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ASSESSMENT OF THE FINANCIAL IMPLICATIONS OF THE GHANA-DIAGNOSIS RELATED GROUPING (G-DRG) PAYMENT FOR INPATIENT SERVICE DELIVERY AT GREATER ACCRA REGIONAL HOSPITAL, GHANA.

BY

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DECLARATION

I hereby do declare that except for the duly acknowledged references to other people's work this piece of work is my own composition and to the best of my knowledge, neither in whole nor in part has this work been presented for the award of a degree in this university or elsewhere.

SIGNATURE DATE: 10TH FEBRUARY, 2023

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SIGNATURE… DATE:10th February 2023

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(SUPERVISOR)

DEDICATION

I dedicate this piece of work to my wife, Mrs. Akosua Frimpomaa Gyasi. May God bless her immensely for all the support.

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May God bless us all.

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LIST OF ABBREVIATIONS

CHMC	CORE HOSPITAL MANAGEMENT COMMITTEE
CM	CASE MIX
DRG	DIAGNOSIS RELATED GROUPING
ENT	EAR, NOSE AND THROAT
G-DRG	GHANA DIAGNOSIS RELATED GROUPING
FFS	FEE FOR SERVICE
HEFRA	HEALTH FACILITIES REGULATORY AGENCY
ICD-10	INTERNATIONAL CLASSIFICATION OF DISEASE (VERSION 10)
LEAP	LIVELIHOOD EMPOWERMENT AGAINST POVERTY
LI	LEGISLATIVE INSTRUMENT
LOS	LENGTH OF STAY
MDC	MAJOR DIAGNOSTIC CATEGORY
NHIA	NATIONAL HEALTH INSURANCE AUTHORITY
NHIS	NATIONAL HEALTH INSURANCE SCHEME
SSNIT	SOCIAL SECURITY AND NATIONAL INSURANCE TRUST

DEFINITION OF TERMS

Co-payment : A fixed amount an individual pays for a covered health care service after the person have paid for deductible

Diagnosis Related Grouping : A diagnosis-related group (DRG) is a case-mix complexity system implemented to categorize patients with similar clinical diagnoses in order to better control hospital costs and determine payor reimbursement rates.

Prospective Payment System (PPS): A prospective payment system is a method of reimbursement in which health insurance payment is made based on a predetermined, fixed amount.

ABSTRACT

Introduction: Ghana introduced National Health Insurance in 2004 as means of achieving Universal Health Coverage. The Ghana-Diagnosis Related Groupings (G-DRG) has been one of the payment mechanisms used to reimburse providers for services and procedures. However, anecdotal evidence suggests that the amount reimbursed for services or G-DRG tariffs may be lower than the market prices for those same, creating a financial gap for services rendered by providers.

Objective: This study assessed the financial implications of the Ghana-Diagnosis Related Grouping (G-DRG) payment system on service delivery at Greater Accra Regional Hospital.

Methods: The design was a longitudinal and descriptive cross-sectional study from the provider perspective using mixed (Quantitative and Qualitative) approach. The 2021 annual performance report of the Greater Accra Regional Hospital was used to purposefully identify the top hundred (100) frequently reported inpatient admissions. Institutional data on G-DRG tariffs issued by the National Health Insurance Authority and the approved hospital charges for managing the sampled medical conditions were extracted and analysed for difference in cost. The top ten conditions from the sample were used to determine the burden of the cost difference on the facility in a five-year trend analysis by comparing price differences of respective years. The qualitative approach utilized purposive sampling method to identify fifteen (15) Key Informants and interviewed on the G-DRG implementation challenges at the facility. Data was analysed using Microsoft Excel 365 and Stata software version 16. Linear regression was used to establish a relationship between G-DRG price difference and average length of stay for medical conditions. In-depth interview data was analysed using NviVo software after categorization of recorded responses under themes.

Results: The study established a statistically significant linear relationship between G-DRG price differentials and a reduced average length of hospital stay for medical conditions (p-value, <.01). There was a cumulative financial gain of 23% on the utilization cost of the top ten inpatient medical conditions over a five year period. Providers also perceived G-DRG tariff causes non-satisfaction of clients and encourages co-payment practices.

Conclusion: The National Health Insurance Authority's G-DRG payment system has varying financial implications such as net financial gain on services rendered, an associated reduction in average length of hospital stay, perceived non-satisfaction of clients and co-payment practices for healthcare provision at Greater Accra Regional Hospital.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

In 2004, Ghana implemented the National Health Insurance Scheme in response to the catastrophic cost on healthcare born by the citizenry and part of collaborated efforts at ensuring sustainable health care financing options that promote financial risk protection and renewed commitment for universal access to healthcare (Kodom et al., 2019). Fortunately, successive governments continue to invest immensely to improve the gains of the scheme and to ensure sustainability especially when various evaluations have highlighted its positive impacts on the poor in the society.

