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**CO-PAYMENT FEE AND UTILISATION OF HEALTHCARE SERVICES: THE CASE
OF OUT-PATIENT INSURED PATIENTS AT AGA-KHAN HOSPITAL MOMBASA**

HEMED TWAHIR

MBA-HCM/89166



**SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF BUSINESS ADMINISTRATION IN HEALTHCARE
MANAGEMENT AT STRATHMORE BUSINESS SCHOOL**

STRATHMORE BUSINESS SCHOOL

STRATHMORE UNIVERSITY

NAIROBI, KENYA.

JUNE 2023

DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

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Hemed Twahir

MBA-HCM/89166

Approval

The dissertation of Hemed Twahir was approved by the following:

Supervisors: Dr Edwin Barasa and Eric Tama

Strathmore Business School

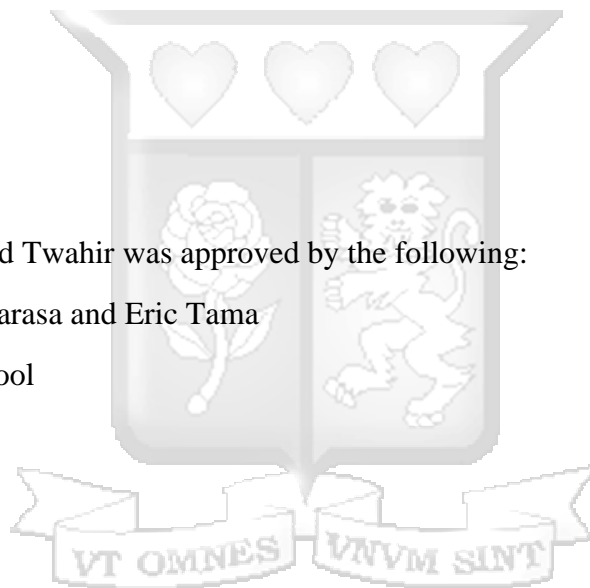
Dr. Ceaser Mwangi

Executive Dean

Strathmore University Business School.

Dr. Bernard Shibwabo

Director, Office of Graduate Studies



ABSTRACT

Third party payers of health such as health insurance companies whom for a long time have been reporting losses (despite an increase in the premium contributions), introduced gate keeping measures such as co-payments to try to control utilisation of health services by patients by reducing hospital visits, consultation, laboratory and pharmaceutical costs. Co-payments introduce out of pocket payments health, a key component in reducing universal health care. The effectiveness of these co-payments in reducing utilisation of health services/ health costs and resulting in savings for the health insurance companies is however still unclear, with some studies arguing that it has little or no effect and some actually having opposite effects of increasing health costs. This was a retrospective cross-sectional study carried out at the Aga-Khan Hospital, Mombasa Outpatient department (OPD) centers amongst different patients seeking healthcare services at the facility. Study patients included all insurance patients seeking health services at these different OPD centres. Those on co-payments were compared with those on no co-payments, seeking to determine if the presence of co-payments affected utilisation of various healthcare services and if so by what extent and at what difference in costs. Utilisation of health was determined through assessing patient numbers and cost. Data of more than 108,000 patients who visited the hospital over a 12-month period in the year 2021 was obtained from the Hospital Management Information System. Descriptive analysis was done presenting counts (percentages) and means (standard deviations) of the different variables. Bivariate analysis tests for differences in the hospital visits among the co-pay groups was done using Chi square tests for categorical variables and one-way analysis of variance (ANOVA) and median tests for the continuous variables, presenting the p values. Utilisation of health services was analysed by mainly comparing number of visits and costs of the different health services in the study population. The co-payment group was further divided into four tiers of co-payments (Kshs 1-500, 501-1000, 1001-1500 and 1501-2000). The findings showed that co-payments generally had the effect of increasing cost of utilisation of healthcare compared to when there was no co-payment and also affected the number of patients attempting to utilise health. Co-payment tier of Kshs 1-500 had the highest number of patients seen for those on co-payment and the number of patients generally decreased as co-payment increased. In conclusion, the study showed that, co-payments affected the overall costs of a patient visit to the hospital. There was also a significant difference in the consultation costs, laboratory costs and pharmaceutical costs per hospital visit of those on co-payment comparing those not on co-payment with those on co-payment paying more to see a doctor at the outpatient department compared to those not on co-payment. The overall utilisation costs per visit were also significantly higher in those who paid co-payment versus those that did not. Analysis of the different tiers of co-payments showed a significant difference in cost of utilisation in some aspects of healthcare in some tiers of co-payments. These results can thus be used by both the insurance companies and other stakeholders in the health industry to influence policy on health financing.

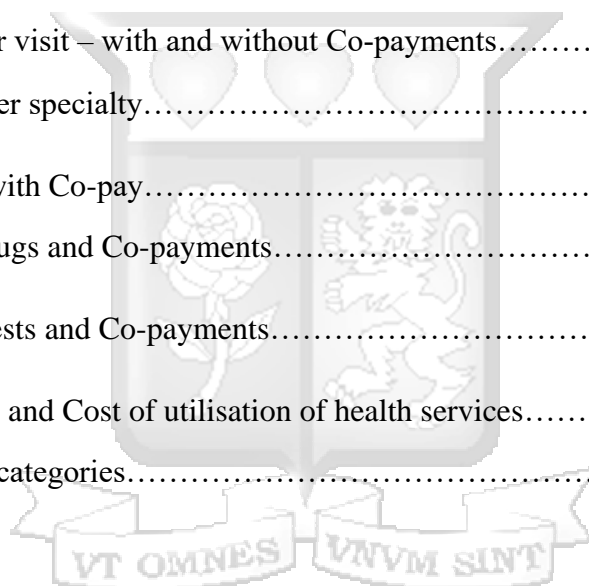
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LIST OF ABBREVIATIONS

AKI	Association of Kenya Insurers
Co-pay	Co-payment
HMIS	Health Management Information System
Kshs	Kenya Shilling
OECD	Organisation for Economic Co-operation and Development
OPD	Outpatient Department
OHC	Outreach Health Centre
OOP	Out of Pocket
WHO	World Health Organisation
SPSS	Statistical Package for Social Sciences



OPERATIONAL DEFINITIONS

Catastrophic Expenditure: This occurs when out of pocket expenditure in healthcare constitutes a large portion of a household or individual's income, thus driving them into poverty.

Chronic Condition: A human health condition that is persistent or otherwise long-lasting. The course of the disease lasts for more than three months.

Co-payment: An additional payment made by a patient on top of that made by a third party including an insurer in order to access healthcare services.

Cost Sharing: The share of costs covered by an insurance company that a patient pays out of his pocket. The term covers forms of payments such as deductibles, coinsurance and copayments.

Gate Keeping: A way of controlling access to healthcare services to patients who may need it, typically done by a physician or nurse, who has the first encounter with a patient.

Moral Hazard: The situation where additional healthcare services are knowingly sought by individuals by the mere fact that they are insured or that the payments for services consumed are made by a third party.

Physician: A medical practitioner, including a doctor, who practices medicine that involves promoting, preserving and maintaining health.

Prescriber: A person in the medical profession who is legally allowed to order medicines for patients.

Premiums: The amount paid by an individual or an organization in order to be insured against certain risks, including ill health.

Price Inelastic: An economic situation where the quantity of a service or good that is supplied or demanded is not affected by changes in the pricing of that good or service.

Rational Use: A state that is not wasteful where people use healthcare commodities and services in a way that meets their needs.

Third Party Payers: An organization/ entity (includes insurers and employers) that pay for healthcare on behalf of the beneficiaries. The beneficiary in most cases pays a premium in advance before the payer takes the responsibility of payments of claims.

User Charges: The amount of money paid by an individual as a necessary condition to access healthcare services.

Utilisation of Health: The act of using a healthcare service, measured by assessing patient numbers and costs of utilisation

ACKNOWLEDGEMENT

I thank my Supervisors, Dr Edwin Barasa, and Dr Eric Tama for graciously accepting to walk with me in this academic journey and agreeing to supervise my dissertation. I also extend my gratitude to Strathmore Business School and Strathmore University for stellar academic guidance in the MBA in Health Management course. My sincere gratitude to my employer, the Aga-Khan Hospital, Mombasa and its leadership for agreeing to me using the hospital data for this dissertation. Lastly, I must appreciate my family for the patience and support shown by them during this academic drive.



CHAPTER ONE:

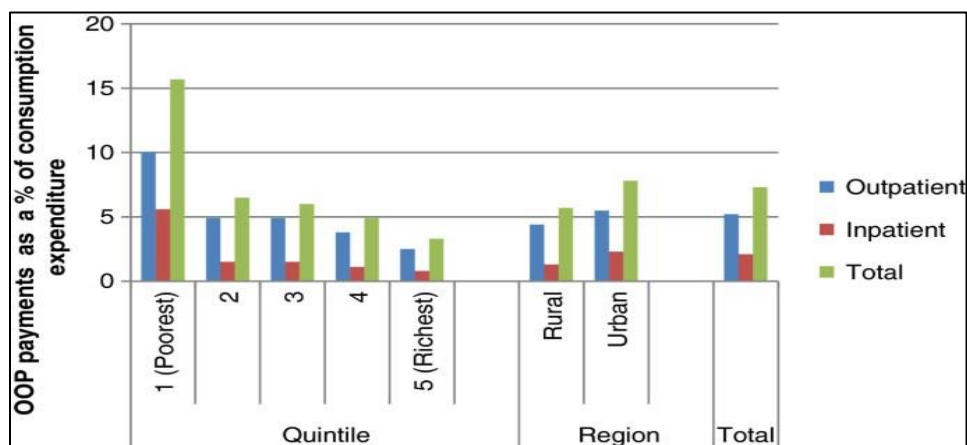
INTRODUCTION

1.1 Background

Cost is an important agenda the corporate and insurance world considers when leveraging user fees to their customers. Whether in public or private healthcare, there are two general purposes of co-payment in the health insurance system; first is to reduce moral hazard and secondly to raise revenue (Drummond & Towse, 2012). Moral hazard causes indiscriminate use of healthcare resulting in reduced revenue for these insurance companies and increased costs of providing and supporting healthcare. The argument from the health insurance industry has been that despite the steady growth of the industry in Kenya in the recent past, the sector still registered losses; total loss of Kshs. 0.78 billion in 2016 up from Kshs. 0.31 billion in 2015. (Association of Kenya Insurers, 2016). It is thought the general loss in the health insurance industry may be due to moral hazard and to correct for this, the various insurances then introduced co-payments on certain groups of patients. The intended effect of co-payments for the patient in health insurance is to introduce out-of-pocket payments hoping to affect their health seeking behaviours at the out-patient level and at other health service levels. This may result in patients who are paying co-payments reducing their number of visits to hospitals or seeking alternative health sources other than their preferred healthcare provider or result in increased total costs of medical care to the patient. User charges (co-payment is one of the user charges) have been employed since the beginning of the 20th Century in several African countries after attaining their independence in an effort to develop financially sustainable models that ensure universal coverage of essential services (Dennis, Benova, Goodman, C. *et al*, 2020). Evidence at the time of introduction of user fees also suggested that unwarranted use of health services contributed to only a small proportion of the cases hence suggesting that moral hazard was then not an issue (Dennis, Benova, Goodman, *et al*, 2020). Kenya was no exception, and the introduction of user fees in the public sector in the early 1990s did not only result in reduced health service seeking in the public sector but also resulted in change in health seeking behaviour where patients moved away from the public sector into the private sector rather than just reducing the overall demand for health (Dennis *et al*, 2020., Matji, Ts'oene, Spencer, Gertler, Byrne, 1996., Mwabu, Ainsworth, Nyamete, 1993., Mbugua, Bloom, Segall, 1995., Chuma & Maina, 2012). Most

of these co-payments are usually fixed with disregard to equity (Chuma & Maina, 2012). (Figure 1)

Figure 1.0: OOP payments as a percentage of consumption expenditure in the rich and poor in Kenya (Chuma & Maina, 2012).



