	(0.05)
Hospital Services	8.43	30.22	3.51	6.61	11.39
	(2.06)	(7.74)	(1.82)	(1.04)	(5.12)
Hospital Share(%)	0.10	0.22	0.08	0.09	0.12
	(0.01)	(0.04)	(0.01)	(0.01)	(0.02)
Capacity-to-Pay	4,393.76	14,252.77	2,163.75	5,712.05	2,257.69
	(98.15)	(374.66)	(47.29)	(149.64)	(67.11)
Sample Households	21,019	3,281	17,738	11,751	9,268

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table 2.6: Comparing 2010-11 Out-of-Pocket Payments across All Households headed by Insured, Uninsured, Employed and Unemployed Household Heads

	All Households	HH Head Insured	HH Head Not Insured	HH Head Employed	HH Head Not Employed
Out-of-Pocket Payments (total)	113.21	324.65	71.05	131.64	84.15
	(5.82)	(31.55)	(2.70)	(8.99)	(4.88)
OOP Share (%)	1.83	1.40	1.91	1.65	2.11
	(0.03)	(0.07)	(0.03)	(0.03)	(0.06)
Medical Products	58.09	159.83	37.81	65.35	46.66
	(2.43)	(12.90)	(1.19)	(3.45)	(3.11)
Product Share (%)	1.02	0.74	1.08	0.93	1.16
	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)
Outpatient Services	53.80	160.88	32.44	64.72	36.57
	(4.99)	(27.77)	(2.15)	(7.95)	(2.76)
OPD Share (%)	0.79	0.63	0.83	0.71	0.93
	(0.02)	(0.06)	(0.02)	(0.02)	(0.04)
Hospital Services	1.32	3.95	0.80	1.57	0.93
	(0.28)	(1.09)	(0.25)	(0.38)	(0.38)
Hospital Share (%)	0.01	0.02	0.01	0.01	0.01
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Capacity-to-Pay	7,524.50	22,582.93	4,522.02	9,241.35	4,817.38
	(148.19)	(646.61)	(77.80)	(216.05)	(164.63)
Sample Households	25,124	3,532	21,592	14,271	10,853

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

2.3 Theoretical and Empirical Methods of Measuring Equity in Health Care Financing

2.3.1 Burden Approach (also known as the WHO methodolody)

2.3.1.1 Xu (2005) Methodology

Following Xu (2005), the first step is to formulate a food expenditure share, which will be denoted by w_f. According to the approach, all purchases made by a household on all foodstuffs plus the value of a household's own food production, are included, while any purchases on alcoholic beverages, tobacco and food consumed outside home are excluded. In the 1995 SAIES, for home-grown or -produced food, data was available on the quantity produced, consumed, sold and the value of sales for sold quantity covering the past 12 months. To determine the value of sales for food produced and consumed by a household, the value of sales was divided by the quantity sold to obtain the average price per good. Then that price was multiplied by the quantity consumed

to obtain the value of sales for consumed food produced; that value was then converted to a monthly figure, which was added to other food expenses already available as monthly values. In the 2000, 2005-06 and the 2010-11 SAIES surveys, home food production was not well-measured and was therefore ignored. In the next step, each household's food expenditure was adjusted for household size and structure - it is referred to as f_e below, by dividing total food expenditure by the consumption equivalence scale h_e given in Equation 2.1. Koch (2018) undertakes an extensive analysis of the importance of the equivalence scale in the Xu (2005) approach, finding little effect in South Africa; therefore, we have not considered alternative equivalence scales.

$$h_e = h^{\beta} \tag{2.1}$$

In (2.1), h_e represents the number of consumption equivalents in the household, h represents the household size and β, estimated to be 0.56 by Xu et al. (2003a) using data from 59 countries (including South Africa), reflects economies of scale in the household. With household food shares (w_f), it is possible to calculate the weighted average of equivalent food expenditure in the 45^{th} and 55^{th} percentile range, which underpins the determination of subsistence. Subsistence expenditure per equivalent (referred to as the poverty line) is described in Equation 2.2 where, $\mathbb{I}(w_f^{45} < w_{f_i} < w_f^{55})$ is an indicator function determining whether or not household i's food share lies within the 45^{th} and 55^{th} percentile of the food share distribution, and $\mathbb{I} = 1$ denotes that it does.

$$\ell = \frac{\sum_{i:\mathbb{I}=1} \omega_i f_{e_i}}{\sum_{i:\mathbb{I}=1} \omega_i} \tag{2.2}$$

In (2.2), ℓ is the poverty line. Having defined the poverty line, it is possible to determine the subsistence level, se_h, which is paramount to the calculation of the capacity to pay.

$$se_h = \ell \times h_e \tag{2.3}$$

A household's capacity to pay (ctp_h) is formally defined as:

$$ctp_h = \begin{cases} tcexp_h - se_h & \text{if } se_h \leq f_e \\ tcexp_h - f_e & \text{otherwise} \end{cases} \tag{2.4}$$

Given a household's capacity to pay and OOP (oop_h), the share of the household's capacity to pay devoted to OOP is simply the ratio:

$$oopctp_h = oop_h / ctp_h \tag{2.5}$$

Once the share of capacity to pay devoted to OOP payments has been calculated, it becomes possible to determine whether or not a household has been seriously affected by these payments. Given an arbitrary proportion, κ, a household is defined as potentially facing CHE if the share exceeds an arbitrary value. $Cata_h$ is defined as an indicator of catastrophic payments; thus,

$cata_h = \mathbb{I}(oopctp_h \geq \kappa)$. For analysis purposes, in addition to $\kappa = 0.4$, which has been used by other authors in existing empirical studies, we considered OOP payments to be catastrophic if they are equal to or exceed $\kappa = 0.05$, $\kappa = 0.10$ and $\kappa = 0.15$ so as to provide document evidence on those CHE thresholds. The choice to use these latter CHE thresholds was derived from documented evidence by Aregbeshola and Khan (2018); World Bank (2012b,a) who used the thresholds (5 percent, 15 percent and 25 percent) for Nigeria, Namibia and Zambia for instance, in addition to the 10 percent and 40 percent CHE thresholds. So, in the case of 40 percent threshold for instance, CHE is defined as:

$$cata_h = \begin{cases} 1 & \text{if } oopctp_h \geq 0.4 \\ 0 & \text{otherwise} \end{cases} \tag{2.6}$$

Another worry that arises is whether or not a household has been “made poor", because they have had to make OOP health care payments. Intuitively, a household is impoverished if their OOP expenditures on health care pushes them below subsistence level. If those expenditures were not made, they would no longer be below subsistence. To put things into perspective, before making OOP health care payments, a household is regarded as poor ($poor_h$) when its total household expenditure is less than its subsistence spending, and non-poor otherwise. That is:

$$poor_h = \begin{cases} 1 & \text{if } tcexp_h < se_h \\ 0 & \text{if } exp_h \geq se_h \end{cases} \tag{2.7}$$

Then given $tcexp \geq se_h$, a household is impoverished if, $tcexp\text{-}oopctp_h < se_h$. The formal definition follows, where $impoor_h$ represents the impoverished.

$$impoor_h = \begin{cases} 1 & \text{if } tcexp_h \geq se_h \text{ and } tcexp_h - oop < se_h \\ 0 & \text{if } tcexp_h \geq se_h \text{ and } tcexp_h - oop \geq se_h \end{cases} \tag{2.8}$$

2.3.2 Income Approach

2.3.2.1 Wagstaff and van Doorslaer (2003) Methodology

The following methods, attributed to Wagstaff and van Doorslaer (2003) is similar to the burden approach, but with slight differences in how food expenses are subtracted. In particular, this method deducts actual food expenses from total household consumption expenditure and considers the remaining total to reflect the household’s income. Rather than using equivalized household size, adult equivalence scales are used, as defined by Equation 2.9 to adjust for the structure and composition of a household size.

$$eqexp_h = (A_h + \alpha K_h)^{\theta} \tag{2.9}$$

In (2.9), $eqexp_h$ is the equivalised household expenditure, A_h is the number of adults in a household and K_h is the number of children in a household, α is the cost of children while θ reflects economies of scale. This adjustment method has been extensively employed using South African data in the measurement of poverty. Most of the studies use $\alpha = 0.5$ and $\theta = 0.9$ (Bhorat, 1999; Leibbrandt and Woolard, 1999; May et al., 1995). We use these same values. Given Koch (2018), we do not expect the choice to matter all that much; however, it should be noted that we do not investigate that here.

Defining OOP payments for each household as oop_h, total expenditures for each household as $tcexp_h$ and food expenditures as f_h, we calculate the catastrophic headcount ratio, which is the percentage of households incurring catastrophic expenses. A household is said to incur catastrophic health care payments if $oop_h/()tcexp_h - f_h)$ exceeds an arbitrary proportion, κ. The headcount is then given by:

$$H = \frac{1}{N} \sum_{i=1}^{N} cata_h, \tag{2.10}$$

where N is the sample size and $cata_h = (oop_h/(tcexp_h$ - $f_h) > \kappa)$.

2.3.2.2 O'Donnell et al. (2008) Methodology

Finally, O'Donnell et al. (2008) defines ability to pay as total household consumption expenditure with food expenditure included, unlike the approach of Wagstaff and van Doorslaer (2003) or the WHO. Defining ability to pay as total household consumption inclusive of food expenditure is problematic, if the non-discretionary expenditure is sensitive to the system of health finance. That is, if ability to pay is defined as household consumption inclusive of food expenditure, as is the case, the relative tax rate imposed on food would be expected to differentially influence household decisions with respect to food spending. This would therefore, imply that the distribution of household consumption net of food expenditure is itself a product of the health finance system and does not provide a benchmark against which to assess the distributional impact of that system. Hence, defining ability to pay gross of food expenses is made under a strong assumption that the means of financing health care does not affect saving decisions. Once a household's ability to pay has been defined, Equation 2.9 is used to adjust for the structure and composition of a household size.

2.4 Empirical Results

Before investigating the incidence of CHE, it is important to note that not all households have incurred OOP. Therefore, in what follows, determinants of households that recorded zero OOP health care payments are examined. Data suggests that about 49 percent in 1995, 42 percent in 2000, 20 percent in 2005-06 and 21 percent of households in 2010-11 recorded zero OOP. Hence, in assessing determinants of OOP non-spending, a logit regression is employed and the marginal

effects from logit, weighted to the population of households, are reported. The research controlled for household head attributes such as age, race, gender, medical aid status, quintile, urban area, province as well as education. The results are reported in Table 2.7.

Table 2.7: Marginal Effects for OOP Payments

	Coefficient.	Std. error
Trend (1995-2011)	-0.019***	(0.000)
Age	-0.005***	(0.001)
Age^2	-0.000**	(0.000)
Male	-0.024***	(0.004)
Coloured	-0.011	(0.009)
Asian	0.059***	(0.016)
White	0.082***	(0.011)
Eastern Cape	-0.019*	(0.010)
Northern Cape	-0.025**	(0.010)
Free State	0.042***	(0.011)
KwaZulu Natal	0.029***	(0.011)
North-West	-0.045***	(0.013)
Gauteng	-0.018*	(0.010)
Mpumalanga	-0.030***	(0.011)
Limpopo	-0.118***	(0.011)
Urban	0.011**	(0.005)
Some Schooling	-0.001	(0.005)
Completed Primary	-0.011**	(0.005)
Completed Secondary	-0.024***	(0.006)
Completed Tertiary	0.002	(0.013)
Medical Aid	-0.099***	(0.007)
HH Head Employed	-0.017***	(0.005)
HHSIZE5-8	0.089***	(0.005)
HHSIZE9-12	0.165***	(0.026)
HHSIZE13+	0.121***	(0.030)
Quintile 2	0.091***	(0.006)
Quintile 3	0.135***	(0.007)
Quintile 4	0.179***	(0.008)
Quintile 5	0.240***	(0.010)
Sample Households	74,728	

Continued on next page...

Marginal Effects (*continued*)

	Coefficient.	Std. error

The table contains marginal effects for OOP payments. Marginal effect is a measure of the instantaneous effect that a change in an independent variable has on the predicted probability of the dependent variable (OOP payments) when the other household head covariates are held constant.

The reference group is poor (quintile 1) Blacks/Africans living in the rural Western Cape province who have no formal education and are living in household size with between 1 and 4 household members. According to Table 2.7, there is a reduction over time, which matches the broad proportions reported earlier and suggests that more households were subject to OOP in 2010-11 than 1995. The probability that a household did not incur OOP decreased by 1.9 percent per year (each survey is approximately five years apart). Asians were six times more likely to not incur OOP than Blacks/Africans, while Whites were eight times more likely than Blacks/Africans to not incur OOP. Those with medical aid cover are 10 percent less likely to avoid OOP than those not covered, and for all households other than poor households the marginal effect is positive. Thus, increased income means households are more likely to avoid OOP. It is also true that urban households are more likely to avoid OOP, while households with employed heads are less likely to avoid OOP. The education marginal effects and provincial marginal effects are somewhat mixed. Although the descriptive statistics suggest that OOP is higher amongst the employed, the insured, more educated and urban (as well as those with higher incomes) – see Tables A.25, A.35 and A.36 in Appendix A – they are not all directly correlated to OOP, as would be expected in any regression setting.

2.5 Which Households Face Catastrophic Health Payments or Impoverishment due to OOP ?

2.5.1 Incidence of Catastrophic Health Expenditures (CHE)

In Tables 2.8, 2.10 and 2.9, the results for CHE are presented, respectively evaluated at various thresholds of OOP as a share of a household's capacity to pay, a household's total consumption expenditure and a household's non-food consumption expenditure. The latter two are usually referred to in the literature as forming the income approach, while the former (i.e. those using household capacity to pay) is referred to in the literature as the burden approach. To quickly summarise, the incidence of CHE is relatively low, regardless of the approach used. When health care payments are evaluated at low thresholds, the incidence of CHE is relatively higher than when the threshold is higher, as should be the case, and this is also true for all approaches. This result is similar to those presented by citetWorldBank2012a,WorldBank2012 when using low

threshold of 5 percent when evaluating the incidence of CHE in Namibia and Zambia. Focusing on the incidence of CHE at the 40 percent level of total consumption expenditure adjusted for subsistence needs (Table 2.8), we found that in 1995, around 0.03 percent of households incurred health expenses that likely forced them to cut back on consumption of at least some of their basic needs, while for the years 2000, 2005-06 and 2010-11, the incidence is 0.06 percent, 0.09 percent and 0.07 percent respectively. While the research does not have a benchmark against which to compare the results for the years 2000 and 2010-11, the findings for the years 1995 and 2005-06 are consistent with those documented by Xu et al. (2003a) and Mills et al. (2012b), who used the same data. Xu et al. (2003a) finds 0.03 percent at the 40 percent threshold using 1995 data, while Mills et al. (2012b) finds a slighlty larger 0.07 percent at the 40 percent threshold using the 2005-06 data.

Table 2.8: Catastrophic Payments Following the Burden Approach

	1995 SA IES	2000 SA IES	2005-06 SA IES	2010-11 SA IES
Catastrophic ≥5	4.5451	4.3596	10.9932	8.6675
	(0.123)	(0.157)	(0.292)	(0.221)
Catastrophic ≥10	1.3124	1.2899	3.3120	2.8094
	(0.067)	(0.090)	(0.167)	(0.135)
Catastrophic ≥15	0.6487	0.6316	1.4035	1.1554
	(0.047)	(0.063)	(0.101)	(0.092)
Catastrophic ≥25	0.1859	0.2514	0.3501	0.3313
	(0.025)	(0.040)	(0.050)	(0.052)
Catastrophic ≥40	0.0349	0.0693	0.0922	0.0669
	(0.011)	(0.021)	(0.028)	(0.021)
Sample Households	28,585	22,506	20,923	25,124

Reported values are the percentage of households classified in each catastrophic payments category, where ≥ 5 is the category in which households are subject to CHE above 5% of their capacity to pay, i.e., estimates follow Xu (2005) methods. Robust standard errors are in parentheses. Sample households refers to the actual number of households in that subgroup but, the reported percentages have been weighted using inverse probability weights obtained from each survey.

When CHE is evaluated in relation to household capacity to pay (defined as total household consumption expenditure or expenditure net of food expenses), CHE incidence remains low. Focusing on the 40 percent threshold, as before, CHE in relation to non-food consumption expenditure (Table 2.9), gives results rather similar to those reported for subsistence based capacity to pay in Table 2.8 for all the years except 2000. For 2000, the incidence is slightly higher than when capacity to pay was defined as total consumption expenditure adjusted for household

subsistence needs.

Table 2.9: Households Subject to Catastrophic Payments at Different Share Percentage of Household Capacity-to-Pay: Income Approach - O'Donnell et al. (2008) Methodology

	1995 SA IES	2000 SA IES	2005-06 SA IES	2010-11 SA IES
Catastrophic ≥5	5.1149	5.0128	12.2841	9.4705
	(0.130)	(0.170)	(0.314)	(0.228)
Catastrophic ≥10	1.5871	1.5701	3.6573	3.1817
	(0.074)	(0.098)	(0.174)	(0.142)
Catastrophic ≥ 15	0.7869	0.8893	1.6654	1.2825
	(0.052)	(0.076)	(0.113)	(0.094)
Catastrophic ≥ 25	0.2261	0.3867	0.3994	0.3737
	(0.028)	(0.048)	(0.053)	(0.053)
Catastrophic ≥40	0.0448	0.2017	0.0968	0.0700
	(0.013)	(0.034)	(0.029)	(0.021)
Sample Households	28,585	22,506	20,923	25,124

Reported values are the percentage of households classified in each catastrophic payments category, where ≥ 5 is the category in which households are subject to CHE above 5% of their ability to pay, i.e., estimates follow O'Donnell et al. (2008) methods. Robust standard errors are in parentheses. Sample households refers to the actual number of households in that subgroup but, the reported percentages have been weighted using inverse probability weights obtained from each survey.

When capacity to pay is not adjusted, either for food expenditures or for subsistence needs, we find that overall CHE is lower, which is to be expected. Those results are presented in Table 2.10.

From a financial protection perspective, the low percentage of households facing CHE suggests a health care system that does not financially burden its citizens. Given "free" health care, as outlined above, these results are both to be expected and to be viewed somewhat positively. However, caution should be exercised when interpreting these results too positively. While the low proportion of CHE at least partly arises from the non-user fee (or at least rather limited user fee environment), it could also arise from non-use of health care services, which might be driven by poverty, i.e., individuals either not earning an income or individuals who may be forced to forego their earnings, if they take the day off to utilise health facilities. Furthermore, the low CHE values could be due to differences in how households (particularly poor vs non-poor) perceive illness and determine their need for care. Regardless of the reason, ultimately, those reasons can influence health facility utilisation, and therefore, influence household health care expenditure. Although we are not able to directly determine which of the above reasons is likely to matter, and we are not able to provide information across all of the years for which we have

Table 2.10: Households Subject to Catastrophic Payments at Different Share Percentage of Household Capacity-to-Pay: Income Approach - Wagstaff and van Doorslaer (2003) Methodology

	1995 SA IES	2000 SA IES	2005-06 SA IES	2010-11 SA IES
Catastrophic ≥5	2.1722	2.2679	6.7269	5.6980
	(0.086)	(0.117)	(0.234)	(0.184)
Catastrophic ≥10	0.6407	0.8459	1.7860	1.6355
	(0.047)	(0.076)	(0.132)	(0.108)
Catastrophic ≥15	0.2447	0.4247	0.7395	0.6688
	(0.029)	(0.051)	(0.076)	(0.076)
Catastrophic ≥25	0.0484	0.2147	0.1702	0.1686
	(0.013)	(0.035)	(0.035)	(0.038)
Catastrophic ≥40	0.0107	0.1197	0.0421	0.0415
	(0.006)	(0.026)	(0.023)	(0.018)
Sample Households	28,585	22,506	20,923	25,124

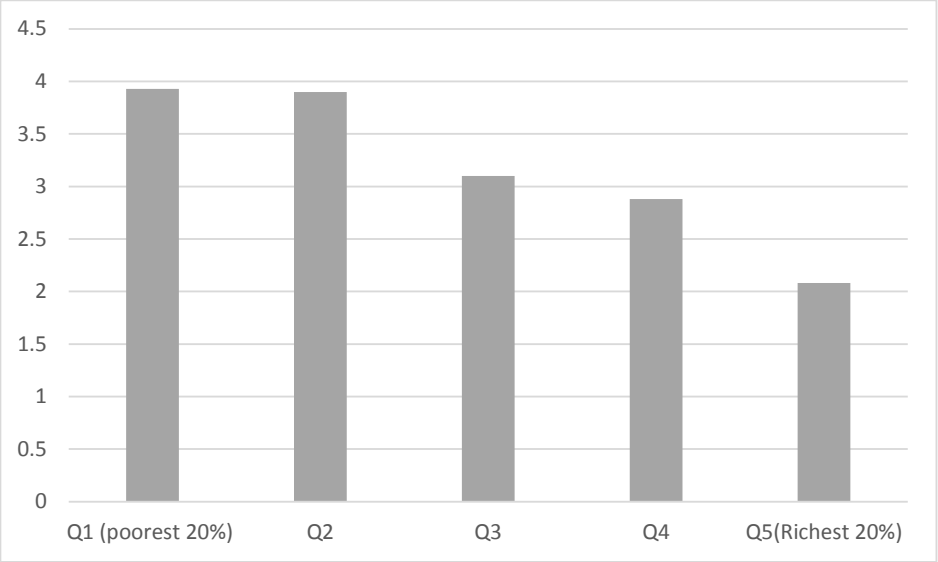
Reported values are the percentage of households classified in each catastrophic payments category, where ≥ 5 is the category in which households are subject to CHE above 5% of their capacity to pay net of food expenditures, i.e., estimates follow Wagstaff and van Doorslaer (2003) methods. Robust standard errors are in parentheses. Sample households refers to the actual number of households in that subgroup but, the reported percentages have been weighted using inverse probability weights obtained from each survey.

expenditure data, we are able to consider if there are obvious treatment decision differences that might be relevant.

We examine this by merging the 1995 Income and Expenditure Survey with the 1995 October Household Survey. The latter survey was given to nearly all of the same households as in the expenditure survey, and the survey covers a wider range of information. In particular, it is possible to see if any member in the household was ill in the last month, and, if they were ill, if and where they chose to seek health care.

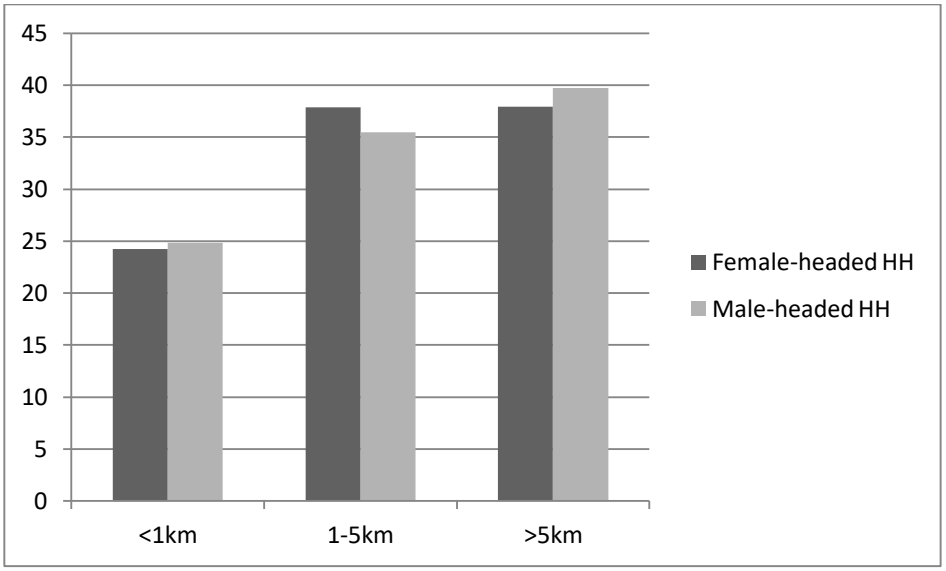
As depicted in Figure 2.5, a negligible percentage of households had household members who did not seek treatment when ill or injured. This proportion ranged between 2 and 4 percent. In the poorest two quintiles, quintiles 1 and 2, we find about 4 percent of households reporting not to have consulted a health worker when confronted with illness or injury. The question used from the 1995 OHS-IES data asked individuals to about their most recent visit to the healthcare provider when ill. However, there could be cases where individuals consulted for preventive care rather than curative care and this was not captured in the IES surveys that we used. These concerns would mean that there was under-reporting of illness that we may report in our analysis. Hence, these limitations are borne in mind as we conduct this analysis and interpret the results.

Figure 2.5: Percentage of households that did not consult when ill or injured, 1995



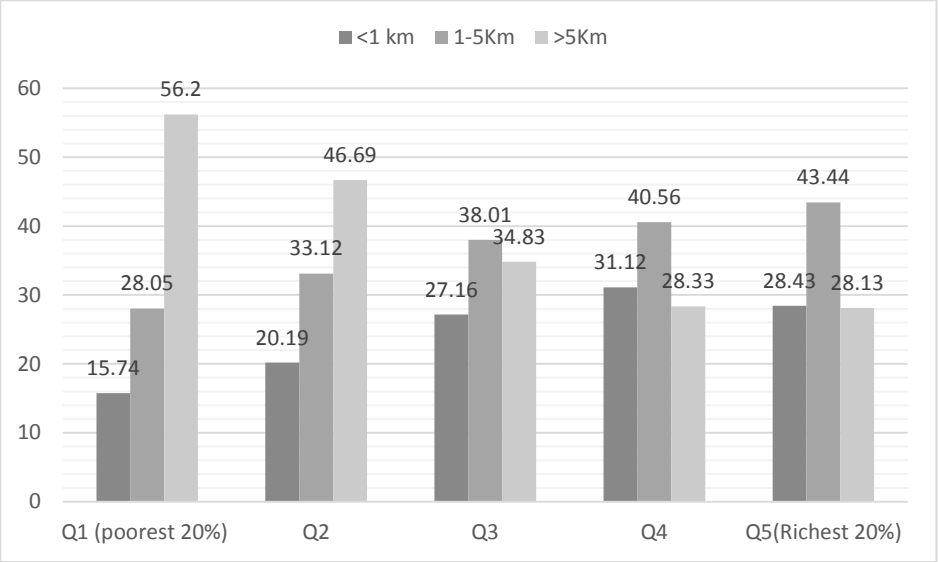
While prohibitive costs such as transport costs could also partly explain why the reported CHE is low as shown earlier, we can only shed light on the distance from health facility by households. This information is only available in the combined 1995 IES/OHS. Figure 2.7 provides a breakdown of distance from the health care facility by gender of household headship and Figure 2.7 by quintile.

Figure 2.6: Distance from health facility by gender of household head, 1995



There are no significant differences in distance to the health care facility across gender of household head. About 24 percent of male and female-headed households traveled less than 1km to the health facility and 36 percent travel between 1 and 5 km while 40 percent travel more than 5 km to the health facility. When considering the quintile, about 56 percent of poorest quintile (quintile 1) travel more than 5 km to the health facility as compared to 28 percent of the households belonging to quintile 5. However, 16 percent travel less than 1 km to the health facility in comparison to 28 percent in quintile 5 who travel the same distance. All in all, this results seem to suggest that health care facilities are in close proximity to households such that, we may expect prohibitive costs associated with transport to access health care being insignificant.

Figure 2.7: Distance from health facility by quintile, 1995



2.5.2 Household Impoverishment

Given the rather small CHE percentages, regardless of approach, it is not surprising that few households are subsequently impoverished due to OOP. The percentage of impoverished households is presented in Table 2.11, and these are weighted using inverse probability weights obtained from each survey. These figures are rather small: 0.12 percent in 1995, 0.22 percent for 2000 and 2005-06 and 0.15 percent in 2010-11.

Table 2.11: Percentage of Households Subject to Impoverishment

	1995 SA IES	2000 SA IES	2005-06 SA IES	2010-11 SA IES
Impoverishment	0.1211	0.2207	0.2226	0.1449
	(0.021)	(0.033)	(0.034)	(0.027)
Sample Households	28,585	22,506	19,974	24,319

Source: Authors' computations using 1995, 2000, 2005-06 and 2010-11 SAIES data.

2.6 Discussion of Results

While there are fluctuations across time on the incidence of CHE related to OOP payments in South Africa, the values are generally low regardless of the method used. Using the 40 percent threshold of total household consumption adjusted for subsistence needs, this incidence ranged from 0.03 percent in 1995 to 0.07 percent in 2010-11. At the 40 percent threshold of non-food expenditure, this incidence is also lower when compared to other African countries such as Ghana which is reported to have a CHE incidence of 2.4 percent (see Akazili et al., 2012), Zambia with 11.2 percent (Masiye et al., 2016), Kenya with 11.4 percent (see Basara et al., 2017; Chuma and Maina, 2012; Kimani et al., 2016) and Swaziland with 2.4 percent (see Ngcamphalala, 2015). Relative to the 40 percent threshold, we find that at all lower thresholds, there was a higher percentage of households incurring CHE. This observation is in line with what other studies document elsewhere when comparing the 40 percent threshold to lower thresholds such as at 5 percent, 10 percent and 25 percent among others. At the 10 percent threshold of total expenditure adjusted for subsistence needs for instance, we find that 1.3 percent of households incurred CHE from OOP payments in 1995, 1.3 percent of households in 2000, 3.3 percent of households in 2005-06 and 2.8 percent of households in 2010-11. At the 10 percent threshold of non-food expenditure, we find that 0.6 percent of households incurred CHE from OOP payments in 1995, 0.9 percent in 2000, 1.8 percent in 2005-06 and 1.6 percent in 2010-11. While these CHE values at the 10 percent threshold are lower relative to the 40 percent threshold, we also observe that

they are still lower compared to the incidence reported in other countries at the same threshold of 10 percent. In Kenya for instance, 14.3 percent of households incurred CHE from OOP (Chuma and Maina, 2012; Kimani et al., 2016; Basara et al., 2017), around 22 percent in both Uganda (Kwesiga et al., 2015) and Egypt (Rashad and Sharaf, 2015b) and about 9 percent in Zambia (Masiye et al., 2016) and Swaziland (Ngcamphalala, 2015; Ngcamphalala and Ataguba, 2018).

Being mindful of the fact that the low proportion of CHE from OOP payments observed in South Africa could be due to non-use of health care services which might be driven by lack of the fee, we also assessed the proportion of individuals that were ill but did not seek treatment in health facilities. We found that a negligible percentage of households (about 0.04 percent) had household members who did not seek treatment when ill.

We also assessed the proportion of households that are pushed into poverty due to making OOP payments. Generally, we found the percentage of impoverished households to be rather small. In 1995, the value was 0.12 percent, 0.22 percent in 2000 and 2005-06 while in 2010-11 it was 0.15 percent. In comparison to other African countries, the level of impoverishment associated with making OOP payments was relatively lower in South Africa. In Mongolia, 12 percent of households are found to be impoverished by OOP payments (Bredenkamp et al., 2012; Dorjdagva et al., 2016), 7 percent in Swaziland (Ngcamphalala, 2015; Ngcamphalala and Ataguba, 2018), 18 percent in Uganda (Kwesiga et al., 2015) and about 9 percent in Ghana (see Akazili et al., 2012).

The low proportions of CHE from OOP payments as well as the low incidence of impoverishment associated with making OOP payments in South Africa, are not surprising. The results rather, show that social protection reforms that have been adopted since 1994 with some widened to cover the whole population are achieving their goals of reducing financial burdens of OOP health payments among South African households. However, due to problems associated with lack of prescribed medicines, distance to the health facility, lack of privacy and long queues in public facilities, some households usually end up paying OOP for health care in the private sector despite healthcare being free in the public sector (see Burger et al., 2012; Burger and Christian, 2018; Macha et al., 2012). This is a signal to policymakers that a lot still needs to be done in South Africa to ensure that continued progress is made as far as universal access and financial protection are concerned. It thus, provides an avenue of opportunity to ensure that all these important indirect costs are augmented and well taken into consideration in the partially implemented NHI for South Africa.

2.7 Conclusions

The goal of the analysis presented in this chapter was to make use of methodologies developed by Xu (2005), O'Donnell et al. (2008) and Wagstaff and van Doorslaer (2003) and apply them to four South African Income and Expenditure Surveys to understand how equitable health care financing is in South Africa, and how the equitability of that financing has or has not changed

over time. As is common in the rest of the literature, our focus was on health care OOP. Through this analysis, we were able to identify a few patterns that are consistent across the surveys. Overall, OOP are rather limited, and this is true in all years for which we have data. In 1995 and 2000, OOP shares of capacity to pay rarely exceed 2.0 percent, on average, while in 2005-06 and 2010-11, the shares are rarely in excess of 2.6 percent. These low levels are not surprising given that South Africa offers “free" public health care to its entire population in primary public health care facilities, which includes dispensing certain drugs at these health facilities without cost. Furthermore, given the low OOP shares, we find negligible impoverishment due to OOP. Impoverishment was found to be 0.12 percent in 1995, 0.22 percent in 2000 and 2005-06, and 0.15 percent in 2010-11.

Overall, these small OOP shares, low CHE proportions and negligible impoverishment percentages indicate a public health care system that places limited financial burden on its citizens. However, the usual caveat applies to any conclusion related to OOP. Such payments do not include expenses associated with accessing and utilising health care, such as transport costs and waiting time, amongst others. Such indirect costs could be higher than the direct costs analysed here. Unfortunately, we are not in a position to consider that, given the data that is available. Therefore, we leave it as a limitation and an open concern. The study is not without limitations. In 1995, data was not collected in some of the homelands implying that, there could be under-representation of households. Also, the four surveys used different methods for collecting expenditure data. Both the 1995 and 2000 IES collected expenditure data using recall method whereby, households were required to recall the expenses they incurred in the previous month or 12 months. This method is susceptible to missing out small and frequently occuring OOP expenditures such as those related to nurse visits and other physicians. The 2005-06 and 2010-11 IES on the other hand, used the diary method and here, households were given diaries to record the expenses they made in the past month. While this method can be viewed as an improvement to the recall method used in earlier surveys, in a small window, the diary method would rather, be unlikely to capture large OOP values. This seems to be the case for OOP payments reported in our descriptive analysis whereby, we observe OOP for physician visits to be relatively large in the recall method and OOP for facility usage (which one would assume would have been the one dominating), to be rather small. Therefore, the recall and diary method both have a challenge of resulting in under-reporting of OOP data. To counter this limitation, a wider window period is needed for households to record their expenditures. Despite these limitations, the way we measured OOP across all the IES surveys, was in line with existing literature and therefore, is we believe has allowed us to gauge how equitable financing health care through OOP is and thus, contribute to existing literature on health care financing in South Africa.

CHAPTER 3

ANALYSING GENDER DIFFERENTIALS IN THE INCIDENCE OF CHE: A DIFFERENCES-IN-DECOMPOSITIONS APPROACH

3.1 Introduction

3.1.1 Gendered-Differences in OOP

As highlighted earlier, in 1994, the principle of gender equality in South Africa influenced policy and legislation formulation in economic and development areas, such as access to health care, employment, water, housing and public works programmes, amongst others (Republic of South Africa, 2015b). Furthermore, the government implemented key domestic development programmes, such as the Reconstruction and Development Programme (RDP), and Growth, Employment and Redistribution (GEAR) which, even though did not specifically focus on women, were meant to advance the country in addressing the legacy of apartheid (Republic of South Africa, 2015b). However, the challenge of unemployment, poverty and inequality continue to affect women more than men (Mushongera et al., 2018; Republic of South Africa, 2015b), which is likely inhibiting South Africa's progress, when it comes to achieving some of the Sustainable Development Goals (SDGs) such as gender equality and eradication of poverty, amongst others.

Relatedly, there are still gaps in the documented empirical evidence. There exist a wealth of studies examining gender inequalities in health status. Using the 2003 Demographic and Health Survey (DHS) from South Africa, Ntuli et al. (2016) examines whether women have worse health outcomes than men. As measures of health, the authors use self-rated health status and health service utilisation. They find that higher prevalence of health conditions among females is a key factor that influences gender-differences in health. In addition, they find that the health gap persists in old age contrary to a common view that health gap closes with age. In using the Health and Demographic Surveillance System from data and 7 other countries, Ng et al. (2010)

examines sex differences in health among women and men. For South Africa, Ng et al. (2010) finds that differences in socio-economic factors such as age, education levels, living arrangements and marital status explained about 82 percent of the health gaps observed between men and women in South Africa. Extensive evidence on gender-gap analysis is also documented in the literature (see amongst others, Burns et al., 2005; Cornell, 2013; Charasse-Pouele and Fournier, 2006; Chirowa et al., 2013; Jayachandran, 2015; Kamel et al., 2003; Kassenbohmer and Sinning, 2014; Omotoso, 2017). To the best of our knowledge, we are not aware of any study that has analysed gendered differences in CHE of OOP. However, we are aware of studies that have included gender as a dummy variable in the regression models when examining the factors associated with CHE through OOP payments (*seeforinstance*, Akinkugbe et al., 2012; Babikir et al., 2018; Buigut et al., 2015; Cleopatra and Eunice, 2018; Kien et al., 2016; Yazdi-Feyzabadi et al., 2018). These studies provide a basis for which the study on gender-differences in CHE of OOP must be conducted. The studies on the factors of CHE have been conducted at an aggregate level and not at a disaggregated level by gender (see for instance Babikir et al., 2018; Xu et al., 2003a; Macha et al., 2012). Hence, these studies limit our understanding of which factors are the key drivers of gender-differenced CHE. Such information is crucial for a country like South Africa, which has a historical background of discrimination based on gender. Availing such information can aid our understanding of CHE factors and their association with gender, while potentially highlighting the sectors that need further intervention or examination, if we are to further reduce gender inequality. Second, existing studies use cross-sectional survey data, focusing on one-way decompositions to analyse health financing equity at a particular time period (see for instance Akinkugbe et al., 2012; Macha et al., 2012; Xu et al., 2003a). Using a one-way decomposition strategy does not unearth changes in the incidence of CHE, further inhibiting our understanding. Have there been any changes in CHE factors over time? Do those changes have a gender dimension to them? Have the gender gaps narrowed over time? Can any of those gap changes be correlated with changes in CHE factors and/or gender differences in those factors? Uncovering answers, even if only partial, can offer further insight into the effectiveness of domestic development policies adopted in South Africa since 1994 in affecting gender inequities in financing health care OOP.

In Chapter 2, we established the proportion of CHE and impoverishment that can be associated with CHE following the three most common methods in the literature. In addition, we presented the marginal effects from a logit regression estimating the probability that a household did not incur OOP health payments. One of the results from that regression was that male headed households were more likely - 17 percent more likely - to not incur OOP. Going a step further, we describe actual payments from the various Income and Expenditure Services broken down by the gender of the household head, as well as the urban/rural locale of the household in Tables 3.1 - 3.4. For the most part, these descriptive statistics suggest that, male-headed households incur larger amounts of OOP, but also have larger capacities to pay – the ones reported are adjusted for

subsistence. Our usage of OOP shares is similar to the affordability indicator used by Burger et al. (2012); Burger and Christian (2018) whereby they adjusted estimated health payments as a share of non-food expenditure to capture unavoidable payments that add to the indirect cost of health care. In our case, OOP payments, called OOP shares, were estimated as health payments adjusted for capacity to pay whereby, the capacity to pay was adjusted for subsistence. Therefore, our analysis can be viewed as a complement to the study by Burger et al. (2012); Burger and Christian (2018), because we show this affordability indicator (OOP shares) by gender whereas, Burger et al. (2012) showed affordability by quintiles so as to provide another dimension which is important to policy.