As a social insurance scheme, it is financed largely through contributions from taxes and premiums by members. Sources such as indirect tax (VAT levy of 2.5%) on selected goods and services, two and a half percentage point deductions from the social security contributions of formal sector workers, internally generated funds from activities such as investments and support from donors as well as development partners are all part of the fund pooling (Kwarteng et al., 2019).

Moreover, there are exemptions to some members in premium payments which potentially affect revenue generation for the scheme and its sustainability. Groups such as persons below the age of 18 years, elderly aged 70 years and above, people classified as indigents or extreme poor in the society, Social Security and National Insurance Trust (SSNIT) pensioners and beneficiaries of the Livelihood Empowerment Against Poverty (LEAP) programme and pregnant women are all exempted from paying premiums (Nsiah-Boateng & Aikins, 2018). However, since formal sector workers or contributors of SSNIT get their premiums deducted at source, they only pay for registration or administrative charges to renew their membership like all members of the exempt group except for indigents, LEAP beneficiaries and pregnant women.

The benefit package of the scheme is reported to cover 95% of health conditions in Ghana including access to a variety of inpatient and outpatient services, surgical care, emergency care, and obstetrics (Okoroh et al., 2018). Under section 37 of the National Health Insurance Act (ACT 852), payment systems that can be used to pay healthcare providers for services rendered to subscribers must be fee for service, diagnosis related groupings, capitation or a payment mechanism that the NHIA Board in consultation with healthcare providers and the Minister for Health may determine. Accordingly, the Scheme has been utilizing multiple provider payment system with periodic evaluation and revision to optimize intended outcomes.

From inception of implementation of the Scheme, the NHIA paid its credentialed providers for both services and medicines through Fee-for-Service payment method and eventually switched to Diagnosis Related Grouping (DRG) payment due to abuse of the system. Subsequently, the Authority began payment reforms by introducing Diagnosis Related Grouping (DRG) method for services at all level of care delivery while maintaining Fee-for-Service for medicines costs (Andoh-Adjei et al., 2019a). This payment system (G-DRG) has been used to pay for services and procedures while payment for medicines have been made using standardized itemized fees (Fee-for-Service) based on a medicines list.

The G-DRG system was anticipated to address challenges such as the poor quality of claims submitted due to healthcare providers inability to code claims properly (leading to the submission of incomplete claims) and the escalating claims utilization costs worsened by spurious claims submission by providers without proper system to monitor fraud. However, cost of claims continued to escalate emanating from fraud and moral hazards which occasioned the piloting and subsequent scaling up of a per capita (capitation) payment mechanism for healthcare services at the primary level but was halted in 2017 (Nonvignon et al., 2022).

1.2 Problem Statement

Many countries practicing health insurance continue to use Diagnosis Related Grouping (DRG) as the principal method for paying providers. Under the DRG clinical case classification system, patients are categorized into DRGs with similar clinical symptoms and resource consumption based on diagnosis, procedure, comorbidities, severity, and other factors with the assumption that patients tied to a DRG are deemed to be medically and economically similar (Zhang & Sun, 2021). Similarly, under Ghana's National Health Insurance Scheme, providers receive a fixed amount for each admission according to the patients DRG instead of the actual inpatient expenditure following provision of care and claims submission (Christmals & Aidam, 2020).The prospective reimbursement nature of the G-DRG system, especially under fluctuating macroecomic environment, creates the possibility of providers incurring risk when treating extraordinarily expensive patients (also called outlier patients) even if they make socially optimal efforts to reduce treatment costs (Takahara, 2016).

Moreover, the all-inclusive nature of the tariff may adversely impact on the finances of facilities after conducting complex investigations to arrive at a diagnosis. There are also concerns about proportionate cover of the tariff on administrative costs at a critical time when public facilities are directed to bear the full cost of all utilities. Ultimately, the sustainability of the scheme is being threatened as some providers transfer treatment cost to patients registered under the scheme through illegal practices such as co-payment for conditions under the benefit package.

1.3 Justification

Many studies on the operations of the Ghana's National Health Insurance Scheme have concentrated on enrollment and effects on quality healthcare utilization (Kodom et al., 2019; Kwarteng et al., 2019; Nonvignon et al., 2022; Nsiah-Boateng & Aikins, 2018; Okoroh et al., 2018). In the area of provider payment methods, only few studies (Amo et al., 2013; Andoh-Adjei et al., 2019a) have looked at implementation challenges and preferences of providers to alternative forms of provider payment methods for services rendered to subscribers of the National Health Insurance Scheme.

Already, a study (Eghan et al. 2015) indicates that, the tariff rates assigned to services and procedures in case groupings per the G-DRG payment mechanism are very low, not updated yearly as per policy and increases the difficulties for service providers to work with such tariffs especially under fluctuating economy. Moreover, there is documented evidence that the introduction of the Ghana Diagnostics Related Groupings mechanism has rather escalated the cost of health care reimbursable by the NHIA (Akonde, 2015). However, linkage between the G-DRG payment system and the cost-of-service delivery on the part of healthcare providers was not established, deepening the relevance for the conduct of this study.