The Impact of co-payments on the utilisation of health services is varied and sometimes unpredictable (Toop, Jackson & Jennifer, 2014.). Various studies have sought to understand the effect of user charges on the utilisation of healthcare services by patients. A study carried out in Kisumu, Kenya looking at one insurance provider and analysing utilisation of laboratory and pharmacy services concluded that the use of co-pay did not affect utilisation of health services in their set up (Gone, 2018). Other studies carried out mainly in the United States came up with different conclusions. (Stroupe et al, 2007). A study on the Medicaid program found that while there might not have been a reduction on the overall trend of utilisation of healthcare, co-payment resulted in a reduction on use of prescription drugs (Hartung et al, 2008), while a similar study on Medicaid cancer patients showed that the introduction of even moderate amounts of co-payments, resulted in patients changing their health seeking behaviour (Subramanian, 2011) by reducing consumption of healthcare. In these studies, while the co-payments did not result in an overall decrease in the cost of healthcare, it non the less resulted in more negative consequences. These patients ended up having more emergency room visits than those without co-payments (Subramanian, 2011). There are other factors that determine how healthcare is utilised; Doctors too play a key role in the ultimate decision on the number and kind of drugs prescribed and influence other kind of health services selected (Dekay & Asch, 1998). They thus become a key player in determining the cost of

healthcare, beyond the control of user fees such as co-payments. So, while theoretically user fees (co-payments) were introduced by insurance companies with the aim of controlling costs and improving revenue and profits, on the ground there is little evidence to support this and sometimes may actually have opposite unintended effects.

1.2 Problem Statement

The high cost of healthcare is a concern worldwide. Kenya is not any different, as health Insurance companies continue reporting losses despite the increase in premiums. The result is that health insurance companies and other third-party payers end up introducing gate keeping measures aiming at controlling the utilisation of health services by patients and reducing moral hazard (Chernew et al, 2010 & Gemmill et al, 2008). These measures include introducing out of pocket payments such as co-payments. The effectiveness of co-payments in reducing utilisation of healthcare services and thus healthcare costs is not certain and, in some cases, unpredictable (Toop, Jackson & Jennifer, 2014.) with some studies showing an increase in both utilisation and costs in certain situations where co-payments have been introduced (Subramanian, 2011). Reduced access to essential medication resulting in more emergency department visits ended up increasing the overall cost of healthcare for these individuals. Introducing co-payments also brings in the feeling of entitlement, resulting in some of the patients demanding for more services or more costly interventions due to having made a co-payment (Tamblyn et al, 2001). Mostly, co-payments shift the burden of payments from the third-party payers to the patients without considering their ability to pay, thus promoting inequity in healthcare (Chuma & Maina, 2012). Has the number of patients seeking treatment at the various outpatient departments been affected by co-payments and if so, how do the numbers compare with insurances that do not charge co-payments? This study will therefore seek to give a better understanding in appreciating how added costs of healthcare such as co-payments may affect patient numbers and health costs.

1.3 Study Objectives

1.3.1 General Objective

To assess the effect of co-payments levied to medically insured patients on utilisation of healthcare services at the Outpatient departments of the Aga-Khan Hospital, Mombasa and its outreach clinics.

1.3.2 Specific Objectives

The specific objectives of the study will be:

- i. To assess the association between co-payments and the number of visits and average consultation costs for Insurance patients seeking healthcare services at the Aga-Khan Hospital, Mombasa Outpatient Department.
- ii. To assess the association between different levels of co-payments and the number of visits and average consultation costs for Insurance patients seeking healthcare services at the Aga-Khan Hospital, Mombasa Outpatient Department.
- iii. To assess the association between co-payments and the average number and average costs of laboratory tests, pharmaceuticals and other hospital related activities for insurance patients seeking healthcare services at the Aga-Khan Hospital, Mombasa Outpatient Department.
- iv. To assess the association between different levels co-payments and the number and average costs of laboratory tests, pharmaceuticals and other hospital related activities for insurance patients seeking healthcare services at the Aga-Khan Hospital, Mombasa Outpatient Department.

1.4 Research Questions

- i. Does the presence of co-payments in medically insured patients affect the average utilisation of healthcare services for patients seeking health services at the Out-patient departments of the Aga-Khan Hospital, Mombasa?
- ii. Does the amount of co-payments levied to medically insured patients affect the average utilisation of healthcare services for clients seeking health services at the Out-patient departments of the Aga-Khan Hospital, Mombasa?
- iii. Does the presence of co-payment in medically insured patients affect the cost of medical care in clients seeking healthcare?

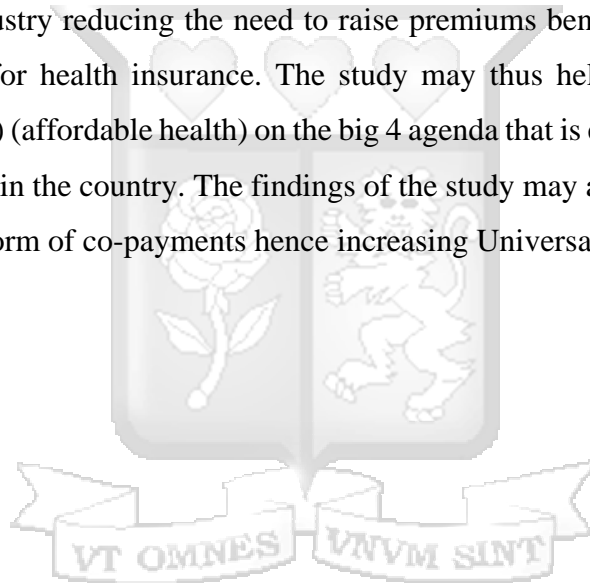
1.5 Justification of the Study

User fees in different forms have been in use in the healthcare industry for quite some time; both in public and private health practice. Depending on the sector, the user fees have been introduced to achieve certain specific effects, either to raise revenue and hence help finance health care or as a

method to reduce moral hazard. In 2020, the medical insurance industry was the largest class in general insurance business, accounting for 34.4% of the total gross direct premium income. This industry has however been making losses with only five out of the 16 medical insurance providers in Kenya having made a profit in 2009 (Association of Kenya Insurers, 2009) To mitigate for the rise in costs of operations, medical insurances react by instituting several mechanisms including restricting access to services (reducing number of visits and number of tests done), cost sharing arrangements like Co-insurance, Co-payment, and Deductibles. These cost sharing mechanisms are designed to discourage the frivolous use of healthcare. This, however, introduces out of pocket (OOP) payments for health services which have been shown to be regressive when it comes to access to health care. Many have argued that these measures may not have the desired effect of reducing utilisation of health care services (Wallace, McConnell, Gallia & Smith, 2008) and indeed the role of co-payments has been questioned by many a Policy maker cautioning its blanket use especially to low-income beneficiaries. The argument is that co-payments raise inequity. By forcing poor people to pay for a service they could not afford to pay for in the first place merely results in the shift of healthcare financing burden to the poor patients (Drummond & Towse, 2012, Gemmill et al, 2008) Despite all these findings user fees in different capacities continue to be used. A review of these practices is therefore important especially in a private hospital setting like that of Aga-Khan Hospital, Mombasa where moral hazard may be more prevalent than in the public healthcare space. It is worth noting that the population served at the Aga-Khan Hospital, Mombasa comes from varied backgrounds with many clients coming from poverty-stricken areas. It is only the insurance cover that allows some of these patients to be attended to in this private hospital. Co-payments leveraged on these poor patients with medical insurance cover is likely to see some of them not being able to afford the initial entry to receiving medical care (despite a medical cover), hence influence ability/ disability to utilize health care. For a health provider like the Aga-Khan hospital, Mombasa, this may affect patient volumes and hence revenue. For the clients, it may see them denied essential quality, affordable medical services. For the insurance industry, this may result in a reduced number of patients seeking medical care, reduced claims, and thus more savings for them.

The study therefore sought to establish the effects of co-payments in utilisation of healthcare services in a private hospital setting where close to 80% of clients have some form of insurance. Aga-Khan Hospital, Mombasa has a unique space in the healthcare industry in proving or negating

the hypothesis that the presence of co-payments on medically insured patients does not change the health seeking trends of these insured clients; that the presence of copay does not deter their health seeking appetites. Health insurance companies sending their clients to Aga-Khan Hospital, Mombasa levy none to varied amounts of co-payments to their clients making Aga-Khan Hospital, Mombasa an ideal place to conduct this study. With the current argument that co-pay may not have the desired effects of reducing moral hazard, and therefore not encouraging much savings for medical insurance industry, the outcome of this study may ultimately help third party payers and insurance companies come up with a better model of engaging patients and health care providers in controlling moral hazard and controlling the overall costs of healthcare services. If properly implemented, this may lead to an improvement in the financial performance of the private healthcare insurance industry reducing the need to raise premiums benefiting both the employers and individuals paying for health insurance. The study may thus help in contributing ideas in sustaining agenda four (4) (affordable health) on the big 4 agenda that is envisioned would stimulate growth and development in the country. The findings of the study may also help in reducing out of pocket payments in the form of co-payments hence increasing Universal Health Coverage (UHC).



CHAPTER TWO:

LITERATURE REVIEW

2.1. Introduction and Overview of Co-payments

Third party payers in a bid to reduce utilisation of healthcare services have introduced gatekeeping mechanisms in the form of Co-payments. With the absence of co-payments, patients are not financially discouraged to forgo care, and are unlikely to only utilize care that is just useful to them. Hence co-payments are envisioned to serve to reduce moral hazard. Very high co-payments however undermine the very reason why individuals insure themselves, that is protection from catastrophic expenditure when they fall ill. Co-payments also place an unnecessary burden on the lower income groups and sicker members of society (Gruber, 2006). A central question for designing health insurance plans is: how large should such a co-payment amount be? This question has been an important source of debate among both academics and health policy makers. Addressing this standoff requires us addressing several questions. First, to what extent do higher patient co-payment charges reduce use of medical care? Second, to what extent is that reduction harmful in terms of personal health. Third, how do these effects vary by patient characteristics such as income and health status? (Gruber, 2006). Co-payments are thus a deliberate attempt by third party insurance payers to introduce out of pocket payments that have been put into place to reduce moral hazard, which will intern reduce utilisation of healthcare by discouraging hospital visits and ultimately reducing health costs. It is also worth noting that very high co-payments put an unnecessary financial burden on lower income groups and vulnerable populations, possibly depriving them of essential medical care.

2.2. Empirical Review

Co-payments have been levied against medically insured patients for some time now. In a private hospital setting like that of Aga-Khan Hospital, Mombasa where more than 80% of the patients are medically insured patients, co-payments are likely to showcase associated concerns if any. Where competition is strife in a small town like Mombasa, our experience tells us that, we not only lose patients to our competitors who have few co-paying clients and with smaller co-payments but patients on co-payments ultimately on average pay more per hospital visit than their counter parts who do not pay co-pay. There is however little evidence to support this as none of the hospital's patient records have been audited along these lines.

2.2.1. Effects of Co-payments on patient numbers and Consultation costs

Consultations costs are the first costs a patient comes across in trying to access healthcare. Co-payment rates are highly influential on the likelihood that an enrollee will use any medical care. The number of face-to-face visits and total outpatient expenditures reduce as co-insurance rates increase. With a 25% co-payment rate, outpatient expenditures are already about 25% lower than with no co-payment. Moving from a 25% to a 95% co-insurance rate lowers spending by another 22%. (Gruber, 2006). This reinforces the discussion that co-payments are able to achieve the desired effects of reducing patient numbers and patient related health costs hence reducing moral hazard. In the case of in-patient care, the relationship between co-payments and utilisation of health is less clear. Inpatient numbers are lower with some co-payments than with free care, but inpatient utilisation is only modestly lower at a 95% co-payment rate than a 25% co-payment rate. The relationship is not as linear as when comparing co-payments and outpatient utilisation.

2.2.3. Effects of varying co-payment on the average expenditures on health services

Data from the RAND study shows that total expenditures of health service provision doubled when co-payments increased significantly (from 15% to 30% increase in expenditure when the co-insurance plan increased from 25% to 95%) strengthening the argument that co-payment rates matter as regards to medical spending for health (Gruber, 2006). The higher the co-pay, the higher the average expenditure per visit. Certain authors have argued that reduced expenditure on healthcare when co-payments are introduced may only be short term, but in the long run may increase the overall costs of care, especially if no cheaper substitutes for the for-gone services are available (Stroupe et al, 2007). This may be due to the adverse health effects of delay of treatment associated with initially seeking alternative treatment because of the introduction out of pocket payments – the co-pay.