We find that in all the years and many types of health care, the capacities to pay differences were large enough to reverse the rankings, when comparing OOP values to OOP shares per capacity to pay. In other words, there are rather extensive differences in OOP, as well as in OOP shares of capacity to pay, related to the gender of the head of the household. These extensive differences are not unsurprising, given that prior to 1994 access to amenities in South Africa were often based on discrimination by race and gender. Furthermore, since the fall of apartheid, considerable effort has been invested in policies aimed at tackling gender (and racial) inequality in health care. In 1994, for instance, South Africa removed user charges at public health facilities for children aged below six, pregnant and nursing mothers and the elderly (African National Congress, 1994; Leatt et al., 2006). These policy initiatives were expected to increase access to and utilisation of public health care facilities, and given the female target audience, were expected to improve health and access for women, in particular. The elimination of user fees was also expected to alleviate household budgets by reducing OOP. However, as we showed in the Chapter 2, OOP has not decreased over that time period in South Africa, nor has the proportion of households not having to incur any OOP. On the other hand, there has been a shift in the relative amounts of OOP and the general capacity to pay to suggest there has been some gendered progress, since 1995.

In 1995, see Table 3.1, male-headed households incurred roughly three times the amount of OOP than female-headed households, but had a capacity to pay that was nearly four times as large; thus, OOP shares were relatively larger in female-headed households. While not the focus of the analysis presented in this Chapter, we also find that in 1995, OOP shares for rural households are about the same as for their urban counterparts yet, the capacity to pay for rural households are twice less than that of urban households. From 2000 to 2010-11, the OOP shares for rural households are higher than those of urban households yet the capacity to pay is in some cases twice or triple less than that of urban households. These findings are contrary to documented literature for other countries which reports that rural areas as compared to urban areas, have lower health expenses but face a higher likelihood to incur catastrophic health expenditures (see for example, Ghiasvand et al., 2015; van Minh et al., 2013; O'Donnell et al., 2005; Rashad and Sharaf, 2015a,b). A plausible reason tied to this finding being that relatively,

rural areas tend to have high poverty levels. Thus, with limited resources due to these already high levels of poverty, a health shock is likely to mess up spending of these households leading them to reduce consumption of some goods particularly food which tend to comprise a larger share of their budget, in favor of medicines.

What we can make of the findings presented in Tables 3.1 to 3.4 is that, in South Africa, since female-headed households tend to be amongst the poorest and also, because during apartheid women were confined to the homelands which tended to be rural areas as compared to men, it can be inferred that the situation of higher OOP shares but lower capacity to pay by rural households, is that faced by women. This therefore, warrants a gender-gap analysis because the aggregate analysis does not offer us much information on changes over time or the drivers of those changes by gender – information which is useful for South Africa when looking at its history of discrimination and the factors that were used for such discrimination.

Table 3.1: 1995 Out-of-Pocket Payments Descriptive Statistics

	All Households	HH Head Female	HH Head Male	Rural Household	Urban Household
Out-of-Pocket Payments (total)	27.33	52.91	17.36	11.98	37.12
	(0.90)	(2.75)	(0.63)	(0.79)	(1.38)
OOP Share (%)	0.97	0.84	1.02	0.99	0.96
	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
Capacity to Pay	2,954.69	6,253.60	1,670.04	1,446.69	3,917.28
	(45.32)	(132.75)	(28.40)	(52.88)	(64.37)
Sample Households	26,716	20,229	6,487	11,561	15,155

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup, but the results have been weighted using inverse proportionality weights so as to match the population.

In 2000, the differences between the different types of households are relatively smaller across the board; see Table 3.2. Male-headed households paid about 75 percent more out-of-pocket, but had more than double the capacity to pay. Thus, as was the case in 1995, female-headed households faced a larger share of OOP. This could indicate the bearing of fruits of both the 1994 and 1996 health care reforms with regard to payment of user fees. In 1994, the user fees were removed among females and other designated groups while in 1996, the policy was extended to the entire nation. So, while we still observe women in 2000 paying a larger of OOP than their male counterparts, the figures are relatively smaller than in 1995, indicating a drop over time.

Table 3.2: 2000 Out-of-Pocket Payments Descriptive Statistics

	All Households	HH Head Male	HH Head Female	Urban Households	Rural Households
Out-of-Pocket Payments (total)	17.74	20.90	12.74	21.83	10.21
	(0.76)	(1.17)	(0.65)	(1.15)	(0.41)
OOP Share (%)	1.04	0.96	1.17	0.93	1.25
	(0.02)	(0.03)	(0.03)	(0.03)	(0.04)
Capacity-to-Pay	2,779.25	3,614.88	1,457.81	3,658.56	1,160.95
	(59.90)	(93.25)	(36.35)	(85.19)	(55.62)
Sample Households	22,475	13,561	8,914	13,419	9,056

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup, but the results have been weighted using inverse proportionality weights so as to match the population.

In the COICOP-based Income and Expenditure Based Surveys[1], it was somewhat easier to split expenses in more detail than in the earlier surveys; doing so offers additional insight into the gender differences in the type of out-of-pocket payment incurred by male-headed and female-headed households. See Tables 3.3 and 3.4 for more details, beginning with Table 3.3. In 2005-06, male-headed households were subject to approximately 80 percent more OOP, driven primarily by differences in purchases of both medical services (75 percent more), outpatient services (nearly 75 percent more) and hospital (inpatient) services (nearly 250 percent more). Since male-headed households also had about 80 percent more capacity to pay, female-headed households devoted a larger share of their capacity to pay to OOP for a number of items, as well as for the total. But what we again see is that the capacity to pay in 2005-06 for both males and females is relatively higher than in 1995. These improvements in capacity to pay, could be mimicking improvements in the economic growth of the country but again, the differences by gender potentially mimick the disparities observed in the labour market by gender. As compared to females, males are better paid than women. The same basic pattern seen previously is also observed to varying degrees in the 2010-11 data; see Table 3.4 for details.

[1]Please, see Chapter 2 or Section 3.2 for more details about the differences between the budget surveys conducted in South Africa.

Table 3.3: 2005-06 Out-of-Pocket Payments Descriptive Statistics

	All Households	HH Head Female	HH Head Male	Urban Households	Rural Households
Out-of-Pocket Payments (total)	77.43	93.89	51.57	98.81	37.51
	(5.58)	(8.98)	(2.60)	(8.51)	(1.66)
OOP Share (%)	2.10	1.91	2.40	1.83	2.59
	(0.03)	(0.04)	(0.05)	(0.04)	(0.05)
Medical Products	29.24	35.25	19.79	38.64	11.68
	(1.33)	(2.09)	(0.95)	(2.03)	(0.40)
Product Share (%)	0.79	0.73	0.89	0.76	0.85
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Outpatient Services	39.76	47.58	27.48	48.39	23.64
	(4.35)	(7.03)	(1.77)	(6.64)	(1.32)
Outpatient Share (%)	1.20	1.07	1.41	0.96	1.65
	(0.02)	(0.03)	(0.04)	(0.03)	(0.04)
Hospital Services	8.43	11.07	4.30	11.78	2.19
	(2.06)	(3.32)	(0.95)	(3.15)	(0.50)
Hospital Share (%)	0.10	0.11	0.09	0.12	0.08
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Capacity-to-Pay	4,393.76	5,343.74	2,901.82	5,802.81	1,763.17
	(98.15)	(145.95)	(98.96)	(144.67)	(43.92)
Sample Households	21,019	11,756	9,263	11,778	9,241

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup, but the results have been weighted using inverse proportionality weights so as to match the population.

With all of the years outlined, another interesting feature to put gender inequity into perspective is with regard to the relative capacity to pay difference between male-headed and female-headed households – see Tables 3.1 - 3.4. In particular, we observe that the relative capacity to pay dropped from more than triple to less than double between 1995 and 2010-11. In 1995, the capacity to pay in male-headed households (ZAR 6253) was 3.7 times larger than it was for female-headed households (ZAR 1670). By 2010-11, male-headed capacity to pay (ZAR 9304) was only 1.9 times that of female-headed households (ZAR 4787) [2]. While caution is exercised due to data challenges related to measurement error and lack of coverage of some homelands in 1995, this finding could signal progress made due to the effectiveness of the “free" health care policies adopted in 1994 and 1996 as well as other policy reforms adopted since 1994. In this chapter, we explore the progress made from 1995 to 2010-11 in inequities in OOP payment, while taking other differences into consideration.

[2]These OOP amounts have not been adjusted for inflation, and, therefore, should not be directly compared across years. However, the ratio of capacities to pay within a year is comparable, as it is unit-less.

Table 3.4: 2010-11 Out-of-Pocket Payments Descriptive Statistics

	All Households	HH Head Female	HH Head Male	Urban Households	Rural Households
Out-of-Pocket Payments (total)	113.21	139.73	72.45	146.12	45.48
	(5.82)	(9.41)	(2.85)	(8.56)	(2.04)
OOP Share (%)	1.83	1.74	1.96	1.78	1.92
	(0.03)	(0.04)	(0.04)	(0.03)	(0.06)
Medical Products	58.09	69.06	41.23	74.07	25.22
	(2.43)	(3.81)	(1.87)	(3.51)	(1.59)
Product Share (%)	1.02	0.96	1.12	1.02	1.02
	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)
Outpatient Services	53.80	69.15	30.20	70.15	20.14
	(4.99)	(8.15)	(1.67)	(7.38)	(1.01)
Outpatient Share (%)	0.79	0.77	0.84	0.74	0.90
	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)
Hospital Services	1.32	1.52	1.02	1.91	0.12
	(0.28)	(0.39)	(0.37)	(0.41)	(0.03)
Hospital Share(%)	0.01	0.01	0.01	0.02	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Capacity-to-Pay	7,524.50	9,304.83	4,787.64	9,550.44	3,355.61
	(148.19)	(230.48)	(106.56)	(207.54)	(120.81)
Sample Households	25,124	14,168	10,956	16,168	8,956

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup, but the results have been weighted using inverse proportionality weights so as to match the population.

3.1.2 Relevant Literature

At the macro level, Xu et al. (2003a), a study that included South Africa among the set of 59 countries, find that larger OOP shares in total health expenditure, higher poverty levels and greater total health expenditure in the share of Gross Domestic Product (GDP) are important contributors to CHE. At the micro level, and more focused on South Africa, Babikir et al. (2018) finds that the odds that a household faces CHE are higher among the poorest households and households that have incurred spending on both hospitalisation and medical supplies. Specifically, the authors find that the odds of incurring CHE from OOP payments are 3.2 times higher among households that have incurred OOP expenditure on hospitalisation. They also find that the odds of facing CHE for medical supplies is two times higher compared to households that incurred expenditure for hospitalisation and eight times higher compared to households that incurred expenses for health insurance and traditional healers. Their research employs a logit model to examine the factors associated with catastrophic OOP health payments at the 40 percent threshold of household non-food expenditures and their data is from the 2008 and 2012 waves of

the National Income Dynamics Survey (NIDS). While there is evidence of the beneficial effect of social grants in redressing gendered health inequity (see for instance Ataguba et al., 2015; Omotoso, 2017; UNICEF, 2014), Babikir et al. (2018) finds that social grants do not alleviate CHE associated with OOP. However, social grant receipt is gender-differenced and relates to changes in gendered health equity (Omotoso, 2017); therefore, it might also relate to changes in health financing equity by gender.

Across a subset of countries, including South Africa, Macha et al. (2012) find that poorer households are not benefiting from or accessing health care services to the same extent as non-poor households, due to affordability, availability and accessibility barriers. They find that 31 percent of those in the poorest income quintile reported not seeking treatment due to transport costs, compared to 6 percent of the wealthiest households. Negative staff attitudes (at the facilities) are also found to be a deterrent to public health care use. The authors use nationally representative household surveys from Ghana, Tanzania and South Africa containing information on self-assessed health, health care utilisation, OOP spending and perceptions of the current public and private health sectors to examine the factors influencing the burden of health care financing and the distribution of health care benefits in Ghana, Tanzania and South Africa. Similar results for South Africa are documented by Mills et al. (2012b), who use the same datasets as Macha et al. (2012) to examine equity in financing and use of health care in Ghana, South Africa and Tanzania. Since female-headed households tend to be amongst the poorest, one can infer from these studies that female households are not benefiting as much as we would expect them to benefit; however, these studies do not offer us much information on changes over time or the drivers of those changes.

Burger and Christian (2018) uses the 2009 and 2010 General Household Survey (GHS) data to examine the progress made in access to health care after more than two decades of democracy in South Africa. The authors use availability, affordability and acceptability to capture access to health care. Of relevance to this analysis is their use of affordability. They designed an indicator to capture unavoidable OOP that add to the indirect cost of health care, including the three modes of transport (train, bus and taxi) that are most likely to be used by the poor to reach the nearest health facility. The authors find that 23 percent of households faced affordability constraints to access health care. This was particularly true among poorer households. They further found that about 73 percent of affordability constraints are associated with travel costs and there was a large discrepancy in affordability between the poor (65 percent) and non-poor (84 percent). Although our measure of affordability continues with capacity to pay, we do offer a comparison over a longer period of time, which was not their main focus.

The wider literature underlines a number of other issues that are likely to relate to OOP than just gender, poverty, and social grants. For example, household structure, such as household size, the presence of a senior member of the household and the presence of children aged five and below in the household increase the probability that a household incurs OOP-based CHE

(Adisa, 2015; Akinkugbe et al., 2012; Barros et al., 2011; Doubova et al., 2015; Wang et al., 2015; O'Donnell et al., 2005). Furthermore, households with a sanitary toilet and safe drinking water are found to have a lower incidence of CHE, when compared to their counterparts (O'Donnell et al., 2005). Where households lack access to clean and locally sourced water, women are more likely than men to be responsible for collecting water and, in some instances, are forced to travel long distances to collect water (Statistics South Africa, 2013). In 2010, in South Africa, women aged 10 years and above were twice (3.9 percent) as likely as male household members (2 percent) to collect water when the water source is 1 kilometre or more away (Statistics South Africa, 2013). Spending time collecting water means that there is less time for the pursuit of employment or alternative economic, vocational and training opportunities (Kimani, 2014). Yet, just like men, education underpins women's full participation in the economy and is therefore central for the achievement of gender equality (Republic of South Africa, 2015a). Employment has been found to an important factor that influences CHE.

For those reasons, this analysis includes access to water and sanitation, along with other socio-economic characteristics, such as education, employment and access to medical aid. While South Africa has made great strides in improving the proportion of people with access to water and basic sanitation,[3] high poverty levels in South Africa are compounded by high levels of inequality and a lack of access to amenities such as water, among women, the youth and the elderly (Republic of South Africa, nd, 1994a). This lack of access to basic amenities is likely to adversely affect health outcomes and can subsequently exacerbate poverty and the incidence of CHE faced by households. Hence, in incorporating the water source when analysing gender differentials in the incidence of CHE, the research hopes to provide an indirect assessment of the effectiveness of policy efforts that, over time, were implemented to redress gender inequalities in the financing of health care, as well as access to basic amenities.

Omotoso (2017) and Ataguba et al. (2015) underscore education and receipt of social grants as key drivers in narrowing the gendered inequality in ill health in South Africa. Furthermore, Burger and Christian (2018) shows the role played by financial constraints in hampering access to health care by households. Yet, most existing empirical studies on health care financing have focused on static gendered analysis, thereby inhibiting the dynamics in the socio-economic factors attributed to the incidence of CHE (*seeforinstance*, Babikir et al., 2018; Macha et al., 2012; Xu et al., 2003a). This implies that there is still a gap in the literature on health financing as the available evidence only paints an incomplete picture of the key drivers of gendered inequality in health and health finance. Existing studies have employed a logit model, when examining the

[3]The proportion of people lacking access to safe water in South Africa has fallen from 40 percent in 1994, to 19 percent in 2015 (UN, 2006). In 2016, an estimated 46.4 percent had access to piped water in their dwellings, 26.8 percent accessed water on site, while 2.4 percent relied on a neighbor's tap and 13.3 percent relied on communal taps (Statistics South Africa, 2017). In 2017, about 88.6 percent of South African households had access to piped water. However, 3.7 percent of households still had to fetch water from rivers, streams, stagnant water pools and dams and springs. Nationally, the percentage of households without sanitation is 3.1 percent as of 2017 (Statistics South Africa, 2017).

factors associated with CHE (*see*, Akinkugbe et al., 2012; Babikir et al., 2018; Buigut et al., 2015; Cleopatra and Eunice, 2018; Kien et al., 2016; Yazdi-Feyzabadi et al., 2018). Our research, rather, adopts a differences-in-decompositions approach to assess the factors associated with changes in CHE from financing health care via direct OOP payments, thereby making a small contribution to the literature on health care financing.

Against this background, this chapter undertakes a gender gap analysis to examine the differences in the incidence of CHE between male-headed and female-headed households in the period 1995 and 2010-11. To do this, the extent of gender inequality in the incidence of CHE was first established. Hereafter, the relative change in gender-based inequality in the incidence of CHE over that time period was examined. Finally, the factors that have contributed to the change in the incidence of CHE between male-headed households and female-headed households, and their relative importance were assessed. The results of the research suggest that the gender gap in the incidence of CHE narrowed by 0.4 percent between 1995 and 2010-11. This reduction in the gender gap isassociated with education, access to piped water and residing in urban areas. For most of the results, it was found that education, having access to piped water and residing in urban areas were positive for both 1995 and 2010-11. These results are consistent with existing evidence that has documented the important role played by access to basic amenities, such as water and also human capital (education) in explaining gendered inequalities in health care.

3.2 Data and Preliminary Information

3.2.1 Data

Data used in this analysis was obtained from the SAIES conducted in 1995, 2000, 2005-06 and 2010-11. These surveys collected household income and consumption expenditures on items such as education, health care, housing, recreation, transport and communication, fuel used for heating, lighting and cooking, expenditure on durable goods as well as on other miscellaneous expenditures. The questionnaire structure for SAIES 1995 and 2001-01 is the same, while that of 2005-06 is similar to 2010-11. In particular, the former 2005-06 and 2010-11 SAIES used Standard Trade Classification when collecting information on household expenditures, while the 2005-06 and 2010-11 switched to using Classification of Individual Consumption According to Purpose (COICOP). Furthermore, in 2005-06, different households were surveyed at different points in time during a 12-month cycle and households were given diaries to record their consumption expenditures. This was an improvement to the 1995 and 2000 IES, when households were required to recall the expenditures they incurred either in the last month or last 12 months (Statistics South Africa, 2012b; Yu et al., 2008), although diary methods often lead to minimal collection of very small expenditures. These differences limit the confidence to compare the pre-COICOP IES (1995 and 2000) and the post-COICOP IES (2005-06 and 2010-11).

However, all the surveys were conducted by Statistics South Africa (StatsSA) and the surveys

collected information on household income and consumption expenditures. Each South African IES is based on a two-stage stratified random sampling technique, implying that each response comes with a weight defined at the level of the household and can be used to create population-relevant statistics. The first stage involved sampling of primary sampling units, while the second stage involved sampling of dwelling units. In the 1995 IES, 2 000 enumerator areas (EA) were selected and within each selected EA, a systematic sample of 10 households was drawn and interviewed. The sample was stratified by race, province, urban and rural area and the sample size was 29 595 households. The 1991 population census served as the basis of drawing the sample for this household survey (Statistics South Africa, 1997; Central Statistics Service, 1996). The 2000 IES, on the other hand, collected information from 26 238 households and this sample was drawn from the 1996 population and housing census. About 3 000 primary sampling units (PSUs) were drawn for the sample and these PSUs were explicitly stratified by province and area type (urban/rural). Within each explicit stratum, the PSUs were then implicitly stratified by district council (DC) and magisterial district (MD) and within the magisterial district, by average household income for formal urban areas and hostels or enumeration area (Statistics South Africa, 2001). Next, a systematic sample of ten dwelling units was drawn from each PSU to be interviewed. Both the 1995 and 2000 IES used the recall method to solicit information on household consumption expenditures and household income (Statistics South Africa, 2012b; Yu et al., 2008). This meant that a single questionnaire was administered to a household at a selected dwelling unit in the sample, and households were required to recall expenditure on all non-durable goods purchased during the month prior to the survey and also to recall purchases of durable and semi-durable goods for the 12 months prior to the survey.

For the 2005-06 IES, about 3 000 primary sampling units (PSUs) were drawn for the newly designed master sample based on the 2001 population census enumeration areas. Then the 3 000 PSUs were divided into four quarterly allocations of 750 each and within each quarterly allocation, a random sample of 250 PSUs were selected every month. Of these selected PSUs, eight dwelling units were systematically selected for interview, resulting in a total of 24 000 dwelling units sampled for fieldwork (Statistics South Africa, 2008b). The objective of this process was to ensure an evenly spread sample over the 12 months of the survey, while keeping it nationally representative in each quarter (Statistics South Africa, 2008b,a; Yu et al., 2008). The sample for the 2010-11 IES, on the other hand, comprised 3 080 PSUs obtained from the master sample and a supplement of 174 urban PSUs obtained from the PSU frame. From the sampled 3 080 PSUs, 31 007 dwelling units were sampled, while 412 dwelling units were sampled from the 174 urban PSUs giving a total of 31 419 dwelling units as a sample of households that were interviewed (Statistics South Africa, 2012a). After data cleaning, the resulting sample sizes were 28 461 households for 1995, 22 470 households for 2000; 20 902 households for 2005-06 and 25 124 households for 2010-11. The research employed sampling weights that came with each SAIES to account for differences in the survey designs.

For comparison purposes, in the analysis presented in Chapter 2, the research defined CHE as out-of-pocket (OOP) payments that are equal to or exceed selected thresholds of 5 percent, 10 percent, 15 percent, 25 percent and 40 percent of non-food expenditure or capacity-to-pay (CTP). However, because of a generally low proportion of the incidence of incurring CHE by households that was observed in Chapter 2, in the analysis presented in this chapter (Chapter 3, the research was confined to the 10 percent threshold of household CTP. Thus, the research defined OOP payments that are equal or greater than 10 percent of household CTP as being burdensome or catastrophic. The variable CHE is therefore a dummy variable with 1 indicating that a household incurred OOP payments that are greater than or equal to 10 percent of the household's non-food expenditure and 0 otherwise.

The explanatory variables used in the analysis comprised (i) education (divided into: no schooling, some schooling, primary, secondary and tertiary); (ii) race (Black/African, Coloured, Asian/Indian and White); (iii) province (Western Cape, Eastern Cape, Northern Cape, Free State, KwaZulu-Natal, North-West, Gauteng, Mpumalanga and Limpopo); (iv) urban area (whether or not the household resides in the urban area); (v) employment status (whether or not the individual is employed); (vi) medical aid status (whether or not the individual has access to a medical aid); (vii) age (with categories 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84 and 85+). The research also included marital status, access to piped water and sanitation type as explanatory variables. However, these variables could not be included for all years, due to unavailability. The research included marital status for the years 1995 and 2000, as data was only available for these years, while access to piped water and flush toilets were only added for the years 1995 and 2010-11s.

3.2.2 Changes in Catastrophic Health Expenditures and Explanatory Variables

In Table 3.5 below, we outline changes in the weighted means of the explanatory variables and the incidence of CHE at the 10% threshold, using data from 1995 and 2010-11, for both males and females (from this point forward male refers to male-headed household and female to female-headed household). These changes – a positive value denotes an increase in the mean over time, while a negative value denotes a decrease – in weighted means suggest changes in the population over the time period.[4] As can be seen in the table, there is some evidence that the population (of household heads) is younger, and contains fewer coloured and white households. There has been an increase in urbanisation, but a decrease in medical aid coverage and employment. There has also been a notable increase in access to clean water and sanitation, as well as an increase in CHE. The increase in CHE is fairly similar across households, while the changes in the means of many other variables are often fairly different. For example, average males residing in urban

[4]Table B.1 in Appendix B provide a detailed overview of the weighted means for all the variables that were used for males and females from 1995 and 2010-11.

areas has increase 0.2 percent, while average females residing in urban areas has increased 0.05 percent.

Table 3.5: Changes in the Weighted Means of the Variables between 1995 and 2010-11 For Males ad Females

	Male		Female	
	Mean	Std. errors	Means	Std. errors
HH Head 20-24yrs	0.010***	(0.003)	0.013***	(0.003)
HH Head 25-29yrs	0.015***	(0.004)	0.016***	(0.005)
HH Head 30-34yrs	0.018***	(0.005)	-0.015***	(0.005)
HH Head 35-39yrs	0.018***	(0.005)	-0.005	(0.005)
HH Head 40-45yrs	-0.009*	(0.005)	-0.018***	(0.005)
HH Head 45-49yrs	-0.001	(0.004)	-0.008*	(0.005)
HH Head 50-54yrs	-0.003	(0.004)	0.011**	(0.005)
HH Head 55-59yrs	-0.002	(0.004)	0.004	(0.004)
HH Head 60-64yrs	-0.005	(0.004)	-0.002	(0.004)
HH Head 65-69yrs	-0.011***	(0.003)	-0.002	(0.004)
HH Head 70-74yrs	-0.011***	(0.003)	0.003	(0.003)
HH Head 75-79yrs	-0.010***	(0.002)	-0.005**	(0.003)
HH Head 80-84yrs	-0.007***	(0.002)	-0.002	(0.002)
HH Head 85yrs+	-0.004***	(0.001)	0.004***	(0.002)
Black	-0.026***	(0.007)	0.123***	(0.007)
Coloured	-0.003	(0.004)	-0.023***	(0.004)
Asian	0.008***	(0.003)	-0.018***	(0.002)
White	0.007	(0.006)	-0.099***	(0.005)
No Schooling	-0.207***	(0.005)	-0.144***	(0.006)
Some Schooling	-0.072***	(0.006)	0.015**	(0.007)
Completed Primary	0.013*	(0.007)	0.022***	(0.007)
Completed Secondary	-0.049***	(0.007)	-0.140***	(0.007)
Completed Tertiary	0.033***	(0.004)	-0.009***	(0.004)
HH Head Employed	-0.030***	(0.006)	-0.263***	(0.007)
Medical Aid	-0.056***	(0.006)	-0.156***	(0.006)
Urban	0.200***	(0.006)	0.054***	(0.007)
Quintile 1	-0.040***	(0.005)	0.044***	(0.006)
Quintile 2	-0.028***	(0.005)	0.034***	(0.006)
Quintile 3	-0.003	(0.006)	0.009	(0.006)
Quintile 4	0.016***	(0.006)	-0.018***	(0.006)

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Changes in the Weighted Means (*continued*)

	Male		Female	
	Mean	Std. errors	Means	Std. errors
Quintile 5	0.055***	(0.007)	-0.069***	(0.006)
Piped Water	0.095***	(0.003)	0.082***	(0.003)
Flush toilet	0.302***	(0.007)	0.140***	(0.008)
Western Cape	0.008*	(0.004)	-0.015***	(0.005)
Eastern Cape	-0.041***	(0.004)	-0.015***	(0.005)
Northern Cape	-0.006***	(0.001)	-0.007***	(0.001)
Free State	-0.009***	(0.003)	-0.016***	(0.003)
KwaZulu Natal	-0.019***	(0.005)	0.032***	(0.006)
North-West	-0.010***	(0.004)	-0.011***	(0.004)
Gauteng	0.096***	(0.008)	0.002	(0.007)
Mpumalanga	0.010***	(0.003)	0.004	(0.003)
CHE≥10	0.010***	(0.002)	0.015***	(0.002)
HHSIZE 5-8	-0.090***	(0.006)	-0.038***	(0.007)
HHSIZE 9-12	-0.032***	(0.003)	-0.014***	(0.004)
HHSIZE 13+	-0.003***	(0.001)	0.001	(0.001)
Sample Households	27,803		24,935	

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

Unfortunately, there are no obvious clear-cut education improvements, in the sense that men or women have clearly received more education. However, it would appear that education completion has worsened. Despite that, the proportion of men having completed primary schooling has increased, as has the proportion of women who have completed primary education. All remaining reported categories have either decreased or changed in a statistically insignificant way. We also assessed changes in the weighted means across shorter periods of time, i.e., between 1995 and 2000, 2000 and 2005-06 and, finally, between 2005-06 and 2010-11. We did so, in order to see if the overall “trends" appeared to be consistent through time. The results are presented in Table B.3, B.9 and B.15 in Appendix B, and they suggest that the trends are not consistent across each survey during the time period.

3.2.3 Gender Gap in the Incidence of CHE

The analysis is continued by estimating the gender gap in the incidence of CHE over the two time periods, being 1995 and 2010-11. To achieve this, we adopt the approach of Omotoso (2017) employing a linear probability model (weighted and)with robust standard errors), while controlling for the previous socio-economic factors. In estimation, we include a year effect (1995

is the base category), a gender effect (males are the base category) and a gender-year interaction effect (males in 1995 are the base category), the last of which provides information on the degree to which the CHE gender gap has improved or worsened from 1995 to 2010-11.

$$CHE_{igt} = \alpha_g g + \gamma_t t + \theta D_{gt} + X'_{gt}\vartheta + \epsilon_{igt} \tag{3.1}$$

In equation 3.1, CHE_{igt} is catastrophic health expenditure for household head i in gender g (base category = male) by year t (base year = 1995); α_g and γ_t are the fixed effects for gender and year respectively. D_{gt} is the gender-year interaction term, X_{gt} are the control variables and ϵ_{igt} is an error term. θ measures how the gender gap in CHE has changed over the 15-year (1995 to 2010-11) time period.

We present the results in Table 3.6, outlining the factors associated with the incidence of CHE, along with the gender gap in CHE for 1995 and 2010-11. Year (Y_{2010} = 1) quantifies the changes in the incidence of CHE over time, the gender dummy captures the gender gap in CHE, and the interaction term, $Y_{2010} *$ Female, captures the change in the gender gap. The results indicate that there has been a slight increase, approximately 1 percent, in the incidence of CHE. However, the results on gender gap are not statistically significant, but they also suggest a slight increase in gender gap by about 1 percent, such that females were 1 percent more likely than males to incur CHE due to making OOP payments.

Table 3.6: Parameter Estimates of the Gender Gap in CHE, 1995 to 2010-11

	Coefficients	Std. errors
Year (Y_{2010}=1)	0.0098***	(0.002)
Female	-0.0002	(0.002)
$Y_{2010} * Female$	0.0022	(0.003)
HH Head 40-44yrs 20-24yrs	-0.0145***	(0.005)
HH Head 40-44yrs 25-29yrs	-0.0002	(0.005)
HH Head 40-44yrs 30-34yrs	-0.0032	(0.005)
HH Head 40-44yrs 35-39yrs	0.0003	(0.005)
HH Head 40-44yrs	-0.0069	(0.004)
HH Head 45-49yrs	-0.0010	(0.005)
HH Head 50-54yrs	-0.0010	(0.005)
HH Head 55-59yrs	-0.0016	(0.005)
HH Head 60-64yrs	0.0002	(0.006)
HH Head 65-69yrs	0.0023	(0.006)
HH Head 70-74yrs	0.0002	(0.005)
HH Head 75-79yrs	0.0030	(0.006)

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Parameter Estimates of the Gender Gap in CHE (*continued*)

	Coefficients	Std. errors
HH Head 80-84yrs	0.0208**	(0.010)
Coloured	0.0009	(0.004)
Asian	0.0031	(0.004)
White	0.0242***	(0.004)
Some Schooling	0.0017	(0.002)
Completed Primary	-0.0010	(0.002)
Completed Secondary	0.0003	(0.002)
Completed Tertiary	0.0014	(0.004)
HH Head Employed	-0.0113***	(0.003)
Medical Aid	-0.0051***	(0.002)
Urban	-0.0009	(0.003)
Quintile 2	-0.0195***	(0.003)
Quintile 3	-0.0281***	(0.003)
Quintile 4	-0.0285***	(0.003)
Quintile 5	-0.0323***	(0.004)
Piped water	-0.0015	(0.003)
Flush toilet	0.0032	(0.003)
Western Cape	0.0157***	(0.004)
Eastern Cape	0.0033	(0.003)
Northern Cape	0.0019	(0.004)
Free State	0.0230***	(0.004)
KwaZulu Natal	0.0161***	(0.003)
North-West	0.0059*	(0.003)
Gauteng	0.0123***	(0.003)
Mpumalanga	0.0140***	(0.003)
Intercept	0.0339***	(0.005)
Sample Households	52,738	
R-squared	0.013	

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

3.2.4 Effects of Explanatory Variables on the Incidence of CHE in 1995 and 2010-11

Even though the analysis presented in Table 3.6 provides some evidence of gender inequality in the financing of health care through OOP payments between 1995 and 2010, the analysis assumed that the factors associated with CHE were the same for both males and females across

the two survey years, which could be restrictive. In Table 3.7, the research has relaxed this assumption and allowed for differential determinants for both women and men in each of the surveys. This will allow the research to uncover the relative change in gender-based inequality in the financing of health care via direct OOP payments. As alluded to earlier, prior to 1994, men and women were not accorded the same level of access to amenities but post 1994, there were substantial reforms adopted in efforts to improve outcomes of the previously disadvantaged groups. Therefore, by providing a breakdown of the factors of CHE for both male and female, the research hopes to gain an understanding of the extent to which the gap in CHE between males and females has narrowed or widened. The results presented in Table 3.7 are also based on linear probability models appropriately weighted to the population and robust to heteroscedasticity.

Table 3.7: Estimated Effect of the Explanatory Variables on the Incidence of CHE of Males and Females, by year

	Male		Female	
	1995	2010-11	1995	2010-11
HH Head 20-24yrs	-0.0140	-0.0245***	-0.0027	-0.0093
	(0.009)	(0.009)	(0.009)	(0.012)
HH Head 25-29yrs	-0.0068	-0.0062	0.0008	0.0132
	(0.008)	(0.009)	(0.007)	(0.013)
HH Head 30-34yrs	-0.0024	-0.0087	-0.0018	0.0039
	(0.009)	(0.009)	(0.006)	(0.013)
HH Head 35-39yrs	-0.0081	0.0019	-0.0021	0.0020
	(0.008)	(0.010)	(0.006)	(0.012)
HH Head 40-44yrs	-0.0031	-0.0090	-0.0030	-0.0130
	(0.008)	(0.009)	(0.006)	(0.010)
HH Head 45-49yrs	-0.0015	-0.0054	0.0010	0.0025
	(0.009)	(0.009)	(0.007)	(0.011)
HH Head 50-54yrs	-0.0025	0.0017	0.0012	-0.0075
	(0.009)	(0.010)	(0.007)	(0.010)
HH Head 55-59yrs	0.0028	0.0012	0.0028	-0.0133
	(0.009)	(0.008)	(0.007)	(0.010)
HH Head 60-64yrs	-0.0001	0.0033	0.0032	-0.0045
	(0.009)	(0.013)	(0.007)	(0.010)
HH Head 65-69yrs	0.0098	0.0008	0.0098	-0.0073
	(0.010)	(0.014)	(0.008)	(0.011)
HH Head 70-74yrs	0.0074	-0.0098	0.0166*	-0.0063
	(0.011)	(0.011)	(0.009)	(0.011)

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Estimated Effect of Explanatory Variables (*continued*)

	Male		Female	
	1995	2010-11	1995	2010-11
HH Head 75-79yrs	0.0111	-0.0093	0.0239**	-0.0100
	(0.013)	(0.013)	(0.010)	(0.012)
HH Head 80-84yrs	0.0052	0.0566*	0.0345**	-0.0049
	(0.013)	(0.033)	(0.017)	(0.013)
Coloured	0.0002	0.0008	-0.0024	0.0114
	(0.004)	(0.007)	(0.004)	(0.011)
Asian	0.0062	-0.0017	0.0097	0.0133
	(0.006)	(0.007)	(0.007)	(0.020)
White	0.0293***	0.0141*	0.0294***	0.0248**
	(0.005)	(0.008)	(0.005)	(0.012)
Some Schooling	0.0055	0.0011	-0.0029	0.0082
	(0.004)	(0.009)	(0.005)	(0.007)
Primary	-0.0045	0.0036	0.0014	0.0011
	(0.004)	(0.010)	(0.005)	(0.008)
Secondary	-0.0012	0.0021	0.0006	0.0015
	(0.003)	(0.010)	(0.003)	(0.009)
Tertiary	0.0005	0.0036	0.0035	-0.0028
	(0.006)	(0.012)	(0.006)	(0.012)
HH Head Employed	-0.0126***	-0.0166***	-0.0161***	0.0001
	(0.004)	(0.006)	(0.003)	(0.005)
Medical Aid	-0.0104***	-0.0000	-0.0116***	-0.0020
	(0.003)	(0.005)	(0.004)	(0.008)
Urban	-0.0003	-0.0059	-0.0017	-0.0055
	(0.003)	(0.006)	(0.003)	(0.009)
Quintile 2	-0.0042	-0.0257***	0.0058	-0.0398***
	(0.004)	(0.007)	(0.004)	(0.007)
Quintile 3	-0.0095**	-0.0371***	-0.0030	-0.0439***
	(0.004)	(0.007)	(0.003)	(0.007)
Quintile 4	-0.0039	-0.0406***	0.0067*	-0.0514***
	(0.004)	(0.007)	(0.004)	(0.007)
Quintile 5	-0.0059	-0.0414***	-0.0026	-0.0503***
	(0.005)	(0.009)	(0.005)	(0.010)
Piped water	-0.0084*	0.0013	-0.0037	-0.0043
	(0.005)	(0.011)	(0.004)	(0.012)

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Estimated Effect of Explanatory Variables (*continued*)

	Male		Female	
	1995	2010-11	1995	2010-11
Flush toilet	0.0012	0.0054	0.0053*	-0.0027
	(0.002)	(0.006)	(0.003)	(0.009)
Western Cape	0.0120**	0.0191**	0.0077	0.0256**
	(0.006)	(0.008)	(0.006)	(0.011)
Eastern Cape	0.0020	0.0007	0.0087*	0.0059
	(0.005)	(0.006)	(0.005)	(0.007)
Northern Cape	0.0070	-0.0021	0.0099	-0.0003
	(0.007)	(0.007)	(0.007)	(0.009)
Free State	0.0026	0.0339***	0.0077*	0.0577***
	(0.004)	(0.008)	(0.005)	(0.011)
KwaZulu Natal	0.0045	0.0172**	0.0046	0.0331***
	(0.004)	(0.007)	(0.005)	(0.008)
North-West	0.0054	0.0042	0.0083	0.0121
	(0.005)	(0.005)	(0.005)	(0.008)
Gauteng	0.0014	0.0194***	0.0017	0.0250***
	(0.004)	(0.006)	(0.005)	(0.008)
Mpumalanga	0.0029	0.0173***	0.0050	0.0303***
	(0.006)	(0.006)	(0.005)	(0.009)
Intercept	0.0329***	0.0520***	0.0185***	0.0510***
	(0.009)	(0.017)	(0.007)	(0.015)
Sample Households	14,040	13,763	14,545	10,390
R-squared	0.015	0.016	0.019	0.021

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

On a more general note, there is little evidence suggesting gender neutrality within each survey as well as time independence within gender. However, a consistent pattern of either a reduction or increment associated with some variables across time and within gender and little of opposing effects for the same variable by gender was found. For example, in both 1995 and 2010-11, the results suggest that belonging to quintile 3 is associated with reductions in the incidence of incurring CHE. For males, the reduction is about 2 percent in 1995 and 3 percent for females, while in 2010-11, the reductions are 1 percent for males and 4 percent for females. Being White is associated with a 3 percent increase of incurring CHE in both 1995 and 2010-11 for males and females. Furthermore, having attained some schooling increases the incidence of incurring CHE for both males and females by 1 percent in 1995. Residing in the Northern Cape

is associated with a 2 percent reduction in the incidence of CHE for males in 2010-11, but a 1 percent increase in the incidence of CHE for females in 1995. Having access to piped water is associated with a 1 percent reduction in the incidence of CHE for females in 1995.