This study will serve as baseline material on recommendations to NHIA for further analysis of reimbursement methodology and the importance of adhering to periodic and regular reviews of tariffs to reflect economic trends in the healthcare industry. It would also help health managers and other stakeholders to understand the plight of providers, the frequently reported cases of co-payment for services, non-availability of medicines and the extended difficult roles of clients search for services allowable at prescribed levels of care.

1.4 General Objective

The general objective of the study is to assess the financial implication of the Ghana-Diagnosis Related Grouping (G-DRG) payment system on services rendered by Greater Accra Regional Hospital.

1.4.1 Specific Objectives

1. To establish a relationship between price differentials and length of stay for in-patients conditions at Greater Accra Regional Hospital.
2. To determine the yearly price differentials between NHIS and Hospital Approved Tariffs
3. To explore providers perceptions on G-DRG implementation challenges at Greater Accra Regional Hospital.

1.5 Research Questions

1. Is there a relationship between price differentials and length of stay for in-patient conditions at Greater Accra Regional Hospital?
2. Is there yearly price differentials between NHIS and Hospital Approved Tariffs?
3. What are the challenges of implementation of the G-DRG payment system on service delivery at Greater Accra Regional Hospital?

1.6 Conceptual Framework

Macroeconomic indicators such as Gross Domestic Product (GDP), inflation, rate of depreciation of the local currency against other international currencies and exchange rate could substantially increase the price of imported commodities used in delivering healthcare in the country. Additionally, lack of appropriate pricing control policy and uncontrolled mark-ups on consumables culminates into variations in service prices across healthcare facilities in the country. Consistency to good procurement practices such as keeping to sourcing of consumables for service delivery from approved routes, with the payment of associated taxes and fees to regulatory bodies by the healthcare distributors, can lead to high procurement prices of medicines and other consumables for providers. Additionally, procurement of branded or innovative medicines to meet the desires of the clients can increase intangible cost to providers.

Next, the operational activities of the National Health Insurance Authority (NHIA), the major financier of services rendered to clients registered with the scheme also adversely affect providers. The non-adherence to the yearly review of the prices as enshrined in the Legislative Instrument (L.I) 1809 makes their prices obsolete at certain times to the median market prices on the market. Additionally, the relatively lower reimbursement prices and the progressive nature of the reimbursement procedure may constraint providers' budgetary allocations in meeting health facilities' requirement expenditures and may affect operating expense ratio. Consequently, availability of essential medicines and other non-drug consumables stocked by providers is affected with decrease in financial power to purchase which subsequently affect operating expense ratio and increases intangible cost from inability to meet clients' expectations.

Again, the propspective nature of the G-DRG payment system may incentivise the provider for early discharges which affects the overall length of stay of clients and can compromise quality of

care (Boes & Napierala, 2021). Providers also pass on indirect cost to patients by either referring clients to other facilities credentialed by the National Health Insurance Authority to access services at a transportation cost or demand payment of the cost differences for services before delivery. Clients are also affected by cost on productive hours lost to searching for the medicines. In summary, these effects may potentially derail sustainability of the NHIS.