2.2.4. Effects of co-payments rates on vulnerable groups and health outcomes

While higher co-payments rates lead to lower levels of both effective and ineffective medical utilisation, they do not seem to have an adverse impact on health outcomes for the average person. When it comes to vulnerable groups however, including children, indigenous people, older people

and the financially disadvantaged, it may result in delay in seeking treatment for serious illness, with consequent health compromise. In a study, amongst the lower income groups, increases in co-payments result in reduced use of healthcare services and medication which in the long run may cause adverse effects on their health thus leading to increased use of emergency services (Lu, 2003). As would have been expected, lower income groups were somewhat more sensitive to co-payments for the use of outpatient care, but less sensitive for inpatient care and comparable on emergency room care and antibiotic use (Gruber, 2006). The sensitivity as regards income groups is more visible for dental care, where a much larger reduction in visits in response to co-payment is seen among lower income groups than among higher income groups even though the effects on total dental expenditures were comparable. For the paediatric population, a much larger reduction in effective care than in ineffective care is seen. Poor children paying co-pay are less likely to get effective medical care compared to their counterparts in the higher income bracket. For the adult population there was not much difference between the higher and lower income groups (Gruber, 2006).

One of the effects of Co-pay on the health system is to exploit the unwillingness to pay for medical services by patients because of the presence of the co-pay. This relationship is quite strong such that close to 30% of patients observed in one study (Baum et al, 2016), 20% of whom had chest pain with a possible differential diagnosis of myocardial infarction declined treatment. Co-payments are meant to veer patients into therapies that are more cost effective and offer value for money, and therefore resulting in lower costs of healthcare (Drummond & Towse, 2012) leaving other more expensive services for those willing to pay. Effects of co-payments on some vulnerable groups is thus a reality with some of these groups willing to forego treatment with an introduction of out of pocket payment such as co-pay.

2.2.5. Effect of co-payments on Cost of pharmaceuticals.

In any health system, provision of reliable, efficacious drugs is one of the goals. There is an overall increase in total expenditure of drugs forcing key players to examine how they can use techniques to lower the cost of pharmaceuticals hence reducing health costs (Schumock et al., 2016). Use of co-pay is seen as one of the methods to try and bring down these costs and some studies have supported its deployment to achieve this. The Veteran affairs study for example showed a decrease in the number of medications obtained after co-pays were introduced, with the largest impact in

those with higher medication use (Stroupe et al, 2007). A study on cancer patients on the Medicaid program showed a change in health seeking behaviours with even a moderate increase in co-pay with a resultant decrease in supply of medication. (Subramanian, 2011). These two studies indicate that copayments reduce utilisation of pharmaceutical services, especially for patients with chronic conditions. On the other hand, people with life threatening conditions are more price inelastic and tend to tolerate more co-payments to obtain their drugs. Their demand for the services is thus not driven by moral hazard but by more complex decision-making processes that tend to ignore this financial implication (Hirsch, Balu, & Schulman, 2014). In such populations, co-payments may therefore result in catastrophic expenditures leading to impoverishment in the low-income earners. The jury on Effects of co-payments on pharmaceuticals is still out there with some studies showing a downward trend with use of co-pay while others showed an overall increase in total expenditure on drugs.

2.2.6. Effect of co-payments on utilisation of laboratory services

Auxiliary services such as pharmacy and laboratory services are some of those that increase the overall cost of healthcare. It is thought that unnecessary tests that are sometimes performed are a major contributor to the high cost of healthcare necessitating third party payers to consider adding controls such as co-pay on laboratory services (Vegting et al., 2011). In most cases it is the physician that decides the number of laboratory tests to be carried out on a patient guided by various reasons. Controlling/ gate keeping at the physician level may therefore help in reducing overall healthcare costs. This can be achieved through co-payments together with physician education on cost control (DeKay & Asch, 1998). One study in a Cyprus Emergency Department revealed that introduction of co-pay by itself did not result in a decrease in the number of laboratory tests done per visit as they were supplier induced but rather resulted in a reduction in number of visits per facility (Petrou, 2016). Being physician driven, reason dictates that other measures must be used instead, including the use of guidelines for investigations and education of the physician as an important stakeholder. In acute and emergency conditions and also in preventive use of laboratory services, introduction of co-payments did not result in a decrease in the utilisation of laboratory services whereas the same was not the case for chronic diseases (Reddy et al, 2014). This must be because investigations in these acute settings are considered to be urgent and are requested regardless of cost as they may be lifesaving. In chronic conditions, co-payments resulted in reduced use of laboratory tests.

This may be because those with chronic conditions had a better understanding of their diseases and could therefore afford to differ some laboratory tests. Effects of co-payments on laboratory services is therefore dependent on the clinical condition of the patient and physician decision, making the relationship between the two unpredictable.

Figure 2.2 Conceptual Framework on effect of Co-pay on Utilisation of Health Services (Gone et al 2018)

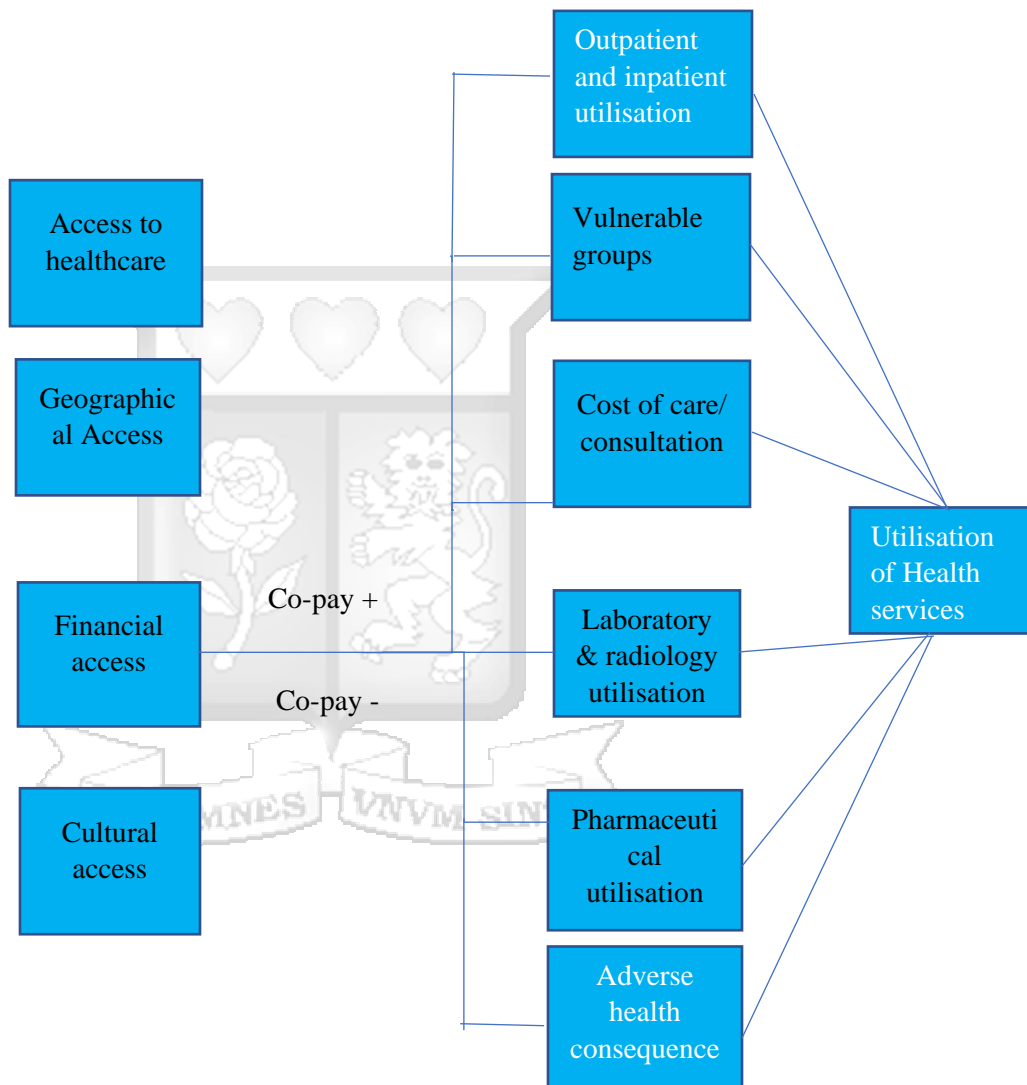


Figure 2.1 Conceptual Framework on effect of Co-pay on Utilisation of Health Services (Gone et al 2018)

The conceptual Framework demonstrated the relationship between access to care keeping in mind the third party payer and the presence or absence of a co-payment. This conceptual framework emphasises how financial access through the third-party payer is affected by the presence or absence of a co-payment. It thus explains how where there is a third-party payer such as a health insurance company, the presence or absence of a co-payment affects the three measurables of utilisation, that is, cost of care (consultation costs), number and cost of pharmaceuticals prescribed and number and cost of laboratory tests done



CHAPTER THREE:

RESEARCH METHODOLOGY

3.1 Study Design

The is a retrospective, cross-sectional study. Patient visit data from all the insurance patients seen at the Aga-Khan Hospital, Mombasa over a one year period; January 2021 to December 2021 was collected and studied. Quantitative data on the average number of visits, cost per visit, number of laboratory tests and average laboratory costs per patient and drugs issued per patient and average drug costs per patient and other average hospital costs per patient were collected from the Hospital Management Information System (HMIS). The data was then analysed based on the different categories of patients.

3.2 Study Population and Sampling

The study population was all insured patients who had been seen at the different out-patient departments of the Aga-Khan Hospital, Mombasa (AKHM) over a one-year period. These patients were classified into two categories, that is, those whose insurance charges co-pay and those whose insurance does not charge co-pay. The ones with co-payments levied were further analyzed from lowest to the highest co-payments paid. These clients were then be categorised into different tiers of co-pay, creating a reasonable gap of 4 co-payment tiers. The 4 co-payment tiers are Kshs 1 to 500, Kshs 501 to 1000, Kshs 1001 to 1500 and Kshs 1500 to 2000.

Data for all insurance patients who received services at the different AKHM Out-Patient departments/ Centres over a one-year period, that is, from January 2021 to December 2021 was collected. The data included 108273 patient visits sampled from the Hospital Management Information System (HMIS). All patients met the inclusion criteria. These were collected and based on the different categories of patients.

3.3 Data Collection

Quantitative data for the period of one year (January 2021 to December 2021) was collected from the facility HMIS system. The data was then entered into a spreadsheet cleaned and prepared for analysis. Data on the average number of visits per doctor, specialty doctor (GP or Specialist) seeing the patients, cost per visit, number and costs of laboratory tests carried out per visit and number of

drugs issued and cost per visit, was collected. Average costs of other services rendered at AKHM were also .

3.4 Data Analysis

Data was cleaned and analysed. Descriptive analysis was done presenting counts (percentages) and means (standard deviations). Bivariate analysis tests for differences in the demographic and clinic costs among the co-pay groups and those not on the co-pay groups was done using Chi square tests for categorical variables and one-way analysis of variance (ANOVA) and median tests for the continuous variables, presenting the p values. The analysis of the data was done in order to determine variations in utilisation of health services in terms of average number of visits, average cost per visit, number of laboratory tests done, and number/ cost of drugs issued to clients with no co-payments and those paying the different tiers of co-payment It was not possible to assess the income levels of the health users as this is a retrospective study, and this is not one of the variables captured in the registration of patients. The Statistical significance was determined at the 5% level of significance with a power of 80%. SPSS software version 20.0.1 was used for all the descriptive and bivariate analysis. The results were then be presented in pie charts, tables and graphs.

3.5 Measures of Reliability and Validity

The data to be used from the study was obtained from the health facility's HMIS system. The data obtained is thus reliable. Data was then be retrieved from the system on two different occasions by different people to ensure observer reliability and test-retest reliability. Some of the patient visits were sampled and confirmed by the system to ensure accuracy. External validity was guaranteed by ensuring that all data within the 12-month period was considered. Content validity was guaranteed as the spreadsheet was structured in a way that captured all the relevant data relating to utilisation of healthcare services and the corresponding presence or absence of a co-payment.

3.6 Ethical Considerations

Approval to carry out the study was sought and granted from the Aga-Khan Hospital's Clinical Hospital Ethics Committee and from the CEO of the Aga-Khan Hospital, Mombasa and from the Strathmore University Ethical Review Board before accessing data from the hospital's HMIS system. Confidentiality of respondents and source of information was assured. Patient data is password protected and will only be accessible to the researcher/s.

CHAPTER FOUR:

PRESENTATION OF RESEARCH FINDINGS

4.1 Descriptive Statistics

4.1.1 Characteristics of the patients

The analysis data was collected over a period 12-month period between 1st January 2021 and 31st December 2021 from the different Out-patient centres across the Aga-Khan Hospital Mombasa network. This included the Out-patient casualty department at the main hospital and the different Aga-Khan Hospital, Mombasa outreach Centres across the broader Coastal region (Outreach centers in Ukunda, Changamwe, Kuze and Kilifi areas).