The research also found time independence within each gender (similar estimates for females or for males in both 1995 and 2010-11) in quintile 2, quintile 3 and being employed. For example, being employed is associated with 1 percent reduction of incurring CHE for males in 1995, but a 2 percent increase in 2010-11 for females. Having access to a medical aid is associated with a 1 percent reduction of incurring CHE for both males and females in 1995. The research found similar estimates in males and females (gender neutrality) in 1995 and 2010-11 for tertiary education. There is, for instance, an associated 1 percent increment in CHE for males and females in 1995 and 2010-11. There is also evidence of gender neutrality among those residing in North-West Province.

In summary, the discussion above sheds light on the differences that exist between males and females in explaining the incidence of CHE. However, this analysis is limited in gaining an understanding of whether or not the gender gap has narrowed or widened over time. Therefore, the research expands on this analysis below by decomposing the differences in the estimated determinants of CHE to be able to get a picture of which factors account for the changes in the gender gap.

3.3 Empirical Strategy

3.3.1 Outline

The research used Blinder-Oaxaca decompositions, which separately partition the gender gap from 1995 and 2010-11 into differences in both observed and unobserved factors. Subsequently, the changes in the gender gap were partitioned into changes in both observed and unobserved factors, using the differences-in-decompositions method. In this way, the differences-in-decompositions approach has similarities with the difference-in-difference approach (Bertrand et al., 2004). The caveat of using a logit estimation technique to examine the factors of CHE is that the model only gives information on the probability of a factor increasing or decreasing the likelihood of a household incurring CHE due to financing health care through direct OOP payments. This does not allow one to examine whether or not there have been changes in the factors associated with the incidence of CHE among females and males over time. Such information is important in a country like South Africa, where a lot of effort has gone into policies aimed at reducing gendered health-financing inequalities associated with socio-economic factors. Women, together with other marginalised groups like the elderly and children, for example, were some of the individuals who were discriminated against under apartheid. However, these groups of individuals have since been targeted by some of the reforms that were implemented by the democratic government so as to improve their outcomes. Therefore, it is key to examine whether the gap between

males and females has over time narrowed, or not, with regard to the socio-economic factors accounting for CHE inequalities. In the analysis, 1995 marks the first year post the “free" health care policy among targeted individual groups, while 2010-11 marks four years post the “free" health care for all policy. The research also conducts the analysis for the years 2000 and 2005-06 in order to establish if there are any changes in the socio-economic factors of CHE in the years between 1995 and 2010-11. To the best of our knowledge, in health care financing, the differences-in-decomposition approach has been applied on SAIES 2005-06 and 2010-11 to examine whether the health financing mechanism is becoming more progressive, or not, between those two time periods by Ataguba (2016). No study has applied the same approach on the determinants of CHE. Rather, in using South African data, the differences-in-decomposition approach has been employed in the analysis of gender equality in health (Omotoso, 2017) and in the labour market (Kassenbohmer and Sinning, 2014). Omotoso (2017), for instance, employs a differences-in-decompositions estimate to assess changes in the social determinants of health and health inequality among males and females between 2005 and 2014. The author finds that between 2005 and 2014, health differentials between males and females narrowed by about 2 percent and these were mainly attributed to changes in women receiving social grants and attaining education. Kassenbohmer and Sinning (2014) used Panel Study of Income Dynamics (PSID) data to analyse changes in wage differentials between white men and white women over the period 1993 to 2006. The authors decomposed distributional changes in the gender wage gap to assess the contribution of observed characteristics measuring individual productivity. They found that the gender gap narrowed by more than 13 percent at the lowest decile, while at the highest decile it narrowed by 4 percent. At the top of the wage distribution, they found that changes in the gender wage gap were mainly attributable to changes in educational attainment, while at the bottom of the distribution, a sizable part of the changes were due to work history changes. Importantly, their findings suggest that the educational success of women could reduce the gender wage gap at the bottom of the distribution both before and during the 1990s.

3.3.2 Decomposing Differences in CHE incidence Between Males and Females

To examine the relative contribution of changes in the socio-economic factors to the change in CHE between males and females over time, the empirical analysis is underpinned by Blinder-Oaxaca decomposition, extended to deal with multiple changes. The research first sets out a typical Blinder-Oaxaca decomposition (as seen below) in order to lay the foundation for the analysis. The decomposition is conducted on two groups, males and females, and they are denoted as $g = f, m$. The research also denotes the catastrophic health expenditures (CHE) by CHE_{ig}, while X_{ig} is a set of characteristics for each individual i in group g. The conditional expectation of CHE_{ig} is linear, so that CHE for individual i in group g is obtained as follows:

$$E\left[CHE_{ig}|X_{ig}\right] = X'_{ig}\beta_g g = f, m \tag{3.2}$$

A Blinder-Oaxaca decomposition separates the CHE gender differential $DeltaCHE^{f,m}$ attributable to differences in observed characteristics and the returns to those endowments. Therefore, the decomposition proposed by Blinder (1973) and Oaxaca (1973) and that generalised by Oaxaca and Ransom (1994) can be expressed as follows:

$$\begin{aligned}\Delta CHE^{f,m} &= E(CHE_m) - E(CHE_f) = E(X_m)'\beta_m - E(X_f)'\beta_f \\ &= \left[E(X_m) - E(X_f)\right]'\beta^* + \left[E(X_m)'(\beta_m - \beta^*) + E(X_f)'(\beta^* - \beta_f\right]\end{aligned} \tag{3.3}$$

The first term on the right hand side, provide an estimate of gender difference (or gender gap) that may be explained by group differences in observed characteristics. The $\left[E(X_m)'(\beta_m - \beta^*) + E(X_f)'(\beta^* - \beta_f\right]$ term is attributable to differences in the returns to males and females. The reference vector β^* is given by the linear combination of the estimates from equation 3.2.

$$\beta^* = \rho\beta_m + (1-\rho)\beta_f \tag{3.4}$$

The linear combination “weights" (ρ) can be chosen by setting $\rho = 1$, which puts all the weight on men, or $\rho = 0$, which puts all the weight on women. If the chosen value of ρ places all the weight on one of the groups, the decomposition will be reference dependent. Therefore, due to results from decomposition being affected by the choice of the reference group in the model, several debates have arisen on the issue of assuming that one or the other group is non-discriminating. Often, this has been argued as giving rise to over-valuation of one group due to under-valuation of the other group. For this reason, the research follows Neumark (1988) and uses the coefficients from a pooled regression over both groups as an estimate for β^*. The research therefore employs this strategy in the subsequent empirical analysis (see equation 3.3.3).

3.3.3 Differencing the Decomposition of the Gender Gap in CHE incidence over Time

The research also wishes to understand whether or not the relative importance of the determinants of CHE between male- and female-headed households has changed or remained constant between 1995 and 2010-11 and if not, what might explain any observed deviation. Therefore, the goal here is to examine the relative importance of the socio-economic determinants in explaining changes in the CHE gender gap due to financing health care directly through OOP payments over time. Oaxaca (1973) has shown that the average gap in an outcome could be decomposed into the differences in the endowments and the returns. However, as implied by equation 3.3, that analysis allows decomposition for only one binary dimension (such as two groups within one

survey or one group across two surveys) rather than multiple dimensions. Thus, as shown below, the research needs to extend the one-way decomposition, as explained by Oaxaca (1973).

To do this, the research begins by extending the notations in equation 3.2. Specifically, the research denotes as the dependent variable for individual i in gender g (base category = male) by year t (base year = 1995). Similarly, X_{itg} is a set of health-related characteristics for each individual i in group g and time t. The conditional expectation of CHE_{itg} remains linear, such that for individual i in group g and survey year t follows:

$$E\left[CHE_{igt}|X_{igt}\right] = X'_{igt}\beta tg \tag{3.5}$$

Where $g = f, m$ and $t = 1995, 2010-11$. Within any survey year, a typical decomposition can be undertaken yielding equation 3.6 which modifies equation 3.3.

$$\begin{aligned}\Delta CHE_t^{f,m} &= E(CHE_{tm}) - E(CHE_{tf}) = E(X_{tm})'\beta_{tm} - E(X_{tf})'\beta_{tf} \\ &= \left[E(X_{tm}) - E(X_{tf})\right]'\beta^* + \left[E(X_{tm})'(\beta_{tm} - \beta^*) + E(X_{tf})'(\beta^* - \beta_{tf})\right]\end{aligned} \tag{3.6}$$

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

$$\begin{aligned}\Delta CHE^{f,m}_{1995,2010-11} &= \Delta CHE^{f,m}_{2010-11} - \Delta CHE^{f,m}_{1995} \\ &= (CHE_{m,2010-11} - CHE_{m,1995}) - (CHE_{f,2010-11} - CHE_{f,1995}) \\ &= \left[E(X_{2010-11,m}) - E(X_{2010-11,f})\right]'\beta^* - \left[E(X_{1995,m}) - E(X_{1995,f})\right]'\beta^* \\ &+ \left[E(X_{2010-11,m})'(\beta_{2010-11,m} - \beta^*) + E(X_{2010-11,f})'(\beta^* - \beta_{2010-11,f}\right] \\ &- \left[E(X_{1995,m})'(\beta_{1995,m} - \beta^*) + E(X_{1995,f})'(\beta^* - \beta_{1995,f})\right]\end{aligned} \tag{3.7}$$

Up to this point, the research has not defined β^*, but assumed it. Previous studies have shown that results from decomposition are affected by the choice of the reference group in the model, resulting in considerable discussion on the weighting matrix and the resulting reference vector (*see*, Fortin, 2008; Jann, 2008; Neumark, 1988; Oaxaca, 1973; Oaxaca and Ransom, 1994). Therefore, in the extended analysis, the research considers four groups rather than two groups, which β^* must take into account. Therefore, the research extends the linear combination in equation 3.4 to cover all four groups, such that:

$$\beta^* = \rho_{1995,m}\beta_{1995,m} + \rho_{1995,f}\beta_{1995,f} + \rho_{2010-11,m}\beta_{2010-11,m} + (1 - \rho_{1995,m} - \rho_{1995,f} - \rho_{2010-11,m})\beta_{2010-11,f}$$

To understand the source of the CHE differentials between males and females over time, the research decomposes the CHE differential into components, describing the contribution of individual characteristics and the coefficients of the individual characteristics.

3.4 Decomposition Results

Table 3.8 displays decomposition results for the incidence of CHE differential between females and males in 2010-11 (panel A) and 1995 (panel B). It can be seen in the previous section that there are differences between males and females in the estimated determinants of CHE between 1995 and 2010-11. Therefore, having identified the differences in the factors associated with increasing the likelihood that a household will incur CHE, the research then turns to decomposition analysis. Here, the aim is to assess the contribution of each factor to the incidence of CHE incurred by differentiating between males and females. In 2010-11, the gender gap in CHE was -0.0061 while in 1995, the gender gap in CHE was -0.0009. These results suggest that over time, the gender gap related to CHE incurred by making OOP payments, has declined by 0.0052 in favour of females. We then used decomposition methods to understand what factors were responsible for this decline[5]. On that note, we found that declining inequalities in CHE from OOP payments is explained by inequalities in education, access to piped water and residing in urban areas. For most of the results, the research found that education, having access to piped water and medical aid, being employed, and residing in urban areas are negative for both 1995 and 2010-11. The gender gap attributed to access to piped water, for instance, is 1.6 percent in 2010-11. This underpins the importance of access to safe water in contributing to the improvement of health outcomes. As shown by H Ghiasvand and H Shabaninejad and M Arab and A Rashidian (2014), dirty and contaminated water combined with poor sanitation contributes not only to malnutrition, but is also a leading cause of death in children, particularly those who are under five years. Also, a lack of local access to clean water forces women to travel long distances to collect water – something that has a direct impact on economic growth due to their inability to search for employment or pursue other economic opportunities. As documented in the literature, employment has an important role in influencing the incidence of CHE Akinkugbe et al. (see 2012). Therefore, if women are limited in pursuing economic opportunities so that they can have some earnings, this will tend to limit their ability to afford to pay for health care OOP should the need arise hence, face poor health outcomes or resort to coping strategies such as selling of assets to finance health care OOP. The results we have presented in Table 3.8 also underscore the importance of education in explaining gender gap differentials in the incidence of CHE. It was found that in 2010-11, 5.0 percent is attributed to gender gap due to primary education, while 3.3 percent is attributed to gender gap due to having some level of schooling below primary schooling in 2010-11 but for 3.2 percent in 1995. As Schultz (1999) has shown, better health enhances the effective and sustained use of knowledge and skills that individuals acquire through education. Individuals or households invest in themselves through education and health to increase their utility, which is underscored by increased earnings (Grossman, 2000). Schooling is also a key determinant of poor people's

[5]I would like to thank the anonymous reviewer for pointing out the large changes in the estimates for Asians and Whites as well as for the quintiles between 1995 and 2010-11 as presented in Table 3.8. I agree that these particular changes are a cause for concern. I did go through the data to be sure that the data manipulation and coding were done properly across all the years and re-ran the model but, could not find any change in the results.

ability to take advantage of income-generating opportunities (Haughton and Khandker, 2009). Empirical research suggests that households headed by individuals who are relatively educated tend to incur lower CHE compared to households headed by individuals with no education (see Zhou et al., 2016). According to theory, health can be generated at less cost for relatively higher educated people than for less educated people, resulting in more health capital (Grossman, 2000). More generally, the persistent association between education and health is well documented for a variety of health outcomes, as so is the influence of education on the incidence of CHE (see for instance Boing et al., 2014; Fazaeli et al., 2015; Li et al., 2012; O'Donnell et al., 2005; Shi et al., 2011; Xu et al., 2006a).

In contrast, the gender gap associated with age is mostly negative. The proportion of gender gap arising due to incurring CHE, for example, was relatively large among individuals aged 55-59 in 2010-11 (at -1.4 percent) as compared to the same aged individuals in 1995 at -3.1 percent. However, the proportion of gender gap associated with individuals aged 20-24 was positive and relatively large in both 1995 and 2010-11. In 1995, for example, it accounted for 34.4 percent in explaining the gender gap, while it was 23.9 percent in 2010-11. This is in line with the relative increase of 1 percent that was observed among females for this age group. The unexplained residual was responsible for 15 percent of the gender gap in CHE.

Table 3.8: OLS Decomposition of the Gender Gap in the Incidence of CHE Differentials

	Changes due to means			Changes due to means		
	Coefficient	S.E	%Expl.	Coefficient	S.E	%Expl.
A: 2010-11[a]				**B:1995**[b]		
Raw Difference	-0.0061***	(0.002)		-0.0009	(0.002)	
HH Head 20-24yrs	-0.0002***	(0.000)	3.3	-0.0001*	(0.000)	11.1
HH Head 25-29yrs	-0.0003**	(0.000)	4.9	-0.0001*	(0.000)	11.1
HH Head 30-34yrs	-0.0004**	(0.000)	4.9	-0.0001	(0.000)	11.1
HH Head 35-39yrs	-0.0003**	(0.000)	4.9	-0.0001	(0.000)	11.1
HH Head 40-44yrs	-0.0001*	(0.000)	1.6	-0.0001	(0.000)11.1	
HH Head 45-49yrs	-0.0001*	(0.000)	1.6	0.0001	(0.000)	-11.1
HH Head 50-54yrs	0.0000	(0.000)	0.0	-0.0001*	(0.000)	11.1
HH Head 55-59yrs	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
HH Head 60-64yrs	0.0001	(0.000)	-1.6	0.0000	(0.000)	0.0
HH Head 65-69yrs	0.0001	(0.000)	-1.6	0.0000	(0.000)	0.0
HH Head 70-74yrs	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
HH Head 75-79yrs	-0.0001	(0.000)	1.6	0.0000	(0.000)	0.0
HH Head 80-84yrs	-0.0003**	(0.000)	4.9	-0.0001	(0.000)	11.1

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Estimated Effect of Explanatory Variables (*continued*)

	Changes due to means			Changes due to means		
	Coefficient	S.E	%Expl.	Coefficient	S.E	%Expl.
Coloured	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
Asian	0.0001*	(0.000)	-1.6	0.0000	(0.000)	0.0
White	0.0016***	(0.000)	-26.2	-0.0006***	(0.000)	66.7
Some Schooling	-0.0001	(0.000)	1.6	0.0000	(0.000)	0.0
Completed Primary	-0.0001**	(0.000)	1.6	-0.0001**	(0.000)	11.1
Completed Secondary	0.0001	(0.000)	-1.6	0.0000	(0.000)	0.0
Completed Tertiary	0.0001	(0.000)	-1.6	0.0000	(0.000)	0.0
HH Head Employed	-0.0026***	(0.000)	42.6	-0.0002***	(0.000)	22.2
Medical Aid	-0.0007***	(0.000)	11.5	0.0000	(0.000)	0.0
Urban	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
Quintile 2	0.0008***	(0.000)	-13.1	0.0000	(0.000)	0.0
Quintile 3	0.0002*	(0.000)	-3.3	0.0000	(0.000)	0.0
Quintile 4	-0.0010***	(0.000)	16.4	-0.0001	(0.000)	11.1
Quintile 5	-0.0025***	(0.000)	41.0	0.0000	(0.000)	0.0
Piped Water	-0.0001	(0.000)	1.6	0.0000	(0.000)	0.0
Flush Toilet	0.0003	(0.000)	-4.9	-0.0000	(0.000)	0.0
Unexplained	-0.0006	(0.002)	9.8	0.0006	(0.001)	-66.7

[a] Decomposition of CHE differential between females and males in 2010-11

[b] Decomposition of CHE differential between females and males in 1995

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Sample Households in 1995: 28,585 (14,040 males, 14,545 females)

Sample Households in 2010-11: 24,153 (13,763 males, 10,390 females)

In Table 3.9, the research decomposes the changes in the CHE over time. These have been obtained by differencing the values in column A and B of Table 3.8. Therefore, in essence, these results reiterate what is presented in Table 3.8. The idea here was to use bootstrapping so as to obtain robust standard errors for the respective covariates presented in Table 3.9. As evident in Table 3.8, it can be observed that the gender gap narrowed by 0.4 percent between 1995 and 2010-11. The results indicate the important role played by education, access to piped water and residing in urban areas to the change in the incidence of CHE. Decomposition of the changes in the incidence of CHE for the years between 1995 and 2010-11 are presented in Tables B.7, B.13 and B.15 respectively, in Appendix B. Between 1995 and 2000 (Tables B.7), the research found that the gender gap narrowed by 0.1 percent. The factors associated with CHE are age, changes in racial compositions, marital status and belonging to quintiles 4 and 5. In particular, the research observed that not being married contributes positively to the incidence of CHE

and so are households belonging to quintile 2. Being relatively old contributes to reducing the gender gap in incurring CHE and so is having medical aid, and belonging to quintile 4 and 5. Between 2000 and 2005-06 (Table B.13), the results suggest that the gender gap narrowed by 0.7 percent. Mostly, this was due to age, residing in urban areas, education (particularly, primary and secondary education), being White and belonging to quintiles 4 and 5. These results, in a way, reiterate a pattern that has been exhibited in Table B.7 for the years 1995 and 2000 regarding the importance of age in narrowing the gender gap in the incidence of incurring CHE. Last, between 2005-06 and 2010-11 (Tables B.15), the gender gap narrowed by 0.2 percent. Consistent with previous years, the research found that the factors associated with a narrowing in the gender gap comprise being employed, belonging to quintiles 4 and 5, residing in urban areas, as well as age.

Table 3.9: OLS Decomposition of Changes in the Incidence of CHE Differential between Males and Females

	Changes due to means	
	Coefficient	Standard error
Raw Difference	-0.0041	
20-24yrs	-0.0001	(0.0089)
25-29yrs	-0.0001	(0.0073)
30-34yrs	-0.0002	(0.0078)
35-39yrs	-0.0001	(0.0077)
40-44yrs	-0.0001	(0.0075)
45-49yrs	-0.0002	(0.0077)
50-54yrs	0.0001	(0.0079)
55-59yrs	0.0000	(0.0075)
60-64yrs	0.0001	(0.0085)
65-69yrs	0.0001	(0.0089)
70-74yrs	0.0000	(0.0103)
75-79yrs	-0.0001	(0.0112)
80-84yrs	-0.0002	(0.0159)
Coloured	0.0000	(0.0037)
Asian	0.0002	(0.0081)
White	0.0025	(0.0056)
Some Schooling	-0.0003	(0.0055)
Primary	0.0000	(0.0054)
Secondary	0.0001	(0.0053)
Tertiary	0.0001	(0.0077)
Employed	-0.0025	(0.0035)

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OLS Decomposition of Changes in CHE Differential(*continued*)

	Changes due to means	
	Coefficient	Standard error
Medical Aid	-0.0008	(0.0039)
Urban	0.0000	(0.0041)
Quintile 2	0.0009	(0.0049)
Quintile 3	0.0002	(0.0047)
Quintile 4	-0.0009	(0.0051)
Quintile 5	-0.0027	(0.0057)
Piped water	-0.0001	(0.0086)
Flush toilet	0.0004	(0.0042)

Bootstrapped SEs using 1000 resamples are reported in parenthesis

Blinder-Oaxaca decomposition is however, not without limitations. The Blinder-Oaxaca decomposition does not restrict the male-female disparities in CHE to comparable individuals. Hence, this can lead to upward bias of the component associated with disrimination. Also, the male-female disparities in CHE could be evolving over time due to improvements in socio-economic development and other confounding factors that we did not control for. The likely effect of this is that we could be under-estimating the gender gap in CHE reported in our analysis. This could partly be the reason why we are observing small declines across the surveys, from 1995 to 2010-11. Another limitation of Oaxaca-Blinder is that it assumes a linear regression model for CHE between males and females which may not necessarily be the case. Therefore, it might be difficult to make inference about the main cause of the unexplained part of the male-female gap in CHE. However, we beleive that the decomposition analysis that we conducted in this analysis allowed us to document evidence in health financing field which can be further improved upon through using other methods that addresses the limitations of Blinder-Oaxaca. The relationships between males and females that we examined in the Chapter, have demonstrated the extent to which women as compared men, are burdened by OOP payments given their low capacity to pay, the larger size of household members they live in which comprise of a significant number of vulnerable individuals. Furthermore, given the “free" health care policy reforms that have been geared towards elevating outcomes of the previous vulnerable groups to their relatively advantaged counterparts, the decomposition analysis has allowed us to see the extent to which the gap in CHE inequality between males and females has been closing over time.

3.5 Discussion of Results

Through this analysis, we were able to uncover a number of differences in CHE from making OOP, between male and female. We found that as compared to males, females are 1 percent more

likely to incur CHE from OOP payments. This finding is consistent with what others have found in health outcomes and equity by gender (see Ntuli et al., 2016; Omotoso, 2017). However, across time, we found that the gender-gap in CHE narrowed by 0.0041 percent in favour of females. We then used decomposition methods to understand what factors were responsible for this decline. On that end, we found that declining inequalities in CHE from OOP payments is explained by inequalities in education, access to piped water and residing in urban areas. These results are also in line with documented evidence on the social determinants of health (see amongst others, World Health Organization, 2008; Omotoso, 2017; H Ghiasvand and H Shabaninejad and M Arab and A Rashidian, 2014; O'Donnell et al., 2005). As per the WHO report on the social determinants of health; education,urban development infrastructure as well as social protection are highlighted as key factors in the improvement of health outcomes and equity. In this regard, as Schultz (1999) has shown, better health enhances the effective and sustained use of knowledge and skills that individuals acquire through education. Individuals or households invest in themselves through education and health to increase their utility, which is underscored by increased earnings (Grossman, 2000). Schooling is also a key determinant of poor people's ability to take advantage of income-generating opportunities (Haughton and Khandker, 2009). Other empirical research suggests that households headed by individuals who are relatively educated tend to incur lower CHE compared to households headed by individuals with no education (see Zhou et al., 2016). This is against the background that, health can be generated at less cost for relatively higher educated people than for less educated people, resulting in more health capital (Grossman, 2000). More generally, the persistent association between education and health is well documented for a variety of health outcomes, as so is the influence of education on the incidence of CHE (see for instance Boing et al., 2014; Fazaeli et al., 2015; Li et al., 2012; O'Donnell et al., 2005; Shi et al., 2011; Xu et al., 2006a).

Generally, our findings underscore the efficiency of government interventions through public policy on health care. Between 1994 and 2016 for example, the proportion of people with access to clean water has increased in South Africa as well as the proportion of females residing in urban areas (Statistics South Africa, 2017). This is concurred by our findings presented in Table 3.5. As argued elsewhere, if women are limited in pursuing economic opportunities so that they can have some earnings because they have to travel long distances to fetch water, this will tend to limit their ability to afford to pay for health care OOP. In such instances, should the need arise, they are therefore, likely to face poor health outcomes or resort to coping strategies such as selling of assets to finance health care OOP due to lack of pursuing economic opportunities and earn an income.

The analysis presented in this chapter has some limitations. Some of the IES (particularly the 1995 and 2000 IESes) collected data on some variables using recall method. This method has its own challenges such as individuals not recalling all the expenditures they have incurred in the past month or past twelve months. Another problem is that of individuals not interpreting the

question in a similar manner that is required of them. This would result in mis-reporting of data which feeds into measurement error. Furthermore, the 1995 IES did not colllect data on some homelands because of the challenges discussed in the data section. It is therefore, possible that a significant proportion of female households were missed out due to that lack of data coverage in the homelands. This would lead to under-representation of female households in the data as well as on the findings relating to them.

Furthermore, the Blinder-Oaxaca decomposition method technique that is employed in this Chapter for analysis purposes, has some limitations. The Blinder-Oaxaca approach used in this analysis decomposes the difference in the mean CHE between males and females. Therefore, the limitation is that it might be difficult to make inference about the main cause of the unexplained part of the male-female gap in CHE. However, as used by (**?**), one extension to the current analysis would be to use quantile regression to decompose the gender differences in the distribution of the covariates and differences in the effects of these covariates. This allows the effect of the covariates to differ over the conditional distribution of the CHE incidence which would be more informative in guiding policy. These limitations were borne in mind when conducting the analysis and interpretation of the results.

3.6 Conclusion

The aim of this chapter was to employ the extended Blinder-Oaxaca model to examine the gender gap in the incidence of CHE using population-weighted SAIES 1995 and 2010-11. The research differenced the Blinder-Oaxaca model to assess the contributions of both observed and unobserved characteristics, their relative importance in explaining the changes in the incidence of CHE and the gender gap in CHE over time. The results suggest that the gender gap in the incidence of CHE narrowed by 0.4 percent between 1995 and 2010-11. This reduction in the gender gap is associated with education, access to piped water and residing in urban areas. For most of the results, the research found that education, having access to piped water and residing in urban areas are positive for both 1995 and 2010-11. The research demonstrated that the gender gap associated with access to piped water is responsible for reducing the gender gap in the incidence of incurring CHE by 12.5 percent in 1995. This underpins the importance of access to safe water in contributing to the improvement of health outcomes. The results also emphasized the importance of education in explaining gender gap differentials in the incidence of CHE. In this regard, the research demonstrated that in 2010-11, 4.2 percent is associated with gender gap due to primary school education, while 1.4 percent is associated with gender gap due to having some level of schooling below primary schooling in 2010-11 but for 3.2 percent in 1995. Therefore, to achieve gender equality in health care financing, there is a need to strengthen public intervention efforts with regard to access to water and sanitation. There is also a need for continued strengthening of efforts in education to build human capital in order to reduce gender inequality and the incidence

of CHE so as to achieve universal financial protection in health care.

CHAPTER 4

PROGRESSIVITY OF OUT-OF-POCKET PAYMENTS AND SOCIO-ECONOMIC DETERMINANTS: EVIDENCE FROM SOUTH AFRICAN INCOME AND EXPENDITURE SURVEYS

4.1 Introduction

Since 1994, the democratic South African government has adopted a wide range of policies to support redistributive measures to redress the legacy of apartheid, including investment in education, social assistance to vulnerable households, contributory social security and housing (Republic of South Africa, 1994b). In health care, the policy interventions include the 1994 user fee abolition in public primary health care facilities (PHC) for certain individuals, as well the 1996 extension of “free" health care to the entire population among public PHC facilities in South Africa (see African National Congress, 1994; Leatt et al., 2006). Other policy initiatives include the introduction of the Government Medical Aid Scheme (GEMS) in 2006 to better pool funds across all government employees (Government Employees Medical Scheme, 2012; Govender et al., 2013). More recently, as it is the case in most countries, South Africa has been striving to achieve universal health access and ensure financial risk protection related to health care among its population, which is to be achieved through the yet to be fully implemented mandatory National Health Insurance (NHI) Republic of South Africa (see 2011).

Despite efforts to redress the inherited health inequality, evidence suggests that not much has really changed. In particular, inequality of opportunity (influence of parents’ education, occupation, place of birth, race and gender) still persist (World Bank, 2018). Therefore, addressing inequality everywhere, including health, remains a priority in South Africa. Within the health sector, a thorough understanding of the social determinants of health is part of that agenda, warranting more evidence. Although considerable attention has been paid to assessing health

inequality and its social determinants (see for example Ataguba et al., 2011, 2015; Baker, 2010; Booysen, 2010; Omotoso, 2017), there is meagre literature (in South Africa and elsewhere) assessing the key drivers of OOP, and the relative changes in those drivers over time. Therefore, we aim to contribute to this gap by dynamically assessing OOP payments, its inherent inequality, along with their determinants.

When it comes to assessing health inequality and changes in it, a common approach is to follow the public finance literature, and examine indexes of inequality, such as the Kakwani Index, which requires tying some measure of health care to a measure of well-being. In an analysis for Finland covering the period 1987 to 1996 Klavus (2001) , OOP is regressive in both periods, but the changes across income deciles was not statistically significant over the period. Klavus (2001) did not decompose their results, more recent research has. Ataguba (2016) assesses the progressivity of health care in South Africa using two of the data sets that we use in this study – the 2005-06 and 2010-11 Income and Expenditure Survey. He finds that the health care system is progressive, that health insurance is particularly so, while OOP is regressive and has become more regressive. 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.

A slightly different strand of the literature relevant for this research is that examining the determinants of OOP. Hwang et al. (2001) assesses OOP comparing people with and without chronic conditions using 1996 Medical Expenditure Panel Survey data from the USA. They find personal medical care OOP rises as the number of chronic conditions increase and this linear relationship persists after controlling for insurance status and other demographic determinants. They also find that health insurance matters. Not having insurance is associated with large OOP. In particular, among the chronically ill, 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 OOP considering a range of different types of OOP (total health care, as well as spending on, for example, laboratory services). 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 payments, and this increase is driven mainly by private health care OOP, they argue that this observation is related to poor quality in the public sector. However, they otherwise find little evidence to suggest more shifting from the public sector to the private. There are similar worries in South Africa, especially with regard to quality of care and queuing for services (see Burger et al., 2012; Burger and Christian, 2018, and other references cited within).

In terms of approach, modeling the determinants of OOP tends to be based on regression, binary regression for models related to binary outcomes (did or did not incur OOP) and other models for the value of OOP. 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 the household head, larger household sizes, years of schooling and transport cost. Using different data, 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 and finds 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. This research suggests that, even though well-being is important for understanding inequality in health, there are other drivers of OOP, and they should not be ignored when considering inequality that might be related to OOP payments. In summary, Ataguba (2016) and Klavus (2001) provide information on the degree of progressivity of OOP payments and whether or not such progressivity has changed over time with little consideration of the drivers of those changes. On the other hand, a larger literature 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 (and elsewhere) inherited from the apartheid regime, such information can potential point to successes, as well as areas in need of further scrutiny or support.[1] 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 to examine OOP regressivity in South Africa. From such analysis, concentration indexes can be calculated, and regressions based on those indexes can be estimated. Such regressions tie OOP inequality to its determinants and, through decomposition techniques, can unearth the relative change in OOP inequality to changes in the social determinants of health. The Oaxaca-type decomposition over the change in the concentration index allows us to explain how

[1] In 1994, the principle of equity in South Africa influenced policy and legislation formulation in economic and development areas such as access to health care, employment, water, housing and public works programmes (Republic of South Africa, 2015b). Furthermore, the government implemented key domestic development programmes, such as the Reconstruction and Development Programme (RDP) and Growth, Employment and Redistribution (GEAR), which were meant to support redistributive measures to address the legacy of apartheid (Republic of South Africa, 2015b). However, the challenge of unemployment, poverty and inequality continue to persist and are a challenge in South Africa (Mushongera et al., 2018; Republic of South Africa, 2015b). Moreover, even with so much effort invested and great strides having been made in improving the proportion of people with access to water and basic sanitation, inequality of opportunity persists (Republic of South Africa, nd, 1994a; World Bank, 2018).

changes in OOP relate to changes in inequality in the social determinants of health and also to changes in the elasticities over time (see Wagstaff et al., 2003; Oaxaca, 1973), where elasticity refers to the percentage change in OOP arising from a unit percentage change in the respective social determinant. Similar research focusing on ill health status, rather than OOP, is available for South Africa (see Omotoso, 2017); thus, our contribution offers a different focus.Our data is from SAIES 1995, 2000, 2005-06 and 2010-11. These are nationally representative household surveys collected by Statistics South Africa and were collected in the democratic era. Importantly, 1995 marks the first year after the “free" health care policy among targeted individual groups, while 2010-11 marks the most recent data available. Therefore, the analysis indirectly correlates some of the post-apartheid policies with either a worsening, or not, of OOP inequality over time. The socio-economic variables examined include education, age, gender, water source, sanitation type, employment status, medical aid status, province and urban residence.

We found that OOP are concentrated among non-poor households, suggesting that there is progressivity in health care financing, at least as it pertains to OOP. As expected, such results are corroborated by the corresponding concentration indices. In addition, between 1995 and 2000, the change in OOP inequality is explained by changing inequality across provinces, education, age groups, medical aid status, as well as urban residence. Between 2000 and 2005-06, changing inequality in OOP was explained by changes across provinces, age groups, household size, and income quintiles. However, between 2005-06 and 2010-11, changes in OOP payment inequality were explained by changing inequality across provinces, as well as female headship of household. When the pattern is examined across the 15-year time period from 1995 to 2010-11, changing inequality across age groups, racial groups, education (particularly completion of secondary education), income quintiles, sanitation and water source for drinking explained changes in OOP inequality. We also found changing elasticities with respect to OOP inequality also play a crucial role in explaining differences over time. Between 1995 and 2000, for example, changing elasticities associated with household size, age and employment status explained many of the changes in OOP inequality. Between 2000 and 2005-06, 20005-2010, as well as between 1995 and 2010-11, changes in inequality in the determinants and changes in the elasticities seem to reinforce each other.

4.2 Data

Data for this analysis is obtained from four nationally representative cross-sectional Income and Expenditure Surveys (IES) collected in 1995, 2000, 2005-06 and 2010-11 among South African households. All the surveys were conducted by Statistics South Africa (StatsSA) and the surveys collected information on household income and consumption expenditures. Each South African IES is based on a two-stage stratified random sampling technique, which implies that each response comes with a weight defined at the level of the household and can be used to create

population-relevant statistics. The first stage involved sampling of primary sampling units, while the second stage involved sampling of dwelling units.

In the 1995 IES, 2 000 enumerator areas (EA) were selected and within each selected EA, a systematic sample of 10 households was drawn and interviewed. The sample was stratified by race, province, urban and rural area and the sample size was 29 595 households. The 1991 population census served as the basis for the household survey (Statistics South Africa, 1997; Central Statistics Service, 1996). The 2000 IES, on the other hand, collected information from 26, 238 households, and this sample was drawn from the 1996 population and housing census. About 3 000 primary sampling units (PSUs) were drawn for the sample and these PSUs were explicitly stratified by province and area type (urban/rural). Within each explicit stratum, the PSUs were then implicitly stratified by district council (DC) and magisterial district (MD) and, within the magisterial district, by average household income for formal urban areas and hostels or enumeration area (Statistics South Africa, 2001). Next, a systematic sample of 10 dwelling units was drawn from each PSU to be interviewed. Both the 1995 and 2000 IES used the recall method to solicit information on household consumption expenditures and household income (Statistics South Africa, 2012b; Yu et al., 2008). In other words, a single questionnaire was administered to a household at a selected dwelling unit in the sample, and households were required to recall expenditure on all non-durable goods purchased during the month prior to the survey and also to recall purchases of durable and semi-durable goods for the 12 months prior to the survey.

For the 2005-06 IES, about 3 000 primary sampling units (PSUs) were drawn from the newly designed master sample, which was based on the 2001 population census enumeration areas. The 3 000 PSUs were divided into four quarterly allocations of 750 each and, within each group, a random sample of 250 PSUs were selected every month. In the selected PSUs, eight dwelling units were systematically selected for interview, resulting in a total of 24 000 dwelling units sampled for fieldwork (Statistics South Africa, 2008b). The objective of this process was to ensure an evenly spread sample over the 12 months of the survey, while keeping it nationally representative in each quarter (Statistics South Africa, 2008b,a; Yu et al., 2008). The sample for the 2010-11 IES, on the other hand, comprised 3 080 PSUs obtained from the master sample and a supplement of 174 urban PSUs obtained from the PSU frame. From the 3 080 PSUs and 174 urban PSUs, 31 007 and 412 dwelling units were sampled, respectively, yielding a total of 31 419 that were interviewed (Statistics South Africa, 2012a). After data cleaning, the resulting sample sizes were 28,461 households for 1995; 22 470 households for 2000; 20 902 households for 2005-06 and 25 124 households for 2010-11. The research used the sample weights that came with each IES to account for differences in the survey designs.

4.2.1 Definition of Variables

Total household OOP health payments were defined as including expenses on consultations, x-ray services, medicines, therapeutic appliances and equipment, dental services, hospital service fees,

pharmacy fees, traditional healer fees, services of medical auxiliaries and other related medical products and service fees. These expenditures do not include any reimbursements that patients expect to receive or have received from their medical aid schemes.

According to the World Health Organization (2008), social determinants of health include 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 of OOP was based on the factors identified by the World Health Organization (WHO) (see World Health Organization, 2008) as important contributors to inequity. However, in South Africa, prior to 1994, access to basic services such as to education, health care and employment were subject to gender and racial discrimination. Consequently, existing empirical literature has documented the important role of these factors in influencing OOP (see Ataguba et al., 2015; Oyinpreye and Moses, 2014; Xu and Saskena, 2011; You and Kobayashi, 2011). Therefore, the inclusion of variables, such as gender, employment, and education were not entirely based on the WHO suggestions alone.