INDEPENDENT VARIABLES **DEPENDENT VARIABLE**

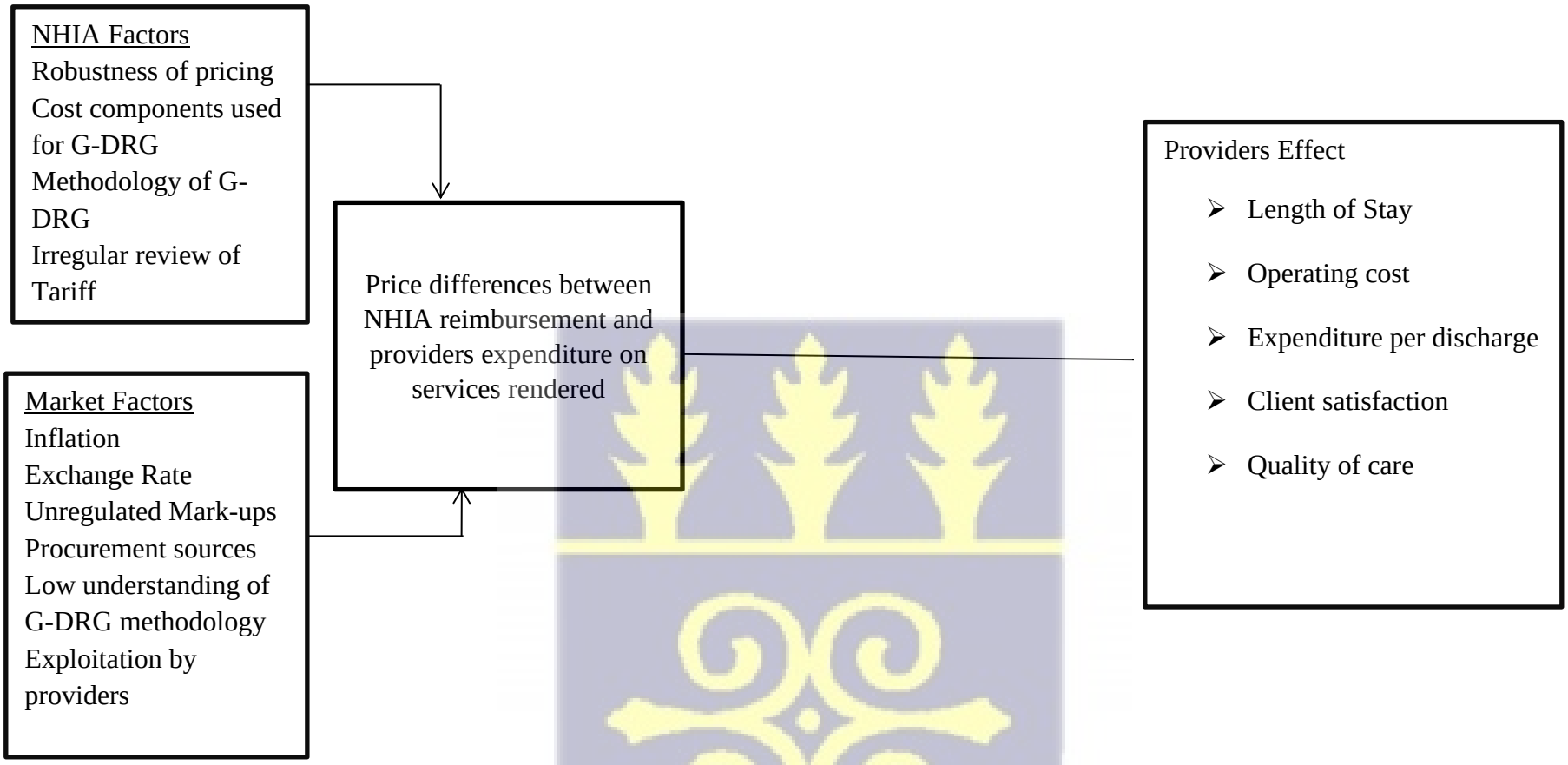

Figure 1.1 Conceptual Framework for causes and effects of G-DRG tariff implementation on providers

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter reviews related literature under the three specific objectives and provides opportunity to detail the key concepts highlighted in the introductory chapter. It deals with conceptual issues relating to overview of NHIS, tariff development, the coding system attached to the tariff, services covered under the scheme and the financial implications of the tariff, the tariff implementation challenges and the effect of tariff on quality-of-service delivery. The chapter reviews related scientific evidence under these thematic areas from a Global, African and the Ghanaian perspectives and explain the interrelationship between the studies and the concept for this work.

2.2 Overview of Ghana's NHIS

In 2003, the NHIS Act (Act 650) was passed to establish the NHIS towards achieving the aim of removing financial barriers to health care services for residents in Ghana. Under this Act, the NHIS operated with a district-wide mutual health insurance scheme with some level of autonomy for management at the district levels. However, the reviewed Act (Act 852) established an overarching administrative body, NHIA, to manage the scheme from a central point with some decentralized functions to its offices countrywide and abolished the mutual health insurance scheme concept (Kwarteng et al., 2019).

The scheme operates with a defined benefit package reported to cover about 95% of the most common diseases attended to by health facilities in Ghana. Under the benefit package, the services covered include general out-patient and in-patient care, reproductive and maternal care, eye, dental, emergency care and a list of essential medicines approved by the NHIA to be reimbursed. The exemption list includes procedures such as dialysis for chronic renal failure, treatments for

cancer (other than cervical and breast cancers), organ transplants and cosmetic surgeries. Management of disease conditions under the Ministry of Health/Ghana Health Service programs such as HIV/AIDS (Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome), immunization and mental health are also not covered under the scheme (Okoroh et al., 2018).

The social health insurance scheme utilizes multiply funding sources although tax constitute most total inflows. There is a 2.5% value added tax levied on selected goods and services consumed in the country, 2.5% of workers' SSNIT (Social Security and National Insurance Trust) pension fund deductible at source, premiums, registration fees, returns on investments and donor support. The membership card is valid for 5 years although there are annual renewals either by payment of premiums and/or registration fees. SSNIT contributors are exempt from paying premium but are required to pay a registration fees. Subscribers from the informal sector are however required to pay an income adjusted yearly premium in addition to a registration fee. Towards promoting access to child, reproductive and maternal health services for the attainment of set targets, pregnant women, and children below 18 years have been exempted from paying premium. Similarly, elderly aged 70+ years and above, and individuals classified as indigents are also exempted from premium payments (Amporfu et al., 2022).