Table 4.1: Descriptive Statistics

Total patients	Count	Percent
Gender of the patient	108273	100%
Male	47853	44%
Female	60420	56%
Category of the patient		
General patient	81601	75.4%
Specialist	25013	23.1%
Dental	1659	1.5%
Was co-payment required?		
No	99058	91.5%
Yes	9215	8.5%
Category of co-payment?		
No co-pay	99058	91.49%
1 to 500	7066	6.53%
501 to 1000	2033	1.88%
1001 to 1500	100	0.09%
1501 to 2000	16	0.01%

All the patients recruited were sampled as all had met the inclusion criteria. This study obtained a total of 108,273 patients who had attended the outpatient departments in Aga Khan Hospital, Mombasa (Table 4.1)

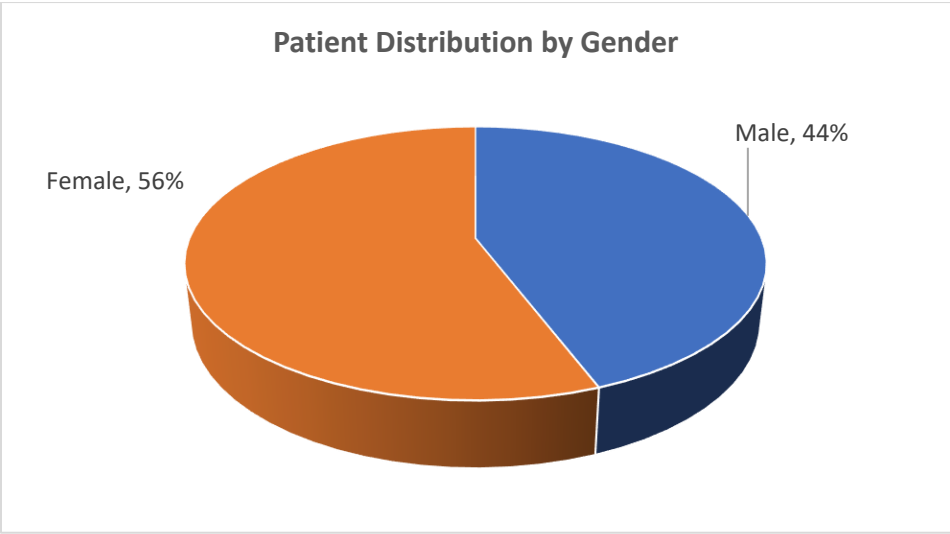


Figure 4.2: Gender of the patient

The results indicate that, over half of the patients, 56 percent (60,420) were females while 44 percent (47,853) were males (Figure 4.1, Table 4.1). Most of the patients seen were seen by a general practitioner doctor (81601, 75.4%) with the different Specialties contributing to 25013 (23.1%) of the patients seen and a very small percentage were dental (1624,1.5%) (Figure 4.2)

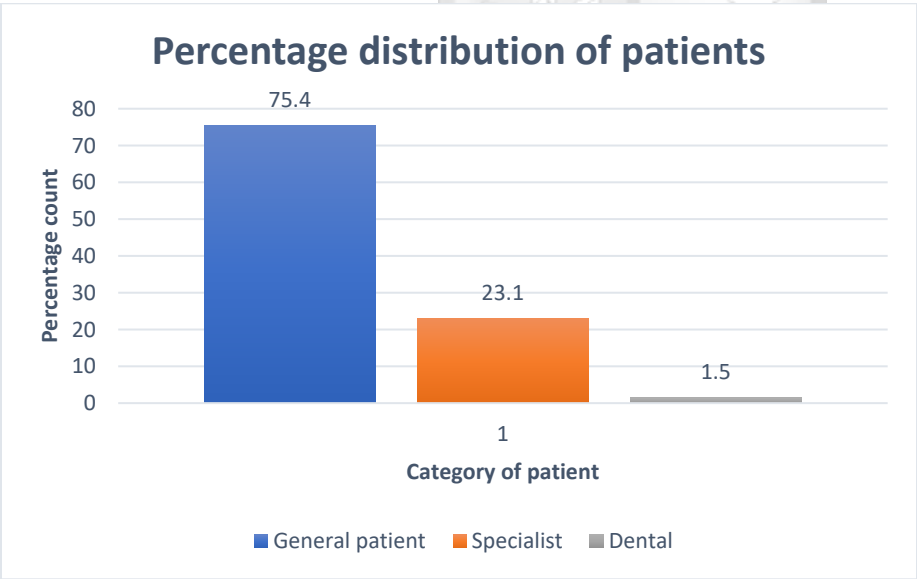


Figure 4.2: Distribution of patients

The age profile of the patients seen was not included in this data and therefore not described here. The patients sampled included only insurance patients and those paid for directly by different corporates schemes. Cash paying patients data was excluded. Of all the patient visits, 9215 (8.5%) were on co-payment, with the rest having no co-payment (Figure 4.3). The co-payments ranged from as low as Kenya Shillings (Kshs) 100 to a high of Kshs 2000 (Figure 4.4).

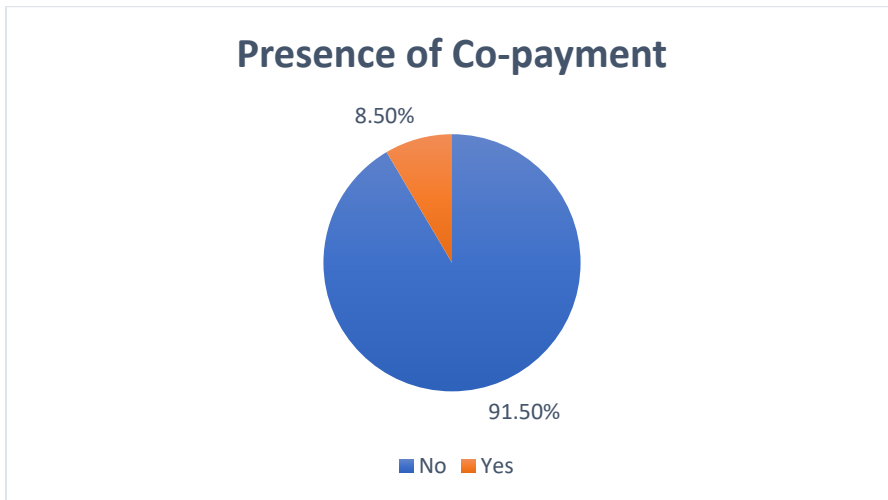


Figure 4.3: Presence of Co-payments

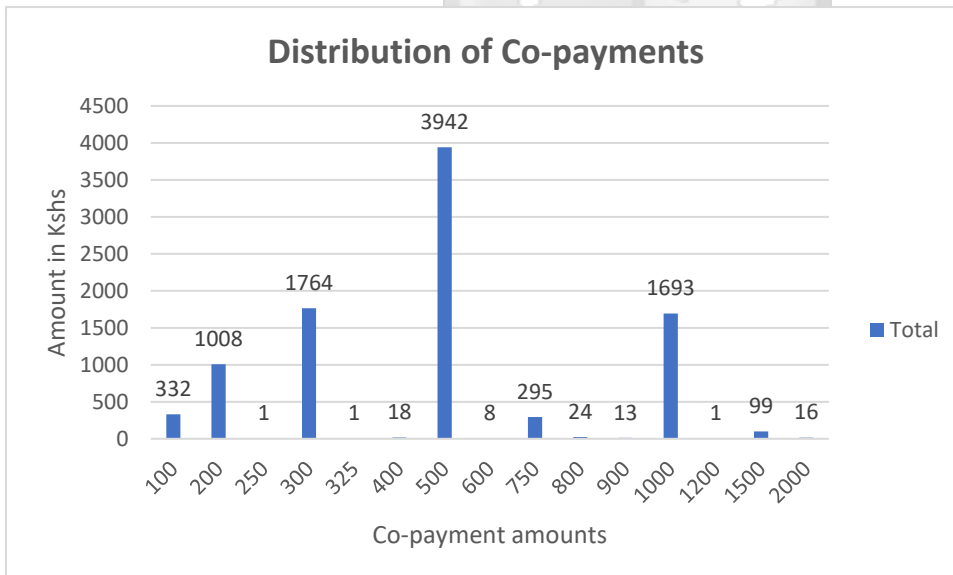


Figure 4.4: Distribution of Co-payments

4.2 Analysis of Groups according to Co-payment Status

4.2.1 Comparison of patients with co-payments and without co-payments

There were more patients on a co-payment of Kshs 500 than any other co-payment (3942, 42.8%), followed by co-payments of Kshs 300 (1764, 19.1%) and Kshs 1000 (1693, 18.4%) respectively. The least number of co-payment patients seen were those on co-payments of Kshs 250, 325 and Kshs 1500 all having one patient seen, accounting for less than 0.01% of the total patients on co-payments (Figure 4.4). The mean co-payment was Kshs 529 (SD= 292) (Table 4.2). The mean Consultation fee paid by all the patients sampled was Kshs1629 (SD= 984.8, range Kshs 1056 to Kshs 3400) (Table 4.6). The mean Consultation fee paid for those on No co-pay was Kshs 1602 (SD= 982) and those on co-payments was Kshs 1918 (SD= 962) (Table 4.6, Figure 4.6). The difference between the two consultations (No Co-pay and Co-pay) was a significant Kshs 316 more towards those on co-pay (P- value 0.000) meaning that those on co-pay end up paying more to see a doctor at the outpatient department compared to those not on co-pay (Table 4.6). With a mean consultation for those on co-pay being Kshs 1918 and the mean co-payment being Kshs 529, then the mean out of pocket of pocket payments for those on co-pay was about 27.6% of the total consultation. The mean number of laboratory tests per patient was 3 tests and mean cost for laboratory services per patient visit for all patients being Kshs 4681 (SD 4078). The cost for laboratory tests per patient visit was higher in those on co-payment (Kshs 5253, SD 4245) compared those on no co-payment (Kshs 4624, SD 4057) (Table 4.6, Figure 4.5). The mean number of drugs per patient visit (pharmaceuticals) prescribed was 4 drugs and the mean cost of pharmaceuticals was Kshs 3214 (SD 3318). The mean cost of pharmaceuticals per patient visit was higher in those on co-pay (Kshs 3357, SD 3249) compared to those on no co-pay (Kshs 3201 SD 3323). The mean costs of other costs (rehabilitation services and radiology services) were Kshs 777 (SD 3549). Like in other costs, those on co-payments paid more for other patient related hospital costs (Kshs 897, SD 3707) compared to those on no co-payments (Kshs 766, SD 3534) (Table 4.6, Figure 4.6)

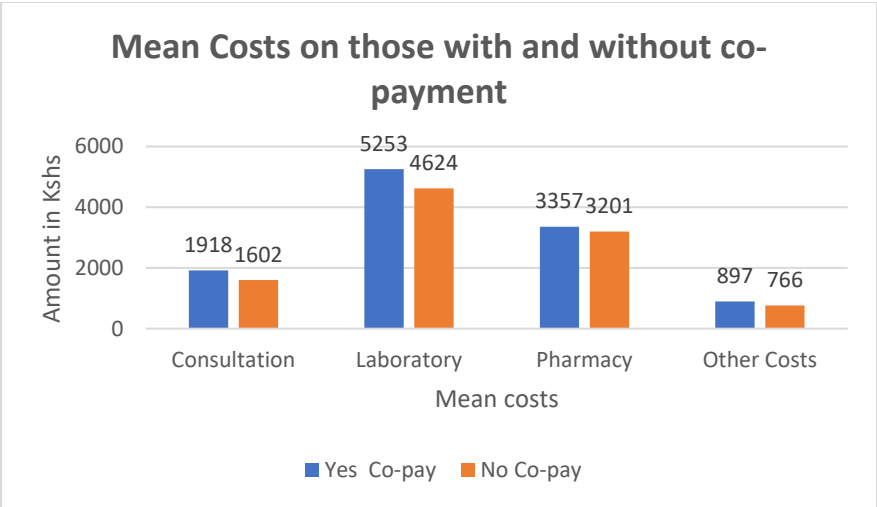


Figure 4.5: Costs with and without Co-payments

The mean cost of the overall visit was Kshs. 6703 (SD= 6300) and the mean costs for each visit were higher on those paying co-pay (Kshs 7959, SD 6532) compared to those on no co-pay (Kshs 6586, SD 6265) (Table 4.6, Figure 4.7).