The explanatory variables used in this analysis comprised the following: (i) education (divided into: no schooling, some schooling, primary, secondary and tertiary); (ii) race (Black/African, Coloured, Asian/Indian and White); (iii) province (Western Cape, Eastern Cape, Northern Cape, Free State, KwaZulu-Natal, North-West, Gauteng, Mpumalanga and Limpopo); (iv) urban area (whether or not the household resides in the urban area); (v) employment status (whether or not the individual is employed); (vi) medical aid status (whether or not the individual has access to a medical aid); (vii) age (with categories 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84 and 85+).

The research also included marital status, access to piped water and sanitation type as explanatory variables. However, inclusion of these variables was not possible for all surveys, due to data not being available. The research included marital status for the years 19956 and 2000, for example. Access to piped water and flush toilets was only added for the years 19956 and 2010-11. The SAIES also collects data on household total consumption expenditure. We summed up all household expenses to create total consumption expenditure and adjusted it for household size and composition using the equivalized scale as defined by Xu (2005).[2]

[2]While this study extends the work done by Ataguba (2016), he adjusted household income using adult equivalence scales represented as $AE = (n_A + \alpha_k)^{\theta}$), where $\theta = 0.75$ and $\alpha = 0.5$. We, on the other hand, apply equivalized scales with $h_e = h^{\beta}$, where h_e represents the number of consumption equivalents in the household and h represents the household size. β reflects the economies of scale and was estimated to be 0.56 (Xu et al., 2003a) using data from 59 countries, including South Africa. Koch (2018). suggests that the choice of scale may not matter all that much, although we do not explore that here.

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

4.3.1 Plotting a Concentration Curve and Estimating a Concentration Index

Health financing equity follows arguments built around tax progressivity in public finance; thus, Kakwani's (1976) index features in this analysis. As the tax elasticity is always unity for proportional taxes (Kakwani, 1976), tax progressivity (related to tax elasticity) arises, when there is a departure from proportionality within a given tax system. Graphically, one compares the Lorenz curve of income to the concentration curve of taxes; progressivity is defined as twice the area between these curves, and is referred to as the Kakwani index. Transferring this concept to the health care system, equity in health financing is the extent to which all (or some) forms of contributions to the health care system, relate to a household's ability to pay, and, as with taxes, the system is progressive if the rich pay a relatively greater proportion than the poor.

A concentration curve plots the cumulative shares of household OOP (On the $y-$axis) against the quantiles of socioeconomic status (on the $x-$axis) ranked by cumulative percentage of the population. It is a graphical view of the pattern of inequality in OOP. 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-degree line running from the bottom left-hand corner to the top right-hand corner, and we would refer to this as the line of equality. 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 the 45-degree line (O'Donnell et al., 2008). However, the concentration curve does not give information on the magnitude of inequality, but that 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 (CI) takes a positive value, and regresssive 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 CI to quantify the degree of inequality in OOP, we examine the change and decompose the change.

As noted above, the Kakwani concentration index is defined as twice the area between the concentration curve and the line of equality, and is bounded between -1 and 1 (Wagstaff, 2000). Formally, it is depicted as:

$$CI = 1 - 2\int_0^1 L_h(p)dp \tag{4.1}$$

The concentration index can also be computed as the covariance between OOP health payments and the fractional rank in the distribution of socio-economic status (O'Donnell et al., 2008).

$$CI = \frac{2}{\mu} cov(OOP_i, S_i) \tag{4.2}$$

Equation 4.2 can also be written as:

$$CI = \frac{2}{n\mu}\left[\sum_{i=1}^{n} OOP_i S_i\right] - 1, \tag{4.3}$$

where CI is the concentration index, which is the measure of relative inequality, such that doubling OOP leaves the CI unchanged. OOP_i is household out-of-pocket health care payments, S_i is the fractional rank of household i in the socio-economic status distribution and μ is the mean of OOP. In line with the concentration curve, from which the Kakwani index is derived, the CI can either be positive or negative, suggesting the direction of the relationship between OOP 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, a change in income inequality should not affect the CI measure of income-related OOP inequality. For computation purposes and generation of standard errors from which to draw statistical inferences, we specify the CI in Equation 4.4.

$$2\sigma_s^2\left(\frac{OOP_i}{\mu}\right) = \alpha + \beta S_i \sum_k \beta_k X_{ki} + \epsilon_i \tag{4.4}$$

In (4.4), σ_s^2 is the variance of the fractional rank, α is the intercept, β is an estimate of the concentration index, β_k are the parameters of the determinants of X_{ki} and ϵ_i is the error term.

4.3.2 Decomposing a change in Concentration Index

As noted before, 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). We follow Wagstaff et al. (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.

Assuming a linear relationship between OOP and the contributions of the k determinants X_k, as outlined in (4.4),

$$OOP = \alpha + \sum_k \beta_k X_k + \epsilon, \tag{4.5}$$

where the terms are as described above. Substituting Equation 4.5 into Equation 4.3, the overall concentration index (CI) is a linear combination of the concentration indices of the determinants plus an error term as:

$$C = \sum_k \left(\frac{\beta_k \overline{X_k}}{\mu}\right) C_k + \frac{GC_\epsilon}{\mu}, \tag{4.6}$$

where μ is the mean of OOP; $\bar{X_k}$ is the mean of each k determinant, C_k is the concentration index for the kth determinant calculated from Equation 4.3 by replacing the variable OOP_i with the

determinant X_k (defined analogously to C); GC_ϵ is the generalized concentration index for the error term (ϵ), defined as

$$GC_\epsilon = \frac{2}{n}\sum_{i=n}^{n} \epsilon_i S_i, \tag{4.7}$$

which is analogous to the Gini coefficient corresponding to the generalised Lorenz curve. Thus, C is made up of two components (equation 4.6). The first component is the deterministic component, which is equal to a weighted sum of the concentration indices of the k regressors, where the weight or "share is the elasticity of OOP with respect to X_k evaluated at the sample mean, ($\eta_k = \beta_k \frac{\bar{X_k}}{\mu}$). The second part is the residual component, captured by the last term. It reflects the inequality in OOP that cannot be explained by systematic variation across income groups in the X_k.

As shown by Wagstaff et al. (2003), the general approach to unravel the causes of changes in OOP payment inequality is to allow for the possibility that all the components of the decomposition in equation 4.6 have changed between over the time period of interest, and simply take the time difference of equation 4.6 as follows:

$$\Delta C = \sum_k (\beta_{kt}\overline{X}_{kt})C_{kt} - \sum_k (\beta kt - 1\overline{X}_{kt-1})C_{kt-1} + \Delta(GC_{\epsilon t}/\mu_t) \tag{4.8}$$

However, as argued by Wagstaff et al. (2003), this approach is uninformative, as it does not allow one to estimate how to what degree changes in inequality in OOP are attributable to changes in inequality in its determinants or elasticities of those determinants. Wagstaff et al. (2003) propose applying Oaxaca-type decomposition ((see, Oaxaca, 1973)) to equation 4.6, to obtain the following:

$$\Delta C = \sum_k \eta_{kt}(C_{kt} - C_{kt-1}) + \sum_k C_{kt-1}\left(\eta_{kt} - \eta_{kt-1}\right) + \Delta\left(\frac{GC_{vt}}{\mu_t}\right) \tag{4.9}$$

where t refers to time period and Δ denotes first differences.

As proposed by Wagstaff et al. (2003), one interesting scenario weights the difference in concentration indices weighted by the second period elasticity and the difference in elasticities is weighted by the first period concentration index, as shown in Equation 4.9. An alternative to Equation 4.9 is to weight the difference in the concentration indices by the first period elasticity, while the difference in elasticities is weighted by the second period concentration index. This is shown in Equation 4.10 below. In using both Equation 4.9 and Equation 4.10, we can compare the results to see whether changing the elasticities with respect to OOP plays an important role in explaining the differences in OOP inequality over time.[3]

$$\Delta C = \sum_k \eta_{kt-1}(C_{kt} - C_{kt-1}) + \sum_k C_k\left(\eta_{kt} - \eta_{kt-1}\right) + \Delta\left(\frac{GC_{vt}}{\mu_t}\right) \tag{4.10}$$

[3]As noted above, this analysis is similar to Omotoso (2017), although she focused on ill health, medical aid coverage, disability, public as well as private health care facility and not on OOP.

The research employs linear models, which are weighted to the population. The dependent variable is actual OOP incurred by households when consuming health care. Such expenditures do not include any reimbursements that patients expect to receive or have received from their medical aid schemes. Therefore, the OOP variable is categorical. The data source of the research suggests that 49 percent of households in 1995, 42 percent in 2000, 20 percent in 2005-06 and 21 percent of households in 2010-11 recorded zero OOP; thus, actual OOP is likely to be skewed, although that skewness does not necessarily imply inequality. For computing the concentration curves, we use SAIES data for all the four surveys, although our decomposition analysis focuses only on our two endpoints, 1995 and 2010-11. The IES collects data on expenditures made by households on food items, household fuel, personal care, housing, education, health, clothing and foot wear, transport and communications, etc. For some of these items, the data collected pertains to a monthly expenditure, while for other items it relates to an annual expenditure. Expenditure data on food items, household fuel and some components of housing, for example, relates to purchases made in the past month, while clothing and footwear, education and health payments (among other expenditures) are annual expenses. Therefore, we aggregated these expenditures to construct total consumption expenditure, where all expenditures given as annual purchases were converted into a monthly figure. The consumption aggregate includes both monetary and non-monetary expenses, and a household is defined as one person or a group of persons dependent on a common pool of income, who share a dwelling unit (accommodation) and other resources such as food (Statistics South Africa, 1995). We chose to use household consumption as a measure of welfare rather than income, because a shortfall in spending takes into account a household's coping mechanisms, when their income is low. Also, in the short run, a household is able to "smooth" its consumption and, hence, it is reasonable to assume that consumption will be more directly related to a household's current living standards compared to income, which is only received intermittently (Deaton, 1992; Deaton and Grosh, 2000; Deaton and Zaidi, 2002). Furthermore, income data are not always reliable in many developing countries (O'Donnell et al., 2008).

4.4 Empirical Results

4.4.1 Data Summary

Table 4.1 present descriptive statistcs (weighted means) for 1995 and 2010-11[4]. As can be seen across these tables, there are some differences in weighted means over the time period. In particular, household heads appear to be a bit younger in 2010-11, less likely to be male, white or coloured. These households are less likely to have received no or only some schooling, but more likely to have completed primary or tertiary education. Thus, it appears that education

[4]Data descriptives for 1995 and 2000 are presented in Table C.1 in Appendix C. For 2000 and 2005-06, these are presented in Table C.2 while for 2005-06 and 2010-11 the summaries are presented in Table C.3.

completion is better, but it is not a straight line increase. They are more likely to live in urban areas and be employed, but less likely to have a medical aid. There has also been an improvement in sanitation and access to piped water.

Table 4.1: Weighted Means of the Dependent and Independent Variables for 1995 and 2010-11

	1995		2010-11	
HH Head 20-24yrs	0.028	(0.001)	0.039	(0.002)
HH Head 25-29yrs	0.072	(0.002)	0.089	(0.002)
HH Head 30-34yrs	0.111	(0.002)	0.117	(0.003)
HH Head 35-39yrs	0.126	(0.002)	0.136	(0.003)
HH Head 40-44yrs	0.124	(0.002)	0.112	(0.003)
HH Head 45-49yrs	0.109	(0.002)	0.104	(0.002)
HH Head 50-54yrs	0.098	(0.002)	0.101	(0.002)
HH Head 55-59yrs	0.082	(0.002)	0.083	(0.002)
HH Head 60-64yrs	0.073	(0.002)	0.069	(0.002)
HH Head 65-69yrs	0.063	(0.001)	0.054	(0.002)
HH Head 70-74yrs	0.046	(0.001)	0.040	(0.001)
HH Head 75-79yrs	0.030	(0.001)	0.021	(0.001)
HH Head 80-84yrs	0.018	(0.001)	0.013	(0.001)
HH Head 85yrs plus	0.011	(0.001)	0.010	(0.001)
Male	0.898	(0.002)	0.838	(0.003)
Black	0.722	(0.003)	0.758	(0.004)
Coloured	0.099	(0.002)	0.087	(0.002)
Asian	0.029	(0.001)	0.026	(0.002)
White	0.165	(0.002)	0.128	(0.003)
No Schooling	0.275	(0.003)	0.090	(0.002)
Some Schooling	0.271	(0.003)	0.238	(0.003)
Completed Primary	0.326	(0.003)	0.351	(0.004)
Completed Secondary	0.341	(0.003)	0.252	(0.004)
Completed Tertiary	0.054	(0.002)	0.068	(0.003)
HH Head Employed	0.244	(0.003)	0.378	(0.004)
Medical aid	0.267	(0.003)	0.172	(0.003)
Urban	0.554	(0.003)	0.695	(0.004)
Quintile 1	0.200	(0.003)	0.200	(0.003)
Quintile 2	0.200	(0.003)	0.200	(0.003)
Quintile 3	0.200	(0.003)	0.200	(0.003)

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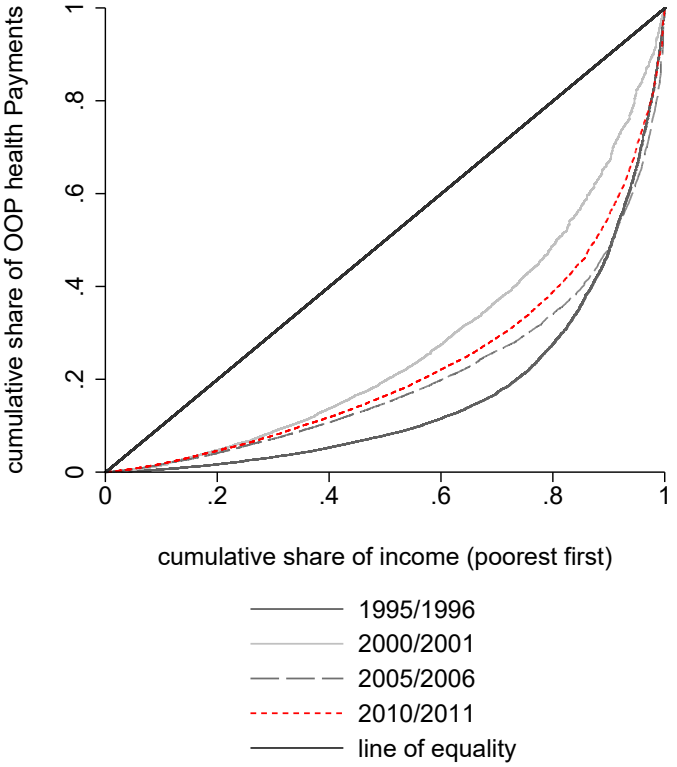
Descriptive Statistics (*continued*)

	1995		2010-11	
Quintile 4	0.200	(0.003)	0.200	(0.003)
Quintile 5	0.200	(0.003)	0.200	(0.004)
Piped water	0.885	(0.002)	0.975	(0.001)
Flush toilet	0.417	(0.003)	0.652	(0.004)
Western Cape	0.114	(0.002)	0.112	(0.002)
Eastern Cape	0.147	(0.002)	0.114	(0.002)
Northern Cape	0.025	(0.001)	0.018	(0.001)
Free State	0.075	(0.001)	0.062	(0.002)
KwaZulu Natal	0.176	(0.002)	0.178	(0.003)
North-West	0.088	(0.002)	0.078	(0.002)
Gauteng	0.207	(0.003)	0.268	(0.004)
Mpumalanga	0.059	(0.001)	0.066	(0.002)
OOP	23.088	(0.683)	116.040	(6.049)
Sample Households	28,585		24,153	

Standard errors in parentheses.

In furtherance to our goals, we plotted concentration curves to shed light on the inequality in the distributions of OOP. The concentration curves show the shares of OOP health care payments against quantiles of the living standards variable, ranked from the poorest to the least poor (richest). If everyone, irrespective of their living standards, is incurring the same OOP for health care, the concentration curve will be a 45-degree line, which is not the case. However, if OOP shares take lower values among poorer people, the concentration curve will lie below the line of equality, and health care finance will be viewed as progressive, which is what we find. See Figure 4.1 for the OOP concentration curves for the 1995, 2000, 2005-06 and 2010-11 survey years.

Figure 4.1: Concentration curves for OOP Health Care Payments, 1995 to 2010-11



The concentration curves for all survey years lie everywhere below the line of equality, suggesting that OOP health care payments are concentrated among non-poorer, and is, therefore, progressive. This result is unsurprising, given the relatively comprehensive range of health care services (including dispensation of basic essential drugs) that are offered for “free" at public health facilities in South Africa. Also, as shown in Chapter 2, OOP shares in general are low, as is the incidence of CHE and impoverishment. However, our results are different from those documented by Ataguba and McIntyre (2012) for 2005-06 finding OOP to be concentrated among poorer households, as opposed to their non-poorer counterparts. We find that the curve for 2000 lies everywhere below the line of equality, but does not lie further away from the line of equality then the rest. Thus, the 2000 concentration curve dominates the rest of them, representing the year for which OOP was the least unequal, and even its most progressive, even though it was regressive. It also appears that the 2010-11 curve dominates those from both 1995 and 2005-6; however, the curves for 1995 and 2005-06 cross each other, suggesting no dominance. Since a visual inspection is not sufficient to conclude dominance, we compute the concentration index and the standard errors of the concentration curve ordinates in order to make inferences about dominance.

4.4.2 Concentration Indexes for Health Care OOP: 1995 to 2010-11

In Table 4.2 below, we present the formal assessment of progressivity using concentration indices. To assess progressivity of OOP payments, the thesis used actual values of OOP instead of a dummy capturing whether or not a household incurred OOP payments. Most studies use dummy variable for OOP payments whereby 1 indicate that a household incurred positive spending and 0 if there was no OOP spending, when assessing whether or not OOP are regressive. Hence, in our case, we find that the concentration index for 1995 and 2005-06 are greater than 1, which could indicate that higher OOP incurred. The results report the relative change in OOP over time, whereby the comparison group comprises male-headed households residing in rural areas in the Western Cape and are Black/Africans with no schooling and are staying in household sizes comprising one to four members. After controlling for sociodemographic variables, the results show that most of the concentration indices for OOP payments are concentrated among the better-off in all the four years and they are statistically significant at conventional levels. Overall, it was found that there is no sustained pattern that is consistent over time in depicting a particular survey year portraying a more or less concentration of OOP among households over time. Hence, the research cannot concretely state whether or not there has been an increase or decrease in OOP health care payments over time, but rather fluctuations from one time period to the other were observed.

Table 4.2: Concentration Indices for OOP Health Care Payments, 1995 to 2010-11

	1995	2000	2005-06	2010-11
CI	1.075***	0.838***	1.029***	0.898***
	(0.104)	(0.141)	(0.194)	(0.162)
Male 20-24yrs	-0.128*	-0.090***	-0.057*	-0.052**
	(0.074)	(0.022)	(0.030)	(0.023)
Female 20-24yrs	-0.111	-0.053**	0.008	-0.034
	(0.071)	(0.025)	(0.027)	(0.027)
Male 25-29yrs	-0.016	-0.067***	-0.024	0.018
	(0.115)	(0.023)	(0.024)	(0.049)
Female 25-29yrs	-0.074	-0.034*	-0.008	-0.013
	(0.060)	(0.018)	(0.025)	(0.024)
Male 30-34yrs	-0.036	-0.028	-0.014	0.016
	(0.072)	(0.025)	(0.024)	(0.065)
Female 30-34yrs	-0.026	-0.023	0.037	0.028
	(0.068)	(0.019)	(0.025)	(0.030)
Male 35-39yrs	-0.010	-0.016	-0.004	-0.009

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Concentration Indices Results (*continued*)

	1995	2000	2005-06	2010-11
	(0.072)	(0.029)	(0.029)	(0.026)
Female 35-39yrs	0.000	-0.003	0.006	0.007
	(0.071)	(0.020)	(0.023)	(0.027)
Male 40-44yrs	0.044	-0.027	0.159	-0.011
	(0.074)	(0.025)	(0.123)	(0.028)
Female 40-44yrs	0.042	0.041	0.030	-0.002
	(0.074)	(0.034)	(0.023)	(0.021)
Male 45-49yrs	0.038	0.032	0.028	0.027
	(0.075)	(0.038)	(0.035)	(0.036)
Female 45-49yrs	0.018	0.020	0.047**	-0.009
	(0.073)	(0.021)	(0.022)	(0.021)
Male 50-54yrs	0.048	0.030	0.090*	0.044
	(0.076)	(0.035)	(0.053)	(0.048)
Female 50-54yrs	0.028	0.061	0.104***	0.029
	(0.074)	(0.037)	(0.032)	(0.024)
Male 55-59yrs	0.096	0.036	0.044	0.070
	(0.116)	(0.028)	(0.037)	(0.049)
Female 55-59yrs	0.013	0.014	0.028	-0.008
	(0.067)	(0.018)	(0.026)	(0.020)
Male 60-64yrs	0.057	0.172***	0.129	0.002
	(0.076)	(0.062)	(0.083)	(0.036)
Female 60-64yrs	0.038	0.031	0.065	-0.003
	(0.075)	(0.019)	(0.040)	(0.024)
Male 65-69yrs	0.065	0.171	0.150*	0.155
	(0.076)	(0.109)	(0.088)	(0.140)
Female 65-69yrs	0.033	0.043**	0.050**	-0.024
	(0.075)	(0.020)	(0.023)	(0.026)
Male 70-74yrs	0.061	0.194**	0.265*	0.014
	(0.077)	(0.096)	(0.142)	(0.041)
Female 70-74yrs	0.069	0.072***	0.066**	-0.004
	(0.077)	(0.027)	(0.030)	(0.033)
Male 75-79yrs	0.044	0.230	0.318	-0.024
	(0.076)	(0.163)	(0.270)	(0.044)
Female 75-79yrs	0.002	0.025	0.064***	-0.077**
	(0.074)	(0.022)	(0.023)	(0.034)

Continued on next page...

Concentration Indices Results (*continued*)

	1995	2000	2005-06	2010-11
Male 80-84yrs	0.122	0.135**	0.116**	0.083
	(0.093)	(0.055)	(0.054)	(0.070)
Female 80-84yrs	0.022	0.091***	0.047*	-0.019
	(0.080)	(0.035)	(0.026)	(0.034)
Male 85yrs plus	0.113	0.018	0.014	0.105
	(0.090)	(0.051)	(0.045)	(0.076)
Female 85yrs plus	0.049	0.254**	0.043	-0.017
	(0.092)	(0.106)	(0.031)	(0.032)
Urban	-0.014	-0.010	-0.036***	-0.005
	(0.011)	(0.010)	(0.012)	(0.010)
Coloured	0.005	-0.013	0.016	0.031
	(0.015)	(0.031)	(0.038)	(0.034)
Asian	0.175***	0.175	0.052	0.070**
	(0.028)	(0.125)	(0.055)	(0.033)
White	0.399***	0.248***	0.258***	0.301***
	(0.026)	(0.058)	(0.075)	(0.055)
Eastern Cape	-0.021	-0.073*	0.005	-0.095***
	(0.023)	(0.042)	(0.046)	(0.037)
Northern Cape	-0.012	-0.089**	0.008	-0.086**
	(0.022)	(0.035)	(0.040)	(0.036)
Free State	-0.033	-0.014	0.083	-0.026
	(0.023)	(0.057)	(0.062)	(0.042)
KwaZulu Natal	-0.047*	-0.033	0.033	-0.046
	(0.024)	(0.046)	(0.047)	(0.040)
North-West	-0.050**	-0.082*	0.017	-0.090**
	(0.023)	(0.043)	(0.051)	(0.040)
Gauteng	-0.089***	-0.089*	0.056	0.004
	(0.027)	(0.048)	(0.074)	(0.051)
Mpumalanga	-0.062***	0.026	0.020	-0.036
	(0.023)	(0.054)	(0.048)	(0.042)
Limpopo	-0.019	-0.089**	0.001	-0.095**
	(0.029)	(0.044)	(0.048)	(0.040)
5-8 HHSize	-0.021	-0.009	0.016	-0.033
	(0.016)	(0.021)	(0.040)	(0.027)
9-12 HHSize	0.010	0.008	-0.013	0.045

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Concentration Indices Results (*continued*)

	1995	2000	2005-06	2010-11
	(0.021)	(0.019)	(0.030)	(0.032)
13+ HHSize	0.018	0.028	-0.026	0.008
	(0.012)	(0.022)	(0.032)	(0.018)
Some Schooling	0.001	0.020**	0.013	-0.007
	(0.013)	(0.009)	(0.010)	(0.008)
Completed Primary	-0.012	0.033**	0.025	-0.017
	(0.015)	(0.016)	(0.017)	(0.018)
Completed Secondary	-0.051***	0.053**	0.005	-0.053**
	(0.017)	(0.023)	(0.028)	(0.027)
Completed Tertiary	-0.033	0.079	0.481**	0.101
	(0.042)	(0.076)	(0.227)	(0.082)
Medical Aid	-0.116***	-0.349***	0.106**	0.014
	(0.016)	(0.050)	(0.045)	(0.037)
HH Head Employed	0.007	-0.000	-0.005	-0.011
	(0.008)	(0.019)	(0.016)	(0.019)
Piped Water	-0.007			0.013
	(0.006)			(0.009)
Flush Toilet	-0.002			-0.039***
	(0.007)			(0.010)
Quintile 2	-0.183***	-0.138***	-0.190***	-0.159***
	(0.020)	(0.030)	(0.039)	(0.032)
Quintile 3	-0.365***	-0.248***	-0.376***	-0.317***
	(0.041)	(0.058)	(0.079)	(0.064)
Quintile 4	-0.506***	-0.322***	-0.571***	-0.463***
	(0.062)	(0.084)	(0.125)	(0.098)
Quintile 5	-0.404***	-0.198**	-0.586***	-0.408***
	(0.073)	(0.097)	(0.170)	(0.115)
Intercept	-0.064	-0.038	-0.140**	0.009
	(0.079)	(0.050)	(0.054)	(0.054)
R^2	0.120	0.058	0.061	0.072
Sample Households	28,585	22,470	21,019	24,153

Source: Author's computations from 1995, 2000, 2005-06 and 2010-11 SAIES. Robust Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

When we focus on the individual socio-demographic characteristics, the results presented in Table 4.2 suggest that OOP is relatively regressive (concentrated among non-poorer households)

among households whose heads are insured in 1995 and 2000, and reside in urban areas in all the four years, and have secondary education in 1995 and 2010-11. The results of regressivity among the insured is not surprising as similar results were documented by Ataguba and McIntyre (2012) when using the 2005-06 SAIES. While the authors found private insurance contributions across the entire population to be progressive, they found it to be regressive across the insured population with a Kakwani index of -0.227.

When focusing on age, the research found that both males and females aged between 20 are less likely to incur OOP payments as compared to males and females who are relatively older and are aged between 55 and 85 plus. This is not surprising given that Grossman's investment theory on human capital postulates that as individuals age, their health stock tends to deteriorate and as such, elderly people purchase a greater amount of medical care than their younger counterparts. The comparison of this research regarding gender results by age groups suggests that elderly males aged 60-64 are less likely to pay OOP payments as compared to their female counterparts. For other age groups, the picture is not so clear. With regard to race, the research found that Asians and Whites are more likely to report OOP payments than Blacks. Across the quintiles, the research found that across the four years, all households, irrespective of their wealth, are less likely to report OOP payments. The results for quintiles are statistically significant at all conventional levels. The research also found that OOP payments increase with increases in household size, and those with piped water source, while those using flush toilets, were found to be less likely to incur OOP payments. Given the data limitations discussed earlier, caution must be exercised when interpreting these results. In 1995 for instance, some of the homelands were not covered in the data collection of 1995 IES and OHS. So, it is likely that what we observe as an increase from 1995 to 2000 for instance or from 1995 to 2010 in some of the variables, is in fact under-representation brought by lack of coverage of the homelands. With regard to OOP payments, even though our finding that as individuals age, they tend to pay more OOP for health care than their younger counterparts is in line with economic theory, caution must be exercised when interpreting this result. This is because in 1995 and 2000, there could be measurement error associated with recall method while in the 2005-06 and 2010-11, the error would be associated with diary method. In the recall method, it could be the case that individuals are more likely to have missed out recalling small OOP they incurred while in the diary method, if the period was short, it is likely households missed out recording the relatively infrequent occurrence of large health expenditure. These challenges would mean there is under-reporting of OOP payments that is analysed in the thesis.

4.4.3 Decomposition Results

The research uses Oaxaca decomposition[5] to show the extent to which inequality in the factors influencing OOP payments over time, are due to changes in inequality in their social determinants and changes in their elasticities with respect to the social determinant. These results are presented in Table 4.3[6].

Table 4.3: Oaxaca-type decomposition of the change in Who Pays for Health Care Through OOP Payments, 1995 to 2010-11

	1995:2000		2000:2005-06		2005-06:2010-11		1995:2010-11	
	$\Delta C\eta$	$\Delta \eta C$	$\Delta C\eta$	$\Delta \eta C$	$\Delta C\eta$	$\Delta \eta C$	$\Delta C\eta$	$\Delta \eta C$
20-24	-0.017	-0.001	0.000	0.000	0.001	0.001	0.000	0.000
25-29	-0.005	-0.001	0.001	0.001	0.001	0.001	0.000	0.000
30-34	-0.004	-0.001	0.000	0.000	0.001	0.001	0.001	0.000
35-39	0.008	-0.002	0.000	0.000	0.001	0.001	-0.001	-0.001
40-44	0.036	-0.002	0.002	0.002	-0.002	-0.002	-0.002	-0.002
45-49	0.015	0.000	-0.001	-0.001	0.000	0.000	-0.001	-0.001
50-54	0.015	-0.001	0.001	0.001	0.000	0.000	0.000	0.000
55-59	0.023	0.001	0.000	0.000	0.000	0.000	0.001	0.001
60-64	0.014	-0.004	0.004	0.004	0.001	0.001	0.001	0.001
65-69	0.012	-0.003	0.005	0.005	0.000	0.000	0.002	0.002
70-74	0.012	-0.004	0.002	0.002	0.004	0.004	0.002	0.002
75-79	0.000	-0.003	-0.001	-0.001	0.003	0.003	0.000	0.000
80-84	0.004	-0.002	0.002	0.002	0.000	0.000	0.000	0.000
85yrs +	0.004	-0.001	0.002	0.002	0.000	0.000	0.000	0.000
Urban	-0.044	0.011	-0.017	-0.017	0.004	0.004	0.011	0.011
Female	0.222	0.011	0.003	0.003	-0.009	-0.009	0.005	0.005
Black	-0.046	-0.018	0.020	0.020	0.011	0.011	0.017	0.017
Asian	0.031	0.002	-0.012	-0.012	0.001	0.001	-0.009	-0.009
White	0.442	-0.137	0.034	0.034	-0.003	-0.003	-0.106	-0.106
Eastern Cape	-0.259	-0.052	-0.019	-0.019	0.012	0.012	0.005	0.005
Northern Cape	-0.002	0.000	0.000	0.000	0.001	0.001	0.000	0.000
Free State	-0.016	-0.002	0.001	0.001	-0.001	-0.001	-0.003	-0.003
KwaZulu Natal	-0.048	0.006	-0.008	-0.008	0.008	0.008	0.006	0.006

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[5]The decomposition results for the inequality in OOP payments along with their associated standard errors for the years 1995, 2000, 2005-06 and 2010-11 are reported in Tables C.8, C.9, C.10 and C.11 in Appendix C

[6]The decomposition results of the concentration indexes for the years 1995 through to 2010-11 are presented in Tables C.4, C.5, C.6 and C.7 in Appendix C.

Oaxaca-type Decomposition (*continued*)

	1995:2000		2000:2005-06		2005-06:2010-11		1995:2010-11	
	$\Delta C\eta$	$\Delta \eta C$	$\Delta C\eta$	$\Delta \eta C$	$\Delta C\eta$	$\Delta \eta C$	$\Delta C\eta$	$\Delta \eta C$
NorthWest	-0.028	-0.002	-0.002	-0.002	0.004	0.004	0.000	0.000
Gauteng	-0.087	-0.003	0.059	0.059	-0.015	-0.015	0.080	0.080
Mpumalanga	-0.026	-0.003	-0.001	-0.001	0.002	0.002	-0.001	-0.001
Limpopo	-0.016	0.016	-0.019	-0.019	0.014	0.014	0.012	0.012
5-8 HHsize	0.084	-0.013	0.003	0.003	0.026	0.026	0.007	0.007
9-12 HHsize	0.017	-0.002	0.004	0.004	0.006	0.006	0.007	0.007
13+ HHsize	0.003	-0.002	0.002	0.002	0.001	0.001	0.000	0.000
Some schooling	-0.033	-0.015	-0.003	-0.003	0.013	0.013	-0.006	-0.006
Completed Primary	0.085	0.016	-0.005	-0.005	0.000	0.000	0.011	0.011
Completed Secondary	0.013	0.033	-0.016	-0.016	-0.036	-0.036	-0.018	-0.018
Completed Tertiary	0.016	0.012	0.090	0.090	-0.067	-0.067	0.036	0.036
Medical aid	-0.203	-0.120	0.312	0.312	-0.077	-0.077	0.117	0.117
Employed	-0.025	0.012	0.000	0.000	0.000	0.000	0.013	0.013
Quintile 2	0.036	-0.002	0.011	0.011	0.000	0.000	0.008	0.008
Quintile 3	0.073	0.001	0.000	0.000	0.000	0.000	0.001	0.001
Quintile 4	0.158	0.100	-0.145	-0.145	0.010	0.010	-0.031	-0.031
Quintile 5	0.523	0.231	-0.458	-0.458	0.078	0.078	-0.142	-0.142
Piped water							-0.002	-0.002
Flush toilet							-0.030	-0.030

Sample Households are 28,585 for 1995, 22,506 for 2000, 20,923 for 2005-06 and 25,124 for 2010-11

A negative sign indicates factors driving inequalities in paying for health care through OOP payments.

The results of the research suggest that between 1995 and 2000, the change in OOP payment inequality explains the changing inequality across provinces, education, age groups, medical aid status as well as urban area of residence. Between 2000 and 2005-06, changing inequality in OOP payments was explained by changes across provinces, age groups, household size, and quintiles. However, between 2005-06 and 2010-11, changes in OOP payment inequality was explained by changing inequality across provinces as well as female headship of household. When the pattern is observed across the 15-year time period from 1995 to 2010-11, it can be observed that changing inequality across age groups, racial groups, education (particularly completion of secondary education), quintiles, type of toilet used as well as water source for drinking, explained changes in OOP payments.

In addition, the research also found that changing elasticities with respect to OOP payments also play a crucial role in explaining differences over time. Between 1995 and 2000, for example, changing elasticities associated with household size, age and employment status explained many

of the changes in OOP payment inequality. Between 2000 and 2005-06, 20005-2010 as well as between 1995 and 2010-11, there were no changes. Rather, changes in inequality in the determinants and changes in the elasticities seemed to reinforce each other. Overall, when all the determinants of OOP payments are taken into consideration, the findings seem to suggest that between 2000 and 20005-06, 2005-06 and 2010-11 and 1995 and 2010-11, most of the changes in OOP payment inequality are attributable to inequality in the social determinants. However, between 1995 and 2000, changing elasticities with respect to their social determinants are largely attributable to inequality in OOP payments. The research also found that the contributions from each determinant to inequality in OOP payments is very negligible (see Tables C.4, C.5, C.6 and C.7 in Appendix C).

4.5 Discussion of Results

The analysis presented in this Chapter was two-fold. The first step of the analysis presented in the chapter was to use concentration curves and indices in assessing who pays for health care OOP in South Africa. To this end, our findings suggested that OOP health payments in South Africa, are pro-poor across all the years analysed i.e. the non-poor shoulder a larger burden of OOP payments as compared to the poor. This result was in agreement with documented evidence that has used South African data (see Ataguba and McIntyre, 2012). Given the low rates of CHE that was reported in Chapter 2, the findings on progressivity of OOP payments is unsurprising. The proportion of CHE reported in Chapter 2 was relatively low when compared to other African countries but, were in a similar range to that observed in developed countries. These findings can be underpinned on the health policy reforms (as well as other redistributive policies with a wider coverage) implemented in South Africa whose aim was to ensure financial protection against the detrimental effects of ill-health. The finding could also be due to measurement error resulting from households not recalling all the OOP payments they incurred or in the diary method, not noting the infrequent but large expenses due to, maybe shorter time period they were expected to record their expenses. Therefore, taking the role of measurement error into consideration, our low CHE as well as low reported lack of seeking treatment by those ill or injured, must be interpreted with caution.

We then examined the socio-economic factors that contribute to progressivity of OOP payments and then decomposed these factors to understand the contribution of each factor to the overall progressivity. In 1995 and 2000, we found that OOP is relatively regressive among households whose heads are insured. This finding was similar to the result documented by Ataguba and McIntyre (2012) who found a Kakwani index of -0.227 across the insured population in South Africa in 2005-06. A plausible explanation for this could be that given that medical aid schemes have not expanded that much over time, the regressivity in OOP payments among the insured could be as a result of members having exhausted their scheme packages within a year, and

thus required to pay OOP for health care while awaiting a new year when their benefits will be refilled. This finding however, of regressive OOP among insured strengthens South Africa's quest to provide health insurance through the NHI, which will be mandatory and therein, some of the challenges observed in the current medical aid schemes, have been documented to make NHI comprehensive.

The research also found that OOP payments increase with increases in household size, and those with piped water source, while those using flush toilets, were found to be less likely to incur OOP payments. While the result on usage of flush toilet (which can be argued to represent clean sanitation) matches the findings documented in the literature, the result on access to safe water as captured by access to piped water is not in line with previous documented literature. O'Donnell et al. (2005) for example, documents lower incidence of CHE households associated with both sanitary toilet and safe drinking water. Therefore, this for South Africa could mean that even though great strides have been made with regard to provision of clean water to the population, more still needs to be done to improve water access so that it does not adversely affect other social outcomes such as health.

Additional socioeconomic factors include access to clean water and sanitation, which are likely to influence health in the household. Reduced incidence of catastrophe for clean living conditions, suggests that public health interventions can offer health care financial risk protection to households. Dirty and contaminated water combined with poor sanitation contributes not only to malnutrition, but are also a leading cause of death in children, particularly those who are under five years (H Ghiasvand and H Shabaninejad and M Arab and A Rashidian, 2014). O'Donnell et al. (2005) also find that CHE incidence is lower in households with a sanitary toilet and safe drinking water. We also found that both males and females aged between 20 are less likely to incur OOP payments as compared to males and females who are relatively older and are aged between 55 and 85 plus. This finding is supported by theory (see Grossman, 1972b, 2000) as well as existing evaluative studies (Adisa, 2015; Akinkugbe et al., 2012; Barros et al., 2011; Brinda et al., 2015; Choi et al., 2015; Doubova et al., 2015; Ntuli et al., 2016; Rahman et al., 2013; Su et al., 2006; Wang et al., 2015).