Facilities contracted by the NHIA to render quality healthcare services to subscribers are assessed with a defined credentialing checklist for qualification. The credentialing assessment and associated contract agreement defines the services for reimbursement to providers, tariffs to be applied and claims submission processes. Compliance to contract terms and general operations of the Authority is routinely monitored through compliance/clinical audits and monitoring exercises embarked upon by the NHIA.

In the spirit of strategic health purchasing agreements, the NHIA is currently paying providers with the Ghana-Diagnosis Related Groupings (G-DRGs), Fee-for-Service for medicines and unbundled services. There are different tariffs for different providers based on ownership types. Public health facilities have lower tariff as the salaries of workers are paid at source by the central government and are factored into tariff development. The G-DRG payment system offers the advantage of controlling cost and ensures that legitimate claims are reimbursed due to the bundling of all cost into a tariff unlike fee-for-service. Capitation, a form of population-based payment was introduced on a pilot basis in some regions as a means controlling escalating cost and improving value for money with conditions managed at the Out-Patients Department level but became politicized and eventually stopped.

Critics of the scheme are worried about the non-compliance of the NHIA to the payment timeliness as stipulated under the Act, resulting in delays in reimbursement and a threat to sustainability of the scheme. The NHIA continues to explore innovative ways to resolve operational challenges and improve the payment turnaround time for providers such as the current shift to mobile renewal of membership cards and electronic claims processing to shorten delays in submission.

2.3 Overview of Tariff Development

The act that regulates Ghana's National Health Insurance makes provision for the Minister on the advice of the National Health Insurance Authority as part of a legislative instrument to make regulations for the operationalization of the scheme including matters relating to the payment of tariffs to credentialed healthcare facilities.

Following the implementation of the National Health Insurance Scheme (NHIS) in 2004, the first tariff developed consisted mainly of fee-for-service for both medicines and services until 2007 when a team reviewed and subsequently developed a new G-DRG tariff system to cater for

inclusive bundled rates for outpatient care, inpatient medical and surgical admissions. In 2011, there was a comprehensive review of the G-DRG list of conditions and tariff rates that incorporated feedback from multiple stakeholders following validation of field data on expenditure for clinical services by healthcare providers.

Coincidentally, the team of experts selected for the tariff review maintained the conceptual framework and principles of the tariff development in 2008 after revising the enlisted medical conditions and tariffs in consultation with selected healthcare providers, experts and the NHIA. Moreover, the framework and strategy have been shared during multiple engagements with stakeholder workshops and subsequently edited to incorporate feedback. These framework and methodology have undeniably become the basis for tariff reviews under the G-DRG system.In adjusting for medical price inflation following the implementation of the tariff, the NHIA in 2014 engaged a group of experts to review the tariff rates to adjust for economic fluctuations which resulted in the development of 620 Diagnosis Related Groupings (DRGs) under eleven specialties of disease conditions with similar clinical presentations, requiring similar treatments and use similar resources for management.

Currently, the NHIA is using a tariff released in July 2022 following the commissioning of a multi-stakeholder team in June 2020 that conducted a service costing exercise used in determining the reviewed tariff rates. Moreover, the reviewed tariff incorporates tariff for childhood cancers and clinical methods of family planning services recently added to the NHIS benefit package, bringing total numbers of G-DRG tariffs to 633. The tariffs are grouped under eleven major diagnostic categories or specialties that comprises of varied clinical conditions and surgical procedures. The eleven clinical specialties are: Adult Surgery, Dental, Paediatrics, Reconstructive Surgery, Ear,

Nose and Throat, Obstetrics and Gynaecology, Adult Medicine, Opthalmology, Orthopaedics, Paediatric Surgery and Out Patient Department.

2.3.1 Code Structure for G-DRG

Under the health system, there are patients with varied severity of illness and diagnosis using different services. Ultimately, the difference in cases from one facility to another results in a case mix, which underpins the development of the G-DRGs. A Case Mix (CM) refers to the relative frequency of admissions of various types of patients, which portrays different needs for hospital resources, or the distribution of inpatient cases treated by a hospital resulting from classification by features of patient illness and the processes of treatment.

To further sub-classify the specialties, there is a regrouping of conditions into procedure driven diseases and treatment driven conditions. For those diagnosis that required operation or procedure, they have been regrouped based on their major organ system and the type of procedures that were performed. However, diagnosis that required treatment have been grouped based on the primary diagnosis.

According to the 2022 Tariff Operations Manual of NHIA, there are seven alphanumeric codes of the G-DRG in the format: AAAANNA. While the first four characters are alphabets (A) and represent the specialty (e.g. OBGY = Obstetrics and Gynaecology). The subsequent characters are numbers (N) and represent the number of the G-DRG within the specialty. There are also age stratifiers in the G-DRG. Patients aged above 12 years have an ending code of A and those aged <12 years have an ending code of C.

