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A Comparison of capitation and fee for service provider payment mechanisms and their effects on cost of healthcare: a case study of the Avenue Hospital, Nairobi

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A COMPARISON OF CAPITATION AND FEE FOR SERVICE PROVIDER PAYMENT MECHANISMS AND THEIR EFFECTS ON COST OF HEALTHCARE: A CASE STUDY OF THE AVENUE HOSPITAL, NAIROBI

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DECLARATION

I hereby declare that this is my original work and has not been submitted for the assessment of a master's degree elsewhere except where I state otherwise by acknowledgement and reference.

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ABSTRACT

Increasing health costs globally have resulted in more patients seeking pre-payment mechanisms for health insurance to avoid catastrophic expenditures. Insurers use capitation and fee for service models for reimbursement, but there is insufficient evidence on which is efficient or cost effective. This study uses retrospective panel data from the Avenue Hospital's electronic medical records (EMR) to compare reimbursement costs using capitation and fee for service models by four Kenyan insurance companies. The costs were compared across similar illnesses in patients presenting at the outpatient department analyzing 3,694 patient visits over a six-month period. The mean costs for treating diseases were used for the analysis, which entailed comparing mean capitation costs to mean fee for service payments. The data was extracted using excel, sorted and filtered, then analyzed in pivot tables and pivot charts. Descriptive analysis was used to derive means and percentage counts that were presented in tables and bar graphs. The analyses revealed that capitation costs are 7.8% lower than the mean costs under the fee for service model. This difference was significant for three out of the four illnesses analyzed, the exception being hypertension. The results of the study concluded proved that payment of health costs by capitation was cheaper than fee for service. This in essence leads to a conclusion that capitation is a cheaper form of insurance than fee for service schemes. The results of the study can be used for further research on cost reduction in provider payment schemes and also inform policy on the relevance of insurance and utilization management in capitation in reducing health costs.

TABLE OF CONTENTS

DEFINITION OF TERMS

Capitation	An amount of money per capita or per person, which may be adjusted for the relative risk of that person needing healthcare (McIntyre, 2007).
Co-payment	Out-of-pocket partial payment by a health insurance member for health services used in addition to the amount paid by the insurance: the aim is to place some cost burden on members and thereby discourage them from excessive use of health services (McIntyre, 2007).
Med 360-HRMIS	Electronic medical record used by Avenue for its information systems
Moral Hazard	A tendency of entitlement to the benefits of health insurance to act as a strong incentive for people to consume more and "better" health care and a weak incentive for them to maintain a healthy lifestyle (McIntyre, 2007).
User Fee	A fee charged at the place and time of service use within a public health facility and paid on an out-of-pocket basis (McIntyre, 2007).

LIST OF ABBREVIATIONS AND ACRONYMS

AHC	Avenue Healthcare
FFS	Fee for service
HMO	Health maintenance organization
HRMIS	Human resource management information system
KEMRI	Kenya Medical Research Institute
LOS	Length of stay
NACOSTI	National commission for science, technology and innovation
NHIF	National health insurance fund
OECD	Organization for economic cooperation and development
OOP	Out of pocket expenditure
PPO	Preferred provider organization
PP	Pre-paid
PPS	Prospective payment system
RBA	Retirement Benefits Authority
UM	Utilization management
WHO	World Health Organization

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENT

I want to thank my University supervisor Dr Frank Wafula for his guidance, patience and encouragement throughout the research process. Secondly, I thank the Avenue Hospital management for their support and kindness in granting me permission to conduct a study using Parklands EMR Hospital data. Lastly, my parents, who supported me with love and understanding. Thank you all for the unwavering support.

1 CHAPTER ONE: INTRODUCTION

1.1 Background

According to the 2016 WHO Global spending on public health, the world spent US$ 7.5 trillion on health, representing close to 10% of global GDP. The average per capita health expenditure was US$ 1,000, but half of the world's countries spent less than US$ 350 per person. Total health spending is growing faster than gross domestic product and increasing more rapidly in low and middle income countries (close to 6% on average) than in high income countries (4%).The report however noted that health system resources are coming less from households paying out of pocket and more through pooled funds, in particular from domestic government sources (Xu K, 2018).

The WHO 2018 Global Monitoring Report on universal healthcare notes that, half of the world's population does not have full coverage of essential health services. Among those who were able to access needed services, many suffered undue financial hardship. Out of pocket spending however declined notably, from 46% to 37%, between the years 2000 to 2016 in the African Region. This decline was driven by the faster relative increase in spending from other sources rather than by a decline in out-of-pocket spending per person (Xu K, 2018).

Revenues to support financing schemes come from three major sources: the government, households, and development partners (i.e., the rest of the world). The private sector continues to be the major financier of health, contributing 40 percent of THE in 2012/13, up from 37 percent in 2009/10. The public contribution to THE was 34 percent in 2012/13, an increase of 17 percent over the 2009/10 estimates. The donor contribution was 26 percent of THE in 2012/13, down from 35 percent in 2009/10 (Kenya National Health Accounts 2012/13., 2015).

According to the Kenya Integrated Household Budget Survey 2016, 19.0% of the population had some form of health insurance cover. Urban areas had a higher proportion (29.2%) of population with health insurance cover compared rural areas (13.3%). The

National Hospital Insurance Fund (NHIF) was the leading health insurance provider reported by 93.9 per cent of the population. Employer contributory insurance coverage was reported by 6.2 per cent of the population (Kenya National Bureau of Statistics, 2018).

Fee for service payment model is reimbursement for specific, individual services provided to a patient, as each specific service (or procedure or intervention or piece of equipment) provided is billed and paid for. It offers an advantage of being relatively flexible and encourages delivery of care but offers no incentive to delivery of efficient care. Fee for service payments are often at risk of overutilization due to provider compensation based on care regardless of the information asymmetry.

In the Capitation payment model prepayments to physicians or medical groups are given based on pre-defined services. The compensation is typically calculated based on the range of services provided, the number of patients involved, and the period of time that the services are provided. HMO practice saves money because unlike traditional plans, managed care plans contract directly with the health care providers to set payment for services. To join a provider network, most doctors and hospitals give managed care plans a discount from their standard fees. The managed care plans then offer their enrollees incentives, such as lower out-of-pocket costs, to use the health care providers in the network. Costs are also lowered by restricting the use of more expensive services, such as hospital care.

1.2 **Statement of the problem**

The Kenya Household Health expenditure and Utilization Survey of 2007 done by KNBS found that 17% of those who needed healthcare services could not access the services from both public and private facilities largely due to financial constraints. Among those who utilized health care, 11.7% experienced catastrophic expenditures, and 4% were impoverished by health care payments. In addition, approximately 2.5 million individuals were pushed into poverty as a result of paying for health care. The poor experienced the highest incidence of catastrophic expenditures (Diana N Kimani, 2016).

As the total health expenditure increases due to improved medical technology, the aging population and worsening non-communicable illnesses, employers offer health insurance for employee retention and to avoid catastrophic health expenditure. The two most common forms of provider payment mechanisms through insurance payments are fee for service and capitation both of which have comparable consumption and spending. The two provider payment mechanisms offer a great choice to consumers and health care providers on opportunities to offer improved access to affordable healthcare while attempting to offer the most optimal coverage. Fee for service payment plans encourage increased consumption by the insured through a phenomenon referred to as moral hazard. Patients who have premiums, low co-payment for insurance will demand more service from investigative to treatments that promise any benefit without regard to risk, time or cost.

Capitation aims to reduce the costs and hospital visits by using utilization management through improved primary care, reduced hospital visits, limiting of the expenses during hospital visits and use of preferred network of specialists and drugs. The results of an empirical analysis revealed that switching from fee for service to capitated managed care reduced hospital costs by 7-12% in both markets, but that insurers reduced costs in different ways in different markets (Parys, 2014).

In view of the increasing healthcare costs, poor healthcare access, catastrophic spending and impoverishment of patients due to health expenditures, this study aims to assess the health spending costs per illness under managed care versus fee for service. This is aimed at providing evidence to inform hospitals and insurance firms on cost effective approaches of paying for healthcare services. The study also aims to evaluate whether utilization management as used in capitation can reduce healthcare costs and as such increase health access, prevent catastrophic expenditure and reduce impoverishment due to health expenditures.

1.3 Objectives of the study

1.3.1 **Overall Objective**

To compare capitation and fee for service provider payment mechanisms through the assessment of spending costs for two non-communicable and two communicable illnesses and effect of utilization management on cost at the Avenue Hospital, Nairobi.