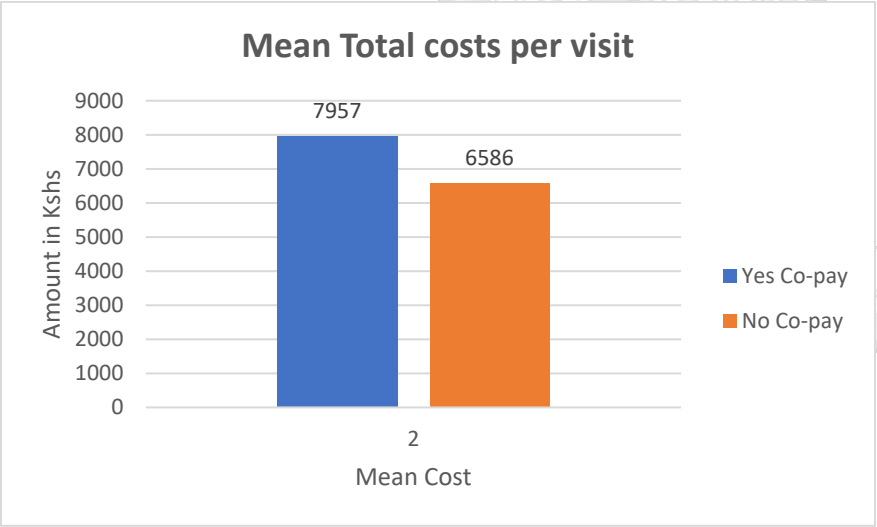


Figure 4.6: Total Costs per visit – with and without Co-payments

4.2.2 Analysis of patients on co-payments seen by General Practitioner and Specialist

On review of the co-payments according to specialty, the mean co-payments were significantly lower in the GP category (Kshs 505, SD 279) and expectedly higher in the Specialist category (Kshs

580, SD 314) (Table 4.2, Table 4.5, Figure 4.7). The number of face-to-face patient visits generally reduced as co-payments increased (Table 4.1, Figure 4.6).

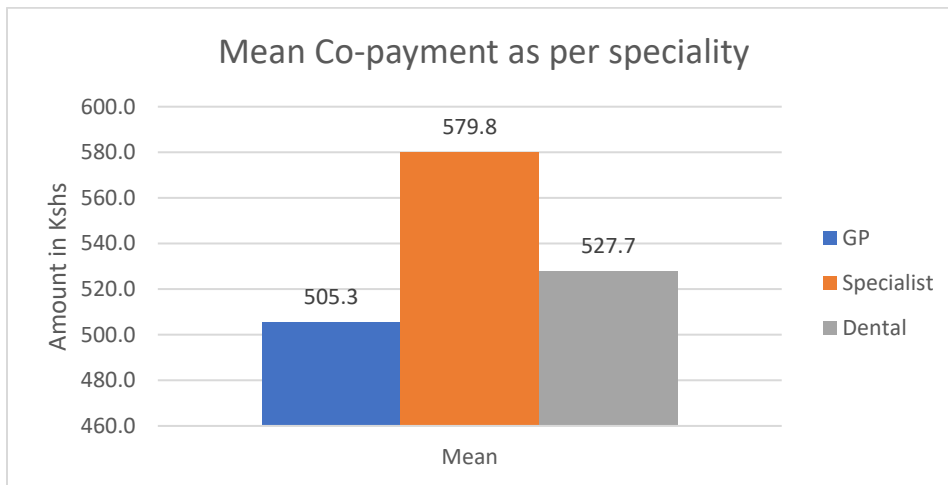


Figure 4.7: Co-payment per speciality

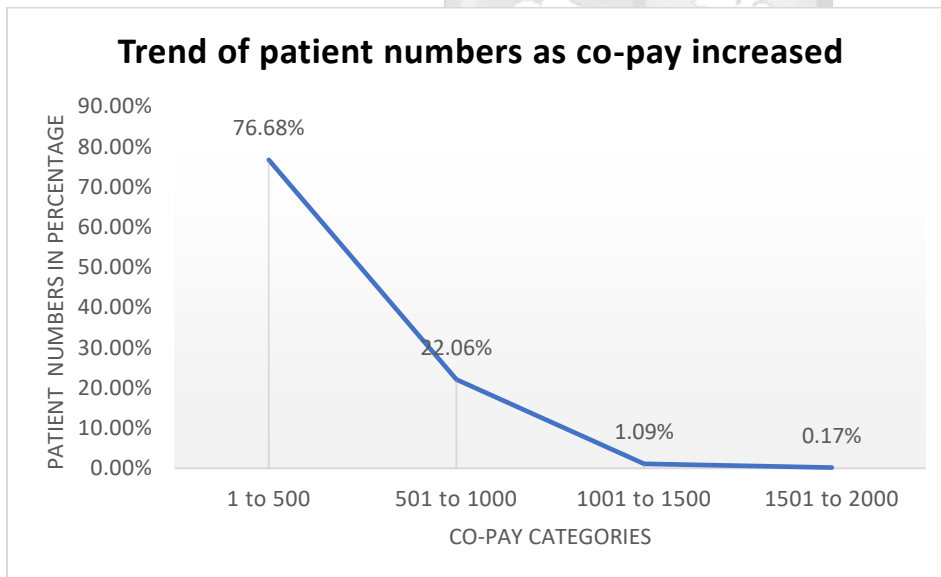


Figure 4.8: Patient trend with Co-pay

Table 4.2 Co-payments according to speciality

	Total	GP	Specialist	Dental
Mean	528.97	505.34	579.76	527.67
Standard Deviation (SD)	292.52	278.50	314.44	300.88

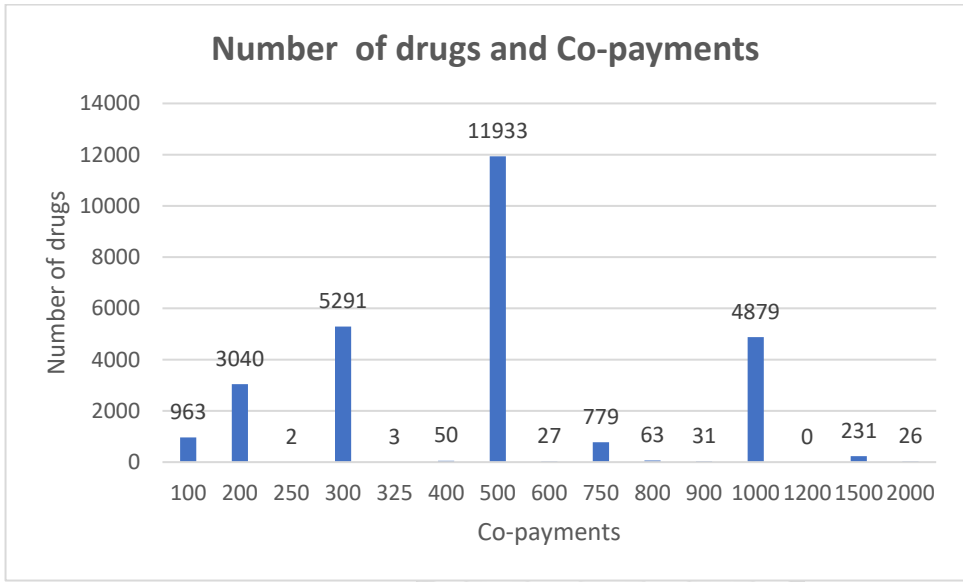


Figure 4.9: Number of Drugs and Co-payments

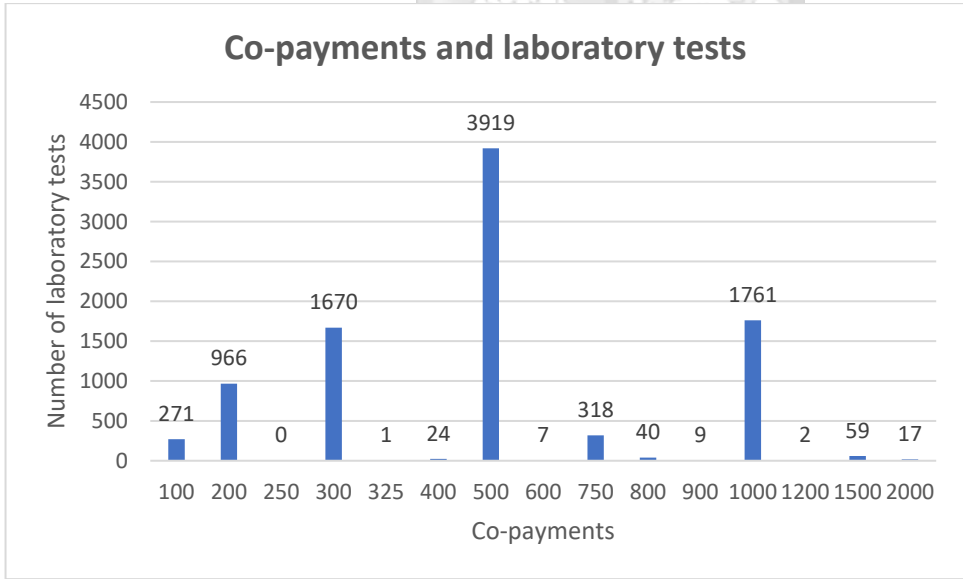


Figure 4.10: Laboratory tests and Co-payments

The health care costs were highest in Pharmaceuticals (37%) and Laboratory services (26%) offered over the one-year period. A quarter of the health costs (25%) were consultations costs; costs that met the patient as he/ she first attempted to access services at the hospital (Figure 4.11)

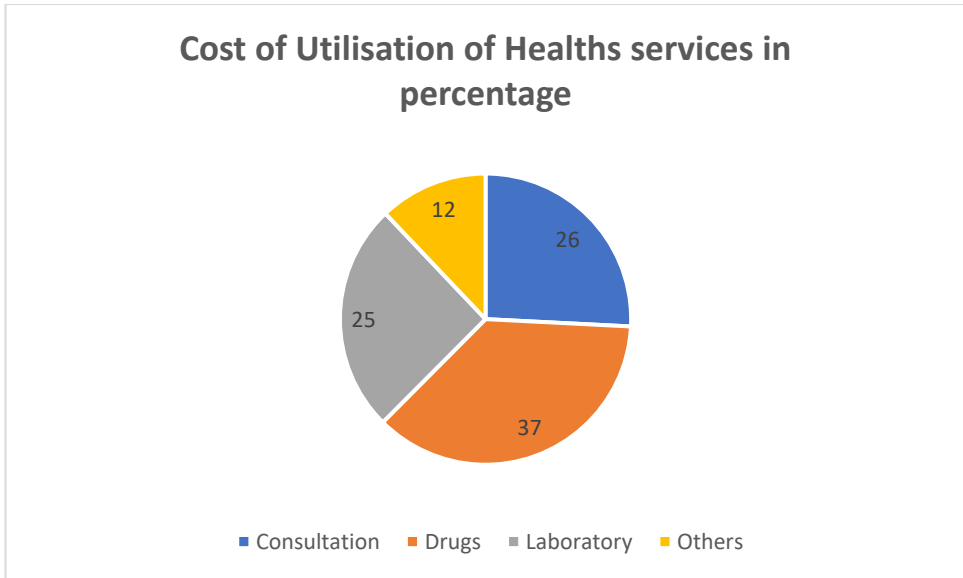


Figure 4.11: Co-payments and Cost of utilisation of health services

4.2.3 Analysis of the Groups based of Co-Pay Status

The different patient groups were analysed depending on those visits that had a co-payment and those that did not. The co-payment groups were categorised into 4 tiers: co-payments of Kshs 1-500 (Tier 1), Kshs 501 to 1000 (Tier 2), Kshs 1001 to 1500 (Tier 3), and Kshs 1501 to 2000 (Tier 4) (Table 4.3, Figure 4.12).