Summarized below are the MDC and their descriptions:

Table 1: Table showing Major Diagnostic Classifications and Descriptions

SN	MDC	DESCRIPTION
1	ASUR	Adult Surgery
2	DENT	Dental and Maxillofacial Surgery
3	ENTH	Ear, Nose and Throat Surgery
4	INVE	Investigations
5	MEDI	Medicine
6	OBGY	Obstetrics and Gynaecology
7	OPHT	Ophthalmology
8	ORTH	Orthopaedics
9	RSUR	Reconstructive surgery
10	ZOOM	Cross-MDC
11	PAED	Paediatrics
12	PSUR	Paediatric Surgery
13	OPDC	OPD Consultation

2.3.2 Service Coverage

The National Health Insurance Authority's Act stipulates the services covered under the scheme and for which tariffs are developed for reimbursement. As specified in Legislative Instrument 1809 schedule II, coverage for the tariff include outpatient services, inpatient services, physiotherapy, catering, diagnostic services, specialized areas, medical diagnostics and therapeutic procedures. Following the incorporation of the severity and utilization mix appropriately into the tariff calculations, the developed tariffs come in different levels of healthcare provision. There are tariffs for Primary, Secondary and Tertiary facilities. Resultantly, the tariff acknowledges the different forms of disease severity managed at the different levels as well as the logistics, indirect and overhead costs of providing quality healthcare at each level. Consequentially, tariff for secondary

or tertiary level facilities are relatively higher as they attend to higher proportion of complex and severe patients for the same procedure or diagnosis than lower-level facilities.

Accordingly, the tariff application process depends on the facility level and the type of services provided. Facility credentialing undertaken by the NHIA determines the range of services including diagnostic and catering services to be reimbursed per level of credentialing and that also provide basis for tariff application.

2.4 Financial Implications of G-DRG Payment System

The diagnosis-related grouping payment system is well known to be characterized by the use of determinants for resource consumption that factors cost of resources for managing a disease condition. According to a study on G-DRG system, even with clients having same diagnosis and similar treatments, a G-DRG payment system may be inadequate to incorporate complexities of disease conditions and factor actual cost, resource utilization and length of stay (Hopfe et al., 2018a). Similarly, a study on financial risk perspective of a G-DRG systems design explains that the DRG payment departs from the fee-for-service model which directly links the amount reimbursed to a proportionate one used for rendering services provided to each patient and highlights the inadequacy of the G-DRG payment system in catering for the full cost of expenses on patients(Lüthi & Widmer, 2017). Moreover, a systematic review conducted in China on G-DRG payment system had already highlighted the importance of DRGs payment in mildly improving the efficiency of healthcare but potentially impede quality and equity in healthcare, especially as the payment system might not factor the total expenditure for healthcare, depending on the components design of the payment (Zou et al., 2020a).

In Germany, a two-center, standardized micro-costing cross-sectional study revealed that the two significant cost drivers for palliative care are total length of stay and duration of care. It noted that

reimbursement within the German-Diagnosis Related Groups system does not cater for all the costs expended, but rather creates a financing deficit for inpatient palliative care (Vogl et al., 2018). Additionally, a study on the challenges and adverse outcomes of implementing G-DRG reimbursement mechanism concluded that, for financial sustainability, reimbursement under G-DRG must be same or more than the hospital's accrued cost as the non incorporation of risk adjustment for certain populations could lead to disproportionate financial burden to hospitals and might potentially discourage hospitals from treating certain patients, due to their financial liability. It further explained that adverse outcomes under G-DRG payment varies from reduced length of patient stay, decreased admissions, early discharge, increased re-admissions, reduced services and increases the practice of patient referrals to other institutions resulting in cost transfers (Barouni et al., 2020b).

For, instance, under different payment systems, conditions such as hip fracture may have its costs and payments analyzed as separate entities with varied total actual cost. Already, a study has found reimbursement of the previous DRG system to be inadequate to account for the hospital cost. It noted that the providers agreed that primary outcome was a net yield between the actual cost of care and the resulting DRG payment as provided by the health insurance company (Grace et al., 2018). However, another study in assessing the effectiveness of bundled payments in reducing cost following bilateral total joint arthroplasty found reduction in bundled payment system for a 90-day episode-of-care cost without a compromised quality of care as patients were not placed at a higher risk of readmission but recommended alternative procedure for older Medicare beneficiaries or patients with complications such as cardiac disease due to concerns about increased costs (Rondon et al., 2019).

In developing country, a study on how to gain from better bundled system information highlighted the challenge of data scarcity and the non-transparency of reimbursement mechanism which results in the final DRG cost handed to providers being largely subjective and creating consequences such as hospitals turning payments away or the introduction of unapproved charges for patient costs that are deemed as non-reflective of the true DRG cost (Kipp & Baveja, 2013). Similarly, a study in South Africa highlighted the issue of inadequate relevant data of hospital cost and the lack of transparency around the bundled payment system which could lead to price differences (Apostoleris, 2018)

Moreover, under Ghana's health insurance implementation context, a study on provider payment and service supply behavior also highlighted the cost difference with payments methods from the cost of management as well as perceived inadequacy of the payment rates (Aryeetey et al., 2016). However, another study on assessing provider preference in all regions in Ghana concluded on G-DRG payment system as the most preferred payment method (Andoh-Adjei et al., 2019a).