1.3.2 **Specific objectives**

i. To measure the average cost of treatment per illness using a fee for service model and a capitation payment model. ii. To describe the payment cost difference between the fee for service model and the capitation payment model

iii. To evaluate the effect of utilization management in health costs in capitation payments

1.3.3 **Research questions**

i. What are the payment costs per illness in fee for service systems versus capitation?

ii. What is the difference in costs between fee for service payment and capitation payment per disease?

iii. What is the effect of utilization management on capitation payments?

1.4 Significance of the study

The study aims to assess whether capitation payments through managed care as practiced by HMOs has an effect on healthcare costs as compared to fee for service payment mechanism. Findings from this study will help stakeholders and policy makers to identify whether the utilization management practices in capitation can be expanded or introduced to other private and public hospitals that may not be Health Maintenance Organizations so as to reduce overall healthcare costs.

The research can be used by conventional insurance providers to evaluate their fee for service reimbursements to health care providers by comparing the benefit of the reduction of costs in health maintenance organizations that use utilization management and institutions that do not. The research findings will also help assess whether the physician

practice in utilization management in capitation based managed care can inform policy and practice. The study aims to promote physician sensitivity to health costs as a burden to patients and thus reduce health costs in hospitals. It also aims to give direction to healthcare researchers, hospital managers and policymakers on future research on insurance and cost effectiveness in hospitals to achieve projected industry targets.

1.5 Scope of the study

This study will be carried out at the Avenue Hospital which is the only private hospital that operates a capitation-based health maintenance organization while allowing cash payers and indemnity insurance clients. Evaluation of service costs will be exclusive of consultation fees which is standard for all patients. The study will review observations from primary data on health costs on patients having similar illnesses from January 2017 to June 2017 at the outpatient department. This is the period Avenue hospital's data capture was fully automated to its electronic medical records and aligned with the international ICD 10 coding after the entire staff were trained on its use to ensure standardization of input. The study will look at cost differences in two communicable illnesses and two noncommunicable illnesses. The study will focus on adult patients where managed care is prevalent in comparison to pediatric care where generic drugs may be avoided due to the aggression needed in treatment.

The period chosen was based on the availability of digitized primary data standardized with ICD 10 diagnostic coding when the hospital changed its health records from manual to electronic. The patients are attended to by physicians trained in managed care and utilization management to reduce the health spending by the HMO clients. The objective is to evaluate the unit costs per illness in managed care compared with indemnity insurance. The study also assesses the impact of utilization management on costs of care in managed care.

2 CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Health purchasers pay providers for the health services offered via different means to avoid catastrophic health expenditures. Each provider payment mechanism offers a given advantage over the others while having its own demerits. The most preferred forms of payments are capitation and fee for service mechanisms and are the most common payment models in Kenya.

2.2 Capitation

Capitation is a quality-based pre-payment model intended to create a system that fosters efficiency and cost-control while providing incentives for better health care. Charging based on quality than the number of procedures limits health care providers to deliver adequate care that keeps the patients healthy and enrolled. In any capitation system, a fixed fee is already paid to a healthcare provider/insurer at pre-arranged intervals for the healthcare services for an eligible individual, and places providers at risk to encourage more efficient styles of practice failure to which he incurs a loss if the pre agreed cost is exceeded.

This is paying a fixed per capita rate to provide care for enrollees in a specified geographic area and the insurer then pays healthcare providers for services (to be) delivered to enrollees based on some payment schedule or contract .Under these circumstances, the insurer may attempt to restrict the beneficiaries' use of high-cost providers through closed panels or high co-payments and/or transfer some financial risk to the providers in order to encourage them to be efficient. The transfer of money to these geographic areas is usually based on the region's specific healthcare needs and disease burden (Boachie, 2013)

2.3 Fee-For-Service (FFS)

This is a method of post payment according to an agreed fee-schedule specifying what is payable for each item of service supplied. The FFS system requires medical (diagnostic and therapeutic) activities and contacts to be separately identified since the price of each item is determined based on forecasts(*ex-ante)* and activities that are not on the list may not be paid. This is largely a variable system since providers increase their returns by producing more services. FFS has two principal benefits: unlimited access to care is guaranteed as well as provision of the best care available, at least if marginal payments compensate for the marginal cost of care (Marc Jegers, 2002).

Nevertheless, negative consequences are possible as providers may produce too much care, i.e. care which does not deliver any significant marginal health benefits, a phenomenon known as supplier induced demand due to providers' information power. Prices are prospectively determined for each service e.g. drugs, imaging and laboratory costs are paid for after the service. FFS payment method is implemented especially in private sector ambulatory care with satisfactory results. In these contexts, patients feel more satisfied with their access to health services, and providers can also provide quality health care which would ultimately result in their patients' satisfaction (Park, 2007).

2.4 Theoretical review

Capitation has a natural advantage in invoking selection and that the superior health of enrollees through risk profiling and patient selection accounts for the lower costs. In this regard, client selection is a major factor in the operation of health insurance markets through risk segmentation.

Reducing unnecessary utilization is appreciated, while exploiting favorable selection is almost always viewed as a social evil. A third hypothesis is that capitation does not reduce utilization, but they do reduce reimbursement to providers. This hypothesis implies that HMOs are able to use market power to prevail upon providers to dispense equivalent treatments for reduced reimbursement. If the reimbursement hypothesis is true, the associated value judgment is less clear.

2.5 Empirical Review

The managed health care revolution in the US produced major changes throughout the health care system. The lower health insurance rates that employers and consumers demanded were made possible in part by lower reimbursement rates to health care providers, hospitals, and suppliers. Plans obtained additional cost savings by negotiating large-volume discounts from health care providers, hospitals, and suppliers; by reducing hospital utilization; and by offering financial incentives for providers to economize. The increase in marketplace competition among plans also has served to bring costs down (Deal, Shiono, & Behrman, 1998).

Effects on overall expenditures and its components: In principle, when the selection effect dominates, HMOs have little or no effect on overall health care expenditures. However, if lower capitation premiums are the result of reduced utilization, than overall expenditures are lower. Independently, a competition effect that lowers costs for fee-for service insurers would also lower total costs. If lower capitation premiums are the result of a reimbursement effect, then total costs may be lowered, depending upon whether providers are able to make up their reduced HMO reimbursement with higher reimbursement from other insurers.

The main features of capitation can be divided into those that affect provider behavior and those that affect consumer behavior.

In calculating the impact of a switch from fee for service to managed care, an estimate of the difference-in-difference model where a comparison of total hospital costs in managed care versus fee for service clients revealed through an empirical analysis that switching from fee for service to managed care reduced hospital costs by 7-12% in both markets, but that insurers reduced costs in different ways in different markets (Parys, 2014).

2.6 Gaps in Utilization management in Kenya

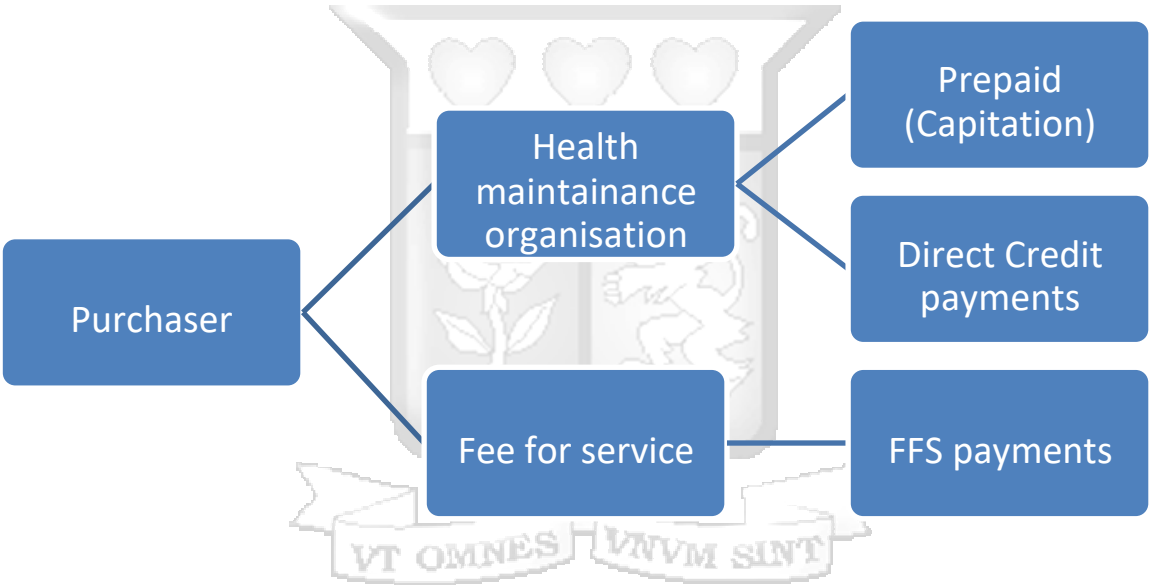
Lack of physician consensus is responsible for varying rates of appropriate and equivocal care and this necessitates further research to evaluate outcomes of different clinical practices in order to strengthen clinical consensus. The prevalence of unnecessary care

seems widespread and even low-use areas have the potential to benefit from successful utilization control activities. The overuse of diagnostic and curative factors in health have a financial impact in that many procedure-oriented hospital admissions are unnecessary and that routine inpatient diagnostic and therapeutic services are overused, even in those patients that are appropriately admitted.