4.6 Conclusion

The question that the research set out to answer in this chapter is: Who pays for health care? The short answer is: non-poorer households pay for health care through OOP payments. In addition, there is a clear pattern of an increase over time in the concentration of OOP health care payments portrayed in some socio-demographic characteristics, but, on the aggregate, such patterns are not consistent across the years for most variables. OOP is, for example, concentrated among better-off females and there is an observed increase in the magnitude of such concentration between 1995 and 2010-11. However, with regard to the concentration of OOP among Asian people, the

research found that such concentration decreased over the same time period. This therefore makes it difficult to generalise on the pattern of inequality over time. However, what can be concretely stated, as suggested by the results presented by way of concentration curves and also the concentration indices, is that financing health care via OOP in South Africa is progressive. What this means is that non-poorer households shoulder a larger burden of OOP health payments as compared to their poorer counterparts. For a country like South Africa, which has over time adopted social protection policies in the form of “free" health care for all, amongst others, this is unsurprising. Rather, there should be continued efforts so that the pattern of progressivity in OOP health care payments do not become regressive as this may have far-reaching consequences for the achievement of other social goals such as stalling poverty reduction initiatives. Amongst the findings of the research, the results suggest that OOP are regressive among insured households. This could either mean that private health care is expensive such that household co-payments are relatively higher or, it could mean that benefit packages are not comprehensive enough such that insured households exhaust them before hand and therefore, end up financing much of their health care directly OOP before they can be credited with new benefits. To this end, the South African government effort of implementing a mandatory National Health Insurance is commendable as some of the challenges associated with private health insurance being regressive, could be addressed.

CHAPTER 5

CONCLUSION

Compared to other forms of health financing, OOP constitute the single biggest barrier to health care access and are, therefore, an inequitable means of financing health care. A concerted effort to balance and even alter the split between OOP and indirect pre-payment health financing mechanisms to promote universal access to health care is part of the South African health policy landscape. Since 1994, the country has adopted a number of social protection reforms, as well as health financing reforms to promote access to health care and financial risk protection against the consumption of health care. While existing evidence is mixed, some of it suggests that the reforms have borne fruit in promoting access to and utilisation of public health care. However, literature also suggests that there have not been many changes (for the better) with regard to health care financial protection. Therefore, in this thesis, we examined data over a lengthy period of time in an effort to present more nuance to our current understanding. Within the scope of the investigation, we addressed three broad questions. We briefly review those questions and what we found, below.

The first question the thesis asked was: What is the incidence of catastrophic health care expenditures (CHE) arising from financing health care OOP in South Africa covering the period 1995 to 2011? To address this question, we classified households, whose OOP was in excess of a predefined threshold, as facing CHE (or not). Thus, we established the percentage of households incurring burdensome expenditures that are likely to force them to reallocate spending from other items towards health care. While the choice of the thresholds is arbitrary, our choice of thresholds was consistent with existing studies to allow for comparison. In this regard, the thresholds that we selected were 5 percent, 10 percent, 25 percent and 40 percent. Overall, we uncovered small OOP shares, low CHE proportions and negligible impoverishment percentages. These low figures to some extent, indicate that the public health care system which the majority

of households use, is affordable. However, the usual caveat applies to any conclusion related to OOP. Such payments do not include expenses associated with accessing and utilising health care, such as transport costs and waiting time, amongst others. Unfortunately, we are not in a position to consider that, given the data that is available. But, due to problems associated with lack of prescribed medicines, lack of privacy and long queues in public facilities still being raised, the issue of affordability and access to health care is worth further researching on, as updated data becomes available. This will ensure that all the indirect costs are augmented in the partially implemented NHI for South Africa. Despite the limitation of data, we examined the usage of health facilities to determine whether or not, the low proportions of households incurring CHE could be due to lack of usage of facilities when ill or injured. To this end, our results on health facility usage indicate that the poor consulted more in public facilities as compared to the most affluent households. This is welcome as it shows that the intended effect of removal of user fees is bearing fruit in that, those who are suppose to benefit from it, are indeed utilising facilities where such policy is applicable. We also assessed the proportion of individuals that were ill but did not seek treatment in health facilities. In addition, we examined the distance travelled to the health care facility by households as an indirect assessment of transport costs. With regard to non-usage of facilities when confronted by illness, we found that a negligible percentage of households (about 0.04 percent) had household members who did not seek treatment when ill. On distance travelled to the health facility, our results suggest that health care facilities are in close proximity to households such that we may expect prohibitive costs associated with transport to access health care to be insignificant. For example, we found about 56 percent of poorest quintile (quintile 1) do travel more than 5 km to the health facility as compared to 28 percent of the households belonging to quintile 5. By gender, we found that about 24 percent of male and female-headed households travelled less than 1km to the health facility and 36 percent travel between 1 and 5 km while 40 percent travel more than 5 km to the health facility.

When considering the public-private mix, overall, we found that, compared to the private sector, OOP in the public health sector are fairly low, which is not too unsurprising since public health care is virtually free, at least at the primary health care level, while in public hospitals it is available at a fee based on the uniform patient fee schedule. Therefore, health payments to the private sector are an important component of out-of-pocket expenditures and, surprisingly, this is true even of the least wealthy and those of generally lower economic status, i.e., those without access to health insurance, those living in a household with an unemployed head and those living with a less educated household head, amongst other measure of well-being. When OOP spending between public and private health facilities is broken down by gender and urban-rural place of residence, we find that in 1995, females OOP was higher in the private sector than for their male counterparts. This is plausible because even though user fees were wiped out for females at the public primary health care level, it was only for those women who were pregnant or nursing.

Implying that for other women, health care was not free. However, from the year 2000 through to 2010-11, we observe that male-headed households are the ones spending more in private health care as opposed to their female counterparts. In 2000 for instance, male-headed households spent about $R32$ OOP in private health care facilities, while female-headed households spent about $R12$. In share terms however, there is not much difference between the shares spent by male and female (-headed households) in private health care facilities. When making comparisons by urban-rural location, urban dwellers spend relatively less in the private health care sector compared to rural dwellers - at least in 1995. From 2000 to 2010-11, private sector OOP by urban dwellers is consistently higher than that spent by their rural counterparts.

After establishing the incidence of CHE, the second question asked was: which socio-economic factors are associated with gender inequalities related to CHE? Our interest to examine this question was mainly to understand the progress made since 1994 in addressing gender inequality since some of the policy reforms adopted in South Africa from 1994 had a gender dimension. From the first question we addressed in this thesis, we found that in all the years (1995 to 2011) and many types of health care, the capacities to pay differences were large enough to reverse the rankings, when comparing OOP values to OOP shares per capacity to pay. In other words, we found that there are rather extensive differences in OOP, as well as in OOP shares of capacity to pay, related to the gender of the head of the household. In 1995, male-headed households incurred roughly three times the amount of OOP than female-headed households, but had a capacity to pay that was nearly four times as large; thus, OOP shares were relatively larger in female-headed households. This therefore, sparked our interest to conduct a gender-gap analysis because the aggregate analysis does not offer much information on changes over time or the drivers of those changes by gender – information which is useful for South Africa when looking at its history of discrimination and the factors that were used for such discrimination. To conduct the analysis, we employed Blinder-Oaxaca decomposition to examine the gender gap (based on the gender of the household head) in the incidence of CHE. We further differenced the Blinder-Oaxaca decomposition to assess the contributions of both observed and unobserved changes in characteristics and their relative importance in explaining the changes in the incidence of CHE and the gender gap in CHE over time. The results suggest that the gender gap in the incidence of CHE narrowed by 0.4 percent between 1995 and 2010-11. This reduction in the gender gap is explained by inequalities in education, access to piped water and residing in urban areas. Most of the results indicated that education, having access to piped water and residing in urban areas were positive for both 1995 and 2010-11. As argued elsewhere, if women are limited in pursuing economic opportunities so that they can have some earnings because they have to travel long distances to fetch water, this will tend to limit their ability to afford to pay for health care OOP. In such instances, should the need arise, they are therefore, likely to face poor health outcomes or resort to coping strategies such as selling of assets to finance

health care OOP due to lack of pursuing economic opportunities and earn an income. Our results are consistent with existing evidence documenting the important role played by access to basic amenities, such as water and proper sanitation, as well as increased human capital (education), in explaining gender inequalities in health care. These findings, underscore the efficiency of the South African government interventions through public policy on health care. Between 1994 and 2016 for example, the proportion of people with access to clean water has increased in South Africa as well as the proportion of females residing in urban areas.

Lastly, we asked: who pays for health care in South Africa? Addressing this question sought to establish whether poor or non-poor households were more likely to incur relatively larger OOP shares (of their capacity to pay) to service their health care needs. To answer this question, we began with descriptive plots of concentration curves for all the four IESes (1995, 2001, 2005-06 and 2010-11) and quantifying the magnitude of inequality observed (by calculating the concentration index). We then decomposed the results across socio-economic factors associated with the observed (in)equality in OOP. With regard to who pays for health care in South Africa through OOP, it was found that health care payments are concentrated among non-poor households, which suggests that there is progressivity in health care financing, at least as it pertains to OOP. Those results are corroborated by the corresponding concentration indices. These findings can be underpinned on the health policy reforms (as well as other redistributive policies with a wider coverage) implemented in South Africa whose aim was to ensure financial protection against the detrimental effects of ill-health.

While the results of this research can be a key input in South Africa's quest to achieving universal health care and the Sustainable Development Goals (SDGs), there are some limitations. The data comes from several cross-sections. However, we are not able to follow households through time to see if, when and how they are burdened by various costs of accessing and utilising health care. Income and Expenditure Surveys do not generally contain information about illness within households or even the prices of goods purchased. While we accept that health care demand may be less elastic than the demand for other goods, knowledge about a wider set of prices would be beneficial. With regard to OOP incurred, the data does not disentangle those payments per household member. Given that in 1994, health care was made “free" for children below the age of 6 as well as pregnant mothers among others, disentangling the OOP data by household member would have been beneficial in allowing an evaluation of who incurs more OOP payments and why, within a household. The data also, does not provide information related to patient views of their most recent health care experience; thus, it is not possible to examine whether there is any link between OOP and either past experiences or future decisions. This limited our interest to undertake an analysis of examining whether or not, there are any experiences that are persistently raised by health care users in the four data-sets that we used, so as to guide

policy on the design of the South African National Health Insurance (NHI). Finally, although the analysis presents a range of associations between outcomes, we cannot pin any of them down as causal. Doing so requires a rather different research design to underpin data collection, both of which could be expensive and time-consuming. We hope to develop such a design in the future.

Another limitation is that, in its data collection method, the 1995 and 2000 IESes required households to recall the expenditures they made in the past 12 months or past month for some expenses. However, from 2005-06 and 2010-11, households were given diaries to record their consumption expenditures, rather than providing recall information on expenditures from the past year. These differences in SAIES data meant OOP payments could be measured with error, based on recall and diary. In particular, recall (used in 1995 and 2000 SAIES) is likely to miss small payments, while the diary method (used in 2005-06 and 2010-11 SAIES) in a small window would rather, be unlikely to capture large OOP values. This seems to be the case for OOP payments reported in our descriptive analysis whereby, we observe OOP for physician visits to be relatively large in the recall method and OOP for facility usage (which, one would assume would have been the one dominating), to be rather small. Therefore, the recall and diary method both have a challenge of resulting in under-reporting of OOP data. To counter this limitation, a wider window period is needed for households to record their expenditures. One other limitation that is likely to feed into measurement error is that in 1995, some of the homelands were not covered in the data collection of 1995 IES and OHS. It is therefore, possible that a significant proportion of female households were missed out due to that lack of data coverage in the homelands. This would lead to under-representation of female households in the data as well as on the OOP payments findings relating to them.

One of the limitations of this thesis also comes from the Blinder-Oaxaca decomposition method technique that is employed in Chapter 3 for analysis purposes. Blinder-Oaxaca decomposition does not restrict the male-female disparities in CHE to comparable individuals. Hence, this can lead to upward bias of the component associated with disrimination. Also, the male-female disparities in CHE could be evolving over time due to improvements in socio-economic development and other confounding factors that we did not control for. The likely effect of this is that we could be under-estimating the gender gap in CHE reported in our analysis. Another limitation of Oaxaca-Blinder is that it assumes a linear regression model for CHE between males and females which may not necessarily be the case. Therefore, it might be difficult to make inference about the main cause of the unexplained part of the male-female gap in CHE. However, we believe that the decomposition analysis that we conducted allowed us to shed light on the factors associated with gender gap on financing health care OOP for proper targeting.

Despite these limitations, the way we measured OOP across all the IES surveys, was in line

with existing literature and therefore, is enough to allow an analysis undertaken in this thesis which mainly, is to relate OOP shares to household capacity to pay. In the same vein, some of the limitations provide avenues for further research as updated data becomes available. The Blinder-Oaxaca approach that is used in the thesis decomposes the difference in the mean of CHE between males and females. As an area of further research, one extension to the current analysis would be to use quantile regression to decompose the gender differences in the distribution of the covariates and differences in the effects of these covariates. As shown by (O'Donnell et al., 2006), this allows the effect of the covariates to differ over the conditional distribution of the CHE incidence which would be more informative in guiding policy. Another possible area worth exploring is to examine whether or not, spending on health care causes households to reduce budget share allocations towards other basic necessary commodities. This would shed light on whether or not households have indeed reduced spending on other basic commodities as well as information on which commodities have been reduced. Such information is key as it will guide policy on which sectors are inversely impacted by household consumption of health care so that they can be acted upon.

APPENDIX A

APPENDIX SUMMARISING HEALTH FINANCING IN SOUTH AFRICA

A.1 Brief Overview

The South African health financing mechanism comprises of a tax funded public health system with free primary health care and minimal charges for inpatient care in public hospitals (Doherty et al., 2002; Republic of South Africa, 2009). While this form of health financing, can be argued as some form of UHC to the South African population, the country is in the process of introducing a mandatory health insurance scheme, the National Health Insurance (NHI) Scheme (Republic of South Africa, 2011). This pursuit is to ensure sustainability in how health care is financed and also an effort to redress the existing inequities in utilization patterns for health care services that are partly blamed on the current health insurance set-up.

Currently, provision of health insurance cover is in the form of voluntary medical aid schemes, which are offered through “closed" employer-based funds and “open" funds (McLeod, 2007). For “closed" funds, cover is only available to employees and their family members, while under “open" funds, cover is open to anyone. These medical aid schemes are regulated through the Medical Schemes Act (No. 131) of 1998, which encourages medical schemes: to enroll anyone who is willing to join at standard rates (open enrollment); to charge a standard fee to every member regardless of their age or state of health (community risk-rating); and to offer a minimum package of healthcare benefits (referred to as Prescribed Minimum Benefits (PMBs)). However, despite the existence of regulations governing medical aid schemes, prior literature reports inequities in health insurance coverage, particularly lack of income and cross-subsidization among the insured, and the possibility that medical aid schemes “cherry pick" their members. On the part of members, there is also likely to be self-selection into schemes. To shed light on medical scheme coverage, we provide, below, a cross-sectional analysis of medical aid trends portrayed over time using South African annual household surveys namely, the October Household Survey (OHS)

and the General Household Survey (GHS). Each line is drawn using LOWESS and represent the weighted proportions of individuals with private health insurance coverage in a particular year.

Figure A.1: Insured population proportions by Age: 1994-2011

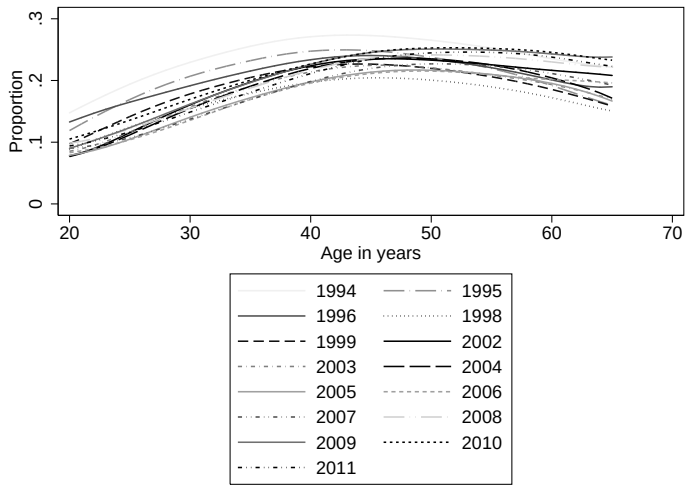


Figure A.1 shows the proportion of the population that has health insurance cover, while Figure A.2 shows the portion of uninsured. Generally the percentage of people covered is low. Among the many reasons, the low proportion of coverage is one of the reasons for introducing a mandatory health insurance scheme. As might be expected, the curves, which are plotted by age, mimic the permanent income hypothesis. Coverage tends to be highest amongst the working age population. Another way to explain it is that it matches trends in the labour market, where there are lower employment levels at younger and higher ages as opposed to those in the middle. Finally, one could match the argument to Grossman's investment theory on human capital, which postulates that as individuals age, their health stock tend to deteriorate and as such, elderly people purchase a greater amount of medical care than their younger counterparts. In Figure A.1, older age profiles exhibit higher health insurance coverage and the cross-sections are nowhere declining. This could be signifying that the old as opposed to the young purchase more health insurance so as to guard themselves against the risk of catastrophic financial loss during times of illness.

The inverse of Figure A.1 is given by Figure A.2, which depicts the proportion of the population that is uninsured. This is not an uninteresting picture because it constitutes a larger chunk of the population and because it represents those who are most likely to be either be partially or wholly subsidized from government coffers.

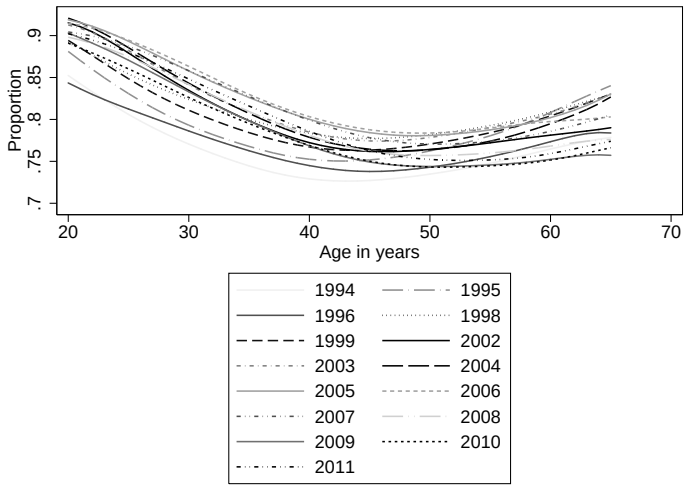
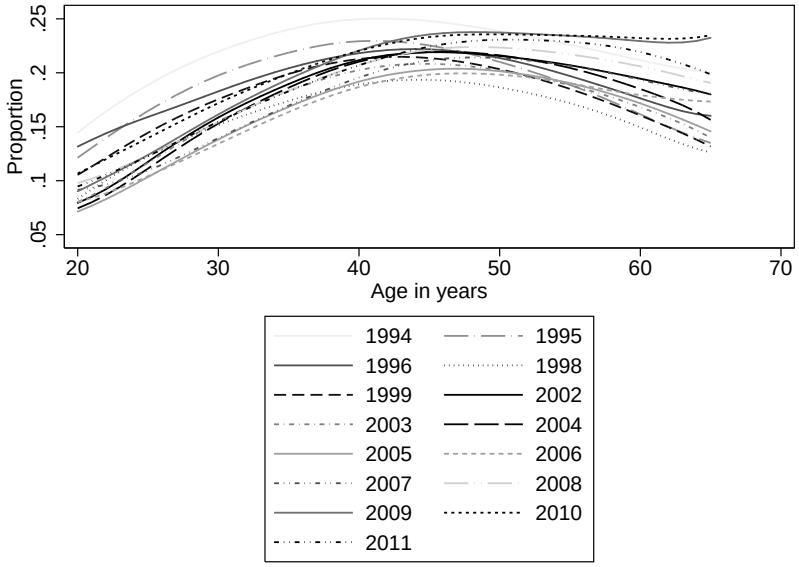


Figure A.2: Uninsured population proportions,1994-2011

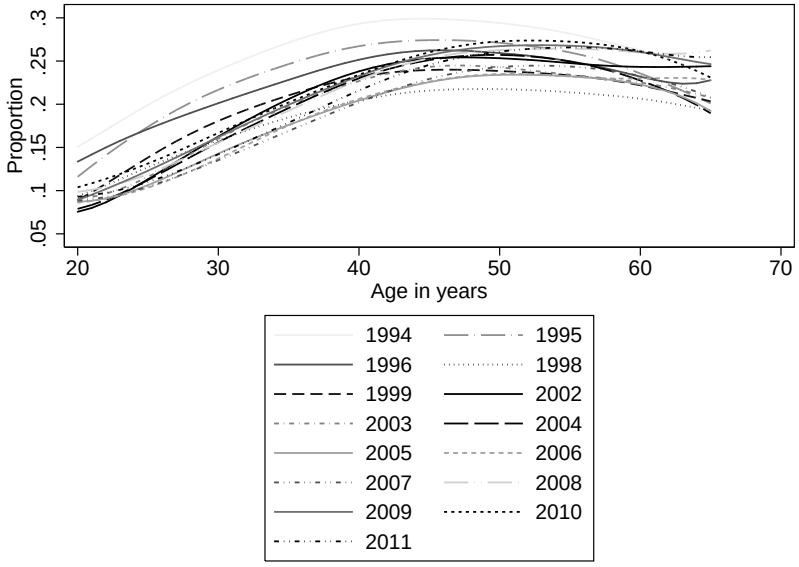
The same pattern can be seen when allowing for comparison between males and females. We observe in Figures A.3 and A.4 for instance, that even though male coverage dominates that of females in almost all the years, coverage rates are low among the youth as compared to their older counterparts. Also evident is that while there are no substantial differences in coverage between the two genders around the age of 20 to 30 years, private health insurance coverage among males outweighs that of females among those aged 31 years to 65. For females, the health insurance coverage is at its peak and mostly concentrated at middle-ages (from ages 30 to 49), and this is around the child-bearing age,s while for males it is concentrated around 41 years and thereafter the rates are non-declining.

Figure A.3: Insured Female proportions,1994-2011



These pictures, in general, suggest that the level of financial protection offered by the health system is relatively good; otherwise, one might expect much higher health insurance coverage rates. As we show in the thesis, financial protection is also fairly good. While this point could be argued, one might conclude that there is no need to introduce a mandatory health insurance scheme, as envisaged by National Health Insurance (NHI). A deeper analysis of this query is beyond the scope of this research.

Figure A.4: Insured Male proportions,1994-2011



A.2 Descriptive Statistics for the Data Used in the Thesis

A.2.0.1 Household Structure and Composition

As documented by previous studies (see Adisa, 2015; Akinkugbe et al., 2012; Boing et al., 2014; Doubova et al., 2015; Fazaeli et al., 2015), the presence of vulnerable (young children and elderly) individuals in a household plays a vital role in determining whether or not a household is likely to incur catastrophic health expenses. Hence, below, we examine household sizes and structures from the data we use. To being, we constrained ourselves to households with a minimum of one household member and a maximum of five members. We observe that from 1995 to 2006, the average South African household size was steady at around 4 people, but by 2011, this had decreased slightly to an average household size of about 3.8 people (Table A.1).

Table A.1: Distributions of Household Sizes

HH Sizes	1995-1996	2000-2001	2005-2006	2010-2011
1	3,258	4,147	3,686	4,627
2	4,156	3,275	3,468	4,389
3	3,948	3,240	3,095	3,954
4	5,042	3,378	3,337	4,106
5	3,974	2,712	2,492	3,002
6+	8,207	5,754	4,941	5,046
Total observations	28,585	22,506	21,019	25,124
Average HH size	4.4	4.1	4.0	3.8

Source: Author's calculations using 1995, 2000, 2005-06 and 2010-11 SAIES.

With regard to the structure and composition, the results presented in Table A.2) do not show an alarming presence of vulnerable individuals. Among households comprising of one individual, our results suggest a relatively higher number of households comprising adults, who are staying alone than elderly individuals staying alone.

Table A.2: Compositions of Different Household Sizes

	1995-1996	2000-2001	2005-2006	2010-2011
One HH Size Structures				
Adult only	2,411	3,632	3,086	3,809
Elderly only	846	514	600	816
Big child only	0	1	0	2
Sample observations	3,258	4,147	3,686	4,627
Two HH Size Structures				
2 Adults	2,290	2,022	2,029	2,593

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Compositions of Different Household Sizes (*continued*)

	1995-1996	2000-2001	2005-2006	2010-2011
2 Elderly	811	306	344	434
1 Adult + 1 elderly	642	452	534	649
1 Adult + 1 big child	229	278	308	411
1 Adult + 1 young child	112	127	140	185
1 Elderly + 1 young child	6	9	20	15
1 Elderly + 1 big child	66	79	81	100
Sample observations	4,156	3,275	3,468	4,389
Three HH Size Structures				
3 Adults	1,001	781	744	1,003
Adults + young children	896	635	581	831
Adults + big children	1,064	998	902	1,091
Adults + elderly	579	389	422	519
Adults + young children + big children	114	118	149	156
Adults + young children + elderly	40	37	44	66
Adults + big children + elderly	166	179	146	193
Young children + elderly	6	2	6	10
Big children + elderly	64	75	72	59
Elderly + young child + big child	9	12	15	14
Elderly only	9	10	3	11
Sample observations	3,948	3,240	3,095	3,954
Four HH Size Structures				
Adults only	726	438	400	508
Adults + young children	516	351	376	510
Adults + big children	1,919	1,230	1,217	1,403
Adults + elderly	384	229	231	309
Adults + young children + big children	930	635	621	771
Adults + young children + elderly	113	81	26	130
Adults + big children + elderly	342	311	288	358
Young children + elderly	2	1	1	1
Big children + elderly	38	29	26	31
Elderly only	1	1	0	0
Elderly + young child + big child	13	18	27	24
Adult + young child + big child + elderly	58	54	59	61
Sample observations	5,042	3,378	3,337	4,106
Five HH Size Structures				

Continued on next page...

Compositions of Different Household Sizes (*continued*)

	1995-1996	2000-2001	2005-2006	2010-2011
Adults only	323	142	134	186
Adults + young children	209	186	190	240
Adults + big children	1,484	903	777	871
Adults + elderly	214	111	102	140
Adults + young children + big children	1,040	784	690	839
Adults + young children + elderly	93	79	95	123
Adults + big children + elderly	405	344	338	373
Young children + elderly	1	0	0	0
Big children + elderly	18	8	10	6
Elderly only	0	0	0	1
Elderly + young child + big child	9	13	11	15
Adult + young child + big child + elderly	178	142	140	208
Sample observations	3,974	2,712	2,492	3,002
Total sample observations	28,585	22,506	21,109	25,124

Source: Author's calculations from SA IES 1995-1996, 2000-2001, 2005-2006 and 2010-2011.

The same is true when examining larger households (four and five household sizes) which could either comprise of only elderly or elderly and young children. In larger household sizes, households comprising of either a child and an elderly individual constitute less than 50 percent of total households throughout the years. What is also of interest is the degree to which households are burdened or not, by vulnerable individuals who are ill. This however, can only be examined using data from the 1995 SAIES (Table **??**)., which we discuss in the thesis.

A.2.1 Expenditure Data: 1995 - 2011

In what follows, we outline descriptive statistics related primarily to OOP data arising from SAIES surveys conducted in 1995, 2000, 2005-06 and 2010-11. The discussions is of a cross-tabulation nature, and is designed to give a feel for the data that we analyse throughout the thesis. These descriptive statistics extend Koch (2015a), who only focused on the years 2005-06 and 2010-11, when employing the approach developed by World Health Organization (WHO) to examine OOP payments made by South African households into the health care system.

In the main text of Chapter 3, we discuss urban/rural, as well as male/female differences in OOP. When OOP is interrogated by education status of the household head, as shown in Table A.3, the results suggests lower OOP among households headed by individuals with no schooling compared to those with some level of schooling.

Table A.3: Comparing 1995 Out-of-Pocket Payments by Schooling Completion Status of Household Head

	HH Head No School	HH Head Some School	HH Head Primary	HH Head Secondary	HH Head Tertiary
Out-of-Pocket Payments (total)	5.99	6.68	24.29	58.96	87.68
	(0.35)	(0.36)	(1.20)	(3.34)	(5.71)
OOP Share (%)	1.03	0.89	0.98	1.00	1.01
	(0.04)	(0.03)	(0.03)	(0.04)	(0.08)
Capacity-to-Pay	787.22	1,002.43	2,434.78	5,923.21	11,056.73
	(20.41)	(21.16)	(51.98)	(133.02)	(508.89)
Sample Households	4,875	7,630	7,927	5,294	990

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.3 reveals that households headed by individuals with some tertiary education spend about 14 times what is spent by households with no schooling. Plausibly this could be explained by preferences related to where they consult when someone in the household is sick. For 2000, a similar comparison arises, although the differences are not nearly as stark, see Table A.4.

Table A.4: Comparing 2000 Out-of-Pocket Payments by Schooling Completion Status of Household Head

	HH Head No School	HH Head Some School	HH Head Primary	HH Head Secondary	HH Head Tertiary
Out-of-Pocket Payments (total)	9.90	11.64	17.75	29.54	45.68
	(0.56)	(0.68)	(1.57)	(2.60)	(7.00)
OOP Share (%)	1.38	1.14	0.97	0.76	0.60
	(0.07)	(0.04)	(0.04)	(0.04)	(0.09)
Capacity-to-Pay	819.95	1,230.48	2,400.28	5,633.20	13,340.88
	(20.33)	(38.43)	(66.92)	(196.95)	(813.44)
Sample Households	4,262	7,438	6,541	3,559	675

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.5: Comparing 2005-06 Out-of-Pocket Payments across All Households by Schooling Completion Status of Household Head

	HH Head No School	HH Head Some School	HH Head Primary	HH Head Secondary	HH Head Tertiary
Out-of-Pocket Payments (total)	28.12	32.74	59.82	115.34	441.88
	(1.04)	(1.43)	(6.03)	(6.44)	(113.19)
OOP Share (%)	2.76	2.43	1.93	1.62	1.71
	(0.08)	(0.06)	(0.06)	(0.06)	(0.24)
Medical Products	9.10	11.15	21.42	55.06	127.10
	(0.44)	(0.46)	(1.69)	(4.16)	(15.86)
Product Share (%)	0.89	0.88	0.75	0.72	0.64
	(0.03)	(0.02)	(0.02)	(0.03)	(0.05)
Out-patient Services	18.37	19.13	31.03	49.27	250.41
	(0.79)	(0.73)	(3.51)	(3.02)	(94.62)
Outpatient Share (%)	1.79	1.47	1.09	0.78	0.76
	(0.07)	(0.04)	(0.05)	(0.04)	(0.13)
Hospital Services	0.66	2.47	7.37	11.01	64.37
	(0.12)	(0.82)	(3.54)	(2.40)	(37.03)
Hospital Share (%)	0.08	0.09	0.09	0.12	0.31
	(0.01)	(0.01)	(0.02)	(0.03)	(0.19)
Capacity-to-Pay	1,311.33	1,579.09	3,282.36	8,047.00	20,597.09
	(50.42)	(36.49)	(117.33)	(245.57)	(1,125.45)
Sample Households	3,889	6,552	6,095	3,837	646

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.6: Comparing 2010-11 Out-of-Pocket Payments across All Households by Schooling Completion Status of Household Head

	HH Head No School	HH Head Some School	HH Head Primary	HH Head Secondary	HH Head Tertiary
Out-of-Pocket Payments (total)	43.06	46.37	85.88	161.26	426.50
	(2.69)	(1.68)	(8.87)	(11.76)	(57.35)
OOP Share (%)	2.26	2.15	1.79	1.49	1.46
	(0.09)	(0.07)	(0.05)	(0.05)	(0.12)
Medical Products	23.40	25.38	40.96	79.27	240.30
	(2.16)	(1.28)	(1.59)	(3.55)	(31.03)
Product Share (%)	1.20	1.18	1.04	0.83	0.81
	(0.06)	(0.04)	(0.03)	(0.03)	(0.07)
Outpatient Services	19.52	20.85	44.02	78.77	183.64
	(1.30)	(0.93)	(8.48)	(10.43)	(45.95)
OPD Share (%)	1.06	0.96	0.74	0.65	0.64
	(0.06)	(0.06)	(0.03)	(0.04)	(0.10)
Hospital Services	0.14	0.14	0.90	3.22	2.56
	(0.06)	(0.05)	(0.39)	(0.96)	(0.90)
Hospital Share (%)	0.01	0.01	0.01	0.02	0.01
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Capacity-to-Pay	2,237.09	2,747.68	5,091.53	11,859.39	29,503.04
	(59.91)	(59.02)	(129.45)	(278.10)	(1,400.40)
Sample Households	3,045	6,743	8,517	5,572	1,247

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

South Africa has a long history of behaivour that drove differences across racial groups. When we consider OOP across these groups, we find that in 1995 for example, all the South African racial groups on average spend about 0.97 percent out-of-pocket as a share of their capacity to pay (Table A.7). In 2000 through to 2010-11 (Tables A.8 to A.10), whites also contribute relatively more via out-of-pocket health care expenses than other racial groups. Such spending is attributable to outpatient services in 2005-06 (Table A.9) and 2010-11 (Table A.10), followed by spending on medical products and hospital services.

Table A.7: Comparing 1995 Out-of-Pocket Payments across Population Group of Household Head

	All Households	HH Head Black	HH Head Coloured	HH Head Asian	HH Head White
Out-of-Pocket Payments (total)	27.33	8.04	14.27	47.87	88.46
	(0.90)	(0.28)	(0.91)	(4.25)	(3.85)
OOP Share (%)	0.97	0.80	0.81	1.13	1.53
	(0.02)	(0.02)	(0.04)	(0.08)	(0.05)
Capacity-to-Pay	2,954.69	1,512.16	2,074.52	4,956.99	7,422.20
	(45.32)	(28.17)	(50.14)	(184.92)	(166.88)
Sample Households	26,716	16,796	3,749	1,010	5,160

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.8: Comparing 2000 Out-of-Pocket Payments by Population Group

	All Households	HH Head Black	HH Head Coloured	HH Head Asian	HH Head White
Out-of-Pocket Payments (total)	17.74	11.98	17.63	47.31	57.55
	(0.76)	(0.49)	(1.38)	(14.05)	(5.41)
OOP Share (%)	1.04	1.09	0.81	1.00	0.89
	(0.02)	(0.02)	(0.05)	(0.12)	(0.08)
Capacity-to-Pay	2,779.25	1,539.97	3,420.98	5,532.42	11,621.55
	(59.90)	(26.46)	(127.74)	(287.60)	(456.53)
Sample Households	22,475	18,107	2,324	445	1,563

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.9: Comparing 2005 Out-of-Pocket Payments across All Households by Population Group of Household Head

	All Households	HH Head Black	HH Head Coloured	HH Head Asian	HH Head White
Out-of-Pocket Payments (total)	77.43	37.70	59.91	133.89	316.00
	(5.58)	(1.31)	(6.25)	(25.03)	(41.91)
OOP Share (%)	2.10	2.20	1.55	2.19	1.82
	(0.03)	(0.03)	(0.08)	(0.47)	(0.11)
Medical Products	29.24	12.90	25.69	55.22	124.52
	(1.33)	(0.37)	(2.19)	(7.47)	(9.62)
Product Share (%)	0.79	0.79	0.71	0.80	0.85
	(0.01)	(0.01)	(0.04)	(0.10)	(0.05)
Outpatient Services	39.76	21.48	26.26	65.97	152.79
	(4.35)	(0.81)	(3.51)	(18.31)	(33.20)
Outpatient Share (%)	1.20	1.32	0.72	1.16	0.78
	(0.02)	(0.03)	(0.06)	(0.35)	(0.06)
Hospital Services	8.43	3.33	7.97	12.69	38.70
	(2.06)	(0.71)	(2.74)	(6.39)	(15.40)
Hospital Share (%)	0.10	0.08	0.11	0.23	0.19
	(0.01)	(0.01)	(0.02)	(0.14)	(0.07)
Capacity-to-Pay	4,393.76	2,208.18	4,554.49	8,687.02	16,591.12
	(98.15)	(41.35)	(218.29)	(777.28)	(527.56)
Sample Households	21,019	16,025	2,677	345	1,954

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.10: Comparing 2010-01 Out-of-Pocket Payments across All Households by Population Group of Household Head

	All Households	HH Head Black	HH Head Coloured	HH Head Asian	HH Head White
Out-of-Pocket Payments (total)	113.21	54.02	116.94	213.99	454.74
	(5.82)	(1.55)	(15.29)	(21.52)	(42.80)
OOP Share (%)	1.83	1.86	1.57	1.53	1.84
	(0.03)	(0.03)	(0.09)	(0.14)	(0.10)
Medical Products	58.09	29.44	54.93	104.51	227.30
	(2.43)	(0.80)	(3.48)	(11.42)	(17.66)
Product Share (%)	1.02	1.04	0.88	0.77	1.02
	(0.02)	(0.02)	(0.04)	(0.08)	(0.05)
Outpatient Services	53.80	24.04	61.46	109.05	220.58
	(4.99)	(1.19)	(13.87)	(15.82)	(37.69)
OPD Share (%)	0.79	0.81	0.69	0.75	0.79
	(0.02)	(0.02)	(0.07)	(0.09)	(0.08)
Hospital Services	1.32	0.54	0.55	0.43	6.85
	(0.28)	(0.21)	(0.22)	(0.25)	(1.79)
Hospital Share (%)	0.01	0.01	0.01	0.01	0.03
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Capacity-to-Pay	7,524.50	4,173.41	7,738.49	16,384.28	26,213.51
	(148.19)	(80.95)	(217.65)	(868.40)	(803.50)
Sample Households	25,124	19,926	2,695	462	2,041

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

At a provincial level, while out-of-pocket spending in absolute figures is relatively higher in the Western Cape province in 1995 (Table A.11), as a share of household capacity to pay, there is not much difference between the Western Cape and Eastern Cape province. Households residing in Gauteng appear to be doing well, compared to other provinces with regards to their capacity to pay. This is unsurprising since Gauteng province is considered South Africa's economic hub and generates a third of the country's gross domestic product (GDP) (Statistics South Africa, 2011; Republic of South Africa, 2015a). From 2000 to 2010-11 (Tables A.12 to A.14), Gauteng and the Western Cape provinces are the ones taking the lead in contributing to the health care system through out-of-pocket payments. A finding that can also be tied to the economic performance of these provinces.