Overall, the challenge of adverse cost difference of the G-DRG providers have been vastly documented and even predicted to be worst with impaired patient functionality. Accordingly, a study that found a direct link with patient functionality status as a determinant of readmission rate, mortality, discharge destination, length of stay and costs recommended incorporation of patient functioning information into DRG costing systems to wholistically capture cost of patient's needs for services (Hopfe et al., 2018a).

2.5 G-DRG Payment System and Length of Stay for Inpatients

There have been several studies especially in high income countries on the effect of the implementation of the diagnosis related group to quality of care (Agarwal et al., 2022; Aragón et al., 2022; Baek et al., 2018). A study in the United States found a reduction in hospital utilization

and average length of stay. In addition, the focus of care changed from the inpatient setting to less costly outpatient settings. Another study on the effects of the DRG system on the quality of care of hospitalized insured patients found DRGs to have a negative effect on the stability of patients during discharge although it produced no effect on the overall quality of care (Rogers et al., 1990) A study in England which used fifteen years of microdata to examine the long term effects of diagnosis related groups on the public healthcare system found that the use of DRGs significantly reduced length of stay in the hospital (Aragón et al,2022) . A study was conducted in Switzerland when there was a transition between payment systems. Thus, some hospitals were still using the fee for service whilst others had transitioned into the DRGs. This gave the researchers the opportunity to compare the two payment systems simultaneously. The study assessed a cohort of patients for the effect of reimbursement plans in terms of length of hospital stay (LOS) and patient outcomes with Community-Acquired Pneumonia from an earlier multicenter trial. Nine-hundred and twenty-five patients from a prior randomised controlled study with community-acquired pneumonia underwent a post-hoc analysis. To evaluate LOS and outcomes between FFS or DRG hospitals, multivariate regression models were used to account for clustering within hospitals, comorbidities, age, gender, and illness severity (using the Pneumonia Severity Index). The results found that compared to FFS hospitals, LOS was dramatically reduced in DRG hospitals. This became confirmed in multivariate adjusted Cox models without differences in 30-day and 18-month mortality rates or recurrence rates within 30 days (Schuetz et al., 2011).

In China, a systematic review found that compared to other forms of payments, DRGs payment systems marginally reduces the length of stay. Patients who went to hospitals that did not use the DRG system were denied equity in healthcare due to cost shifting, patient selection and inferior healthcare. Results on overall spending, out-of-pocket costs, and healthcare quality, however,

varied widely (Zou et al., 2020b). In Shanghai, China, an interrupted time series study was used to evaluate data from 2013–2019. The study found a reduction in length of stay however there was no change in mortality rates (Feng et al.,2020). In 2009, Hong Kong's public inpatient care payment system switched from a worldwide budget system to one based on diagnosis-related groups (DRGs), and it then switched back in 2012. The study's goal was to assess the changes brought about by the switch from a DRG-based system to the global budget. The cross-sectional study included information on patients who were 45 years of age or older and were admitted to public acute care facilities in Hong Kong before (April 2006 to March 2009), during (April 2009 to March 2012), and after (April 2012 to November 2014) the discontinuation of the DRG scheme. The data was analysed from January to June 2021. The level and slope of outcome variables were estimated using an interrupted time series approach, accounting for pre-trends, after the establishment and cessation of DRGs. The introduction of DRGs was associated with a decrease in the mean length of stay, increase in the number of patients admitted, reduction in in-hospital mortality, and a decrease in emergency readmissions. Discontinuation of the DRG scheme was associated with an increase in the mean length of stay and a reduction in the number of patients treated after adjusting for covariates; no statistically significant change was observed in in-hospital mortality or emergency readmission rate. Overall, the results show that the use of DRGs was linked to shorter hospital stays and higher hospital volumes, while its removal was linked to longer stays and lower hospital volumes. Following the end of DRGs, in-hospital mortality and emergency readmission rates did not dramatically change. A systematic review by Barouni et al (2020) on implementation outcomes of DRGs found that the average length of stay in most hospitals reduced after the implementation of the DRGs. However, there was no change in mortality rate. Twenty

five percent of the respondents intimated an increase in readmission rate. In more than half of the studies, there were fewer operations, hospitalizations, and tests in the lab.

There was a change in Thailand's payment mechanism for hospital admission in 2007 from fee-for-service to DRGs. In a study conducted by Damrongplasit & Atalay (2021) post the introduction of the DRGs, a national representative micro-level data (Health and Welfare surveys) was used and difference-in-difference done to examine the parameters studied. The results showed a percentage point decline in hospitalization, an increase of admission at community hospitals (the lowest level inpatient public health care facility), and less chance of admission at higher level public health care facilities like general hospitals. In that study, there was no significant change in LOS, frequency of admission, or out of pocket medical expenses for patients on admission associated with the post-2007 payment mechanism change.