The current studies on managed care addressing utilization management are mainly in the United States due to the existence of HMOs for more than three decades. The studies thereby may not directly apply to Kenya due to the different patient demographics, lower income rates as Kenya has a gross national income of $1,380 per annum according to the World Bank in 2017. Availability of managed care hospitals Kenya has one HMOs run hospital higher rate of informal employment at 75 percent with poor enrolment into health insurance is also a hindrance to the studies on managed care.

2.7 Conceptual Framework

The ultimate health system outcomes of efficiency, improved quality and equity as dependent variables envisioned by health providers rely on independent variables by as chosen by purchasers and mixed variables as provided for by provider payment mechanisms. The purchasers therefore rely on the efficiency of the providers as they choose different means of payment to offer the best health outcomes as noted. Purchasers can choose insurance payments that may be directly sourced from the HMO or may have open fee for service schemes. The HMO payments can be pre-paid through a capitation system or may be directly credited to the purchasers. Fee for service payments are however billed on a per use basis based on an ex ante agreement on service prices.



Conceptual framework of provider payment mechanisms accessible to insurance purchasers in Avenue hospital

Figure 2.1

Regardless of the utilization pattern under consideration as an incentive in capitation and irrespective of whether patients, clinicians, or institutions are primarily affected by the control mechanism, there are four basic methods that have been used to change utilization behavior:

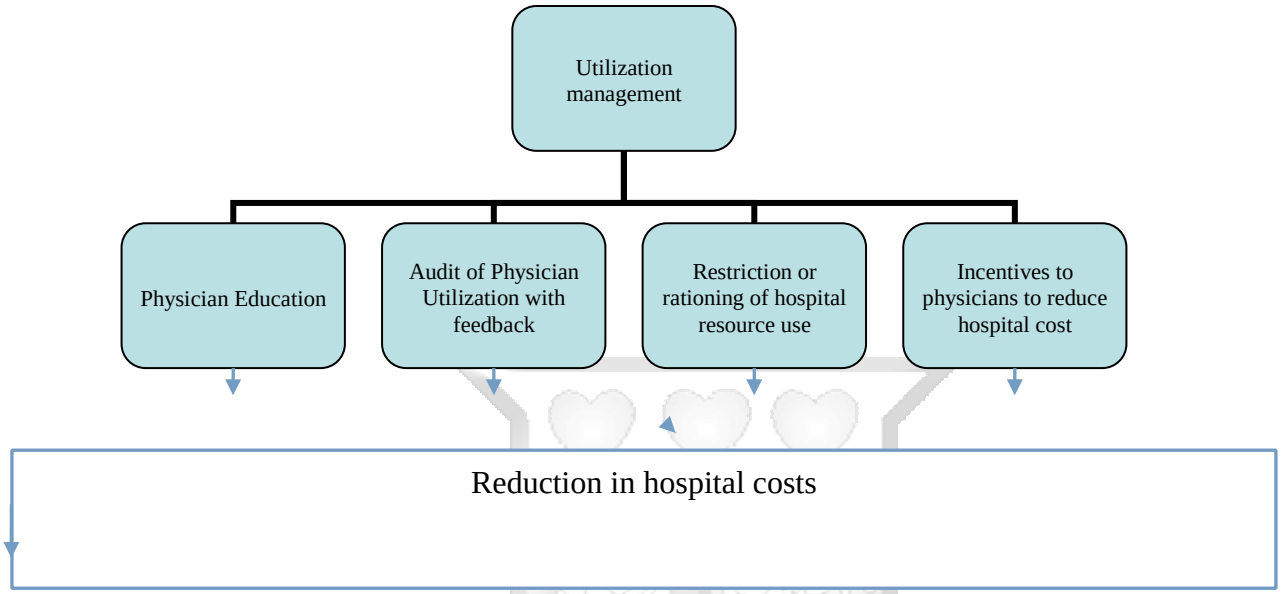


Figure 2.2: Conceptual framework on Utilization management

2.8 Explanation of variables

Physician education, audit with feedback, restrictions or rationing, and incentives are strategies applied to reduce hospital admissions and while others have been used to limit resource utilization and length of admission. Education is the most palatable intervention when attempting to change clinical behavior. Individual inappropriate behavior is identified and it is assumed that increased knowledge will result in changes in practice.
Unfortunately, there is little evidence for the efficacy of education.

A controlled study of house officers in a university teaching hospital showed no impact of a cost-containment teaching strategy. Audit and feedback method is less palatable to reviewed clinicians because individual care is scrutinized and aberrant or inappropriate behavior may be identified limitations but impedes on physician autonomy (Credé, 1989). Generally, this method requires that appropriate utilization rates or indications be defined which are then applied to individuals or groups of providers. These data are presented to

the providers in order to change the future behavior of high or low "outliers" with regard to patient sending per utility.

Incentives are the final set of cost-containment strategies. Incentives can be positive or negative, involve institutions, clinicians, or patients, and are most commonly financial. The greatest change in institutional financial incentives in medical care history has been the PPS. The use of the foregoing is practiced and restricted to managed care patients whereas the cash payers are not restricted to any specific resource use. The conventional insurance patients are not restricted to any limits of drug costs or drug use unlike the managed care patients who may be restricted to the use of generics and a limited outpatient cost use. Of note is that there are minimal laws governing managed care in Kenya as the requisite legislation has not been passed or enacted.

3 CHAPTER THREE: METHODOLOGY

3.1 Introduction

The chapter looks at the study methodology. The research was retrospective study done at Avenue hospital over a 6-month period. The chapter looked at the study design, population and sampling, inclusion and exclusion criteria, presentation, analysis, research quality, ethical considerations and data extraction.

3.2 Research Design

The study was retrospective, analyzing quantitative data over a period of 6 months from Jan 2017 to July 2017. This is the period Avenue hospitals medical records were fully integrated to its Med 360 electronic medical records and aligned to the ICD 10 international diagnostic coding. An assessment of the health spending per illness based on payment mechanism was done through the Avenue Hospital Med 360 EMR.

3.3 Study Population

The population sampled were patients attending Avenue healthcare facilities offering managed care through its HMO. Avenue hospital was picked as it is the only private hospital that operates a fully privatized HMO system while still offering payments via fee for service schemes and out of pocket payments. The population studied patient visits who paid using fee for service insurance schemes, capitation through the Avenue healthcare AHC based HMO. The data obtained had 13,555 patient visits at Parkland hospital between Jan 2017 to June 2017. Of the data only 3,694 visits were assessed as they were within the top 10 illnesses that was within the study. This was analyzed through the top 4 fees for service payers by volume of their health costs. Only patients paying by AHC capitation and who were among the four fee for service schemes namely Jubilee, APA, Resolution health and AON MiNET insurance schemes were considered for the study.

3.4 Data Collection

Patient data was collected from the Avenue hospital Med 360 EMR through an excel database. The data collected included the patient visit, payment mechanism, illness treated and cost of treatment. Costs considered were exclusive of the consultation fees as that was

standard to all patients. The cost was cumulative of laboratory investigation, imaging, and pharmacy charges per visit. The data was then anonymized filtered and sorted to remove errors and repeated entries.

3.5 Data Presentation and analysis

The data was be stratified by filtering based on each insurance payer assessed against each of the top 10 of the hospital's disease burden in cost and patient volume. Additional analysis was done to compare capitation and fee for service costs in 4 illnesses to assess the difference in costs. Microsoft excel was used for the development of pivot tables and pivot charts. Descriptive analysis was used based on the actual counts, the mean and median cost spending for each provider payment mechanism against each illness. The results of the analysis are presented in tables and graphs.