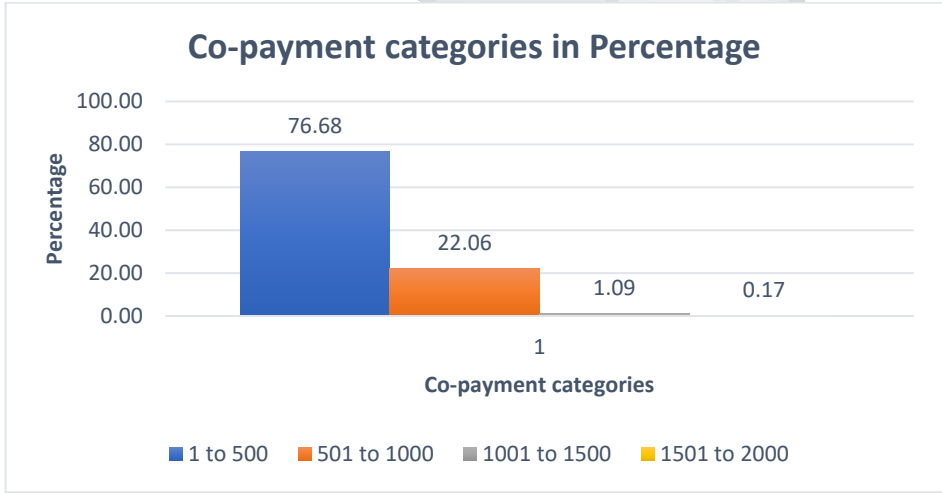


Figure 4.12: Co-payment categories

The analysis then proceeded to analyse the individual co-payment groups. The patient visits were further divided into those seen by a General Practitioner, seen by a Specialist and those seen by a dentist reviewing the differences in utilisation of services (Table 4.1, Figure 4.7).

Table 4.3: Descriptive Statistics – category of patients and category of Co-payments

Category of co-payment on total distribution		
No co-pay	99058	91.49%
1 to 500	7066	6.53%
501 to 1000	2033	1.88%
1001 to 1500	100	0.09%
1501 to 2000	16	0.01%

Table 4.4: Copayment by gender and purpose of visit

	Total patients	Male	Female	Mean difference	P-value
Co-payment amount in Kenya Shillings					
Mean	529.0	524.5	532.3	-7.79	0.207
Std. Deviation	292.5	292.6	292.4		
General Patient					
Mean	505.3	501.8	508.1	-6.32	0.375
Std. Deviation	278.5	281.2	276.4		
Specialty clinic					
Mean	579.8	579.8	579.7	0.101	0.993
Std. Deviation	314.4	311.6	316.3		
Dental					
Mean	527.7	529.2	526.0	3.25	0.957
Std. Deviation	300.9	309.7	294.4		

The average copayment amount for all categories (GP, Specialist and Dental) of patients is Kshs 529.0 (SD±293) (Table 4.4). Further analysis using T-test statistics was done to estimate the difference in copayment amount and tiers by gender. The results indicate that males paid less by Kshs 7.79 than females and the difference could be attributed to chance. Analysis on the amount of copayment for each service sought by gender of the patient revealed varied differences although none was statistically significant (Table 4.4).

The analysis of variance (ANOVA) using least squares difference was used to estimate the differences in copayment paid by the category of the patient. The results indicate that GP a patient pays a significantly lower amount by Kshs 74.42 (p-value=0.00) compared to Specialty visits and Kshs 22.33 lower than dental patients (p-value=0.439). On the other hand, the Specialist patients pay a marginally higher amount by Kshs 52.08 (p-value=0.079) than Dental patients (Table 4.5).

Table 4.5: Copayment by category of the patient

Patient category		Mean Diff (I-J)	Std. Error	Sig.	95% UCI	95% LCL
(I)	(J)					
General patient	Specialist	-74.4*	6.53680	0.000	-87.2	-61.6
	Dental	-22.3	28.86173	0.439	-78.9	34.2
Specialist	Dental	52.1	29.13035	0.074	-5.01	109.2

4.3 Utilisation by co-payment terms

4.3.1 Utilisation of different health services according to co-payment status

This study sought to examine the utilisation of healthcare services among insurance patients delineating them along copayment terms. The results of the mean, standard deviation and T-test statistic of the amount charged from consultation, laboratory, medication, and other associated costs (Table 2.6).

Table 2.6: Utilisation of different health services – with and without co-payments

Charges	Statistics	Total	Copayment		Critical value	p-value
			Yes	No		
Consultation Costs	Mean	1629.3	1918.0	1602.4	$\mu=-315.6$	0.000
	Std. Deviation	984.8	962.9	982.5		
Laboratory test needed	Percentage (%)	33.6	36.0	33.3	$\chi^2=26.8$	0.000
Number of lab works requested	Mean	2.6	2.7	2.6	D=-0.011	0.998
	Std. Deviation	1.5	1.5	1.5		
Laboratory Costs	Mean	4681.5	5253.2	4624.0	$\mu=-629.1$	0.000
	Std. Deviation	4078.1	4244.5	4056.6		
Medication prescribed	Percentage (%)	83.7	81.1	83.9	$\chi^2=47.9$	0.000
Number of medications dispensed	Mean	3.6	3.7	3.6	D=-0.01	1.000
	Std. Deviation	2.1	2.2	2.1		
Medication Costs	Mean	3214.1	3357.3	3201.2	$\mu=-156.2$	0.000
	Std. Deviation	3317.7	3249.2	3323.5		
Other patient related hospital related Costs	Mean	5537.8	5681.6	5522.5	$\mu=-159.0$	0.469
	Std. Deviation	7962.3	7739.5	7985.6		
Total Costs of Utilisation of Health care	Mean	6703.1	7957.1	6586.5	$\mu=-1370.7$	0.000
	Std. Deviation	6300.1	6531.8	6265.4		

The results indicate that a patient seeking any healthcare service at the various Aga Khan Healthcare services OPD centres will on average be charged a consultation fee of Kshs 1629.3 (SD=984.8). When the patient is on co-payment terms, they will significantly pay Kshs 315.6 more than their counterparts not on co-pay who pays Kshs 1602.3 (SD=982). After consultation, one in every three (33.6 percent) of all the patients are advised to undertake an average of 2.6 (SD=1.5) laboratory tests showing that the presence of co-pay did not affect the number of tests ordered (Table 4.6)

Based on the lab works, patients on average pay Kshs 4681.5 (SD=4078.1) on laboratory tests, where those with co-payment arrangements pay Kshs 5253.2 (SD=4244.5) compared to those not on copayments Kshs 4624 (SD=4056.6) which is Kshs 629 significantly more than those with no copayment. After consultation or laboratory review, 83.7 percent of the patients were prescribed an average of 3.6 (SD=2.1) medications. Closer analysis indicates that 81.1 percent of patients with copayment received 3.7 (SD=2.2) medications similarly to the 83.9 percent of those without copayment who received 3.6 (SD=2.1). The cost associated with the medication indicates that each patient will on average pay with Kshs 3214.1 (SD=3317.7), and patients with copayment will pay Kshs 3357.3 (SD=3249.2) which is significantly more by Kshs 156.2 as compared to those with non-copayment. (Table 4.6)

Other patient related hospital related charges preferred to the patient averages to Kshs 5537.8 (SD=7962.3) and the difference between those with or without copayment is due to chance. Finally, the total charges average to Kshs 6703.1 (SD=6300.1) with patients on copayment terms paying an average of Kshs 7957.1 (SD=6531.8) which is significantly higher by Kshs 1370.7 as compared to those with no copayment (Table 4.6)

4.3.2 Utilization by copayment tiers

The utilization of the insurance by the patients was analysed using ANOVA by the categories of co-payment amount (Table 4.7).

Table 4.7: Utilisation of health services by category of copayment

Co-payment tiers		Mean Diff (I-J)	Std. Error	Sig.	95% U CI	95% L CI
(I)	(J)					
Dependent Variable: Consultancy fee charges in Kshs						
1 to 500	501 to 1000	-352.4*	23.8	0.000	-399.2	-305.6

Co-payment tiers		Mean Diff (I-J)	Std. Error	Sig.	95% U CI	95% L CI
(I)	(J)					
	1001 to 1500	-776.7*	95.5	0.000	-963.9	-589.6
	1501 to 2000	-1232.7*	237.3	0.000	-1697.8	-767.6
501 to 1000	1001 to 1500	-424.3*	97.1	0.000	-614.7	-234.0
	1501 to 2000	-880.3*	237.9	0.000	-1346.7	-413.9
1001 to 1500	1501 to 2000	-456.0	255.2	0.074	-956.4	44.4
Dependent Variable: Laboratory Costs in Kshs						
1 to 500	501 to 1000	-877.2*	176.0	0.000	-1222.3	-532.1
	1001 to 1500	475.7	832.8	0.568	-1157.2	2108.6
	1501 to 2000	-5590.6*	1891.3	0.003	-9298.9	-1882.2
501 to 1000	1001 to 1500	1352.9	842.9	0.109	-299.8	3005.6
	1501 to 2000	-4713.3*	1895.8	0.013	-8430.4	-996.2
1001 to 1500	1501 to 2000	-6066.2*	2063.2	0.003	-10111.5	-2021.0
Dependent Variable: Drugs charges in Kshs						
1 to 500	501 to 1000	-528.6*	92.1	0.000	-709.3	-348.0
	1001 to 1500	-36.2	392.7	0.926	-806.0	733.0
	1501 to 2000	603.1	978.6	0.538	-1315.2	2521.4
501 to 1000	1001 to 1500	492.4	398.8	0.217	-289.3	1274.2
	1501 to 2000	1131.8	981.0	0.249	-791.4	3055.0
1001 to 1500	1501 to 2000	639.3	1052.7	0.544	-1424.2	2703.0
Dependent Variable: Other patient related Hospital Costs in Kshs						
1 to 500	501 to 1000	-1633.6*	466.5	0.000	-2548.7	-718.4
	1001 to 1500	1205.2	1740.8	0.489	-2209.4	4619.9
	1501 to 2000	-97.3	3457.3	0.978	-6879.2	6684.5
501 to 1000	1001 to 1500	2838.9	1770.8	0.109	-634.8	6312.5
	1501 to 2000	1536.2	3472.5	0.658	-5275.5	8348.0
1001 to 1500	1501 to 2000	-1302.6	3856.3	0.736	-8867.1	6261.9
Dependent Variable: Total fee in presence of co-payment in Kshs						
1 to 500	501 to 1000	-1979.7*	163.1	0.000	-2299.3	-1660.1
	1001 to 1500	-871.0	652.4	0.182	-2150.0	408.0
	1501 to 2000	-4384.1*	1621.6	0.007	-7562.8	-1205.4
501 to 1000	1001 to 1500	1108.7	663.6	0.095	-192.2	2409.6
	1501 to 2000	-2404.4	1626.1	0.139	-5592.0	783.1
1001 to 1500	1501 to 2000	-3513.1*	1744.5	0.044	-6932.8	-93.4

The average amount charged per copayment tier which comprise of Tier 1 (Kshs 1 to 500), Tier 2 (Kshs 501 to 1000), Tier 3 (Kshs 1001 to 1500) and Tier4 (Kshs 1501 to 2000) were compared and analysed using Anova. In consultation charges, using Tier 1 as the reference point, Tier 2, Tier 3, and Tier 4 significantly pays more averaging to Kshs 352.4, 776.7 and 1232.7, respectively.

Similarly, patients in Tier 2 on average significantly pay Kshs 424.3 and 880.3, lower than Tier 3 and Tier 4, respectively. The Tier 3 pays on average Kshs 456.0 which is marginally lower than Tier 4 patients (Table 4.7). Apart from the last 2 tiers, comparison between the co-pay tiers showed that consultation costs significantly increased as co-pay increased.

In the laboratory, holding Tier 1 patients as reference point, Tier 2 and Tier 4 will significantly pay more by Kshs 877.2 and Kshs 5590.6, respectively, whereas the difference in average amount by Tier 3 occurs by chance. Those in Tier 2 will significantly on average pay less amount by Kshs 4713.3 as compared to Tier 3, and those in Tier 3 will significantly on average pay less amount by Kes 6066.2 as compared to Tier 4 patients. The difference in average amount comparing any other two tiers apart from what is discussed is assumed to have occurred by chance (Table 4.7). Apart from one tier, comparison between the co-pay tiers showed that laboratory costs increased as the co-pay amounts increased.

For the medication and other hospital related costs, only Tier 1 patients on average pay significantly lower by Kshs 528.6 and Kshs 1633.6, respectively as compared to Tier 2 patients. The rest of differences observed in average amounts paid between the various other tiers for both Medication and hospital related costs was not statistically significant. On total cost, Tier 1 significantly on average pays Kshs 1979.7 and Kshs 4384 lower than Tier 2, and Tier 4, respectively, whereas Tier 3 significantly pays on average Kshs 3513.1 lower than Tier 4. Most of the tiers showed an increased total per visit costs with increase in co-payment amounts. The rest of the differences in the average amounts paid between any other two Tiers is not statistically significant and can be attributed to chance.