Table A.11: Comparing 1995 Out-of-Pocket Payments by Province

	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu Natal	Northwest	Gauteng	Mpumalanga	Limpopo
Out-of-Pocket Payments (total)	43.45	18.86	29.50	20.24	23.47	16.67	35.93	16.37	32.00
	(2.54)	(1.37)	(3.22)	(1.79)	(1.46)	(1.52)	(2.84)	(1.38)	(7.19)
OOP Share (%)	1.22	1.21	1.08	0.82	0.95	1.04	0.80	0.82	0.69
	(0.06)	(0.04)	(0.09)	(0.04)	(0.04)	(0.06)	(0.04)	(0.06)	(0.08)
capacity	3,497.72	1,684.24	2,159.69	1,828.21	2,651.80	1,944.04	4,771.12	2,070.99	2,989.91
	(103.43)	(62.37)	(127.11)	(79.25)	(66.99)	(81.11)	(146.10)	(74.50)	(364.51)
Sample Households	3,208	5,193	1,407	3,096	4,895	2,428	3,218	2,347	924

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.12: Comparing 2000 Out-of-Pocket Payments by Province

	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	Northwest	Gauteng	Mpumalanga	Limpopo
Out-of-Pocket Payments (total)	29.99	11.08	12.43	21.02	18.89	12.34	19.87	23.17	7.17
	(3.48)	(0.75)	(1.31)	(3.56)	(2.07)	(0.79)	(1.70)	(3.31)	(0.67)
OOP Share (%)	0.88	1.28	0.74	1.45	1.20	1.00	0.81	1.61	0.69
	(0.06)	(0.08)	(0.06)	(0.08)	(0.04)	(0.05)	(0.05)	(0.07)	(0.06)
Capacity-to-Pay	5,019.21	1,751.36	3,005.93	2,531.32	2,271.26	2,250.47	3,754.54	2,064.01	1,328.96
	(264.66)	(86.52)	(241.58)	(187.82)	(138.43)	(219.41)	(142.47)	(129.02)	(66.52)
Sample Households	2,093	3,011	1,150	1,987	3,832	2,456	3,280	1,920	2,746

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.13: Comparing 2005-06 Out-of-Pocket Payments across Provinces

	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	Northwest	Gauteng	Mpumalanga	Limpopo
Out-of-Pocket Payments (total)	117.51	50.50	52.26	97.16	63.84	60.80	113.97	50.96	35.09
	(15.15)	(3.80)	(7.20)	(18.23)	(5.08)	(6.31)	(21.14)	(4.38)	(3.48)
OOP Share (%)	1.57	2.39	1.97	2.46	2.91	1.94	1.62	2.12	1.78
	(0.08)	(0.08)	(0.11)	(0.11)	(0.10)	(0.12)	(0.08)	(0.09)	(0.08)
Medical Products	53.17	22.11	19.39	42.54	22.88	25.57	36.03	19.39	12.78
	(6.91)	(2.38)	(1.56)	(7.45)	(1.33)	(3.05)	(3.53)	(2.82)	(1.14)
Product Share (%)	0.70	0.91	0.91	1.10	1.04	0.75	0.63	0.61	0.59
	(0.04)	(0.03)	(0.05)	(0.06)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)
Outpatient Services	57.24	25.62	21.43	36.17	34.56	30.64	61.88	29.30	19.76
	(10.05)	(2.06)	(1.90)	(3.63)	(3.43)	(4.48)	(17.35)	(2.43)	(2.71)
OPD Share (%)	0.77	1.43	0.94	1.26	1.76	1.09	0.84	1.43	1.13
	(0.06)	(0.07)	(0.08)	(0.06)	(0.07)	(0.09)	(0.05)	(0.07)	(0.07)
Hospital Services	7.10	2.78	11.44	18.44	6.40	4.59	16.06	2.28	2.55
	(2.14)	(1.01)	(6.44)	(15.34)	(1.95)	(1.95)	(6.97)	(0.99)	(1.44)
Hospital Share (%)	0.09	0.05	0.12	0.10	0.11	0.10	0.15	0.09	0.05
	(0.03)	(0.01)	(0.04)	(0.03)	(0.02)	(0.05)	(0.04)	(0.03)	(0.02)
Capacity-to-Pay	8,320.11	2,937.14	2,916.95	3,974.06	3,389.81	3,473.17	6,210.44	3,244.67	2,082.88
	(504.01)	(127.57)	(130.11)	(215.01)	(166.87)	(289.76)	(271.73)	(232.78)	(92.35)
Sample Households	2,388	2,811	1,720	1,747	4,702	1,556	2,480	1,673	1,942

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.14: Comparing 2010-11 Out-of-Pocket Payments across Provinces

	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	Northwest	Gauteng	Mpumalanga	Limpopo
Out-of-Pocket Payments (total)	194.79	46.94	79.61	110.07	88.84	60.34	183.68	96.69	31.74
	(20.80)	(3.46)	(14.24)	(9.63)	(4.61)	(4.67)	(19.87)	(7.36)	(1.91)
OOP Share(%)	1.85	1.32	1.16	2.86	2.27	1.47	1.74	2.35	1.29
	(0.07)	(0.06)	(0.07)	(0.09)	(0.07)	(0.07)	(0.07)	(0.08)	(0.13)
Medical Products	93.92	29.41	44.33	58.49	46.38	31.57	92.71	47.56	17.67
	(6.19)	(1.63)	(4.64)	(6.95)	(2.48)	(2.48)	(8.44)	(3.43)	(1.33)
Product Share (%)	0.99	0.90	0.89	1.44	1.26	0.79	1.03	1.22	0.59
	(0.04)	(0.04)	(0.04)	(0.06)	(0.05)	(0.05)	(0.04)	(0.05)	(0.03)
Outpatient Services	97.92	16.74	33.35	50.54	41.26	27.89	89.15	48.71	13.91
	(18.91)	(2.43)	(11.83)	(4.98)	(3.19)	(3.75)	(17.11)	(5.18)	(1.20)
OPD Share (%)	0.85	0.41	0.26	1.40	1.00	0.68	0.70	1.12	0.70
	(0.05)	(0.04)	(0.06)	(0.06)	(0.04)	(0.05)	(0.05)	(0.05)	(0.12)
Hospital Services	2.95	0.79	1.93	1.05	1.20	0.88	1.82	0.42	0.17
	(1.13)	(0.73)	(1.49)	(0.39)	(0.83)	(0.82)	(0.61)	(0.23)	(0.07)
Hospital Share (%)	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01
	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
Capacity-to-Pay	10,100.60	4,630.94	6,351.46	5,774.82	6,211.41	5,956.04	11,536.48	6,329.79	3,740.13
	(275.53)	(160.83)	(298.06)	(227.03)	(266.55)	(426.05)	(473.27)	(326.82)	(123.22)
Sample Households	2,932	3,312	1,198	2,162	3,603	2,503	3,860	2,293	3,261

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.15: Comparing 1995 Out-of-Pocket Payments by Marital Status of Household Head

	All Households	HH Head Married	HH Head Widow	HH Head Divorced	HH Head Never Married
Out-of-Pocket Payments (total)	27.33	34.34	18.40	30.23	9.87
	(0.90)	(1.33)	(1.56)	(4.26)	(0.78)
OOP Share (%)	0.97	0.96	1.33	1.08	0.73
	(0.02)	(0.02)	(0.06)	(0.09)	(0.03)
Capacity-to-Pay	2,954.69	3,651.61	1,560.53	2,569.92	1,764.20
	(45.32)	(65.95)	(60.49)	(166.63)	(77.11)
Sample Households	26,716	16,516	4,049	1,259	3,462

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.16: Comparing 2000 Out-of-Pocket Payments by Marital Status of Household Head

	All Households	HH Head Married	HH Head Widow	HH Head Divorced	HH Head Never Married
Out-of-Pocket Payments (total)	17.74	22.31	13.70	18.88	10.09
	(0.76)	(1.34)	(0.88)	(3.07)	(0.50)
OOP Share (%)	1.04	1.02	1.27	1.09	0.91
	(0.02)	(0.03)	(0.05)	(0.09)	(0.04)
Capacity-to-Pay	2,779.25	3,617.73	1,562.32	2,906.50	1,752.86
	(59.90)	(100.02)	(87.88)	(227.15)	(68.33)
Sample Households	22,475	12,000	4,038	1,318	5,119

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

A.2.2 Public-Private Mix: 1995 - 2011

Here, we analyze how much was spent in the public versus private health care sector. Overall, we find that, compared to the private sector, OOP in the public health sector are fairly low, which is not too unsurprising since public health care is virtually free, at least at the primary health care level, while in public hospitals it is available at a fee based on the uniform patient fee schedule. Therefore, health payments to the private sector are an important component of out-of-pocket expenditures and, surprisingly, this is true even of the least wealthy and those of generally lower economic status, i.e., those without access to health insurance, those living in a household with an unemployed head and those living with a less educated household head, amongst other measure of well-being.

Table A.17: Comparing 1995 Public and Private Out-of-Pocket Payments Distinguished by Location and Gender of Household Head

	All Households	HH Head Male	HH Head Female	Urban Household	Rural Household
Public Expenses	7.30	8.87	3.27	4.51	9.09
	(0.61)	(0.40)	(1.91)	(0.31)	(0.98)
Public Share (%)	0.42	0.56	0.05	0.52	0.35
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Private Expenses	20.02	8.49	49.64	7.48	28.03
	(0.64)	(0.40)	(1.99)	(0.68)	(0.95)
Private Share(%)	0.55	0.46	0.79	0.47	0.61
	(0.01)	(0.01)	(0.03)	(0.02)	(0.02)
Sample Households	26,716	20,229	6,487	11,561	15,155

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

When OOP spending between public and private health facilities is broken down by gender and urban-rural place of residence, we find that in 1995, females OOP was higher in the private sector than for their male counterparts. This is plausible because even though user fees were wiped out for females at the public primary health care level, it was only for those women who were pregnant or nursing. Implying that for other women, health care was not free.

Table A.18: Comparing 2000 Public and Private Out-of-Pocket Payments Distinguished by Location and Gender of Household Head

	All Households	HH Head Male	HH Head Female	Urban Household	Rural Household
Public Expenses	6.41	7.32	4.96	8.03	3.42
	(0.31)	(0.47)	(0.29)	(0.46)	(0.17)
Public Share (%)	0.43	0.39	0.50	0.43	0.45
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Private Expenses	24.20	31.97	11.93	32.54	8.86
	(1.31)	(2.07)	(0.76)	(1.99)	(0.51)
Private Share (%)	0.77	0.77	0.77	0.72	0.86
	(0.02)	(0.03)	(0.03)	(0.02)	(0.04)
Sample Households	22,475	13,561	8,914	13,419	9,056

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

However, from the year 2000 through to 2010-11, we observe that male-headed households

are the ones spending more in private health care as opposed to their female counterparts. In 2000 for instance, male-headed households spent about $R32$ OOP in private health care facilities, while female-headed households spent about $R12$. In share terms however, there is not much difference between the shares spent by male and female (-headed households) in private health care facilities.

Table A.19: Comparing 2005-06 Public and Private Out-of-Pocket Payments Distinguished by Location and Gender of Household Head

	All Households	HH Head Male	HH Head Female	Urban Household	Rural Household
Public Expenses	3.72	3.85	3.52	3.72	3.72
	(0.34)	(0.49)	(0.40)	(0.31)	(0.77)
Public Share (%)	0.21	0.18	0.25	0.17	0.28
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Private Expenses	73.57	89.87	47.99	94.91	33.74
	(5.57)	(8.96)	(2.56)	(8.50)	(1.47)
Private Share (%)	1.88	1.72	2.14	1.66	2.30
	(0.03)	(0.04)	(0.05)	(0.04)	(0.05)
Sample Households	21,019	11,756	9,263	11,778	9,241

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

When making comparisons by urban-rural location, urban dwellers spend relatively less in the private health care sector compared to rural dwellers - at least in 1995. From 2000 to 2010-11, private sector OOP by urban dwellers is consistently higher than that spent by their rural counterparts.

Table A.20: Comparing 2010-11 Public and Private Out-of-Pocket Payments Distinguished by Location and Gender of Household Head

	All Households	HH Head Male	HH Head Female	Urban Household	Rural Household
Public Expenses	7.17	7.67	6.39	8.59	4.25
	(0.40)	(0.61)	(0.41)	(0.58)	(0.27)
Public Share (%)	0.24	0.23	0.26	0.24	0.22
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Private Expenses	105.90	131.86	66.00	137.34	41.20
	(5.80)	(9.37)	(2.81)	(8.53)	(2.01)
Private Share (%)	1.59	1.51	1.70	1.53	1.70
	(0.03)	(0.04)	(0.04)	(0.03)	(0.05)
Sample Households	25,124	14,168	10,956	16,168	8,956

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Tables A.21 to A.24 document OOP towards public and private health facilities by the different population groups. Consistently from 1995 to 2010-11, white headed households had more OOP in private health facilities followed by Asians, Coloureds and lastly, blacks/Africans. In 1995, white headed households spend 1.1 percent in private health care compared to 0.39 percent spent on the same by blacks/Africans. In 2000, whites spend about 1.38 percent in private health care sector followed by Asians and blacks at 0.79 and 0.73 percent respectively, then coloureds at 0.48 percent (Table A.22).

Table A.21: Comparing 1995 Public and Private Out-of-Pocket Payments Distinguished by Population Group of Household Head

	All Households	HH Head Black	HH Head Coloured	HH Head Asian	HH Head White
Public Expenses	7.30	3.09	4.64	17.85	19.73
	(0.61)	(0.13)	(0.37)	(2.43)	(2.73)
Public Share (%)	0.42	0.41	0.42	0.45	0.43
	(0.01)	(0.01)	(0.03)	(0.04)	(0.03)
Private Expenses	20.02	4.95	9.63	30.03	68.73
	(0.64)	(0.23)	(0.83)	(2.76)	(2.70)
Private Share (%)	0.55	0.39	0.39	0.68	1.10
	(0.01)	(0.01)	(0.03)	(0.05)	(0.04)
Sample Households	26,716	16,796	3,749	1,010	5,160

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

The same is true when the evaluation is done for 2010-11. For these different households, private payments made by white headed households are a multiple of public payments. The multiple is approximately 40 for white headed households (Table A.24).

Table A.22: Comparing 2000 Public and Private Out-of-Pocket Payments Distinguished by Population Group of Household Head

	All Households	HH Head Black	HH Head Coloured	HH Head Asian	HH Head White
Public Expenses	6.41	4.18	9.02	12.45	20.99
	(0.31)	(0.15)	(0.97)	(1.45)	(2.69)
Public Share (%)	0.43	0.44	0.46	0.46	0.38
	(0.01)	(0.01)	(0.04)	(0.06)	(0.05)
Private Expenses	24.20	10.82	16.73	52.13	132.24
	(1.31)	(0.55)	(1.67)	(14.51)	(11.17)
Private Share (%)	0.77	0.73	0.48	0.79	1.38
	(0.02)	(0.02)	(0.04)	(0.12)	(0.10)
Sample Households	22,475	18,107	2,324	445	1,563

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.23: Comparing 2005-06 Public and Private Out-of-Pocket Payments Distinguished by Population Group of Household Head

	All Households	HH Head Black	HH Head Coloured	HH Head Asian	HH Head White
Public Expenses	3.72	3.11	4.44	10.44	5.66
	(0.34)	(0.37)	(0.77)	(2.45)	(1.29)
Public Share (%)	0.21	0.24	0.22	0.21	0.05
	(0.01)	(0.01)	(0.02)	(0.04)	(0.01)
Private Expenses	73.57	34.52	55.32	122.96	309.89
	(5.57)	(1.26)	(6.16)	(24.93)	(41.90)
Private Share (%)	1.88	1.96	1.33	1.97	1.77
	(0.03)	(0.03)	(0.08)	(0.47)	(0.11)
Sample Households	21,019	16,025	2,677	345	1,954

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.24: Comparing 2010-11 Public and Private Out-of-Pocket Payments Distinguished by Population Group of Household Head

	All Households	HH Head Black	HH Head Coloured	HH Head Asian	HH Head White
Public Expenses	7.17	6.31	5.07	23.24	10.59
	(0.40)	(0.35)	(0.58)	(4.53)	(2.20)
Public Share (%)	0.24	0.28	0.14	0.27	0.06
	(0.01)	(0.01)	(0.02)	(0.04)	(0.01)
Private Expenses	105.90	47.57	111.83	190.76	443.84
	(5.80)	(1.50)	(15.21)	(21.16)	(42.71)
Private Share (%)	1.59	1.58	1.44	1.26	1.78
	(0.03)	(0.03)	(0.09)	(0.13)	(0.10)
Sample Households.	25,124	19,926	2,695	462	2,041

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.25: Comparing 1995 Public and Private Out-of-Pocket Payments Distinguished by Schooling Completion Status of Household Head

	HH Head No School	HH Head Some School	HH Head Primary	HH Head Secondary	HH Head Tertiary
Public Expenses	2.96	3.16	7.14	13.57	16.80
	(0.24)	(0.18)	(0.51)	(2.50)	(3.23)
Public Share (%)	0.54	0.49	0.42	0.28	0.24
	(0.03)	(0.02)	(0.02)	(0.02)	(0.04)
Private Expenses	3.03	3.52	17.16	45.39	70.87
	(0.23)	(0.30)	(1.04)	(2.18)	(4.63)
Private Share (%)	0.50	0.40	0.56	0.71	0.78
	(0.03)	(0.02)	(0.03)	(0.03)	(0.06)
Sample Households	4,875	7,630	7,927	5,294	990

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.26: Comparing 2000 Public and Private Out-of-Pocket Payments Distinguished by Schooling Completion Status

	HH Head No School	HH Head Some School	HH Head Primary	HH Head Secondary	HH Head Tertiary
Public Expenses	3.81	4.38	6.22	10.41	16.77
	(0.26)	(0.29)	(0.50)	(1.13)	(3.54)
Public Share (%)	0.56	0.48	0.40	0.32	0.27
	(0.03)	(0.02)	(0.02)	(0.03)	(0.06)
Private Expenses	6.78	8.56	22.76	48.84	121.13
	(0.53)	(0.61)	(2.75)	(4.24)	(14.29)
Private Share (%)	0.87	0.71	0.73	0.81	0.99
	(0.06)	(0.03)	(0.04)	(0.05)	(0.10)
Sample Households	4,262	7,438	6,541	3,559	675

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.27: Comparing 2005-06 Public and Private Out-of-Pocket Payments Distinguished by Schooling Completion Status of Household Head

	HH Head No School	HH Head Some School	HH Head Primary	HH Head Secondary	HH Head Tertiary
Public Expenses	3.54	3.42	3.01	3.44	12.97
	(0.37)	(0.29)	(0.27)	(0.67)	(6.30)
Public Share (%)	0.37	0.30	0.19	0.07	0.06
	(0.03)	(0.02)	(0.01)	(0.01)	(0.03)
Private Expenses	24.58	29.29	56.71	111.65	428.11
	(0.95)	(1.38)	(6.01)	(6.40)	(113.12)
Private Share (%)	2.38	2.13	1.74	1.55	1.64
	(0.07)	(0.05)	(0.06)	(0.06)	(0.24)
Sample Households	3,889	6,552	6,095	3,837	646

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.28: Comparing 2010-11 Public and Private Out-of-Pocket Payments Distinguished by Schooling Completion Status of Household Head

	HH Head No School	HH Head Some School	HH Head Primary	HH Head Secondary	HH Head Tertiary
Public Expenses	6.75	5.82	7.05	8.03	10.16
	(1.78)	(0.39)	(0.48)	(0.95)	(3.02)
Public Share (%)	0.33	0.32	0.26	0.14	0.05
	(0.05)	(0.03)	(0.02)	(0.01)	(0.01)
Private Expenses	36.26	40.52	78.75	152.84	416.27
	(1.94)	(1.63)	(8.86)	(11.69)	(57.20)
Private Share (%)	1.92	1.83	1.52	1.35	1.41
	(0.08)	(0.06)	(0.04)	(0.05)	(0.12)
Sample Households	3,045	6,743	8,517	5,572	1,247

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

At the provincial level, households in the Northwest province, followed by the Northern Cape, Eastern Cape and Western Cape spend more out-of-pocket in public health care facilities. Households in the Western Cape, followed by Eastern Cape and KwaZulu Natal provinces spend more out-of-pocket on private health facilities (Table A.29). However, in the year 2000, households in the Eastern Cape, Free State and KwaZulu Natal provinces spent more out-of-pocket in the private health sector. In the public health sector, it is households in the Free State, followed by Mpumalanga and KwaZulu Natal provinces that are spending relatively more (Table A.30). A similar pattern, in which private payments represent the largest component, across provinces is also evident in the years 2005-06 and 2010-11 (see Tables A.31 and A.32)).

Table A.29: Comparing 1995 Public and Private Out-of-Pocket Payments Distinguished by Province

	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	Northwest	Gauteng	Mpumalanga	Limpopo
Public Expenses	11.27	5.09	9.45	4.87	6.94	5.91	9.55	3.76	3.69
	(1.32)	(0.44)	(1.71)	(0.81)	(0.57)	(0.92)	(2.30)	(0.46)	(0.71)
Public Share(%)	0.50	0.57	0.60	0.34	0.39	0.61	0.30	0.30	0.18
	(0.03)	(0.02)	(0.08)	(0.03)	(0.02)	(0.05)	(0.03)	(0.03)	(0.03)
Private Expenses	32.18	13.76	20.04	15.37	16.52	10.76	26.37	12.61	28.30
	(2.05)	(1.25)	(2.39)	(1.50)	(1.25)	(1.17)	(1.64)	(1.26)	(7.13)
Private Share (%)	0.72	0.65	0.48	0.49	0.56	0.44	0.49	0.52	0.51
	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Sample Households	3,208	5,193	1,407	3,096	4,895	2,428	3,218	2,347	924

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Among households headed by individuals who have health insurance, our results generally suggest that they spend more in private health care facilities than in public, while their uninsured household head counterparts, spend more in public health facilities along with a significant share in private facilities. We find, for instance, that in 1995, households headed by individuals with health insurance spent about 0.72 percent in the private sector while their uninsured counterparts spent around 0.47 percent (Table A.33). In 2010-11, households headed by uninsured individuals spent about 1.63 percent, while those headed by insured household heads spent relatively less – 1.35 percent – in the private sector. By employment status, households headed by an employed individual spent about 1.45 percent in 2010-11, while their counterparts spent around 1.79 percent in the private sector.

Table A.30: Comparing 2000 Public and Private Out-of-Pocket Payments Distinguished by Province

	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	Northwest	Gauteng	Mpumalanga	Limpopo
Public Expenses	12.77	3.56	4.85	8.35	7.27	4.94	6.44	7.75	2.04
	(1.54)	(0.32)	(0.62)	(1.90)	(0.52)	(0.47)	(0.74)	(1.23)	(0.20)
Public Share(%) (	0.46	0.42	0.43	0.66	0.57	0.43	0.32	0.63	0.23
	(0.04)	(0.03)	(0.05)	(0.05)	(0.02)	(0.03)	(0.02)	(0.04)	(0.02)
Private Expenses	43.07	13.31	24.70	23.39	20.79	13.93	34.61	22.78	8.44
	(6.84)	(1.29)	(4.50)	(3.86)	(2.53)	(1.56)	(3.52)	(2.88)	(1.21)
Private Share(%)	0.69	0.96	0.52	0.93	0.79	0.68	0.72	1.11	0.54
	(0.06)	(0.08)	(0.07)	(0.06)	(0.04)	(0.04)	(0.05)	(0.06)	(0.06)
Sample Households	2,093	3,011	1,150	1,987	3,832	2,456	3,280	1,920	2,746

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.31: Comparing 2005-06 Public and Private Out-of-Pocket Payments Distinguished by Province

	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	Northwest	Gauteng	Mpumalanga	Limpopo
Public Expenses	3.68	1.63	1.54	1.87	5.35	2.19	4.32	3.23	5.56
	(0.64)	(0.22)	(0.30)	(0.30)	(0.49)	(0.54)	(0.70)	(0.38)	(2.52)
Public Share (%)	0.14	0.14	0.08	0.12	0.39	0.12	0.19	0.31	0.20
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.02)
Private Expenses	113.43	48.82	50.72	95.22	58.41	58.54	109.45	47.66	29.45
	(15.13)	(3.79)	(7.20)	(18.19)	(5.04)	(6.26)	(21.13)	(4.37)	(2.39)
Private Share (%)	1.43	2.25	1.89	2.34	2.52	1.82	1.43	1.82	1.58
	(0.08)	(0.08)	(0.11)	(0.10)	(0.10)	(0.11)	(0.07)	(0.08)	(0.08)
Sample Households	2,388	2,811	1,720	1,747	4,702	1,556	2,480	1,673	1,942

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.32: Comparing 2010-11 Public and Private Out-of-Pocket Payments Distinguished by Province

	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	Northwest	Gauteng	Mpumalanga	Limpopo
Public Expenses	5.32	2.86	2.86	7.52	9.21	4.78	11.15	4.02	5.07
	(0.98)	(0.36)	(1.13)	(1.08)	(0.93)	(0.82)	(1.25)	(0.56)	(0.55)
Public Share (%)	0.11	0.11	0.13	0.29	0.28	0.18	0.34	0.16	0.25
	(0.01)	(0.01)	(0.03)	(0.04)	(0.02)	(0.02)	(0.04)	(0.02)	(0.03)
Private Expenses	189.38	44.03	76.70	101.85	79.61	55.47	172.33	92.60	26.50
	(20.78)	(3.43)	(14.21)	(9.55)	(4.50)	(4.60)	(19.81)	(7.27)	(1.82)
Private Share(%)	1.74	1.20	1.03	2.56	1.99	1.29	1.39	2.18	1.04
	(0.07)	(0.06)	(0.07)	(0.09)	(0.07)	(0.06)	(0.06)	(0.08)	(0.10)
Sample Households	2,932	3,312	1,198	2,162	3,603	2,503	3,860	2,293	3,261

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.33: Comparing 1995 Public and Private Out-of-Pocket Payments Distinguished by Insurance and Employment Status of Household Head

	All Households	HH Head Insured	HH Head Not Insured	HH Head Employed	HH Head Not Employed
Public Expenses	7.30	0.59	10.52	7.42	7.03
	(0.61)	(0.20)	(0.89)	(0.84)	(0.52)
Public Share (%)	0.42	0.01	0.61	0.31	0.66
	(0.01)	(0.00)	(0.02)	(0.01)	(0.03)
Private Expenses	20.02	45.90	7.61	22.60	14.09
	(0.64)	(1.80)	(0.36)	(0.84)	(0.85)
Private Share (%)	0.55	0.72	0.47	0.47	0.74
	(0.01)	(0.02)	(0.01)	(0.01)	(0.03)
Sample Households	26,716	7,685	19,031	17,313	9,403

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.34: Comparing 2000 Public and Private Out-of-Pocket Payments Distinguished by Insurance and Employment Status of Household Head

	All Households	HH Head Insured	HH Head Not Insured	HH Head Employed	HH Head Not Employed
Public Expenses	6.41	6.04	6.47	3.47	6.67
	(0.31)	(0.77)	(0.33)	(0.32)	(0.33)
Public Share (%)	0.43	0.10	0.49	0.43	0.43
	(0.01)	(0.01)	(0.01)	(0.03)	(0.01)
Private Expenses	24.20	84.79	13.19	9.82	25.51
	(1.31)	(6.62)	(0.89)	(2.27)	(1.41)
Private Share(%)	0.77	0.94	0.74	0.59	0.79
	(0.02)	(0.06)	(0.02)	(0.05)	(0.02)
Sample Households	22,475	3,049	19,426	1,783	20,692

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.35: Comparing 2005-06 Public and Private Out-of-Pocket Payments Distinguished by Insurance and Employment Status of Household Head

	All Households	HH Head Insured	HH Head Not Insured	HH Head Employed	HH Head Not Employed
Public Expenses	3.72	6.56	3.08	3.94	3.37
	(0.34)	(1.69)	(0.15)	(0.53)	(0.22)
Public Share (%)	0.21	0.06	0.24	0.16	0.29
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Private Expenses	73.57	245.08	34.78	86.72	52.27
	(5.57)	(28.31)	(2.10)	(8.14)	(6.25)
Private Share (%)	1.88	1.70	1.92	1.64	2.28
	(0.03)	(0.09)	(0.03)	(0.04)	(0.06)
Sample Households	21,019	3,281	17,738	11,751	9,268

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.36: Comparing 2010-11 Public and Private Out-of-Pocket Payments Distinguished by Insurance and Employment Status of Household Head

	All Households	HH Head Insured	HH Head Not Insured	HH Head Employed	HH Head Not Employed
Public Expenses	7.17	7.65	7.07	7.05	7.35
	(0.40)	(1.49)	(0.38)	(0.52)	(0.63)
Public Share (%)	0.24	0.05	0.28	0.19	0.31
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Private Expenses	105.90	316.83	63.84	124.37	76.77
	(5.80)	(31.50)	(2.65)	(8.97)	(4.82)
Private Share (%)	1.59	1.35	1.63	1.45	1.79
	(0.03)	(0.07)	(0.03)	(0.03)	(0.05)
Sample Households	25,124	3,532	21,592	14,271	10,853

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

When OOP health care payments are assessed by marital status, our results suggest that households headed by married individuals followed by households headed by divorced individuals, spend relatively more in private facilities than in public facilities in 1995 (Table A.37). This pattern is also consistent in 2000. Results presented in Table A.38 suggests that, households headed by married individuals paid about R33 in private facilities while in public facilities, their contribution was about R7.64 in 2000.

Table A.37: Comparing 1995 Public and Private Out-of-Pocket Payments Distinguished by Marital Status of Household Head

	All Households	HH Head Married	HH Head Widow	HH Head Divorced	HH Head Never Married
Public Expenses	7.30	8.32	7.07	9.84	3.48
	(0.61)	(0.91)	(0.94)	(2.65)	(0.43)
Public Share (%)	0.42	0.37	0.64	0.44	0.39
	(0.01)	(0.01)	(0.04)	(0.05)	(0.03)
Private Expenses	20.02	26.03	11.33	20.39	6.39
	(0.64)	(0.95)	(1.10)	(3.23)	(0.63)
Private Share (%)	0.55	0.59	0.69	0.65	0.34
	(0.01)	(0.02)	(0.04)	(0.07)	(0.02)
Sample Households	26,716	16,516	4,049	1,259	3,462

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

Table A.38: Comparing 2000 Public and Private Out-of-Pocket Payments Distinguished by Marital Status

	All Households	HH Head Married	HH Head Widow	HH Head Divorced	HH Head Never Married
Public Expenses	6.41	7.64	5.58	7.07	4.06
	(0.31)	(0.51)	(0.56)	(1.29)	(0.25)
Public Share(%)	0.43	0.40	0.54	0.43	0.43
	(0.01)	(0.01)	(0.03)	(0.04)	(0.02)
Private Expenses	24.20	33.00	15.33	24.35	10.84
	(1.31)	(2.21)	(2.57)	(4.11)	(1.02)
Private Share (%)	0.77	0.82	0.85	0.86	0.59
	(0.02)	(0.03)	(0.05)	(0.09)	(0.03)
Sample Households	22,475	12,000	4,038	1,318	5,119

Robust standard errors in parentheses. Sample households refers to the actual number of households in that subgroup but, the results have been weighted using inverse proportionality weights so as to match the population.

APPENDIX B

APPENDIX FOR DECOMPOSITION ANALYSIS

B.1 Descriptive Statistics

B.1.1 Weighted Means for 1995 to 2010-11

Table B.1 provides weighted means of CHE (using 10 percent threshold) and the explanatory variables between 1995 and 2010-11 for males and females.

Table B.1: Weighted Means of CHE and the Explanatory Variables between 1995 and 2010-11 For Males and Females

	Male			Female		
	1995	2010-11	Δ	1995	2010-11	Δ
HH Head 20-24yrs	0.082	0.109	0.027	0.022	0.027	0.005
HH Head 25-29yrs	0.166	0.172	0.006	0.061	0.072	0.011
HH Head 30-34yrs	0.174	0.175	0.002	0.103	0.105	0.001
HH Head 35-39yrs	0.161	0.141	-0.020	0.122	0.133	0.011
HH Head 40-45yrs	0.109	0.083	-0.026	0.126	0.116	-0.010
HH Head 45-49yrs	0.080	0.072	-0.008	0.112	0.111	-0.002
HH Head 50-54yrs	0.072	0.075	0.003	0.100	0.107	0.006
HH Head 55-59yrs	0.072	0.069	-0.003	0.083	0.086	0.003
HH Head 60-64yrs	0.036	0.034	-0.003	0.078	0.077	-0.001
HH Head 65-69yrs	0.025	0.024	-0.001	0.067	0.061	-0.006
HH Head 70-74yrs	0.019	0.017	-0.002	0.050	0.046	-0.004
HH Head 75-79yrs	0.006	0.007	0.001	0.033	0.024	-0.009

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Weighted Means of CHE (*continued*)

	Male			Female		
	1995	2010-11	Δ	1995	2010-11	Δ
HH Head 80-84yrs	0.005	0.007	0.002	0.020	0.014	-0.006
HH Head 85yrs+	0.003	0.003	0.000	0.012	0.011	-0.000
Black	0.830	0.896	0.066	0.709	0.741	0.031
Coloured	0.050	0.036	-0.014	0.104	0.094	-0.011
Asian	0.006	0.007	0.001	0.032	0.029	-0.003
White	0.116	0.061	-0.056	0.171	0.136	-0.034
No Schooling	0.102	0.061	-0.041	0.289	0.104	-0.186
Some Schooling	0.246	0.226	-0.021	0.277	0.247	-0.030
Completed Primary	0.333	0.413	0.080	0.332	0.336	0.004
Completed Secondary	0.480	0.252	-0.228	0.323	0.244	-0.079
Completed Tertiary	0.085	0.049	-0.036	0.051	0.070	0.019
HH Head Employed	0.790	1.256	0.466	0.182	1.413	1.232
Medical Aid	0.267	0.104	-0.163	0.267	0.178	-0.089
Urban	0.573	0.696	0.124	0.552	0.669	0.117
Quintile 1	0.117	0.177	0.060	0.209	0.204	-0.005
Quintile 2	0.162	0.195	0.033	0.204	0.201	-0.003
Quintile 3	0.253	0.247	-0.006	0.194	0.191	-0.003
Quintile 4	0.260	0.235	-0.024	0.193	0.193	0.000
Quintile 5	0.209	0.146	-0.063	0.199	0.210	0.011
Piped water	0.961	0.980	0.019	0.876	0.974	0.098
Flush toilet	0.372	0.631	0.259	0.422	0.656	0.234
Western Cape	0.101	0.066	-0.035	0.116	0.117	0.001
Eastern Cape	0.087	0.113	0.026	0.153	0.130	-0.024
Northern Cape	0.032	0.014	-0.019	0.024	0.018	-0.006
Free State	0.091	0.055	-0.035	0.073	0.061	-0.012
KwaZulu Natal	0.131	0.164	0.033	0.182	0.186	0.004
North-West	0.125	0.097	-0.028	0.084	0.072	-0.013
Gauteng	0.315	0.317	0.002	0.194	0.249	0.055
Mpumalanga	0.030	0.076	0.046	0.062	0.063	0.001
CHE≥10	0.009	0.022	0.014	0.014	0.029	0.016
Sample Households	2,464	3,920		26,121	21,204	

B.1.2 Summary Descriptives for 1995 to 2000

Table B.2: Weighted Means of CHE and the Explanatory Variables between 1995 and 2000 For Males and Females

	Male			Female		
	1995	2000	Δ	1995	2000	Δ
HH Head 20-24yrs	0.031	0.045	0.014	0.026	0.033	0.007
HH Head 25-29yrs	0.081	0.088	0.007	0.063	0.065	0.002
HH Head 30-34yrs	0.117	0.124	0.007	0.104	0.097	-0.007
HH Head 35-39yrs	0.129	0.143	0.014	0.123	0.112	-0.011
HH Head 40-44yrs	0.125	0.132	0.007	0.123	0.099	-0.024
HH Head 45-49yrs	0.105	0.115	0.010	0.113	0.105	-0.008
HH Head 50-54yrs	0.102	0.093	-0.009	0.093	0.091	0.002
HH Head 55-59yrs	0.082	0.072	-0.010	0.082	0.073	-0.009
HH Head 60-64yrs	0.070	0.061	-0.009	0.077	0.093	0.016
HH Head 65-69yrs	0.057	0.047	-0.010	0.069	0.069	0.000
HH Head 70-74yrs	0.042	0.033	-0.009	0.051	0.066	0.015
HH Head 75-79yrs	0.025	0.018	-0.007	0.035	0.037	0.042
HH Head 80-84yrs	0.016	0.013	-0.003	0.020	0.031	0.011
HH Head 85yrs plus	0.010	0.006	-0.004	0.011	0.016	0.005
Black	0.740	0.751	0.011	0.703	0.874	0.171
Coloured	0.095	0.088	-0.007	0.103	0.065	-0.038
Asian	0.026	0.032	0.006	0.032	0.013	-0.019
White	0.152	0.129	-0.023	0.178	0.048	-0.130
Married	0.224	0.700	0.476	0.247	0.266	0.019
Divorced/Widow	0.038	0.103	0.065	0.081	0.440	0.359
Single	0.739	0.198	-0.541	0.673	0.294	-0.379
No Schooling	0.270	0.133	-0.137	0.276	0.224	-0.0052
Some Schooling	0.286	0.298	0.012	0.261	0.328	0.067
Completed Primary	0.344	0.319	-0.025	0.320	0.286	-0.034
Completed Secondary	0.331	0.198	-0.133	0.344	0.142	-0.202
Completed Tertiary	0.050	0.051	0.001	0.054	0.021	-0.033
HH Head Employed	0.752	0.088	-0.664	0.726	0.077	-0.649
Medical Aid	0.263	0.198	-0.065	0.272	0.083	-0.189
Urban	0.544	0.708	0.164	0.564	0.550	-0.014
Quintile 1	0.196	0.147	-0.049	0.204	0.285	0.081
Quintile 2	0.197	0.165	-0.032	0.203	0.256	0.053
Quintile 3	0.201	0.192	-0.009	0.199	0.213	0.014

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Weighted Means of CHE (*continued*)

	Male			Female		
	1995	200	Δ	1995	2000	Δ
Quintile 4	0.205	0.233	0.028	0.195	0.149	-0.046
Quintile 5	0.201	0.264	0.063	0.199	0.097	-0.102
Western Cape	0.112	0.104	-0.008	0.117	0.067	-0.050
Eastern Cape	0.139	0.113	-0.026	0.154	0.170	0.016
Northern Cape	0.025	0.020	-0.005	0.025	0.014	-0.011
Free State	0.072	0.067	-0.005	0.078	0.058	-0.020
KwaZulu Natal	0.179	0.174	-0.005	0.174	0.214	0.040
North-West	0.092	0.077	-0.015	0.085	0.071	-0.014
Gauteng	0.214	0.314	0.100	0.199	0.210	0.011
Mpumalanga	0.057	0.056	-0.001	0.060	0.061	0.001
CHE≥10	0.015	0.012	-0.003	0.017	0.014	-0.003
Sample Households	14,040	13,556		14,545	8,914	

Table B.3: Changes in the Weighted Means of the Variables between 1995 and 2000 For Males ad Females

	Male		Female	
	Mean	Std. errors	Means	Std. errors
HH Head 20-24yrs	0.014***	(0.003)	0.007***	(0.003)
HH Head 25-29yrs	0.007*	(0.004)	0.002	(0.004)
HH Head 30-34yrs	0.007	(0.005)	-0.007	(0.005)
HH Head 35-39yrs	0.013***	(0.005)	-0.011**	(0.005)
HH Head 40-45yrs	0.008	(0.005)	-0.024***	(0.005)
HH Head 45-49yrs	0.010**	(0.004)	-0.008*	(0.005)
HH Head 50-54yrs	-0.009**	(0.004)	-0.002	(0.004)
HH Head 55-59yrs	-0.010***	(0.004)	-0.009**	(0.004)
HH Head 60-64yrs	-0.009***	(0.003)	0.016***	(0.004)
HH Head 65-69yrs	-0.010***	(0.003)	0.001	(0.004)
HH Head 70-74yrs	-0.009***	(0.003)	0.016***	(0.004)
HH Head 75-79yrs	-0.007***	(0.002)	0.001	(0.003)
HH Head 80-84yrs	-0.003*	(0.002)	0.011***	(0.003)
HH Head 85yrs+	-0.004***	(0.001)	0.005***	(0.002)
Black	0.011*	(0.006)	0.171***	(0.006)

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Changes in the Weighted Means (*continued*)