3.6 Inclusion and exclusion criteria

3.6.1 Inclusion criteria

Hospital visits from January 2017 to June 2017. Subjects who attended only Avenue Parklands clinic. Patient visits that had payments made through Jubilee, APA, Resolution health and AON MiNET insurance. Only illnesses occurring within the top 10 list of the hospital's disease burden were assessed. Visits that had clear ICD 10 based diagnostic coding and health costs were assessed.

3.6.2 Exclusion Criteria

Incomplete data entries with blank ICD diagnosis on the HRMIS were not be included. Patients visiting clinics that have discounted charges on the consultation, laboratory or imaging costs. Inpatient visits and admissions were excluded in the study. Pediatric visits were excluded from the study due to the aggression of care and the unwillingness of caregivers to opt for generic or conservative treatment in their malady.

3.7 Research Quality

Validity was ensured by using digitized data extracted from the hospitals HRMIS system. Reliability of the data is assured as the data is from input made through hospital trained

physicians, nurses and registration clerks that have strict log-in credentials into the HRMIS system and illnesses use a standardized diagnosing of ICD 10 coding to ensure uniformity.

3.8 **Research Ethics**

Ethical approval was sought from the Strathmore university institutional review board prior to the national research ethics body NACOSTI or KEMRI. The researcher's intent to assess the EMR data based on the aims and objectives of the research was shared internally with Avenue hospital management and approval was granted after anonymization of the data to protect the patient identity.

3.9 **Data Extraction**

A sample of the data excel sheet from which the extraction is based on is as shown below: The data extracted was exclusive of consultation expenditure which is standard to all patients. The total cost is an aggregation of laboratory, diagnostic and pharmacy expenses.

Date	**Patient**	**Sex**	**Age**	**Payment mechanism**	**Account**	**Primary Diagnosis**	**Total Amount**
03-03-17	P66779	Female	63	FFS(AAR)	AAR DOMESTIC	Acute pharyngitis	3080.25
18-03-17	P3114	Male	35	FFS(APA)	AAR HEALTH SERVICES	Dermatophytosis	4500.35
30-06-17	P43	Male	51	CAPITATION(AON)	AHCCITY CLOCK	Diabetes	3320.50

Table 3.1 Example of excel data extract sheet

4 CHAPTER FOUR; PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

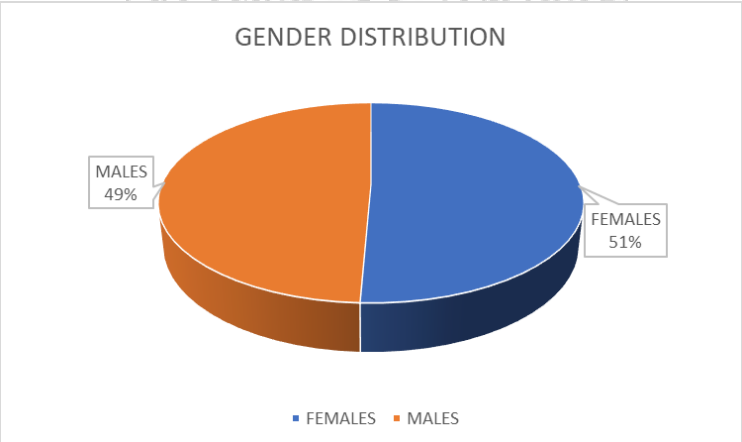
This chapter describes the analysis of data followed by a discussion of the research findings. The chapter discusses the data collection results, demographic characteristics, a descriptive analysis and the interpretation or inferential analysis. Data was analyzed to identify, describe and explore the healthcare costs in capitation and fee for service payment mechanisms.

4.2 Descriptive Statistics

4.2.1 Analyzed hospital

The data was obtained from Parklands Avenue hospital EMR as an excel extract. Data extracted from the hospital EMR was for the period between January 2017 and June 2017 was as follows. Persons younger than 12 years of age were excluded from the data as they did not meet the inclusion criteria. The age range of patients seen was between 13 to 82 years with a median age of 36.7years. The total data analyzed was 3,694 patient visits of the total data obtained that had 13,555. The excluded data included out of pocket payments, insurance payers who were not analyzed and illnesses that were not amongst the top 10 hospitals disease burden.

4.2.2 Gender difference and age representation in the data



FEMALES	MALES	TOTAL
1,872	1,822	3,694

Figure 4.0 Distribution of patient visits by gender

The data showed 51 percent of females to 49 percent of males in the analyzed data. The age range was 13 years to 82 years. Persons below 12 years of age were excluded from the data due to their treatment without consideration of utilization management.

4.2.3 **Volume of patient visits and health costs of the data per illness**

The study data showed 3,694 patient visits with a total health cost of Ksh 18,295,912.23 made by (APA, AON MiNET, Jubilee and Resolution health) four fee for service payment mechanisms and capitation by payments made by AHC. This was through the cumulative cost of the top 10 disease burden as seen at Parklands hospital for outpatient visits. 69 % or 2,546 of the patient visits studied made payments through capitation while the 31 percent was through the fee for service schemes, Jubilee visits were 504 at 14 %, APA 241 at 7%, Resolution health 215 at 6% and finally 188 AON visits at 5%.

Table 4.1 Volume of patient visits, sum of total health cost and percentage count of the top 10 illnesses at Parklands hospital.

Location Name	Parklands Hospital		
Primary Diagnosis	Top 10 illnesses		
Row Labels	**Sum of Total Amount**	**Count of Patient**	**PERCENTAGE COUNT OF PATIENT VISITS**
AHC	12,290,190.04	2,546	**69%**
AON	1,015,736.35	188	**5%**
APA	1,254,125.95	241	**7%**
JUBILEE	2,614,037.27	504	**14%**
RESOLUTION HEALTH	1,121,822.62	215	**6%**
Grand Total	**18,295,912.23**	**3,694**	**100%**

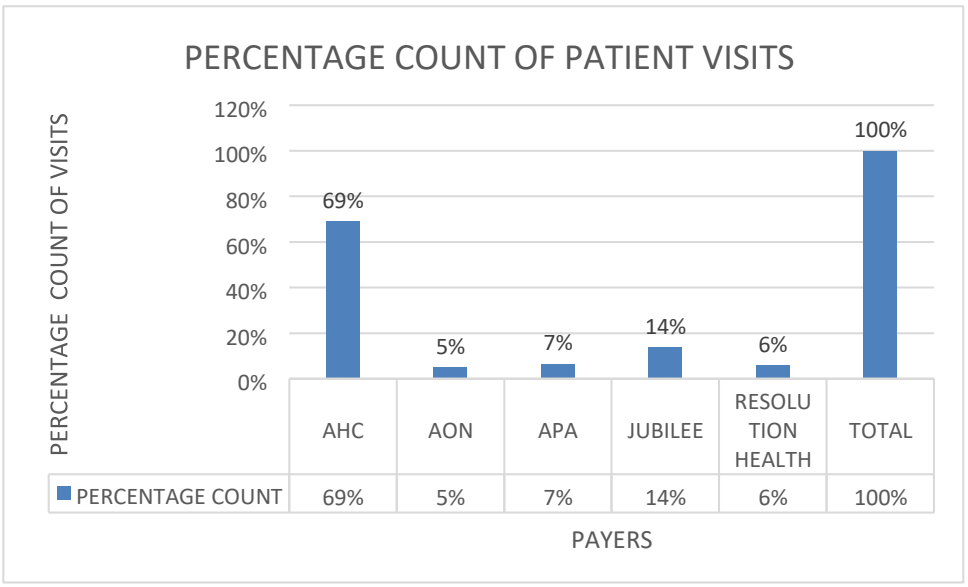


Figure 4.2 Percentage count of patient visits based on payers.

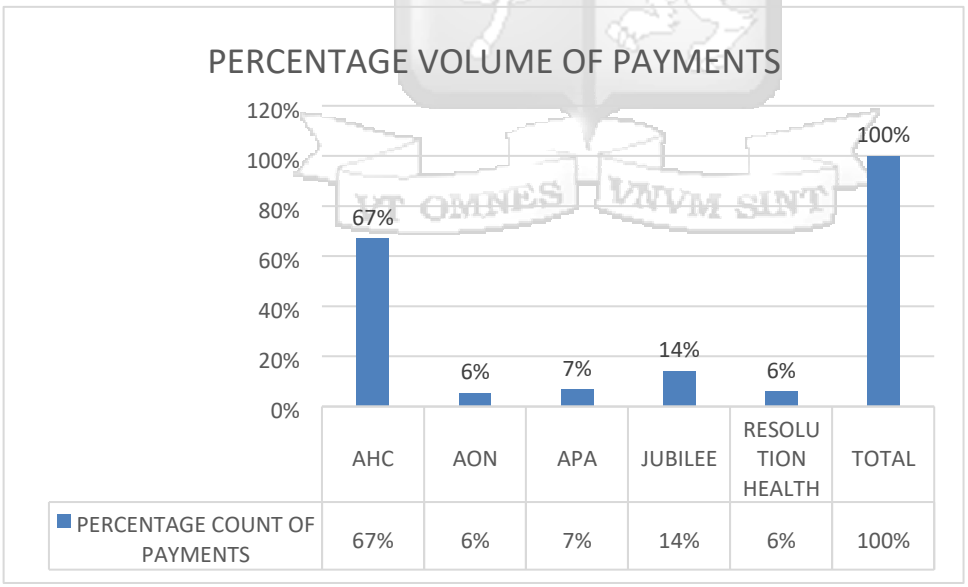


Figure 4.3 Percentage volume of payments made by payers for the top 10 illnesses

Payments made by each payer as a percentage to the total health cost was similar to the numerical visits as a percentage with AHC paying 67% of the total cost @Ksh 12.2 million.