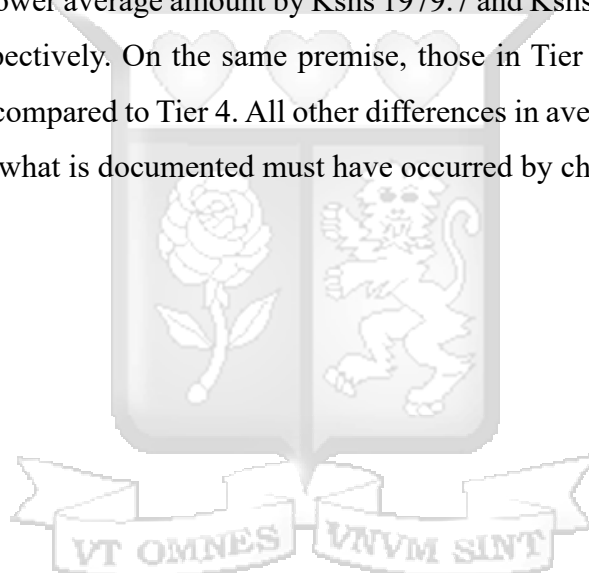
4.3.3 Total utilisation by co-payment terms

The total utilization of the insurance cover was analysed using a T-test to estimate whether the amount charged differed between the two categories of co-payment (Yes/No). The results indicate that the mean amount charged is Kshs 6586.5 (SD=6264.4) and Kshs 7957.1 (SD=6531.8) for no copayment and with copayment, respectively. This implies that those with no co-payment, significantly ($t=-20.0$, $p\text{-value}=0.00$) paid a lower amount of Kshs 1370.7 than their counterparts who did co-payment when they visited the hospital

Table 4.8: Total charges distributed by copayment tiers.

Co-payment tiers		Mean Diff (I-J)	Std. Error	Sig.	95% U CI	95% L CI
(I)	(J)					
Dependent Variable: Total charges in Kshs						
1 to 500	501 to 1000	-1979.7*	163.0	0.000	-2299.3	-1660.0
	1001 to 1500	-871.0	652.4	0.182	-2150.0	408.0
	1501 to 2000	-4384.1*	1621.6	0.007	-7562.8	-1205.4
501 to 1000	1001 to 1500	1108.7	663.6	0.095	-192.2	2409.6
	1501 to 2000	-2404.4	1626.1	0.139	-5592.0	783.1
1001 to 1500	1501 to 2000	-3513.1*	1744.5	0.044	-6932.8	-93.4

Tier 1 paid significantly lower average amount by Kshs 1979.7 and Kshs 4384 as compared to those in Tier 2 and Tier 4, respectively. On the same premise, those in Tier 3 paid on average a lower amount by Kshs 3513 as compared to Tier 4. All other differences in average amounts paid between any two Tiers apart from what is documented must have occurred by chance (Table 4.8)



CHAPTER FIVE:

DISCUSSION, CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS

5.1 Discussion

The study attempted to determine the effects of co-payments on the utilisation of healthcare at the Aga-Khan Hospital's different outpatients departments. Utilisation was measured by analysing the number of patient visits and reviewing the costs of these visits in terms of consultation, laboratory, pharmaceutical and other hospital related activities costs. While the average number of patients visiting the hospital, those on co-payment versus those not on co-payments and those on different co-payments generally varied, the trend was that as co-payments increased, the patients being seen at the different OPD centres decreased. Patients on co-payments on the lowest Tier (Kshs 1-500) were most, accounting for more than three quarters of those on co-payments. The numbers decreased to 20% of the total in the tier 2 category (Kshs 501-1000) and less than 2% in both Tier 3 and 4 (Kshs 1001-1500 and Kshs 1501-2000 respectively). This decline in the numbers of patients seen as co-payments increased was also observed in the RAND study where the higher the co-payments, the less likely patients used medical care. (Gruber, 2006). The reduction in patient visits as co-payment increased was an expected finding. This explains by the fact that co-payment as an out of pocket payment discouraged utilisation of healthcare in terms of hospital visits serving the expected purposed of reducing moral hazard for the third party payers

The costs of utilisation of the different health services, however, increased in most aspects of health care provision with an increase in co-pay. The current study differed with results of other studies that indicated that co-payments reduce the overall cost of healthcare (Baum et al., 2016; Drummond & Towse, 2012) or had no effect on the overall cost of health care (Gone et al, 2018), it instead concurred with the findings of one study that showed that co-payments increased the overall cost of healthcare (Subramanian, 2011). Data from the RAND study showed that total expenditures of health service provision doubled when co-insurance increased significantly (Gruber, 2006). This same phenomenon was seen in this study where when copayments increased from Kshs 1-500 to Kshs 1001-1500, the average costs of utilisation of healthcare doubled and when co-payments increased from Kshs 1001-1500 to Kshs 1501-2000. Certain authors have argued that reduced expenditure on healthcare when co-payments are introduced may only be short term, but in the long run may increase the overall costs of care, especially if no cheaper substitutes for the for-gone

services are available (Stroupe et al, 2007). This may be due to the adverse health effects of delay of treatment which are more costly to treat and commonly seen in chronic patients. This could have been the case with our study as some of the patients, especially those seen by specialists, suffer from chronic diseases. It could also be from the fact that all the OPD centres at the Aga-Khan Hospital, Mombasa also act as casualty centres treating emergency and acute cases. These acute cases have been shown to be price in-elastic and are not controlled by increase in cost. This too might explain the increase in healthcare costs as co-payments increased (Hirsch, Balu, & Schulman, 2014).

The amount of co-payment as described influenced the overall cost of a visit despite a downward trend in hospital visits. Co-payments and increased amounts of co-payments affected costs of utilisation of laboratory services and medication costs. It is possible that an initial reduced access to essential medication (co-pay reduces hospital visits) resulted in more emergency department visits ending up with increased overall costs of healthcare for these individuals on high co-pay. Introducing co-payments also brings in the feeling of entitlement, resulting in some of the patients demanding more services or asking for more costly interventions due to having made a co-payment as was seen in the study by Tamblyn (Tamblyn et al, 2001). Collusion between patient and doctor may therefore have resulted in unnecessary tests being done and more than needed pharmaceuticals being prescribed, hence higher average costs of utilisation of health for those on co-payments. Most of the insurance companies opted for a co-payment between Kshs 1-500; the lowest tier, accounting for three quarters (3/4) of all the patients on co-payments. This preference for the lower tier of co-pay may mean that while insurances may have introduced co-pay to stem moral hazard, they were keen not to over burden their clients. Having a higher number of patients on high co-payments would have also led to monumental expenses on the side of both the patient and the insurances paying for health services.

Some of the studies have shown that the increase in healthcare costs is mainly in patients with chronic conditions who may have higher costs in later visits due to missed opportunities for addressing certain healthcare needs, hence more complications which become more expensive to treat (Del Mar 2014). Since this study did not look at the clinical condition of the patient it is difficult to confirm if the trend seen in this study is related to this. It is unlikely to be by chance as the phenomenon was seen in various aspects of health care utilisation in this study.

The study observed that patients on co-payment seeing a general practitioner (GP) were not only more than those seen by specialists but paid significantly lower to be seen than if they were on co-pay and being seen by a specialist. This is not surprisingly different from expected norms as general doctors all over the world charge significantly less than their specialist colleagues. It was also seen in Kisumu in the Gone study (Gone et al, 2018). It is also expected that those who go see specialists are sicker, more chronic patients whose health requirements are more than the average patient seeing a GP and are therefore more willing to spend.

The overall Total cost, the consultation cost, the laboratory costs, and Medications costs were significantly higher in patients who paid co-pay than those that did not. There was however no significant difference in costs in other hospital related costs (radiology, physiotherapy) comparing those on co-pay and those not. This is probably because the number of requests for these services may have been lower compared to other hospital health related services and not as commonly prescribed as laboratory services as these health-related services are not needed in all patients. In this study therefore, the amount of co-payment made had a significant effect on the overall cost of a visit. Those who paid higher co-payments had significantly higher cost of visit than those with lower co-payments. The study also showed decreasing number of patients seen as the co-tier amounts increased.

The study showed that a quarter of the health costs (25%) was consultations costs; costs that may affect access of health utilisation. One of the effects of Co-pay on the health system is to exploit the unwillingness to pay for medical services by patients. The higher the consultation the higher the likelihood of deterring utilisation of health, exactly what the insurances companies were hoping to achieve by introducing a co-payment. This relationship is quite strong such that close to 30% of patients observed in the Baum study, a fifth of whom had chest pain with a possible differential diagnosis of myocardial infarction declined treatment (Baum et al 2016). Consultation costs hence play a significant role in determining initial access to healthcare.

Higher co-payments also had a significant effect on the laboratory costs per visit. The patient visits with a co-payment of Kshs. 1-500 showed a significantly lower laboratory cost of a visit as compared to other co-payment groups. The significant difference was seen when comparing Tier 1 and Tier 2 patients and comparing Tier 1 and Tier 4 patients. The possible way to explain this difference in laboratory costs is the kind of patients being seen between these tiers with sicker more

acute patients in the higher tiers hence requiring more investigations or by the fact that this was influenced by the doctor or patient. The feeling of entitlement for a patient paying a higher co-payment has been described previously resulting in some of the patients demanding for more services or more costly interventions due to having made a co-payment (Tamblyn et al, 2001) and may result in the patient colluding with doctors to request unnecessary lab tests and pharmaceuticals. This negates the assumption that a higher co-pay results in savings for the insurance health providers.

The cost of drugs accounted for about 40% of the total cost of utilisation of health at the Aga-Khan Hospital over the one-year period of the study. In this study, the average per visit medication costs and other patient related hospital costs increased when the co-payment doubled from 1-500 to 501-1000. Any further increase in co-payments did not seem to have the same effect on the two costs. The higher tiers did not show any significant difference in utilisation costs as regards pharmaceuticals and other hospital costs when compared with the lower tiers. This study did not show a difference in the number of medications prescribed between those on co-pay and those not on co-pay, differing with results of other studies that showed a decrease in number of drugs issued after a co-payment was introduced (Stroupe et al., 2007; Subramanian, 2011). The lack of difference in the number of drugs prescribed with the increase in co-payments is likely to be explained by the fact that the higher tiers had smaller numbers. Another explanation could be that those on higher tiers are people with life threatening chronic conditions and are more price inelastic and tend to tolerate more co-payments to obtain their drugs. Their demand for the services is thus not driven by moral hazard but by more complex decision-making processes that tend to ignore this financial implication (Hirsch, Balu, & Schulman, 2014).

This study did not show any significant difference in utilisation of health services between the male and female population of the study when put on co-pay. In the African set up where women are considered almost a vulnerable population, this trend is encouraging. In other studies, vulnerable populations were more sensitive to co-payments with a larger reduction in effective healthcare (Gruber, 2006).

5.2 Conclusion

Co-payments generally have the effect of increasing cost of Utilisation of healthcare once the copayment is made compared to when there is no co-payment. The highest number of patients seen

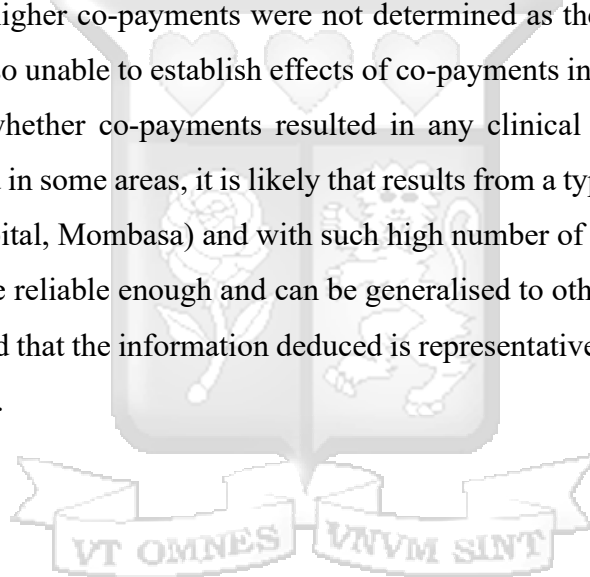
for those on co-payment were when co-pay was between Kshs 1-500, and the numbers generally decreased as co-payment increased. Despite this trend, the average cost of utilisation of health at the Aga-Khan Hospital, Mombasa increased. The increased cost in utilisation of health was seen right from consultation charges which were Kshs 315 significantly higher compared to those not on co-payment. The amount of co-payment had a significant effect on the utilisation and overall cost of healthcare services. Co-payments in most cases (the current study included) are usually made at the point of registration of a patient. They may therefore reduce access to care but may not reduce the overall utilisation of individual healthcare services, since their utilisation is not completely dependent on the co-payment. In this study co-payments not only affected the overall costs of a patient visit to the hospital, but also affected the consultations costs, laboratory costs and medication costs in some cadres of co-payments.