	Male		Female	
	Mean	Std. errors	Means	Std. errors
Coloured	-0.007*	(0.004)	-0.037***	(0.004)
Asian	0.006**	(0.002)	-0.019***	(0.002)
White	-0.023***	(0.006)	-0.130***	(0.005)
Married	0.476***	(0.006)	0.019***	(0.007)
Divorced/Widow	0.065***	(0.004)	0.360***	(0.007)
Single	-0.541***	(0.006)	-0.379***	(0.007)
No Schooling	-0.137***	(0.005)	-0.052***	(0.007)
Some Schooling	0.012*	(0.006)	0.067***	(0.007)
Completed Primary	-0.025***	(0.007)	-0.034***	(0.007)
Completed Secondary	-0.133***	(0.006)	-0.203***	(0.006)
Completed Tertiary	0.001	(0.003)	-0.033***	(0.003)
HH Head Employed	-0.664***	(0.005)	-0.650***	(0.005)
Medical Aid	-0.065***	(0.006)	-0.189***	(0.006)
Urban	0.164***	(0.006)	-0.014*	(0.008)
Quintile 1	-0.049***	(0.005)	0.081***	(0.007)
Quintile 2	-0.033***	(0.005)	0.054***	(0.006)
Quintile 3	-0.009***	(0.006)	0.014**	(0.006)
Quintile 4	0.028***	(0.006)	-0.047***	(0.006)
Quintile 5	0.063***	(0.006)	-0.102***	(0.006)
Western Cape	-0.008*	(0.004)	-0.049***	(0.004)
Eastern Cape	-0.026***	(0.004)	0.016***	(0.005)
Northern Cape	-0.005***	(0.001)	-0.011***	(0.001)
Free State	-0.005*	(0.003)	-0.020***	(0.003)
KwaZulu Natal	-0.005	(0.005)	0.039***	(0.006)
North-West	-0.015***	(0.003)	-0.014***	(0.004)
Gauteng	0.101***	(0.007)	0.010	(0.008)
Mpumalanga	-0.001	(0.003)	0.000	(0.003)
CHE≥10	-0.003*	(0.002)	-0.003	(0.002)
Sample Households	27,596		23,459	

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

Table B.4: Parameter Estimates of the Gender Gap in CHE, 1995 to 2000

	Coefficients	Std. errors
Year (Y_{2010}=1)	-0.0126***	(0.002)
$Y_{2000} * Female$	-0.0001	(0.003)
Female	-0.0006	(0.002)
HH Head 20-24yrs	-0.0086**	(0.004)
HH Head 25-29yrs	-0.0055**	(0.003)
HH Head 30-34yrs	-0.0045	(0.004)
HH Head 35-39yrs	-0.0076**	(0.004)
HH Head 40-44yrs	-0.0053	(0.004)
HH Head 45-49yrs	-0.0051**	(0.004)
HH Head 50-54yrs	-0.0024	(0.004)
HH Head 55-59yrs	-0.0033*	(0.003)
HH Head 60-64yrs	0.0013	(0.004)
HH Head 65-69yrs	0.0068	(0.005)
HH Head 70-74yrs	0.0104*	(0.006)
HH Head 75-79yrs	0.0122**	(0.006)
HH Head 80-84yrs	0.0224***	(0.009)
Coloured	-0.0035*	(0.002)
Asian	0.0060*	(0.004)
White	0.0210***	(0.003)
Divorced/Widow	0.0012	(0.002)
Single	-0.0061***	(0.001)
Some Schooling	0.0021	(0.002)
Completed Primary	-0.0024	(0.001)
Completed Secondary	-0.0028	(0.002)
Completed Tertiary	0.0016	(0.003)
HH Head Employed	-0.0101***	(0.002)
Medical Aid	-0.0109***	(0.002)
Urban	-0.0017	(0.001)
Quintile 2	-0.0039*	(0.002)
Quintile 3	-0.0064***	(0.002)
Quintile 4	-0.0027	(0.002)
Quintile 5	-0.0059**	(0.003)
Western Cape	0.0121***	(0.003)

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Parameter Estimates of the Gender Gap in CHE (*continued*)

	Coefficients	Std. errors
Eastern Cape	0.0097***	(0.002)
Northern Cape	0.0079**	(0.003)
Free State	0.0105***	(0.002)
KwaZulu Natal	0.0063***	(0.002)
North-West	0.0064***	(0.002)
Gauteng	0.0055**	(0.002)
Mpumalanga	0.0105***	(0.003)
Intercept	0.0272***	(0.004)
Sample Households	51,055	
R-squared	0.011	

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

Table B.5: Estimated Effect of the Explanatory Variables on the Incidence of CHE of Males and Females, by year

	Male		Female	
	1995	2000	1995	2000
HH Head 20-24yrs	-0.0133	-0.0062	-0.0003	-0.0162
	(0.009)	(0.004)	(0.009)	(0.010)
HH Head 25-29yrs	-0.0064	-0.0026	0.0024	-0.0137*
	(0.008)	(0.004)	(0.007)	(0.008)
HH Head 30-34yrs	-0.0023	0.0040	0.0002	-0.0225***
	(0.009)	(0.005)	(0.006)	(0.009)
HH Head 35-39yrs	-0.0080	-0.0037	0.0003	-0.0161*
	(0.008)	(0.004)	(0.006)	(0.009)
HH Head 40-44yrs	-0.0029	-0.0001	-0.0010	-0.0149
	(0.008)	(0.005)	(0.006)	(0.010)
HH Head 45-49yrs	-0.0015	-0.0006	0.0026	-0.0197**
	(0.009)	(0.005)	(0.007)	(0.009)
HH Head 50-54yrs	-0.0026	0.0019	0.0027	-0.0092
	(0.008)	(0.005)	(0.007)	(0.011)
HH Head 55-59yrs	0.0026	-0.0036	0.0030	-0.0138*
	(0.009)	(0.004)	(0.007)	(0.008)
HH Head 60-64yrs	-0.0003	0.0122	0.0032	-0.0098

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Estimated Effect of Explanatory Variables (*continued*)

	Male		Female	
	1995	2000	1995	2000
	(0.009)	(0.008)	(0.007)	(0.010)
HH Head 65-69yrs	0.0094	0.0149*	0.0094	-0.0067
	(0.010)	(0.008)	(0.008)	(0.010)
HH Head 70-74yrs	0.0066	0.0343**	0.0152	-0.0127
	(0.011)	(0.016)	(0.009)	(0.010)
HH Head 75-79yrs	0.0106	0.0174	0.0226**	-0.0055
	(0.013)	(0.013)	(0.011)	(0.013)
HH Head 80-84yrs	0.0046	0.0369	0.0315*	0.0117
	(0.013)	(0.023)	(0.017)	(0.015)
Coloured	0.0003	-0.0054	-0.0021	-0.0055
	(0.004)	(0.004)	(0.004)	(0.005)
Asian	0.0061	0.0062	0.0095	-0.0030
	(0.006)	(0.007)	(0.007)	(0.010)
White	0.0289***	0.0096*	0.0279***	0.0019
	(0.005)	(0.005)	(0.005)	(0.007)
Divorced/Widow	0.0027	-0.0010	0.0117	0.0008
	(0.008)	(0.004)	(0.007)	(0.004)
Single	-0.0055*	-0.0049*	-0.0082***	-0.0019
	(0.003)	(0.003)	(0.003)	(0.003)
Some Schooling	0.0062	0.0014	-0.0013	0.0063
	(0.004)	(0.005)	(0.005)	(0.004)
Completed Primary	-0.0057	-0.0009	-0.0005	0.0016
	(0.004)	(0.005)	(0.005)	(0.004)
Completed Secondary	-0.0026	-0.0028	-0.0015	-0.0029
	(0.003)	(0.005)	(0.003)	(0.005)
Completed Tertiary	-0.0015	-0.0016	0.0003	-0.0025
	(0.006)	(0.007)	(0.006)	(0.008)
HH Head Employed	-0.0130***	-0.0013	-0.0150***	-0.0072**
	(0.004)	(0.003)	(0.003)	(0.003)
Medical Aid	-0.0100***	-0.0138***	-0.0103***	-0.0042
	(0.003)	(0.004)	(0.004)	(0.006)
Urban	-0.0013	-0.0038	-0.0009	-0.0014
	(0.002)	(0.003)	(0.002)	(0.003)
Quintile 2	-0.0049	-0.0032	0.0050	-0.0019

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Estimated Effect of Explanatory Variables (*continued*)

	Male		Female	
	1995	2000	1995	2000
	(0.004)	(0.005)	(0.004)	(0.004)
Quintile 3	-0.0106***	-0.0041	-0.0044	-0.0065
	(0.004)	(0.005)	(0.003)	(0.004)
Quintile 4	-0.0054	-0.0078	0.0057	0.0025
	(0.004)	(0.005)	(0.004)	(0.006)
Quintile 5	-0.0074	-0.0038	-0.0030	-0.0018
	(0.005)	(0.006)	(0.005)	(0.008)
Western Cape	0.0125**	0.0177***	0.0079	0.0105*
	(0.006)	(0.005)	(0.006)	(0.006)
Eastern Cape	0.0041	0.0205***	0.0097**	0.0047
	(0.004)	(0.006)	(0.005)	(0.004)
Northern Cape	0.0067	0.0152***	0.0084	-0.0017
	(0.007)	(0.005)	(0.007)	(0.005)
Free State	0.0018	0.0207***	0.0062	0.0195***
	(0.004)	(0.005)	(0.005)	(0.007)
KwaZulu Natal	0.0065	0.0105***	0.0058	0.0046
	(0.004)	(0.003)	(0.005)	(0.004)
North-West	0.0050	0.0099***	0.0075	0.0053
	(0.005)	(0.003)	(0.005)	(0.005)
Gauteng	0.0016	0.0132***	0.0017	0.0065
	(0.004)	(0.004)	(0.005)	(0.005)
Mpumalanga	0.0036	0.0220***	0.0050	0.0122**
	(0.006)	(0.005)	(0.005)	(0.006)
Intercept	0.0318***	0.0061	0.0213***	0.0226**
	(0.010)	(0.006)	(0.008)	(0.009)
Sample Households	14,040	13,556	14,545	8,914
R-squared	0.015	0.015	0.021	0.008

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

Table B.6: OLS Decomposition of the Gender Gap in the Incidence of CHE Differentials, 1995 to 2000

	Changes due to means			Changes due to means		
	Coefficient	S.E	%Expl.	Coefficient	S.E	%Expl.
A: 2000[a]				**B:1995**[b]		
Raw Difference	-0.0022	(0.002)		-0.0020	(0.002)	
HH Head 20-24yrs	-0.0001*	(0.000)	4.6	0.0000	(0.000)	0.0
HH Head 25-29yrs	-0.0001*	(0.000)	4.6	-0.0001	(0.000)	5.0
HH Head 30-34yrs	-0.0001*	(0.000)	4.6	-0.0001	(0.000)	5.0
HH Head 35-39yrs	-0.0002**	(0.000)	9.09	-0.0001	(0.000)	5.0
HH Head 40-44yrs	-0.0001	(0.000)	4.6	0.0000	(0.000)	0.0
HH Head 45-49yrs	-0.0001	(0.000)	4.6	0.0000	(0.000)	0.0
HH Head 50-54yrs	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
HH Head 55-59yrs	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
HH Head 60-64yrs	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
HH Head 65-69yrs	-0.0001	(0.000)	4.6	-0.0001	(0.000)	5.0
HH Head 70-74yrs	-0.0002	(0.000)	9.09	-0.0001	(0.000)	5.0
HH Head 75-79yrs	-0.0003***	(0.000)	13.6	-0.0002***	(0.000)	10.0
HH Head 80-84yrs	-0.0005***	(0.000)	22.7	-0.0001*	(0.000)	5.0
Coloured	-0.0001	(0.000)	4.6	0.0000	(0.000)	0.0
Asian	0.0002**	(0.000)	-9.09	-0.0001**	(0.000)	5.0
White	0.0016***	(0.000)	-72.7	-0.0007***	(0.000)	35.0
Divorced/Widow	-0.0012	(0.001)	54.5	-0.0002	(0.001)	10.0
Single	0.0005***	(0.000)	22.7	-0.0004***	(0.000)	20.0
Some Schooling	0.0000	(0.000)	0.0	0.0001*	(0.000)	-5.0
Completed Primary	-0.0001*	(0.000)	4.6	-0.0001*	(0.000)	5.0
Completed Secondary	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
Completed Tertiary	0.0001	(0.000)	-4.6	0.0000	(0.000)	0.0
HH Head Employed	-0.0001	(0.000)	4.6	-0.0004***	(0.000)	20.0
Medical Aid	-0.0013***	(0.000)	59.1	0.0001	(0.000)	5.0
Urban	-0.0001	(0.000)	4.6	0.0000	(0.000)	0.0
Quintile 2	0.0002	(0.000)	-9.09	0.0000	(0.000)	0.0
Quintile 3	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
Quintile 4	-0.0002	(0.000)	9.09	0.0000	(0.000)	0.0
Quintile 5	-0.0009**	(0.000)	40.9	0.0000	(0.000)	0.0
Unexplained	0.0010	(0.002)	-45.5	0.0002	(0.002)	-10.0

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Estimated Effect of Explanatory Variables (*continued*)

	Changes due to means			Changes due to means		
	Coefficient	S.E	%Expl.	Coefficient	S.E	%Expl.

[a]Decomposition of CHE differential between females and males in 2000

[b]Decomposition of CHE differential between females and males in 1995

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Sample Households in 1995: 28,585 (14,040 males; 14,545 females)

Sample Households in 2000: 22,470 (13,556 males; 8,914 females)

Table B.7: OLS Decomposition of Changes in the Incidence of CHE Differential between Males and Females

	Changes due to means	
	Coefficient	Standard error
Raw Difference	0.0002	
HH Head 20-24yrs	-0.0001	(0.0073)
HH Head 25-29yrs	0.0000	(0.0060)
HH Head 30-34yrs	0.0000	(0.0060)
HH Head 35-39yrs	0.0001	(0.0059)
HH Head 40-44yrs	-0.0001	(0.0062)
HH Head 45-49yrs	-0.0001	(0.0064)
HH Head 50-54yrs	-0.0000	(0.0067)
HH Head 55-59yrs	-0.0000	(0.0059)
HH Head 60-64yrs	0.0000	(0.0074)
HH Head 65-69yrs	0.0000	(0.0079)
HH Head 70-74yrs	-0.0001	(0.0088)
HH Head 75-79yrs	-0.0001	(0.0113)
HH Head 80-84yrs	-0.0004	(0.0151)
Coloured	-0.0001	(0.0028)
Asian	0.0003	(0.0069)
White	0.0009	(0.0052)
Divorced/Widow	-0.0001	(0.0055)
Single	0.0009	(0.0027)
Some Schooling	-0.0001	(0.0043)
Completed Primary	0.0000	(0.0041)
Completed Secondary	0.0000	(0.0036)

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OLS Decomposition of Changes in CHE Differential(*continued*)

	Changes due to means	
	Coefficient	Standard error
Completed Tertiary	0.0001	(0.0069)
HH Head Employed	0.0003	(0.0034)
Medical Aid	-0.0014	(0.0035)
Urban	-0.0001	(0.0025)
Quintile 2	0.0002	(0.0036)
Quintile 3	0.0000	(0.0036)
Quintile 4	-0.0002	(0.0039)
Quintile 5	-0.0009	(0.0049)

Bootstrapped SEs using 1000 resamples are reported in parenthesis

B.1.3 Summary Descriptives for 2000 to 2005-06

Table B.8: Weighted Means of CHE and the Explanatory Variables between 2000 and 2005-06 For Males ad Females

	Male			Female		
	2000	2005-06	Δ	2000	2005-06	Δ
HH Head 20-24yrs	0.045	0.047	0.002	0.033	0.042	0.009
HH Head 25-29yrs	0.088	0.110	0.022	0.065	0.073	0.008
HH Head 30-34yrs	0.124	0.144	0.020	0.097	0.102	0.005
HH Head 35-39yrs	0.143	0.123	-0.020	0.112	0.102	-0.010
HH Head 40-44yrs	0.132	0.109	-0.023	0.099	0.104	0.005
HH Head 45-49yrs	0.115	0.112	-0.003	0.105	0.109	0.004
HH Head 50-54yrs	0.093	0.090	-0.003	0.091	0.097	0.006
HH Head 55-59yrs	0.072	0.077	0.005	0.073	0.077	0.004
HH Head 60-64yrs	0.061	0.063	0.002	0.093	0.085	-0.008
HH Head 65-69yrs	0.047	0.049	0.002	0.069	0.071	0.002
HH Head 70-74yrs	0.033	0.031	-0.002	0.066	0.059	-0.007
HH Head 75-79yrs	0.018	0.019	0.001	0.037	0.032	-0.005
HH Head 80-84yrs	0.013	0.008	-0.005	0.031	0.017	-0.014
HH Head 85yrs plus	0.006	0.007	0.001	0.016	0.016	0.000
Black	0.751	0.729	-0.022	0.874	0.830	-0.044
Coloured	0.088	0.080	-0.008	0.065	0.075	0.010
Asian	0.032	0.031	-0.001	0.013	0.015	0.002

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Weighted Means of CHE (*continued*)

	Male			Female		
	2000	2005-06	Δ	2000	2005-06	Δ
White	0.129	0.159	0.030	0.048	0.079	0.031
No Schooling	0.133	0.097	-0.036	0.224	0.199	-0.025
Some Schooling	0.298	0.247	-0.051	0.328	0.299	-0.029
Completed Primary	0.319	0.342	0.023	0.286	0.297	0.011
Completed Secondary	0.198	0.261	0.063	0.142	0.177	0.035
Completed Tertiary	0.051	0.053	0.002	0.021	0.028	0.007
HH Head Employed	0.088	0.731	0.643	0.077	0.442	0.365
Medical Aid	0.198	0.226	0.028	0.083	0.119	0.036
Urban	0.708	0.707	-0.001	0.550	0.563	0.013
Quintile 1	0.147	0.159	0.012	0.285	0.265	-0.020
Quintile 2	0.165	0.172	0.007	0.256	0.244	-0.012
Quintile 3	0.192	0.196	0.004	0.213	0.206	-0.007
Quintile 4	0.233	0.226	-0.007	0.149	0.159	0.010
Quintile 5	0.264	0.247	-0.017	0.097	0.126	0.029
Western Cape	0.104	0.112	0.008	0.067	0.087	0.020
Eastern Cape	0.113	0.120	0.007	0.170	0.168	-0.002
Northern Cape	0.020	0.025	0.005	0.014	0.021	0.007
Free State	0.067	0.077	0.010	0.058	0.064	0.006
KwaZulu Natal	0.174	0.158	-0.016	0.214	0.210	-0.004
North-West	0.077	0.079	0.002	0.071	0.062	-0.009
Gauteng	0.314	0.273	-0.041	0.210	0.183	-0.027
Mpumalanga	0.056	0.070	0.014	0.061	0.071	0.010
CHE≥10	0.012	0.028	0.016	0.014	0.040	0.026
Sample Households	13,556	11,756		8,914	9,263	

Table B.9: Changes in the Weighted Means of the Variables between 2000 and 2005-06 For Males ad Females

	Male		Female	
	Mean	Std. errors	Means	Std. errors
20-24yrs	0.002	(0.004)	0.009***	(0.004)
25-29yrs	0.023***	(0.006)	0.008	(0.005)
30-34yrs	0.019***	(0.006)	0.005	(0.006)

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Changes in the Weighted Means (*continued*)

	Male		Female	
	Mean	Std. errors	Means	Std. errors
35-39yrs	-0.020***	(0.006)	-0.010*	(0.006)
40-45yrs	-0.023***	(0.005)	0.004	(0.005)
45-49yrs	-0.003	(0.005)	0.004	(0.006)
50-54yrs	-0.002	(0.005)	0.006	(0.006)
55-59yrs	0.005	(0.004)	0.004	(0.005)
60-64yrs	0.002	(0.004)	-0.008	(0.006)
65-69yrs	0.001	(0.003)	0.002	(0.005)
70-74yrs	-0.002	(0.003)	-0.007	(0.005)
75-79yrs	0.000	(0.002)	-0.004	(0.003)
80-84yrs	-0.005***	(0.002)	-0.014***	(0.003)
85yrs+	0.001	(0.001)	0.000	(0.002)
Black	-0.022***	(0.008)	-0.044***	(0.008)
Coloured	-0.009**	(0.004)	0.009**	(0.005)
Asian	-0.001	(0.003)	0.003	(0.003)
White	0.029***	(0.007)	0.031***	(0.006)
No Schooling	-0.036***	(0.005)	-0.025***	(0.007)
Some Schooling	-0.051***	(0.007)	-0.028***	(0.009)
Primary	0.023***	(0.008)	0.010	(0.009)
Secondary	0.063***	(0.008)	0.035***	(0.008)
Tertiary	0.002	(0.004)	0.007**	(0.003)
HH Head Employed	0.643***	(0.006)	0.365***	(0.008)
Medical Aid	0.028***	(0.008)	0.036***	(0.006)
Urban	-0.001	(0.007)	0.013	(0.009)
Quintile 1	0.012**	(0.006)	-0.021**	(0.008)
Quintile 2	0.007	(0.006)	-0.012	(0.008)
Quintile 3	0.004	(0.007)	-0.006	(0.008)
Quintile 4	-0.006	(0.007)	0.010	(0.007)
Quintile 5	-0.017**	(0.008)	0.029***	(0.007)
Western Cape	0.008	(0.005)	0.019***	(0.006)
Eastern Cape	0.007	(0.005)	-0.002	(0.007)
Northern Cape	0.005***	(0.001)	0.008***	(0.001)
Free State	0.011***	(0.004)	0.007*	(0.004)
KwaZulu Natal	-0.016**	(0.006)	-0.004	(0.008)
North-West	0.002	(0.005)	-0.008**	(0.004)

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Changes in the Weighted Means (*continued*)

	Male		Female	
	Mean	Std. errors	Means	Std. errors
Gauteng	-0.041***	(0.009)	-0.027***	(0.009)
Mpumalanga	0.014***	(0.003)	0.010***	(0.004)
CHE≥10	0.016***	(0.002)	0.026***	(0.003)
Sample Households	16,591		26,781	

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

Table B.10: Parameter Estimates of the Gender Gap in CHE, 2000 to 2005-06

	Coefficients	Std. errors
Year (Y_{2005}=1)	0.0242	(0.003)
$Y_{2005} * Female$	0.0077*	(0.004)
Female	-0.0051**	(0.002)
20-24yrs	-0.0063	(0.007)
25-29yrs	-0.0140***	(0.005)
30-34yrs	-0.0054	(0.005)
35-39yrs	-0.0025	(0.006)
40-44yrs	-0.0015	(0.005)
45-49yrs	-0.0025	(0.005)
50-54yrs	0.0022	(0.006)
55-59yrs	-0.0034	(0.005)
60-64yrs	0.0070	(0.006)
65-69yrs	0.0113*	(0.007)
70-74yrs	0.0257**	(0.011)
75-79yrs	0.0208**	(0.009)
80-84yrs	0.0215**	(0.010)
Coloured	-0.0059**	(0.003)
Asian	0.0038	(0.014)
White	0.0012	(0.004)
Some Schooling	0.0029	(0.003)
Primary	-0.0021	(0.003)
Secondary	-0.0010	(0.005)
Tertiary	0.0033	(0.007)
Employed	0.0114***	(0.003)

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Parameter Estimates of the Gender Gap in CHE (*continued*)

	Coefficients	Std. errors
Medical Aid	0.0033	(0.004)
Urban	-0.0104***	(0.002)
Quintile 2	-0.0130***	(0.004)
Quintile 3	-0.0198***	(0.003)
Quintile 4	-0.0210***	(0.003)
Quintile 5	-0.0203***	(0.005)
Western Cape	0.0150***	(0.004)
Eastern Cape	0.0142***	(0.004)
Northern Cape	0.0126***	(0.005)
Free State	0.0232***	(0.004)
KwaZulu Natal	0.0267***	(0.004)
North-West	0.0084**	(0.004)
Gauteng	0.0187***	(0.004)
Mpumalanga	0.0173***	(0.004)
Intercept	0.0197***	(0.006)
Sample Households	43,489	
R-squared	0.018	

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

Table B.11: Estimated Effect of the Explanatory Variables on the Incidence of CHE of Males and Females, by year

	Male		Female	
	2000	2005-06	2000	2005-06
HH Head 20-24yrs	-0.0078**	-0.0120	-0.0171	0.0135
	(0.004)	(0.019)	(0.011)	(0.018)
HH Head 25-29yrs	-0.0034	-0.0185	-0.0144*	-0.0202*
	(0.004)	(0.017)	(0.008)	(0.012)
HH Head 30-34yrs	0.0037	-0.0098	-0.0229***	-0.0016
	(0.005)	(0.018)	(0.009)	(0.013)
HH Head 35-39yrs	-0.0035	0.0016	-0.0164*	-0.0022
	(0.004)	(0.019)	(0.009)	(0.013)
HH Head 40-44yrs	0.0001	0.0005	-0.0150	-0.0019
	(0.005)	(0.018)	(0.010)	(0.012)

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Estimated Effect of Explanatory Variables (*continued*)

	Male		Female	
	2000	2005-06	2000	2005-06
HH Head 45-49yrs	-0.0003	-0.0061	-0.0197**	0.0082
	(0.005)	(0.017)	(0.009)	(0.013)
HH Head 50-54yrs	0.0023	-0.0038	-0.0091	0.0147
	(0.005)	(0.017)	(0.011)	(0.015)
HH Head 55-59yrs	-0.0034	-0.0083	-0.0135*	0.0041
	(0.004)	(0.017)	(0.008)	(0.013)
HH Head 60-64yrs	0.0126	0.0002	-0.0095	0.0214
	(0.008)	(0.017)	(0.010)	(0.015)
HH Head 65-69yrs	0.0152*	0.0182	-0.0062	0.0099
	(0.008)	(0.019)	(0.010)	(0.014)
HH Head 70-74yrs	0.0347**	0.0621	-0.0121	0.0178
	(0.016)	(0.038)	(0.010)	(0.015)
HH Head 75-79yrs	0.0178	0.0194	-0.0050	0.0404**
	(0.013)	(0.023)	(0.013)	(0.019)
HH Head 80-84yrs	0.0375*	0.0154	0.0122	0.0144
	(0.023)	(0.026)	(0.015)	(0.017)
Coloured	-0.0048	-0.0072	-0.0051	-0.0132
	(0.004)	(0.005)	(0.005)	(0.010)
Asian	0.0072	0.0102	-0.0024	-0.0087
	(0.007)	(0.028)	(0.010)	(0.028)
White	0.0102**	0.0037	0.0025	-0.0189
	(0.005)	(0.008)	(0.007)	(0.012)
Some Schooling	0.0012	-0.0023	0.0061	0.0024
	(0.005)	(0.008)	(0.004)	(0.008)
Primary	-0.0014	-0.0087	0.0011	0.0003
	(0.005)	(0.008)	(0.004)	(0.009)
Secondary	-0.0036	-0.0023	-0.0035	0.0022
	(0.005)	(0.011)	(0.005)	(0.011)
Tertiary	-0.0024	0.0075	-0.0033	-0.0042
	(0.007)	(0.015)	(0.008)	(0.018)
HH Head Employed	-0.0020	-0.0137	-0.0075**	-0.0028
	(0.003)	(0.010)	(0.003)	(0.006)
Medical Aid	-0.0135***	0.0090	-0.0042	0.0270**
	(0.004)	(0.007)	(0.006)	(0.011)

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Estimated Effect of Explanatory Variables (*continued*)

	Male		Female	
	2000	2005-06	2000	2005-06
Urban	-0.0039	-0.0141***	-0.0016	-0.0203***
	(0.003)	(0.005)	(0.003)	(0.007)
Quintile 2	-0.0032	-0.0188**	-0.0019	-0.0209***
	(0.005)	(0.008)	(0.004)	(0.008)
Quintile 3	-0.0040	-0.0257***	-0.0065	-0.0371***
	(0.005)	(0.008)	(0.004)	(0.008)
Quintile 4	-0.0077	-0.0289***	0.0026	-0.0410***
	(0.005)	(0.007)	(0.006)	(0.008)
Quintile 5	-0.0035	-0.0307***	-0.0017	-0.0421***
	(0.006)	(0.011)	(0.008)	(0.012)
Western Cape	0.0174***	0.0020	0.0104*	0.0425***
	(0.005)	(0.009)	(0.006)	(0.013)
Eastern Cape	0.0203***	0.0112	0.0046	0.0209**
	(0.006)	(0.010)	(0.004)	(0.008)
Northern Cape	0.0148***	0.0152	-0.0022	0.0244**
	(0.005)	(0.010)	(0.005)	(0.011)
Free State	0.0209***	0.0105	0.0197***	0.0531***
	(0.005)	(0.009)	(0.007)	(0.012)
KwaZulu Natale	0.0100***	0.0297***	0.0044	0.0540***
	(0.003)	(0.010)	(0.004)	(0.009)
North-West	0.0096***	0.0001	0.0050	0.0199*
	(0.003)	(0.009)	(0.005)	(0.012)
Gauteng	0.0129***	0.0154*	0.0064	0.0331***
	(0.003)	(0.009)	(0.005)	(0.010)
Mpumalanga	0.0219***	0.0079	0.0120**	0.0245**
	(0.005)	(0.010)	(0.006)	(0.010)
Intercept	0.0054	0.0621***	0.0229***	0.0382***
	(0.006)	(0.018)	(0.009)	(0.012)
Sample Households	13,556	11,756	8,914	9,263
R-squared	0.015	0.024	0.008	0.022

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

Table B.12: OLS Decomposition of the Gender Gap in the Incidence of CHE Differentials

	Changes due to means			Changes due to means		
	Coefficient	S.E	%Expl.	Coefficient	S.E	%Expl.
A: 2005-06[a]				**B:2000**[b]		
Raw Difference	-0.0094***	(0.003)		-0.0022	(0.002)	
HH Head 20-24yrs	-0.0001*	(0.000)	1.1	-0.0001*	(0.000)	4.6
HH Head 25-29yrs	-0.0002**	(0.000)	2.1	-0.0002**	(0.000)	9.1
HH Head 30-34yrs	-0.0001	(0.000)	1.1	-0.0001	(0.000)	4.6
HH Head 35-39yrs	-0.0001	(0.000)	1.1	-0.0002	(0.000)	9.1
HH Head 40-44yrs	0.0000	(0.000)	0.0	-0.0002	(0.000)	9.1
HH Head 45-49yrs	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
HH Head 50-54yrs	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
HH Head 55-59yrs	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
HH Head 60-64yrs	0.0000	(0.000)	0.0	-0.0001	(0.000)	4.6
HH Head 65-69yrs	-0.0002	(0.000)	2.1	-0.0002	(0.000)	9.1
HH Head 70-74yrs	-0.0003*	(0.000)	3.2	-0.0004*	(0.000)	18.2
HH Head 75-79yrs	-0.0004**	(0.000)	4.3	-0.0003**	(0.000)	13.6
HH Head 80-84yrs	-0.0003***	(0.000)	3.2	-0.0005***	(0.000)	22.7
Coloured	-0.0002***	(0.000)	2.1	-0.0003***	(0.000)	13.6
Asian	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
White	0.0006***	(0.000)	-6.4	0.0005***	(0.000)	22.7
Some Schooling	-0.0001	(0.000)	1.1	0.0000	(0.000)	0.0
Completed Primary	-0.0002*	(0.000)	2.1	-0.0001*	(0.000)	4.6
Completed Secondary	-0.0004*	(0.000)	4.3	-0.0002*	(0.000)	
Completed Tertiary	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
HH Head Employed	-0.0032***	(0.001)	34.0	-0.0001	(0.000)	4.6
Medical Aid	-0.0002	(0.000)	2.1	-0.0002	(0.000)	9.1
Urban	-0.0010***	(0.000)	10.6	-0.0011***	(0.000)	50.0
Quintile 2	0.0006***	(0.000)	6.4	0.0010***	(0.000)	-45.5
Quintile 3	0.0003**	(0.000)	3.2	0.0001	(0.000)	-4.6
Quintile 4	-0.0010***	(0.000)	10.6	-0.0015***	(0.000)	68.2
Quintile 5	-0.0016***	(0.000)	1.7	-0.0021***	(0.000)	95.5
Unexplained	-0.0083***	(0.001)	88.3	-0.0066***	(0.001)	300

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Estimated Effect of Explanatory Variables (*continued*)

	Coefficient	S.E	%Expl.	Coefficient	S.E	%Expl.

[a] Decomposition of CHE differential between females and males in 2005-06

[b] Decomposition of CHE differential between females and males in 2000

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Sample Households in 2000: 22,470 (13,556 males; 8,914 females)

Sample Households in 2005-06: 21,019 (11,756 males; 9,263 females)

Table B.13: OLS Decomposition of Changes in the Incidence of CHE Differential between Males and Females

	Changes due to means	
	Coefficient	Standard error
Raw Difference	-0.0072	
HH Head 20-24yrs	0.0000	(0.0107)
HH Head 25-29yrs	0.0000	(0.0100)
HH Head 30-34yrs	0.0000	(0.0103)
HH Head 35-39yrs	0.0001	(0.0100)
HH Head 40-44yrs	0.0002	(0.0100)
HH Head 45-49yrs	0.0000	(0.0102)
HH Head 50-54yrs	0.0000	(0.0105)
HH Head 55-59yrs	0.0000	(0.0103)
HH Head 60-64yrs	0.0001	(0.0113)
HH Head 65-69yrs	0.0000	(0.0122)
HH Head 70-74yrs	0.0001	(0.0129)
HH Head 75-79yrs	-0.0001	(0.0147)
HH Head 80-84yrs	0.0002	(0.0196)
Coloured	0.0001	(0.0042)
Asian	0.0000	(0.0104)
White	0.0001	(0.0066)
Some Schooling	-0.0001	(0.0055)
Completed Primary	-0.0001	(0.0056)
Completed Secondary	-0.0002	(0.0063)
Completed Tertiary	0.0000	(0.0101)
HH Head Employed	-0.0031	(0.0040)
Medical Aid	0.0000	(0.0049)
Urban	0.0001	(0.0037)

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OLS Decomposition of Changes in CHE Differential(*continued*)

	Coefficient	Standard error
Quintile 2	-0.0004	(0.0051)
Quintile 3	0.0002	(0.0047)
Quintile 4	0.0005	(0.0050)
Quintile 5	0.0005	(0.0067)

Bootstrapped SEs using 1000 resamples are reported in parenthesis

B.1.4 Summary Descriptives for 2005-06 to 2010-11

Table B.14: Weighted Means of CHE and the Explanatory Variables between 2005-06 and 2010-11 For Males ad Females

	Male			Female		
	2005-06	2010-11	Δ	2005-06	2010-11	Δ
HH Head 20-24yrs	0.047	0.040	-0.007	0.042	0.038	-0.004
HH Head 25-29yrs	0.110	0.096	-0.014	0.073	0.079	0.006
HH Head 30-34yrs	0.144	0.135	-0.009	0.102	0.089	-0.013
HH Head 35-39yrs	0.123	0.147	0.024	0.102	0.118	0.016
HH Head 40-44yrs	0.109	0.116	0.007	0.104	0.105	0.001
HH Head 45-49yrs	0.112	0.104	-0.008	0.109	0.105	-0.004
HH Head 50-54yrs	0.090	0.099	0.009	0.097	0.105	0.008
HH Head 55-59yrs	0.077	0.080	0.003	0.077	0.087	0.010
HH Head 60-64yrs	0.063	0.065	0.002	0.085	0.075	-0.010
HH Head 65-69yrs	0.049	0.046	-0.003	0.071	0.067	-0.004
HH Head 70-74yrs	0.031	0.031	0.000	0.059	0.054	-0.005
HH Head 75-79yrs	0.019	0.015	-0.004	0.032	0.030	-0.002
HH Head 80-84yrs	0.008	0.009	0.001	0.017	0.019	0.002
HH Head 85yrs plus	0.007	0.006	-0.001	0.016	0.015	-0.001
Black	0.729	0.714	-0.015	0.830	0.827	-0.003
Coloured	0.080	0.092	0.0012	0.075	0.080	0.005
Asian	0.031	0.034	0.003	0.015	0.014	-0.001
White	0.159	0.159	0.000	0.079	0.080	0.001
No Schooling	0.097	0.063	-0.034	0.199	0.133	-0.066
Some Schooling	0.247	0.214	-0.033	0.299	0.276	-0.023
Primary	0.342	0.357	0.015	0.297	0.342	0.045
Secondary	0.261	0.282	0.021	0.177	0.205	0.028

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Weighted Means of CHE (*continued*)

	Male			Female		
	2005-06	2010-11	Δ	2005-06	2010-11	Δ
Tertiary	0.053	0.084	0.031	0.028	0.044	0.016
HH Head Employed	0.731	0.722	-0.009	0.442	0.463	0.021
Medical Aid	0.226	0.207	-0.019	0.119	0.115	-0.004
Urban	0.707	0.744	0.037	0.563	0.618	0.055
Quintile 1	0.159	0.156	-0.003	0.265	0.248	-0.017
Quintile 2	0.172	0.170	-0.002	0.244	0.237	-0.007
Quintile 3	0.196	0.198	0.002	0.206	0.208	0.002
Quintile 4	0.226	0.221	-0.005	0.159	0.177	0.018
Quintile 5	0.247	0.255	0.008	0.126	0.130	0.004
Western Cape	0.112	0.119	0.007	0.087	0.101	0.014
Eastern Cape	0.120	0.098	-0.022	0.168	0.139	-0.029
Northern Cape	0.025	0.018	-0.007	0.021	0.018	-0.003
Free State	0.077	0.063	-0.014	0.064	0.061	-0.003
KwaZulu Natal	0.158	0.160	0.002	0.210	0.206	-0.004
North-West	0.079	0.081	0.002	0.062	0.074	0.012
Gauteng	0.273	0.310	0.037	0.183	0.202	0.019
Mpumalanga	0.070	0.067	-0.003	0.071	0.065	-0.006
CHE≥10	0.028	0.025	-0.003	0.040	0.032	-0.008
Sample Households	11,756	13,763		9,263	10,390	

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

Table B.15: Changes in the Weighted Means of the Variables between 2005-06 and 2010-11 For Males ad Females

	Male		Female	
	Mean	Std. errors	Means	Std. errors
20-24yrs	-0.007*	(0.004)	-0.004	(0.004)
25-29yrs	-0.015**	(0.006)	0.006	(0.006)
30-34yrs	-0.009	(0.007)	-0.013**	(0.006)
35-39yrs	0.024***	(0.006)	0.015**	(0.006)
40-45yrs	0.007	(0.005)	0.002	(0.006)
45-49yrs	-0.008	(0.005)	-0.004	(0.006)
50-54yrs	0.009**	(0.005)	0.007	(0.006)

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Changes in the Weighted Means (*continued*)