Jubilee payments were 14 % with Ksh 2.6 million. APA made 7% of the payments at 1.25 million with AON and Resolution health making 6% each at Ksh 1.1m and 1.02million each. The top payers through each insurance schemes were noted to be the capitation based AHC as the hospital operates an HMO based system. This was however followed by fee for service schemes and direct payers.

4.3 Analysis based on provider payment mechanisms

The patient visits were studied based on provider payment mechanism. Capitation payers who were AHC clients were evaluated per illness group based on the ICD 10 coding and further stratified as per the top 10 illnesses. Fee for service payers were also assessed and in this case four insurance schemes were chosen based on their patient volume. The insurance payers included APA, AON insurers, Jubilee and Resolution health.

The analysis then proceeded to analyze the individual payments per illness in two noncommunicable diseases and two communicable illnesses. This was done after sorting of the and filtering of the payment mechanism, illness assessed, patient volume and health costs derived from pivot tables and pivot charts. Lastly, a comparison of the mean healthcare costs in capitation versus the fee for service schemes was evaluated and the mean costs spending per payment mechanism assessed as a percentage of the mean total cost by both payers.

4.3.1 Mean illness cost for both FFS and AHC payments

Table 4.2 ; Fee for service and capitation costs based on the top 10 illnesses at Parklands

Cover	(FFS and Capitation)
Location Name	Parklands

Row Labels	Sum of Total Amount	Count of Patient	Mean Cost
Acute nasopharyngitis [common cold]	5,738,134.64	1,281.00	4,479.42
Acute pharyngitis	3,091,382.10	639.00	4,837.84
Asthma	975,658.87	151.00	6,461.32
Dyspepsia	1,359,933.23	267.00	5,093.38
Essential (primary) hypertension	1,471,184.59	228.00	6,452.56
Gastritis and duodenitis	1,524,840.83	234.00	6,516.41
Plasmodium falciparum malaria	551,369.78	104.00	5,301.63
Soft tissue disorders related to use; overuse and pressure	2,107,694.40	512.00	4,116.59
Urinary tract infection, site not specified	957,967.18	153.00	6,261.22
Vasomotor and allergic rhinitis	517,746.61	125.00	4,141.97
Grand Total	**18,295,912.23**	**3,694.00**	**4,952.87**

The health costs incurred at Parklands hospital by mean cost were variable as seen in communicable and non-communicable diseases. Acute nasopharyngitis had the highest patient visits at 1,864 and overall cost at Ksh 8,572,383.48 with mean cost per visit at Ksh 4,479.19. Asthma a non-communicable illness had an average cost of Ksh 6,461.32 per patient visit. Essential hypertension had an overall expenditure of 6,452 Ksh for the 228 patients seen. The average health cost per visit for each patient among the 3,694 was Ksh 4,954.87

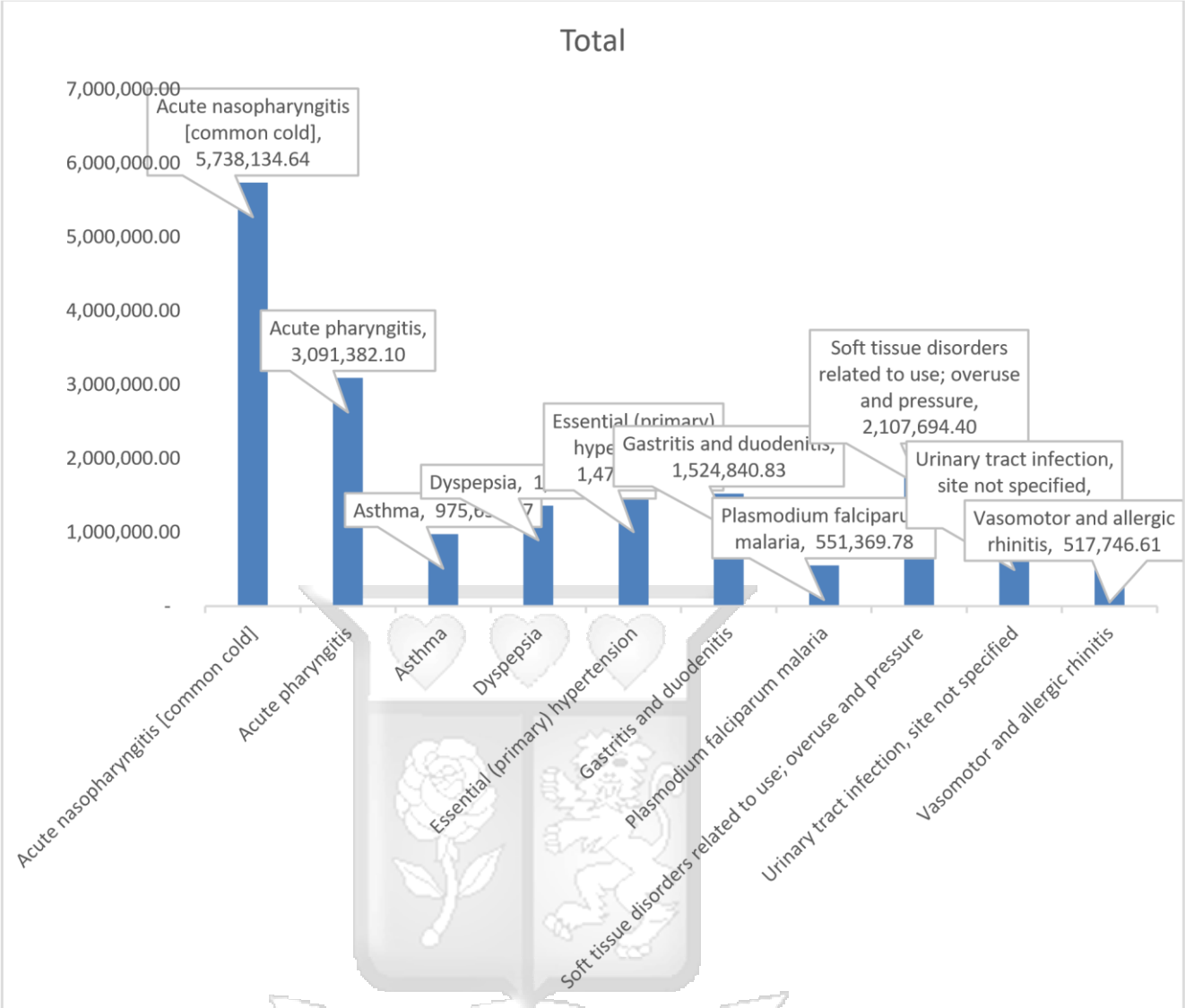


Figure 4.4 Fee for service and capitation costs based on the top 10 illnesses in Parklands

4.3.2 Health costs per illness paid by capitation

The top illnesses were assessed based on their mean cost spending achieved by assessing the sum of total amount paid in relation to the patient visits.

AHC insurance payments (capitation payments) had a mean cost of Ksh 4,827.25 among the 2,546 patient visits within the 6-month period. This was 97% of the mean average for both fee for service and capitation mean at Ksh 4,952.87. The highest payments made by capitation insurance clients came in non-communicable illnesses like asthma and essential

hypertension while communicable illnesses like acute nasopharyngitis with 884 visits had an overall expense of Ksh 3,827,516.72.