5.3 Recommendations

Co-payments are instituted with major intents in mind; to reduce Moral Hazard which is the opportunistic use of healthcare with disregard for the real need for it and to raise revenue. Co-payments, as applied in this study, served more to control access (reducing the number of patient visits as co-pay increased) but did not affect the overall cost at the point of utilisation. Also, the amount of co-payment made seemed to influence the overall cost of individual healthcare services in most aspects of healthcare utilisation. Co-payments should thus be priced at a level that does not hinder services and most importantly should be effected at individual levels of utilisation of healthcare. For example, considering that laboratory and pharmaceuticals costs take up the biggest burden of health utilisation in a private institution (as seen in this study), the co-payments should be instituted at these specific health levels. This way, the insurance companies would have a better grasp of their financial burden as regards paying for health care services. They would probably have better control of the issue of moral hazard the co-pay as was originally intended for. This can be achieved by regularly auditing and reviewing data such as these ones and adjusting pricing for the co-payments based on such findings. Gruber in his study saw that an outpatient co-payment affected in-patient costs. Recommending a further analysis of the patients seen in this study to evaluate their inpatient utilisation and costs (for those who ended up being admitted) may solve this question.

5.4 Limitations of the study

The study was carried out in a single facility. Similar information comparing other private facilities may have had more value in making the results more credible. Also, utilisation of health services may have been influenced by the doctor attending to the patient as has been described in similar studies, a relationship this study could not ascertain. It was not possible to look at patient-specific differences in this data set. The patient distribution amongst the four tiers of co-payments could have considered the acute and chronic conditions of the patients; factors that strongly determine utilisation of healthcare. It was also not possible to assess the socioeconomic conditions and the age profile of the patients sampled as this data was not readily available in the study. Effects of co-payments on the clinical outcomes such as return visits/ readmissions, prolonged stays in hospital, especially those paying higher co-payments were not determined as they were beyond the scope of this study. We were also unable to establish effects of co-payments in the vulnerable population (children, elderly) and whether co-payments resulted in any clinical adverse outcomes in this population. While limited in some areas, it is likely that results from a typical facility like the study site (The Aga-Khan Hospital, Mombasa) and with such high number of patients assessed, that, the results from this study are reliable enough and can be generalised to other institutions that may be charging co-payments and that the information deduced is representative of what co-payment does to the healthcare industry.



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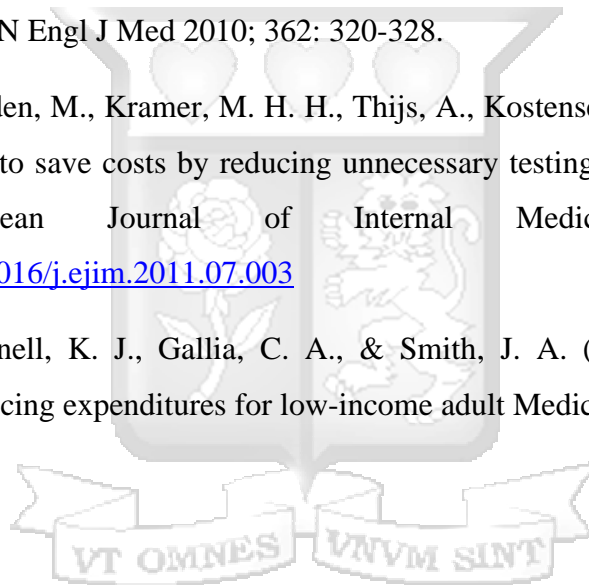
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APPENDICES

APPENDIX 1: DISSERTATION EXAMINATION PROCESS AND CLEARANCE

Ole Sangale Rd, Madaraka Estate
P. O Box 59857 - 00200, Nairobi, Kenya.
Cell: +254 703 034 414/6/7, Twitter: @SBSKenya
Facebook/LinkedIn: Strathmore Business School
Email: info@sbs.ac.ke or visit www.sbs.strathmore.edu



Dissertation Examination Process and Clearance for Graduation

Step	Activity	Proposed Deadline	Proposed Graduation Year*
1	Submit dissertation for examination	May 2022	2022
2	Dissertation examination	JUN 2022	2022
3	Oral defense of dissertation	June/July 2022	2022
4	Correction of dissertation	July 2022	2022
5	**Certification of final version of dissertation and Registration for graduation		

Important Notes

1. *Graduation is on the last Friday in June. A student needs to have been registered to graduate by the last week of May.
2. **The dissertation should have been corrected and confirmed as the final version before graduation.

SIGNATURES AND DATES		
Candidate Name: Hemed Twahir	Signature: 	Date: 05/02/2022
Co-Supervisor:	Signature:	Date:
Co-Supervisor: (if applicable)	Signature:	Date:
Faculty Dean	Signature:	Date:

Please forward to Dean, School of Graduate Studies (SGS)

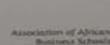
Dean (school of Graduate Studies) Signature:

Date

.....

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APPENDIX 2: SUPERVISOR AND STUDENT AGREEMENT

Ole Sangale Rd, Madaraka Estate
 P. O Box 59857 - 00200, Nairobi, Kenya.
 Cell: +254 703 034 414/6/7, Twitter: @SBSKenya
 Facebook/LinkedIn: Strathmore Business School

Email: info@sbs.ac.ke or visit www.sbs.strathmore.edu

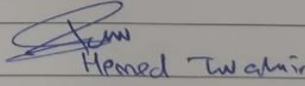


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Responsibilities of Student

The Student will undertake to:

1. Plan and discuss with the supervisor the research topic and timetable for the research. The student must take full responsibility for the design, methodology and presentation of the research project.
2. Discuss and agree on a schedule of meetings and appropriate feedback with the supervisor.
3. Adhere to relevant University research policies and regulations, related (but not limited) to plagiarism, copyright, data protection, health and safety, and ethical practices that may arise in the course of research.
4. Maintain progress according to the agreed schedule including submission of written material in sufficient time to allow for discussion and comment before proceeding to the next stage of research.
5. Take responsibility for editing the text. This includes ensuring that the attributions, footnotes, bibliography, and other technical details are accurate and complete, the language technically correct, and the argument logically clear and consistent.
6. Take the initiative in raising problems or difficulties encountered and sharing responsibility for seeking solutions.
7. Inform their supervisor of any personal circumstances which prevent them from working on their research.
8. Evaluate their work for plagiarism by subjecting it to Turnitin.org and attaching the Turnitin report to the submitted work.
9. Ensure that the supervisor has had adequate time to peruse the dissertation before submitting a final draft for examination.
10. Accept responsibility for producing the bound copies of the dissertation required for the examination process and after.
11. Make any amendments to the dissertation required within the stipulated time after receiving notification of the examination results.

AGREEMENT	
We confirm that we have read and understood this statement and agree to be guided by it for as long as we work together.	
Candidate Name: Hemed Twahir	Signature:  Hemed Twahir
Co-Supervisor:	Signature:
Co-Supervisor: (if applicable)	Signature:
Date Received:	05/03/2022

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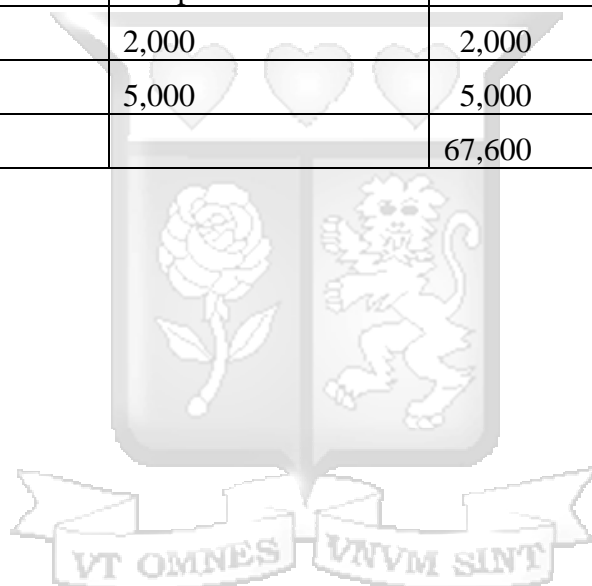


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APPENDIX 3: BUDGET

ITEM	COMPUTATION	TOTAL
Printing of Proposal	3 copies*40*kshs 10	1,200
Binding of Proposal	3 copies*Kshs 200	600
Data Collection	10,000	10,000
Data Analysis	20,000	20,000
Transport	26,000	26,000
Printing of Thesis	4 copies*50*Kshs 10	2,000
Binding of Thesis	4 copies*Kshs 200	800
Courier	2,000	2,000
Miscellaneous	5,000	5,000
Total		67,600



APPENDIX 4: CONSENT FORM

Part A


I am Hemed Twahir, a student of Strathmore Business School currently undertaking a Masters in Business Administration in Health Management. I work at the Aga-Khan Hospital, Mombasa (AKHM) providing both in-patient and Out-patient Clinical services. I am undertaking a study titled “The Effect of Co-pay User fees on the Utilisation of Healthcare in a Kenyan private Hospital – A case study of Aga-Khan Hospital Mombasa Out- Patient Department”. The study will be carried out at the Aga-Khan Hospital, Mombasa Outpatient departments in Mombasa, Kenya and data will be obtained from the hospital’s HMIS system. Individual data will not be revealed, and confidentiality will be always maintained.

Part B

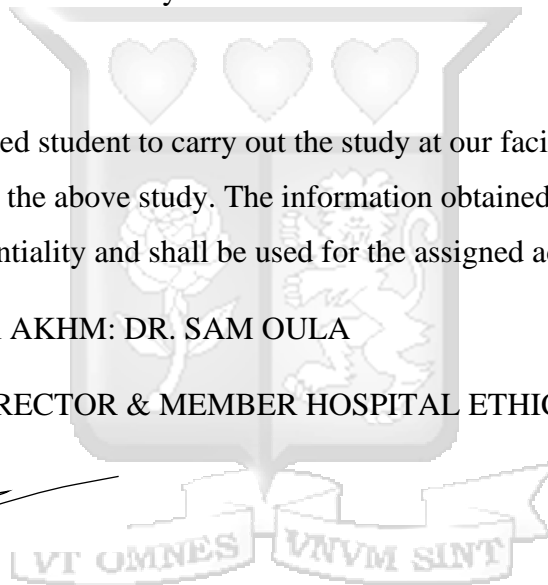
We authorise the above-named student to carry out the study at our facility and access data from our HIMS system relating to the above study. The information obtained from the Organisation shall be treated with confidentiality and shall be used for the assigned academic purpose only.

Name of representative from AKHM: DR. SAM OULA

Designation: MEDICAL DIRECTOR & MEMBER HOSPITAL ETHICS COMMITTEE

Signature: 

Date: April 14th 2022



APPENDIX 5: ETHICAL APPROVAL



4th October 2022

Dr Twahir Hemed,
Hemed.Twahir@strathmore.edu

Dear Dr Twahir,

RE: Does Co-Payment Fee Affect the Utilisation of Healthcare Services in Insured Patients? A Case Study of Aga-Khan Hospital Mombasa Out- Patient Department

This is to inform you that SU-ISERC has reviewed and **approved** your above **SU- master's** research proposal. Your application reference number is **SU-ISERC1474/22**. The approval period is from **4th October 2022 to 3rd October 2023**.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 48 hours of notification
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 48 hours
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to SU-ISERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) <https://research-portal.nacosti.go.ke/> and obtain other clearances needed.

Yours sincerely,

Dr Ben Ngoye,
Secretary; SU-ISERC

Cc: Prof Fred Were,
Chairperson; SU-ISERC

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email admissions@strathmore.edu www.strathmore.edu


APPENDIX 6: NACOSTI PERMIT

Republic of Kenya
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **400180**

RESEARCH LICENSE

Date of Issue: **19/October/2022**




This is to Certify that Dr. Hemed Twahir of Strathmore University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Mombasa on the topic: DOES CO-PAYMENT FEE AFFECT THE UTILISATION OF HEALTHCARE SERVICES IN INSURED PATIENTS? A CASE STUDY OF AGA-KHAN HOSPITAL MOMBASA OUT- PATIENT DEPARTMENT for the period ending : 19/October/2023;

License No: **NACOSTI/P/22/21027**

Applicant Identification Number: **400180**

Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code



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See overleaf for conditions