	Male		Female	
	Mean	Std. errors	Means	Std. errors
55-59yrs	0.003	(0.004)	0.009*	(0.005)
60-64yrs	0.002	(0.004)	-0.010*	(0.005)
65-69yrs	-0.002	(0.004)	-0.004	(0.005)
70-74yrs	0.001	(0.003)	-0.005	(0.004)
75-79yrs	-0.003*	(0.002)	-0.002	(0.003)
80-84yrs	0.001	(0.001)	0.002	(0.002)
85yrs+	-0.000	(0.001)	-0.001	(0.002)
Black	-0.015*	(0.008)	-0.003	(0.008)
Coloured	0.012***	(0.004)	0.005	(0.005)
Asian	0.003	(0.003)	-0.002	(0.003)
White	0.001	(0.008)	0.000	(0.007)
No Schooling	-0.033***	(0.004)	-0.066***	(0.007)
Some Schooling	-0.033***	(0.007)	-0.023***	(0.008)
Primary	0.015*	(0.008)	0.045***	(0.009)
Secondary	0.021**	(0.008)	0.028***	(0.008)
Tertiary	0.031***	(0.005)	0.017***	(0.004)
Employed	-0.008	(0.007)	0.021**	(0.010)
Medical Aid	-0.019**	(0.008)	-0.004	(0.007)
Urban	0.037***	(0.007)	0.055***	(0.009)
Quintile 1	-0.003	(0.006)	-0.017**	(0.008)
Quintile 2	-0.002	(0.006)	-0.008	(0.008)
Quintile 3	0.002	(0.007)	0.002	(0.008)
Quintile 4	-0.005	(0.007)	0.019***	(0.007)
Quintile 5	0.008	(0.008)	0.004	(0.007)
Western Cape	0.007	(0.005)	0.015**	(0.006)
Eastern Cape	-0.022***	(0.005)	-0.028***	(0.007)
Northern Cape	-0.006***	(0.001)	-0.003**	(0.001)
Free State	-0.014***	(0.004)	-0.003	(0.004)
KwaZulu Natal	0.002	(0.007)	-0.004	(0.008)
North-West	0.002	(0.005)	0.012***	(0.004)
Gauteng	0.036***	(0.009)	0.019**	(0.009)
Mpumalanga	-0.003	(0.003)	-0.006*	(0.004)
CHE≥	-0.003	(0.003)	-0.009**	(0.003)
Sample Households	25,519		19,653	

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Changes in the Weighted Means (*continued*)

	Male		Female	
	Mean	Std. errors	Means	Std. errors

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

Table B.16: Parameter Estimates of the Gender Gap in CHE, 2005-06 to 2010-11

	Coefficients	Std. errors
Year (Y_{2010}=1)	-0.0033	(0.003)
$Y_{2010} * Female$	-0.0039	(0.004)
Female	0.0029	(0.004)
20-24yrs	-0.0098	(0.007)
25-29yrs	-0.0086	(0.006)
30-34yrs	-0.0045	(0.006)
35-39yrs	0.0031	(0.006)
40-44yrs	-0.0036	(0.006)
45-49yrs	0.0007	(0.006)
50-54yrs	0.0029	(0.006)
55-59yrs	-0.0012	(0.005)
60-64yrs	0.0067	(0.007)
65-69yrs	0.0078	(0.007)
70-74yrs	0.0165	(0.011)
75-79yrs	0.0138	(0.009)
80-84yrs	0.0189*	(0.011)
Coloured	-0.0018	(0.004)
Asian	0.0024	(0.012)
White	0.0077*	(0.005)
Some Schooling	0.0022	(0.004)
Primary	-0.0005	(0.004)
Secondary	0.0017	(0.005)
Tertiary	0.0037	(0.007)
Employed	0.0102***	(0.003)
Medical Aid	0.0063*	(0.004)
Urban	-0.0108***	(0.003)
Quintile 2	-0.0262***	(0.004)
Quintile 3	-0.0360***	(0.004)

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Parameter Estimates of the Gender Gap in CHE (*continued*)

	Coefficients	Std. errors
Quintile 4	-0.0395***	(0.004)
Quintile 5	-0.0406***	(0.005)
Western Cape	0.0209***	(0.005)
Eastern Cape	0.0107***	(0.004)
Northern Cape	0.0114**	(0.005)
Free State	0.0352***	(0.005)
KwaZulu Natal	0.0333***	(0.004)
North-West	0.0079*	(0.004)
Gauteng	0.0239***	(0.004)
Mpumalanga	0.0201***	(0.004)
Intercept	0.0501***	(0.008)
Sample Households	45,172	
R-squared	0.015	

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

Table B.17: Estimated Effect of the Explanatory Variables on the Incidence of CHE of Males and Females, by year

	Male		Female	
	2005-06	2010-11	2005-06	2010-11
HH Head 20-24yrs	-0.0120	-0.0248***	0.0135	-0.0092
	(0.019)	(0.009)	(0.018)	(0.012)
HH Head 25-29yrs	-0.0185	-0.0063	-0.0202*	0.0133
	(0.017)	(0.009)	(0.012)	(0.013)
HH Head 30-34yrs	-0.0098	-0.0089	-0.0016	0.0040
	(0.018)	(0.009)	(0.013)	(0.013)
HH Head 35-39yrs	0.0016	0.0018	-0.0022	0.0020
	(0.019)	(0.010)	(0.013)	(0.012)
HH Head 40-44yrs	0.0005	-0.0091	-0.0019	-0.0129
	(0.018)	(0.009)	(0.012)	(0.010)
HH Head 45-49yrs	-0.0061	-0.0053	0.0082	0.0025
	(0.017)	(0.009)	(0.013)	(0.011)
HH Head 50-54yrs	-0.0038	0.0018	0.0147	-0.0076
	(0.017)	(0.010)	(0.015)	(0.010)

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Estimated Effect of Explanatory Variables (*continued*)

	Male		Female	
	2005-06	2010-11	2005-06	2010-11
HH Head 55-59yrs	-0.0083	0.0012	0.0041	-0.0134
	(0.017)	(0.008)	(0.013)	(0.010)
HH Head 60-64yrs	0.0002	0.0035	0.0214	-0.0047
	(0.017)	(0.013)	(0.015)	(0.010)
HH Head 65-69yrs	0.0182	0.0008	0.0099	-0.0076
	(0.019)	(0.014)	(0.014)	(0.011)
HH Head 70-74yrs	0.0621	-0.0097	0.0178	-0.0065
	(0.038)	(0.011)	(0.015)	(0.011)
HH Head 75-79yrs	0.0194	-0.0091	0.0404**	-0.0101
	(0.023)	(0.013)	(0.019)	(0.012)
HH Head 80-84yrs	0.0154	0.0565*	0.0144	-0.0051
	(0.026)	(0.033)	(0.017)	(0.013)
Coloured	-0.0072	0.0014	-0.0132	0.0112
	(0.005)	(0.007)	(0.010)	(0.011)
Asian	0.0102	-0.0010	-0.0087	0.0129
	(0.028)	(0.007)	(0.028)	(0.020)
White	0.0037	0.0146*	-0.0189	0.0247**
	(0.008)	(0.007)	(0.012)	(0.012)
Some Schooling	-0.0023	0.0011	0.0024	0.0082
	(0.008)	(0.009)	(0.008)	(0.007)
Completed Primary	-0.0087	0.0039	0.0003	0.0009
	(0.008)	(0.010)	(0.009)	(0.008)
Completed Secondary	-0.0023	0.0026	0.0022	0.0012
	(0.011)	(0.010)	(0.011)	(0.009)
Tertiary	0.0075	0.0041	-0.0042	-0.0031
	(0.015)	(0.012)	(0.018)	(0.012)
HH Head Employed	-0.0137	-0.0167***	-0.0028	-0.0001
	(0.010)	(0.006)	(0.006)	(0.005)
Medical Aid	0.0090	0.0000	0.0270**	-0.0021
	(0.007)	(0.005)	(0.011)	(0.008)
Urban	-0.0141***	-0.0030	-0.0203***	-0.0076
	(0.005)	(0.005)	(0.007)	(0.006)
Quintile 2	-0.0188**	-0.0253***	-0.0209***	-0.0399***
	(0.008)	(0.007)	(0.008)	(0.007)

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Estimated Effect of Explanatory Variables (*continued*)

	Male		Female	
	2005-06	2010-11	2005-06	2010-11
Quintile 3	-0.0257***	-0.0364***	-0.0371***	-0.0441***
	(0.008)	(0.007)	(0.008)	(0.007)
Quintile 4	-0.0289***	-0.0394***	-0.0410***	-0.0518***
	(0.007)	(0.007)	(0.008)	(0.007)
Quintile 5	-0.0307***	-0.0401***	-0.0421***	-0.0506***
	(0.011)	(0.009)	(0.012)	(0.010)
Western Cape	0.0020	0.0201**	0.0425***	0.0252**
	(0.009)	(0.008)	(0.013)	(0.011)
Eastern Cape	0.0112	0.0009	0.0209**	0.0062
	(0.010)	(0.006)	(0.008)	(0.007)
Northern Cape	0.0152	-0.0011	0.0244**	-0.0006
	(0.010)	(0.007)	(0.011)	(0.009)
Free State	0.0105	0.0344***	0.0531***	0.0576***
	(0.009)	(0.008)	(0.012)	(0.011)
KwaZulu Natal	0.0297***	0.0174**	0.0540***	0.0332***
	(0.010)	(0.007)	(0.009)	(0.008)
North-West	0.0001	0.0047	0.0199*	0.0118
	(0.009)	(0.005)	(0.012)	(0.008)
Gauteng	0.0154*	0.0202***	0.0331***	0.0247***
	(0.009)	(0.006)	(0.010)	(0.008)
Mpumalanga	0.0079	0.0178***	0.0245**	0.0303***
	(0.010)	(0.006)	(0.010)	(0.009)
Intercept	0.0621***	0.0531***	0.0382***	0.0471***
	(0.018)	(0.012)	(0.012)	(0.010)
Sample Households	11,756	13,763	9,263	10,390
R-squared	0.024	0.016	0.022	0.021

Robust standard errors in parentheses. ***p<0.01, ** p<0.05, * p<0.1.

Table B.18: OLS Decomposition of the Gender Gap in the Incidence of CHE Differentials

	Changes due to means			Changes due to means		
	Coefficient	S.E	%Expl.	Coefficient	S.E	%Expl.
A: 2010-11[a]				**B:2005-06**[b]		
Raw Difference	-0.0061***	(0.002)		-0.0094***	(0.003)	
HH Head 20-24yrs	-0.0002***	(0.000)	3.3	-0.0001**	(0.000)	1.1
HH Head 25-29yrs	-0.0004**	(0.000)	6.6	-0.0003**	(0.000)	3.2
HH Head 30-34yrs	-0.0004**	(0.000)	6.6	-0.0003**	(0.000)	3.2
HH Head 35-39yrs	-0.0002*	(0.000)	3.3	-0.0002*	(0.000)	2.1
HH Head 40-44yrs	-0.0001	(0.000)	1.6	-0.0001	(0.000)	1.1
HH Head 45-49yrs	-0.0001	(0.000)	1.6	-0.0001	(0.000)	1.1
HH Head 50-54yrs	0.0000	(0.000)	0.0	-0.0001	(0.000)	1.1
HH Head 55-59yrs	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
HH Head 60-64yrs	0.0001	(0.000)	1.6	0.0000	(0.000)	0.0
HH Head 65-69yrs	0.0000	(0.000)	0.0	0.0001	(0.000)	-1.1
HH Head 70-74yrs	-0.0001	(0.000)	1.6	-0.0001	(0.000)	1.1
HH Head 75-79yrs	-0.0002	(0.000)	3.3	-0.0002	(0.000)	2.1
HH Head 80-84yrs	-0.0003	(0.000)	4.9	-0.0002	(0.000)	2.1
Coloured	-0.0001**	(0.000)	1.6	-0.0001*	(0.000)	1.1
Asian	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
White	0.0007***	(0.000)	-11.5	0.0008***	(0.000)	-8.5
Some Schooling	-0.0001	(0.000)	1.6	-0.0001	(0.000)	1.1
Completed Primary	-0.0001	(0.000)	1.6	-0.0002	(0.000)	2.1
Completed Secondary	-0.0002	(0.000)	3.3	-0.0002	(0.000)	2.1
Completed Tertiary	0.0000	(0.000)	0.0	0.0000	(0.000)	0.0
HH Head Employed	-0.0022***	(0.001)	36.1	-0.0023***	(0.001)	24.5
Medical Aid	0.0003	(0.000)	-4.9	0.0003	(0.000)	3.2
Urban	-0.0013***	(0.000)	21.3	-0.0011***	(0.000)	11.7
Quintile 2	0.0015***	(0.000)	-24.5	0.0014***	(0.000)	-14.9
Quintile 3	0.0003*	(0.000)	-4.9	0.0005***	(0.000)	-5.3
Quintile 4	-0.0018***	(0.000)	29.5	-0.0020***	(0.000)	21.2
Quintile 5	-0.0039***	(0.000)	63.9	-0.0040***	(0.000)	42.6
Unexplained	0.0027	(0.002)	-44.3	-0.0009	(0.003)	9.6

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Estimated Effect of Explanatory Variables (*continued*)

	Changes due to means			Changes due to means		
	Coefficient	S.E	%Expl.	Coefficient	S.E	%Expl.

[a]Decomposition of CHE differential between females and males in 2010-11

[b]Decomposition of CHE differential between females and males in 2005-06

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Sample Households in 2005-06: 21,019 (11,756 males; 9,263 females)

Sample Households in 2010-11: 24,153 (13,763 males; 10,390 females)

Table B.19: OLS Decomposition of Changes in the Incidence of CHE Differential between Males and Females

	Changes due to means	
	Coefficient	Standard error
Raw Difference	0.0036	
20-24yrs	-0.0001	(0.0120)
25-29yrs	-0.0001	(0.0110)
30-34yrs	-0.0001	(0.0114)
35-39yrs	0.0000	(0.0113)
40-44yrs	0.0000	(0.0110)
45-49yrs	0.0000	(0.0112)
50-54yrs	0.0001	(0.0112)
55-59yrs	0.0001	(0.0114)
60-64yrs	0.0000	(0.0121)
65-69yrs	0.0001	(0.0130)
70-74yrs	0.0000	(0.0137)
75-79yrs	-0.0000	(0.0156)
80-84yrs	0.0001	(0.0206)
Coloured	0.0000	(0.0052)
Asian	0.0000	(0.0111)
White	-0.0001	(0.0069)
Some Schooling	0.0000	(0.0064)
Primary	0.0001	(0.0066)
Secondary	0.0000	(00073)
Tertiary	0.0000	(0.0108)
Employed	0.0001	(0.0042)
Medical Aid	0.0001	(0.0052)

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OLS Decomposition of Changes in CHE Differential(*continued*)

	Changes due to means	
	Coefficient	Standard error
Urban	-0.0002	(0.0045)
Quintile 2	-0.0001	(0.0061)
Quintile 3	-0.0003	(0.0057)
Quintile 4	0.0002	(0.0059)
Quintile 5	-0.0001	(0.0077)

Bootstrapped SEs using 1000 resamples are reported in parenthesis

APPENDIX C

APPENDIX FOR ANALYSIS ON SOCIO-ECONOMIC DETERMINANTS OF OOP

C.1 Summary Descriptive Statistics

Table C.1: Weighted Means of the Dependent and Independent Variables for 1995 and 2000

	1995		2000	
20-24yrs	0.028	(0.001)	0.040	(0.002)
25-29yrs	0.072	(0.002)	0.079	(0.002)
30-34yrs	0.111	(0.002)	0.114	(0.003)
35-39yrs	0.126	(0.002)	0.131	(0.003)
40-44yrs	0.124	(0.002)	0.120	(0.003)
45-49yrs	0.109	(0.002)	0.111	(0.003)
50-54yrs	0.098	(0.002)	0.092	(0.002)
55-59yrs	0.082	(0.002)	0.072	(0.002)
60-64yrs	0.073	(0.002)	0.073	(0.002)
65-69yrs	0.063	(0.001)	0.056	(0.002)
70-74yrs	0.046	(0.001)	0.046	(0.002)
75-79yrs	0.030	(0.001)	0.025	(0.001)
80-84yrs	0.018	(0.001)	0.020	(0.001)
85yrs plus	0.011	(0.001)	0.010	(0.001)
Female	0.898	(0.002)	0.388	(0.004)

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Descriptive Statistics (*continued*)

	1995		2000	
Black	0.722	(0.003)	0.799	(0.004)
Coloured	0.099	(0.002)	0.079	(0.002)
Asian	0.029	(0.001)	0.024	(0.001)
White	0.165	(0.002)	0.098	(0.003)
Married	0.234	(0.003)	0.531	(0.004)
Divorced/widow	0.060	(0.002)	0.234	(0.003)
Single	0.705	(0.003)	0.235	(0.004)
No Schooling	0.270	(0.003)	0.168	(0.003)
Some Schooling	0.274	(0.003)	0.310	(0.004)
Primary	0.332	(0.003)	0.306	(0.004)
Secondary	0.339	(0.003)	0.176	(0.003)
Tertiary	0.054	(0.002)	0.039	(0.002)
Employed	0.244	(0.003)	0.084	(0.002)
Medical Aid	0.267	(0.003)	0.153	(0.003)
Urban	0.554	(0.003)	0.647	(0.004)
Quintile 1	0.200	(0.003)	0.200	(0.003)
Quintile 2	0.200	(0.003)	0.200	(0.003)
Quintile 3	0.200	(0.003)	0.200	(0.003)
Quintile 4	0.200	(0.003)	0.200	(0.003)
Quintile 5	0.200	(0.003)	0.199	(0.004)
Western Cape	0.114	(0.002)	0.090	(0.002)
Eastern Cape	0.147	(0.002)	0.135	(0.003)
Northern Cape	0.025	(0.001)	0.017	(0.001)
Free State	0.075	(0.001)	0.063	(0.002)
KwaZulu Natal	0.176	(0.002)	0.189	(0.003)
North-West	0.088	(0.002)	0.074	(0.002)
Gauteng	0.207	(0.003)	0.274	(0.004)
Mpumalanga	0.059	(0.001)	0.058	(0.002)
OOP	23.088	(0.683)	17.734	(0.762)
Sample Households	28,585		22,470	

Standard errors in parentheses.

Table C.2: Weighted Means of the Dependent and Independent Variables for 2000 and 2005-06

	2000		2005-06	
20-24yrs	0.040	(0.002)	0.039	(0.002)
25-29yrs	0.079	(0.002)	0.091	(0.004)
30-34yrs	0.114	(0.003)	0.125	(0.004)
35-39yrs	0.131	(0.003)	0.111	(0.003)
40-44yrs	0.120	(0.003)	0.106	(0.003)
45-49yrs	0.111	(0.003)	0.109	(0.003)
50-54yrs	0.092	(0.002)	0.095	(0.003)
55-59yrs	0.072	(0.002)	0.078	(0.002)
60-64yrs	0.073	(0.002)	0.075	(0.003)
65-69yrs	0.056	(0.002)	0.061	(0.002)
70-74yrs	0.046	(0.002)	0.046	(0.002)
75-79yrs	0.025	(0.001)	0.028	(0.001)
80-84yrs	0.020	(0.001)	0.014	(0.001)
85yrs plus	0.010	(0.001)	0.014	(0.001)
Female	0.388	(0.004)	0.389	(0.005)
Black	0.799	(0.004)	0.769	(0.005)
Coloured	0.079	(0.002)	0.078	(0.003)
Asian	0.024	(0.001)	0.025	(0.002)
White	0.098	(0.003)	0.128	(0.004)
No Schooling	0.168	(0.003)	0.136	(0.003)
Some Schooling	0.310	(0.004)	0.268	(0.004)
Primary	0.306	(0.004)	0.324	(0.005)
Secondary	0.176	(0.003)	0.229	(0.005)
Tertiary	0.039	(0.002)	0.043	(0.002)
Employed	0.084	(0.002)	1.381	(0.005)
Medical aid	0.153	(0.003)	0.184	(0.004)
Urban	0.647	(0.004)	0.651	(0.004)
Quintile 1	0.200	(0.003)	0.200	(0.004)
Quintile 2	0.200	(0.003)	0.200	(0.004)
Quintile 3	0.200	(0.003)	0.200	(0.004)
Quintile 4	0.200	(0.003)	0.200	(0.004)
Quintile 5	0.199	(0.004)	0.199	(0.005)
Western Cape	0.090	(0.002)	0.102	(0.003)

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Descriptive Statistics (*continued*)

	2000		2005-06	
Eastern Cape	0.135	(0.003)	0.138	(0.003)
Northern Cape	0.017	(0.001)	0.024	(0.001)
Free State	0.063	(0.002)	0.072	(0.002)
KwaZulu Natal	0.189	(0.003)	0.178	(0.004)
North-West	0.074	(0.002)	0.073	(0.003)
Gauteng	0.274	(0.004)	0.238	(0.005)
Mpumalanga	0.058	(0.002)	0.071	(0.002)
OOP	17.734	(0.762)	77.561	(5.613)
Sample Households	22,470	20,902		

Standard errors in parentheses.

Table C.3: Weighted Means of the Dependent and Independent Variables for 2005-06 and 2010-11

	2005-06		2010-11	
20-24yrs	0.039	(0.002)	0.040	(0.001)
25-29yrs	0.091	(0.004)	0.088	(0.002)
30-34yrs	0.125	(0.004)	0.116	(0.003)
35-39yrs	0.111	(0.003)	0.134	(0.003)
40-44yrs	0.106	(0.003)	0.111	(0.003)
45-49yrs	0.109	(0.003)	0.104	(0.002)
50-54yrs	0.095	(0.003)	0.102	(0.002)
55-59yrs	0.078	(0.002)	0.083	(0.002)
60-64yrs	0.075	(0.003)	0.070	(0.002)
65-69yrs	0.061	(0.002)	0.055	(0.002)
70-74yrs	0.046	(0.002)	0.041	(0.001)
75-79yrs	0.028	(0.001)	0.021	(0.001)
80-84yrs	0.014	(0.001)	0.013	(0.001)
85yrs plus	0.014	(0.001)	0.010	(0.001)
Female	0.389	(0.005)	0.840	(0.003)
Black	0.769	(0.005)	0.766	(0.004)
Coloured	0.078	(0.003)	0.085	(0.002)
Asian	0.025	(0.002)	0.025	(0.001)
White	0.128	(0.004)	0.124	(0.003)

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Descriptive Statistics (*continued*)

	2005-06		2010-11	
No Schooling	0.136	(0.003)	0.097	(0.002)
Some Schooling	0.268	(0.004)	0.244	(0.003)
Primary	0.324	(0.005)	0.348	(0.004)
Secondary	0.229	(0.005)	0.245	(0.004)
Tertiary	0.043	(0.002)	0.066	(0.002)
Employed	1.381	(0.005)	1.388	(0.004)
Medical aid	0.184	(0.004)	0.166	(0.003)
Urban	0.651	(0.004)	0.673	(0.004)
Quintile 1	0.200	(0.004)	0.200	(0.003)
Quintile 2	0.200	(0.004)	0.200	(0.003)
Quintile 3	0.200	(0.004)	0.200	(0.003)
Quintile 4	0.200	(0.004)	0.200	(0.003)
Quintile 5	0.199	(0.005)	0.200	(0.004)
Western Cape	0.102	(0.003)	0.108	(0.002)
Eastern Cape	0.138	(0.003)	0.127	(0.002)
Northern Cape	0.024	(0.001)	0.018	(0.001)
Free State	0.072	(0.002)	0.060	(0.001)
KwaZulu Natal	0.178	(0.004)	0.182	(0.003)
North-West	0.073	(0.003)	0.076	(0.002)
Gauteng	0.238	(0.005)	0.260	(0.004)
Mpumalanga	0.071	(0.002)	0.065	(0.002)
OOP	77.561	(5.613)	113.210	(5.823)
Sample Households	20,902	25,124		

Standard errors in parentheses.

C.2 Inequality Decomposition

Tables C.4, C.5, C.6 and C.7 below present decompositions of the concentration indexes for the years 1995 through to 2010-11. The numbers were obtained by decomposing the concentration indexes into their explained components. Therefore, the numbers denote relative contributions of each variable to the concentration index in each year.

Table C.4: Contributions to the Concentration Indices, 1995 to 2000

	1995	2000
20-24	0.0012	0.0004
25-29	-0.0005	-0.0012
30-34	-0.0004	-0.0010
35-39	0.0007	-0.0009
40-44	0.0013	-0.0006
45-49	0.0006	0.0005
50-54	0.0002	-0.0004
55-59	-0.0008	-0.0002
60-64	-0.0013	-0.0049
65-69	-0.0018	-0.0045
70-74	-0.0018	-0.0058
75-79	0.0000	-0.0030
80-84	-0.0004	-0.0024
85yrs +	-0.0006	-0.0014
Urban	-0.0123	-0.0008
Female	-0.0035	0.0080
Black	0.0077	-0.0104
Asian	0.0133	0.0150
White	0.2787	0.1414
Eastern Cape	0.0071	0.0185
Northern Cape	0.0002	0.0002
Free State	0.0030	0.0006
KwaZulu Natal	-0.0006	0.0050
NorthWest	-0.0254	0.0014
Gauteng	-0.0353	-0.0386
Mpumalanga	0.0024	-0.0002
Limpopo	0.0036	0.0192
5-8 HHsize	-0.0118	-0.0248
9-12 HHsize	-0.0052	-0.0075
13+ HHsize	-0.0010	-0.0029
Some schooling	0.0056	-0.0097
Completed Primary	-0.011	0.0048
Completed Secondary	0.0019	0.0350

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Inequality Decompositions (*continued*)

	1995	2000
Completed Tertiary	0.0103	0.0224
Medical aid	-0.0971	-0.2169
Employed	-0.0115	0.0007
Quintile 2	-0.0147	-0.0169
Quintile 3	-0.0007	0.0001
Quintile 4	0.0608	0.0852
Quintile 5	0.4109	0.4276

Number of households in 1995 and 2000 are 28,585 and 22,470 respectively

Table C.5: Contributions to the Concentration Indices, 2000 to 2005-06

	2000	2005-06
20-24	0.0004	0.0004
25-29	-0.0012	-0.0006
30-34	-0.0010	-0.0006
35-39	-0.0009	-0.0012
40-44	-0.0006	0.0012
45-49	0.0005	0.0000
50-54	-0.0004	0.0001
55-59	-0.0002	0.0001
60-64	-0.0049	-0.0006
65-69	-0.0045	-0.0014
70-74	-0.0058	-0.0040
75-79	-0.0030	-0.0036
80-84	-0.0024	-0.0004
85yrs +	-0.0014	0.0000
Urban	-0.0008	-0.0179
Female	0.0080	0.0106
Black	-0.0104	0.0100
Asian	0.0150	0.0034
White	0.1414	0.1761
Eastern Cape	0.0185	-0.0003
Northern Cape	0.0002	-0.0001
Free State	0.0006	0.0014

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Inequality Decompositions (*continued*)

	2000	2005-06
KwaZulu Natal	0.0050	-0.0032
NorthWest	0.0014	-0.0002
Gauteng	-0.0386	0.0200
Mpumalanga	-0.0002	-0.0010
Limpopo	0.0192	0.0002
5-8 HHsize	-0.0248	-0.0218
9-12 HHsize	-0.0075	-0.0039
13+ HHsize	-0.0029	-0.0013
Some schooling	-0.0097	-0.0128
Completed Primary	0.0048	-0.0001
Completed Secondary	0.0350	0.0185
Completed Tertiary	0.0224	0.1121
Medical aid	-0.2169	0.0954
Employed	0.0007	0.0011
Quintile 2	-0.0169	-0.0058
Quintile 3	0.0001	0.0000
Quintile 4	0.0852	0.0162
Quintile 5	0.4276	0.1832

Number of households in 2000 and 2005-06 are 22,470 and 20,902 respectively

Table C.6: Contributions to the Concentration Indices, 2005-06 to 2010-11

	2005-06	2010-11
20-24	0.0004	0.0010
25-29	-0.0006	-0.0001
30-34	-0.0006	0.0001
35-39	-0.0012	0.0001
40-44	0.0012	-0.0004
45-49	0.0000	0.0001
50-54	0.0001	0.0004
55-59	0.0001	-0.0003
60-64	-0.0006	0.0000
65-69	0.0137	0.0000
70-74	-0.0040	0.0000

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Inequality Decompositions (*continued*)

	2005-06	2010-11
75-79	-0.0036	-0.0002
80-84	-0.0004	-0.0001
85yrs +	0.0000	-0.0002
Urban	-0.0179	-0.0138
Female	0.0106	0.0015
Black	0.0100	0.0209
Asian	0.0034	0.0042
White	0.1761	0.1735
Eastern Cape	-0.0003	0.0115
Northern Cape	-0.0001	0.0005
Free State	0.0014	0.0003
KwaZulu Natal	-0.0032	0.0044
NorthWest	-0.0002	0.0042
Gauteng	0.0200	0.0049
Mpumalanga	-0.0010	0.0009
Limpopo	0.0002	0.0143
5-8 HHsize	-0.0218	-0.0053
9-12 HHsize	-0.0039	0.0016
13+ HHsize	-0.0012	-0.0007
Some schooling	-0.0128	0.0001
Completed Primary	-0.0001	0.0002
Completed Secondary	0.0185	-0.0178
Completed Tertiary	0.1121	0.0449
Medical aid	0.0954	0.0188
Employed	0.0011	0.0015
Quintile 2	-0.0058	-0.0056
Quintile 3	0.0000	0.0000
Quintile 4	0.0162	0.0260
Quintile 5	0.1832	0.2615

Number of households in 2005-06 and 2010-11 are 20,902 and 25,124 respectively

Table C.7: Contributions to the Concentration Indices, 1995 to 2010-11

	1995	2010-11
20-24	0.0012	0.0011
25-29	-0.0005	-0.0001
30-34	-0.0004	0.0001
35-39	-0.0007	0.0001
40-44	0.0013	-0.0004
45-49	0.0006	0.0001
50-54	0.0188	0.0004
55-59	-0.0008	-0.0003
60-64	-0.0013	-0.0000
65-69	-0.0018	0.0000
70-74	-0.0018	-0.0000
75-79	0.0000	-0.0002
80-84	-0.0004	-0.0001
85yrs +	-0.0006	-0.0002
Urban	-0.0146	-0.0032
Female	-0.0035	0.0015
Black	0.0066	0.0232
Asian	0.0132	0.0043
White	0.2787	0.1730
Eastern Cape	0.0067	0.0121
Northern Cape	0.0002	0.0005
Free State	0.0031	0.0003
KwaZulu Natal	-0.0006	0.0050
NorthWest	0.0040	0.0044
Gauteng	-0.0353	0.0045
Mpumalanga	0.0024	0.0010
Limpopo	0.0037	0.0154
5-8 HHsize	-0.0118	-0.0054
9-12 HHsize	-0.0052	0.0016
13+ HHsize	-0.0010	-0.0007
Some schooling	0.0056	0.0000
Completed Primary	-0.0109	-0.0000
Completed Secondary	0.0018	-0.0164

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Inequality Decompositions (*continued*)

	1995	2010-11
Completed Tertiary	0.0102	0.0457
Medical aid	-0.0974	0.0191
Employed	-0.0116	0.0017
Piped water	0.00290.0007	
Flush toilet	0.0037	-0.0263
Quintile 2	-0.0143	-0.0064
Quintile 3	-0.0007	0.0000
Quintile 4	0.0600	0.0288
Quintile 5	0.4091	0.2674

Number of households in 1995 and 2010-11 are 28,585 and 25,124 respectively

C.3 Oaxaca-type Decomposition of Change

Tables C.8, C.9, C.10 and C.11 present a change in the concentration index for OOP payments for the years 1995, 2000, 2005-06 and 2010-11. The change over time in the concentration index, weighted by first period elasticity is denoted by $\Delta C\eta$. The numbers denote the relative contributions of the changes in the explanatory variables to changes in the concentration index in each year. The numbers were obtained by estimating Equation 4.9.

Table C.8: Oaxaca-type decomposition of the change in Who Pays for Health Care Through OOP Payments, 1995 to 2000

	$\Delta C\eta$	Standard error
20-24	-0.017	(0.032)
25-29	-0.005	(0.024)
30-34	-0.004	(0.024)
35-39	0.008	(0.023)
40-44	0.036	(0.023)
45-49	0.015	(0.024)
50-54	0.015	(0.025)
55-59	0.023	(0.023)
60-64	0.014	(0.025)
65-69	0.012	(0.026)
70-74	0.012	(0.027)
75-79	0.000	(0.032)

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Oaxaca-type Decomposition (*continued*)

	$\Delta C\eta$	Standard errors
80-84	0.004	(0.036)
Urban	-0.044	(0.013)
Female	0.222	(0.013)
Black	-0.046	(0.021)
Asian	0.031	(0.031)
White	0.442	(0.024)
Eastern Cape	-0.259	(0.021)
Northern Cape	-0.002	(0.030)
Free State	-0.016	(0.021)
KwaZulu Natal	-0.048	(0.020)
NorthWest	-0.028	(0.023)
Gauteng	-0.087	(0.022)
Mpumalanga	-0.026	(0.022)
Limpopo	-0.016	(0.027)
5-8 HHsize	0.084	(0.010)
9-12 HHsize	0.017	(0.019)
13+ HHsize	0.003	(0.049)
Some schooling	-0.033	(0.016)
Completed Primary	0.085	(0.017)
Completed Secondary	0.013	(0.015)
Completed Tertiary	0.016	(0.028)
Medical aid	-0.203	(0.015)
Employed	-0.025	(0.015)
Quintile 2	0.036	(0.014)
Quintile 3	0.073	(0.015)
Quintile 4	0.158	(0.016)
Quintile 5	0.523	(0.021)

Sample Households are 28,585 for 1995, and 22,470 for 2000

Bootstrapped standard errors using 1000 resamples are reported in parenthesis.

Table C.9: Oaxaca-type decomposition of the change in Who Pays for Health Care Through OOP Payments, 1995 to 2010-11

	$\Delta C\eta$	Standard error
20-24	0.000	(0.033)

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Oaxaca-type Decomposition (*continued*)

	$\Delta C\eta$	Standard errors
25-29	0.001	(0.027)
30-34	0.000	(0.026)
35-39	0.000	(0.025)
40-44	0.002	(0.025)
45-49	0.000	(0.025)
50-54	0.001	(0.024)
55-59	0.000	(0.025)
60-64	0.004	(0.025)
65-69	0.005	(0.027)
70-74	0.002	(0.028)
75-79	-0.001	(0.030)
80-84	0.002	(0.035)
Urban	-0.017	(0.015)
Female	0.003	(0.013)
Black	0.020	(0.024)
Asian	-0.012	(0.038)
White	0.034	(0.027)
Eastern Cape	-0.019	(0.028)
Northern Cape	0.000	(0.036)
Free State	0.001	(0.029)
KwaZulu Natal	-0.008	(0.027)
NorthWest	-0.002	(0.032)
Gauteng	0.059	(0.029)
Mpumalanga	-0.001	(0.029)
Limpopo	-0.019	(0.033)
5-8 HHsize	0.003	(0.010)
9-12 HHsize	0.004	(0.019)
13+ HHsize	0.002	(0.036)
Some schooling	-0.003	(0.012)
Completed Primary	-0.005	(0.014)
Completed Secondary	-0.016	(0.018)
Completed Tertiary	0.090	(0.029)
Medical aid	0.312	(0.017)
Employed	0.000	(0.015)
Quintile 2	0.011	(0.013)

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Oaxaca-type Decomposition (*continued*)

	$\Delta C\eta$	Standard errors
Quintile 3	0.000	(0.015)
Quintile 4	-0.145	(0.017)
Quintile 5	-0.458	(0.022)

Sample Households are 22,470 for 2000, and 20,902 for 2005-06

Bootstrapped standard errors using 1000 resamples are reported in parenthesis.

Table C.10: Oaxaca-type decomposition of the change in Who Pays for Health Care Through OOP Payments, 2005-06 to 2010-11

	$\Delta C\eta$	Standard error
20-24	0.001	(0.030)
25-29	0.001	(0.025)
30-34	0.001	(0.024)
35-39	0.001	(0.023)
40-44	-0.002	(0.022)
45-49	0.000	(0.023)
50-54	0.000	(0.021)
55-59	0.000	(0.022)
60-64	0.001	(0.023)
65-69	0.000	(0.024)
70-74	0.004	(0.025)
75-79	0.003	(0.027)
80-84	0.000	(0.033)
Urban	0.004	(0.012)
Female	-0.009	(0.013)
Black	0.011	(0.018)
Asian	0.001	(0.033)
White	-0.003	(0.021)
Eastern Cape	0.012	(0.025)
Northern Cape	0.001	(0.030)
Free State	-0.001	(0.025)
KwaZulu Natal	0.008	(0.024)
NorthWest	0.004	(0.029)
Gauteng	-0.015	(0.025)

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Oaxaca-type Decomposition (*continued*)

	$\Delta C\eta$	Standard errors
Mpumalanga	0.002	(0.027)
Limpopo	0.014	(0.028)
5-8 HHsize	0.026	(0.009)
9-12 HHsize	0.006	(0.014)
13+ HHsize	0.001	(0.022)
Some Schooling	0.013	(0.013)
Completed Primary	0.000	(0.013)
Completed Secondary	-0.036	(0.017)
Completed Tertiary	-0.067	(0.024)
Medical aid	-0.077	(0.013)
Employed	0.000	(0.010)
Quintile 2	0.000	(0.013)
Quintile 3	0.000	(0.013)
Quintile 4	0.010	(0.015)
Quintile 5	0.078	(0.020)

Sample Households are 20,902 for 2005-06, and 25,124 for 2010-11

Bootstrapped standard errors using 1000 resamples are reported in parenthesis.

Table C.11: Oaxaca-type decomposition of the change in Who Pays for Health Care Through OOP Payments, 1995 to 2010-11

	$\Delta C\eta$	Standard errors
20-24	0.000	(0.030)
25-29	0.000	(0.021)
30-34	0.001	(0.022)
35-39	-0.001	(0.021)
40-44	-0.002	(0.020)
45-49	-0.001	(0.020)
50-54	0.000	(0.022)
55-59	0.001	(0.020)
60-64	0.001	(0.022)
65-69	0.002	(0.022)
70-74	0.002	(0.024)
75-79	0.000	(0.028)
80-84	0.000	(0.034)

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Oaxaca-type Decomposition (*continued*)

	$\Delta C\eta$	Standard errors
Urban	0.011	(0.011)
Female	0.005	(0.014)
Black	0.017	(0.014)
Asian	-0.009	(0.026)
White	-0.106	(0.017)
Eastern Cape	0.005	(0.017)
Northern Cape	0.000	(0.022)
Free State	-0.003	(0.017)
KwaZulu Natal	0.006	(0.016)
NorthWest	0.000	(0.019)
Gauteng	0.080	(0.018)
Mpumalanga	-0.001	(0.018)
Limpopo	0.012	(0.018)
5-8 HHsize	0.007	(0.010)
9-12 HHsize	0.007	(0.014)
13+ HHsize	0.000	(0.040(
Some schooling	-0.006	(0.016)
Completed Primary	0.011	(0.016)
Completed Secondary	-0.018	(0.014)
Completed Tertiary	0.036	(0.022)
Medical aid	0.117	(0.012)
Employed	0.013	(0.010)
Quintile 2	0.008	(0.012)
Quintile 3	0.001	(0.013)
Quintile 4	-0.031	(0.014)
Quintile 5	-0.142	(0.017)
Piped water	-0.002	(0.020)
Flush toilet	-0.030	(0.012)

Sample Households are 28,585 for 1995 and 25,124 for 2010-11

Bootstrapped standard errors using 1000 resamples are reported in parenthesis.

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