Table 4.3 Mean health costs by capitation payments per illness

Location Name	Parklands Hospital
Payment mechanism	Capitation (AHC)

Row Labels	Sum of Total Amount	Count of Patient	MEAN COST
Acute nasopharyngitis [common cold]	3,827,516.72	884	**4,329.77**
Acute pharyngitis	1,951,161.05	428	**4,558.79**
Asthma	628,716.88	103	**6,104.05**
Dyspepsia	927,903.14	186	**4,988.73**
Essential (primary) hypertension	1,053,530.58	155	**6,796.97**
Gastritis and duodenitis	1,058,298.27	164	**6,453.04**
Plasmodium falciparum malaria	296,570.18	47	**6,310.00**
Soft tissue disorders related to use; overuse and pressure	1,620,497.56	398	**4,071.60**
Urinary tract infection, site not specified	623,588.60	102	**6,113.61**
Vasomotor and allergic rhinitis	302,407.06	79	**3,827.94**
Grand Total	**12,290,190.04**	**2,546**	**4,827.25**

Location Name	Parklands Hospital
Cover	(4 fee for service insurance schemes)

Row Labels	Count of Patient	Sum of Total Amount	MEAN COST
Acute nasopharyngitis [common cold]	397	1,910,617.92	4,812.64
Acute pharyngitis	211	1,140,221.05	5,403.89
Asthma	48	346,941.99	7,227.96
Dyspepsia	81	432,030.09	5,333.70
Essential (primary) hypertension	73	417,654.01	5,721.29
Gastritis and duodenitis	70	466,542.56	6,664.89
Plasmodium falciparum malaria	57	254,799.60	4,470.17
Soft tissue disorders related to use; overuse and pressure	114	487,196.84	4,273.66
Urinary tract infection, site not specified	51	334,378.58	6,556.44
Vasomotor and allergic rhinitis	46	215,339.55	4,681.29
Grand Total	**1,148**	**6,005,722.19**	5,231.47

The mean cost in capitation payments for the 10 illnesses was Ksh 4,827.25 (92.2% of FFS) against a mean cost of Ksh 5,231.47 in fee for service insurance.

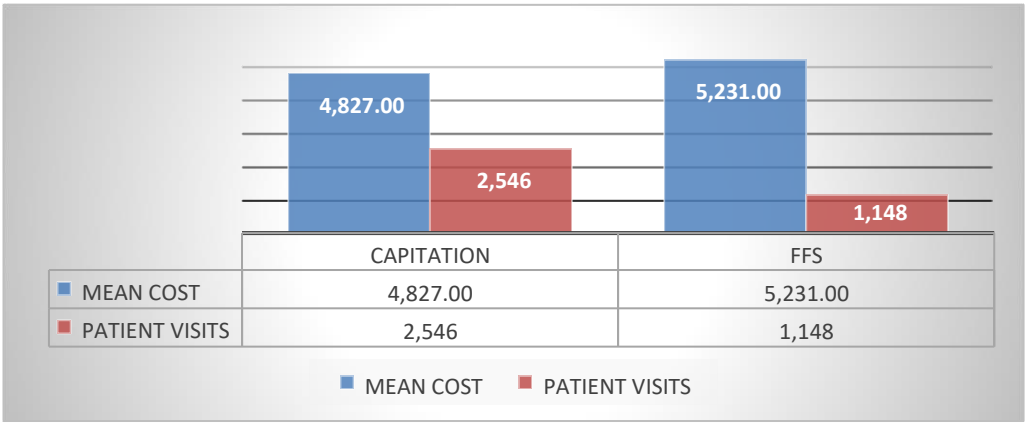


Table 4.4 Capitation and FFS mean cost and patient visits

This is a significant difference of 7.8 percent was significant and was further analyzed per illness. The 7.8% lower cost difference in the mean cost in capitation as compared with the mean cost in fee for service ranged widely per illness.

4.3.3 Assessment of expenditure difference

A further analysis of individual illnesses sought to evaluate the consistency that capitation was cheaper than fee for service insurance and by what margin.

Non communicable disease; a) ASTHMA

Table 4.4 Asthma costs based on provider payment mechanism

Location Name	Parklands Hospital
Primary Diagnosis	**Asthma**

Row Labels	**Count of Patient**	**Sum of Total Amount**	**MEAN** PERCENTAGE FROM **COST** THE MEAN	
AHC	103	628,716.88	6104.05	94%
AON	12	72,049.43	6004.12	93%
APA	6	46,799.72	7799.95	121%
JUBILEE	21	158,960.57	7569.55	117%
RESOLUTION HEALTH	9	69,132.27	7681.36	119%
Grand Total	**151**	**975,658.87**	**6461.32**	**100%**

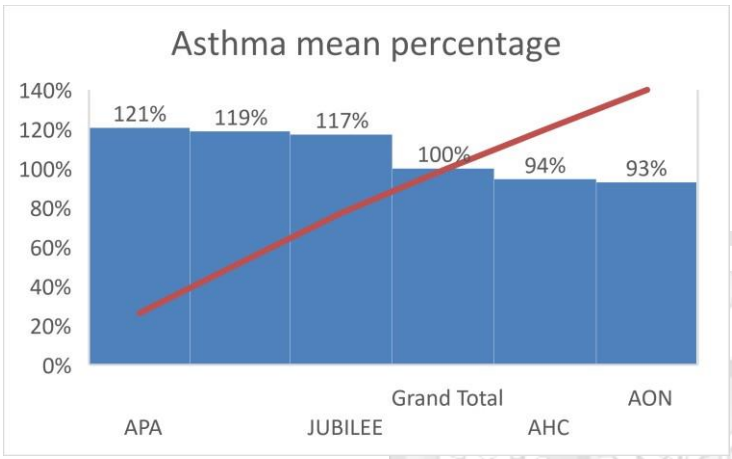
The mean cost in asthma spending for 5 payers was Ksh 6,461.32. Mean capitation payments in asthma were however less than the total mean at 6,104.05. This showed a difference of 6%, meaning patients making payments by capitation paid less.

Fee for service payments ranged from 93% of the total mean by AON, to 117%,119% and 121% for Jubilee, Resolution health and APA respectively.

Capitation costs in asthma were lower than the average asthma cost at Ksh 6,104.5 or 94% of the mean asthma cost of Ksh 6,461.23.AON insurance mean costs were also significantly lower than the mean cost spending by 7% at Ksh 6,004.12.Other fee for service schemes

were however well above the mean cost with resolution health at Ksh 7,681.36 having a 19 % higher cost .APA spending in asthma was also 21% more than the average at 7,799.95.

Figure 4.5 Percentage changes in Asthma cost



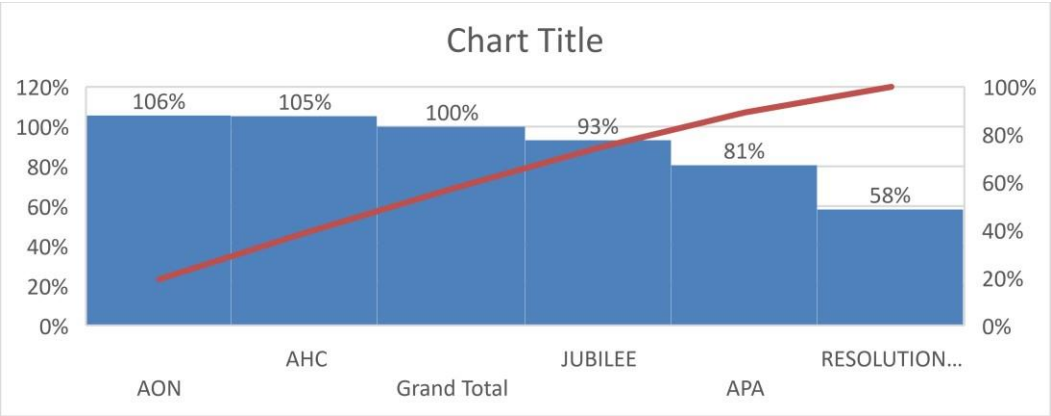
b) Essential Hypertension

Table 4,5 Essential hypertension costs based on provider payment mechanism

Account	(All)
Location Name	Parklands Hospital
Primary Diagnosis	Essential (primary) hypertension

Row Labels	Count of Patient	Sum of Total Amount	MEAN COST	PERCENTAGE FROM MEAN
AHC	155	1,053,530.58	6,796.97	105%
AON	12	81,707.66	6,808.97	106%
APA	16	83,299.70	5,206.23	81%
JUBILEE	37	222,472.83	6,012.78	93%
RESOLUTION HEALTH	8	30,173.82	3,771.73	58%
Grand Total	**228**	**1,471,184.59**	**6,452.56**	100%

Figure 4.6 Percentage changes on the mean cost in Essential Hypertension



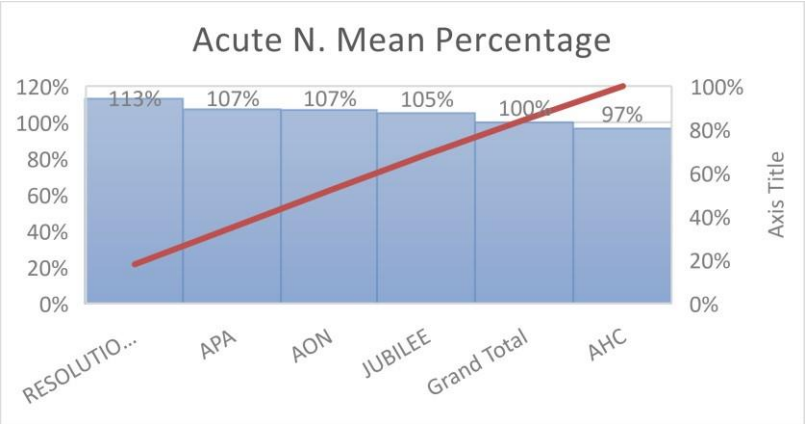
Capitation costs in Essential hypertension were 5% above the mean cost for the five payers assessed. The mean cost was Ksh 6,452 with expenses by APA, Jubilee and resolution health at 81%,93% and 58% of the overall mean.

This expressed a fact that capitation payments were not cheaper in capitation but was in fact more costly compared to the three fee for service payers that had a lower mean.

Communicable disease; a) Acute Nasopharyngitis

Table 4.6 Percentage changes on the mean cost in Acute Nasopharyngitis

Figure 4.7 Acute Nasopharyngitis costs based on the provider payment mechanism



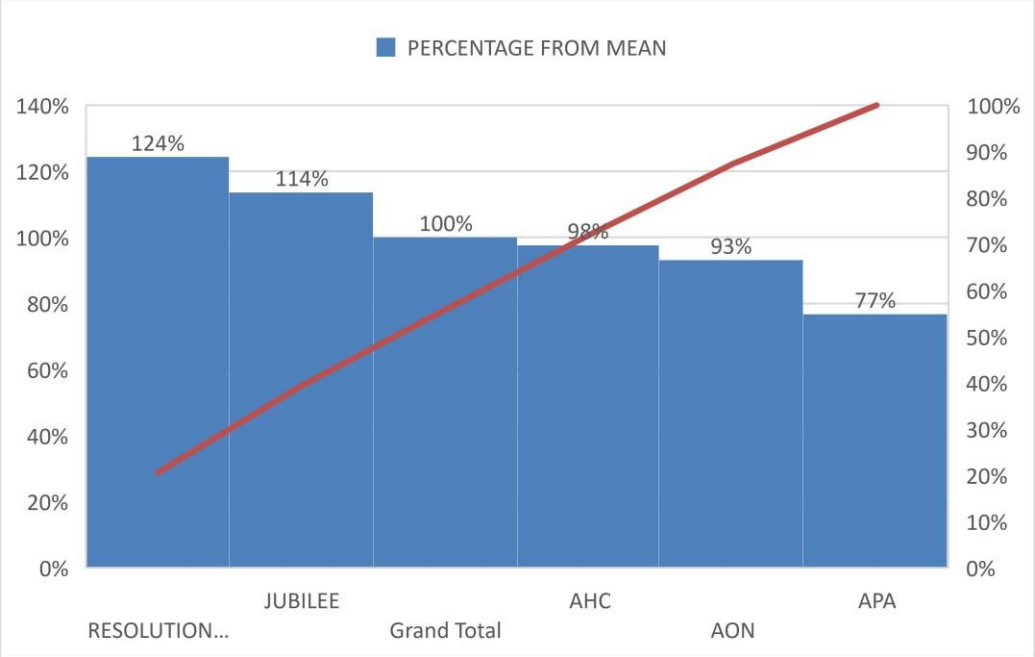
Primary D.	Acute nasopharyngitis
Account	(All)
Location Name	Parklands Hospital

Row Labels	Count of Patient	Sum of Total Amount	MEAN COST	PERCENTAGE FROM THE MEAN
AHC	884	3,827,516.72	4,329.77	97%
AON	62	296,791.78	4,786.96	107%
APA	91	436,673.73	4,798.61	107%
JUBILEE	162	762,044.80	4,703.98	105%
RESOLUTION HEALTH	82	415,107.61	5,062.29	113%
Grand Total	**1,281**	**5,738,134.64**	4,479.42	100%

Acute nasopharyngitis had the highest disease burden in terms of patient visits with 1281 patient visits recorded. Capitation payments were 97% of the mean average for the 5 payers with a mean of Ksh 4,329.77 against the mean of Ksh 4,479.42. AON and APA had a similar percentage from the mean at 107% with Jubilee and resolution health at 105 % and 113% difference from the mean cost.

b) Urinary tract infections

Figure4.8 Urinary tract mean percentage changes



In urinary tract infections, capitation expenses were 98% of the overall mean at Ksh 6113.61 of the overall mean at Ksh 6,261.22. This was a 2 percent difference from the average mean. Of note is that other fee for service schemes were also significantly lower than the mean cost at 77% and 93 % for APA and AON payers. Payments by Jubilee and resolution health were at 114% and 124% higher than the average mean.

Primary Diag	Urinary tract infection,
Location	Parklands Hospital

Row Labels	Count of Patient	Sum of Total Amount	MEAN PERCENTAGE COST FROM MEAN	
AHC	102	623,588.60	6,113.61	98%
AON	9	52,462.22	5,829.14	93%
APA	9	43,236.43	4,804.05	77%
JUBILEE	27	191,973.81	7,110.14	114%
RESOLUTION HEALTH	6	46,706.12	7,784.35	124%
Grand Total	**153**	**957,967.18**	6,261.22	100%

Table 4.7 Urinary tract infection costs based on provider payment mechanism

5 CHAPTER FIVE; DISCUSSION

5.1 Introduction

This chapter analyzed the results obtained from the data with relevance to the study objectives. The results were further assessed in relation to existing studies and research findings. Research limitations are explained due to factor variability with recommendations made to guide future analysis.

5.2 Discussion

The study objective was a comparison of capitation and fee for service health costs for outpatient spending at Avenue healthcare Parklands. The data analyzed showed that capitation payments were 69% of the hospital visits made for the illnesses assessed over the 6-month period. This is attributable to the strict utilization management practice in HMOs where patients can only visit listed facilities. The percentage count for other fee for service schemes was less than 15 percent each as the patients were free to seek services in any other facility.

The data results from the analyzed illnesses showed that capitation was cheaper than fee for service payments and their cumulative average. The study agrees with (Van Parys, 2015) study that managed care plans reduce health costs. Of the 3,694 patient visits analyzed, the study showed a 7.8 % reduction in cost for capitation payments in comparison with the fee for service provider payment schemes. The mean cost in capitation payments for the 10 illnesses was Ksh 4,827.25 (92.2% of FFS) against a mean cost of Ksh 5,231.47 in fee for service insurance.

The current study differs with the rand health insurance experiment that a reduction of 30 percent was evident when comparing fee for service schemes to capitation payments. The study also differs with (Polsky and Nicholson, 2001) study that HMOs have little or no effect on overall health expenditures. They attributed the cost changes were noted due to the competition effect on fee for service schemes by entry of HMOs in a market leading to

cost reduction due to reduced premiums. The findings however agree with findings from the rand hypothesis that show that fee for service schemes are more expensive than capitation schemes as the users have unlimited access to care in comparison to the regulated capitation.

5.3 Research limitations

5.3.1 Sampling

The sampling was limited to one institution due to the unavailability of HMOs. The study had mixed illnesses for its observation and this was not compared with different institutions. Variability in hospital charges for similar costs also limits a direct comparison of health costs per illness.

5.3.2 Data generalization

The results cannot be generalized due to the physician autonomy in treatment as most institutions do not use standard protocols for treatment. The data cannot also be generalized to children whose treatment is aggressive and utilization practices are bypassed by physicians in children.

5.3.3 Data variables

The ICD 10 coding has a wide data variety and patient coinfections prevent a direct comparison in illnesses that may present at the same time. Patients present with secondary and tertiary diagnoses that are treated at the same time that leads to exclusion of a large data set for a direct comparative analysis.

5.3.4 Correlational tests and Analysis period

A correlational analysis was not carried as associations were not evaluated in the health costs. The time period for the data analysis was also limited to due the data being made available after the proposal was presented to the institution by the researcher.

5.3.5 Complex data and complex instruments used for collection

Patient and hospital data are complex to collect due to expensive EMRs that is needed in all institutions to for comparison. Multiple input by various stakeholders with lack of standardization due to autonomy in patient management and differing diagnosis also limits a standardization of cost and leads to a wider variance.

5.4 **Conclusion**

The study affirms that capitation costs are less than fee for service health costs, though there are exclusions to this with regard to availability or lack of treatment options in certain illnesses. Capitation may have an effect on reduction of the overall hospital costs through a competition effect by its entry into the market that will lead to competitive fee for service pricing. Generalization of data is impossible due to different organizations or hospitals using different incentives to reduce their costs.

5.5 **Recommendations**

The demonstration that capitation is cheaper than fee for service provider payment mechanisms provides an opportunity for hospital managers and insurance teams to embrace utilization management as a means of reducing health costs. Utilization management as a practice should be included in physician training to improve efficiency and increase health access through reduced costs.

The research should be conducted further to identify illnesses that offer the biggest incentives and reduction in cost. A comparative analysis with different institutions would be essential to determine the difference with other provider payment mechanisms.

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    and WHO: Half the world lacks access to essential health services, 100 million still pushed into extreme poverty because of health expenses: https://www.who.int/news-room/detail/13-12-2017-world-bank-and-who-half-theworld-lacks-access-to-essential-health-services-100-million-still-pushed-intoextreme-poverty-because-of-health-expenses
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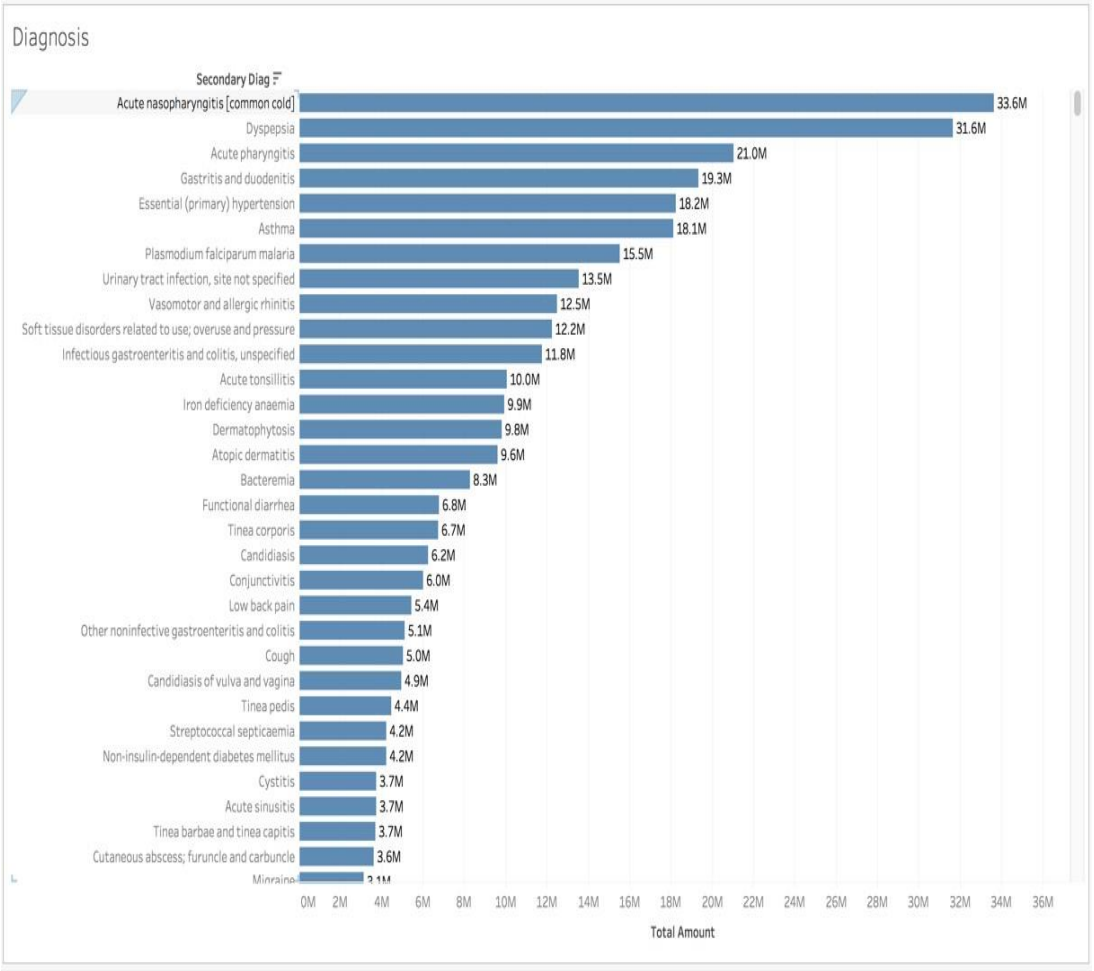
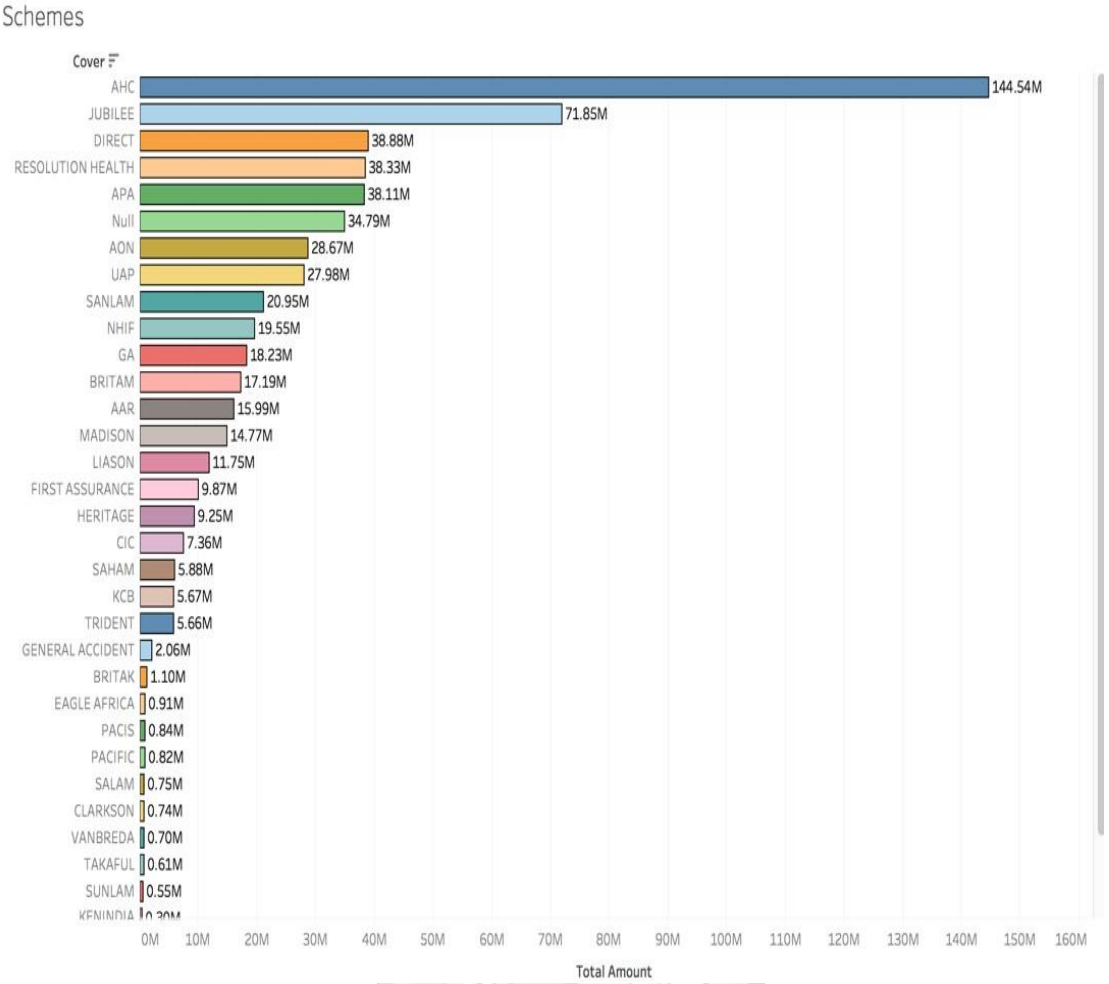


Appendix 1

List of illnesses highlighting the total hospital disease burden



Appendix 2

List of hospital payment mechanisms by volume of payments made