In England, a study concluded that DRG payment reform gives rise to actual effects on healthcarte delivery processes and reduces hospital stays for patients. This results resonated with the practice of improving efficient use of resources in hospital care and portrays DRG payment as an effective payment system in developing control over escalating healthcare expenses (Aragón et al., 2022)

Moreover, a systematic review on G-DRG implementation in low and middle income countries found very few evidence to support the impact of DRGs in healthcare due to very few studies done in that area in most low and middle income countries (Mathauer & Wittenbecher, 2013). Further literature searches confirm their statement of scanty evidence in these countries including Ghana.

2.6 G-DRG Implementation Challenges and Resolution

The importance of improving the challenges for the implementation of Diagnosis Related Groupings (Bundled Payments) as explained in many studies cannot be overemphasized. Already, a year experience report in arthroplasty has recommended that bundled payments for care

including fracture should utilize adaptive model that is equitable such that patients payment rate accounts for their increased costs and risks (Preston et al., 2018). Similarly, a systematic review that assessed the effect bundled payment on healthcare utilization and quality acknowledged the benefits of bundled payment programs in maintaining or improving quality while the cost of patients are lowered in the management of Lower Extremity Joint Replacement (LEJR), but concluded that while scaling up to cover other conditions, there is the need for patient-level heterogeneity to be factored, risk stratification included, and changes to specific design features for specific episodes considered (Agarwal et al., 2022).

Moreover, a study on the effects of bundled payment system in healthcare payment reform which explored a change from a health insurance's fee-for-service payment system to bundled payments created a platform of solutions for implementation challenges of the Diagnosis Related Groupings. In the study pilot, using bundled payment models was identified to improve success,creating a platform to influence the development and subsequent operationalization of bundled payment systems and recommended that for providers and payers to be able to benefit in areas of reducing patient cost and improving patient outcomes, there is the need for integration to ensure affordable and quality health systems with implementation of the bundled payments (Delisle, 2019).

Dwelling on the principle of integration as a strategy for improving the bundled payment system, a study on examining how bundled payments change healthcare in the field of cardiology revealed that among the predominant factors that augment the implementation of bundled payments is the frequent merger of private physicians as part of the comprehensive hospital-physician practice model. The merger saw agreements for both accountable care organizations as well as bundled payment through a high sense of cohesion realized after integrating other specialists and

individuals routinely separated in academic silos to promote improved acceptance and adoption of bundled payments (Shih et al., 2015).

Again, another systematic review enlisted challenges such as financial, administrative, and ethical issues in the areas of differences in payment, operationalization within different hospital systems, and changes to routine care practices in impeding ease of incorporation and highly recommended a strategy of standard care pathways and improved collaborations among clinicians for inpatient and outpatient towards improving the challenge (Dietz et al., 2019)

In Europe, the bundled payment system continues to make impact in the areas of increasing activity and reducing length of stay but there is enough documentation on the inability of the prospective payment nature of Diagnosis Related Group to improve healthcare quality or control hospital expenditure on patients. Moreover, a research report on reforming payment for healthcare to achieve better value highlighted countries supplementing DRG payment with other payment initiatives such as pay for performance (P4P) for the achievement of specific quality goals; while other countries are practicing the operationalization of volume caps and differences in payment above a cap to contain total costs and improve implementation of the Diagnosis Related Groupings (Charlesworth et al., 2012). However, a study on how developing nations can gain better in bundled tariff have reported that sound clinical framework and a stepwise approach towards better understanding of the actual cost factored in bundled-payments rates as fundamental requirements for achieving success in implementation of the Diagnosis Related Groupings (Kipp & Baveja, 2013).

In Ghana, a study on strategic health purchasing progress mapping have recommended the neeed for reconciliation between the level of bundling and reduction in the burden of auditing and verification of claims. Moreover, the study also suggested consideration for alternative payment

methods to reduce the unintended incentives and effects of individual payment mechanisms. Ultimately, the objectives of improving quality and access while maximizing efficiency in service delivery and controlling expenditure ensures the financial sustainability of the NHIS (Amporfu et al., 2022)

CHAPTER THREE

3.0 METHODS

3.1 Introduction

This chapter explains in detail the methods of the study. It includes the study site, study design, study population, data collection procedure and analysis.

3.2 Study Design

The study was both longitudinal and descriptive cross-sectional study using mixed (Quantitative and Qualitative) approach from the providers perspective. The quantitative method utilized institutional data on G-DRG tariff issued by the National Health Insurance Authority and the clients claims summaries submitted by the facility. In the qualitative approach, key informants were identified and interviewed on the cost, service benefits and challenges of implementing G-DRG tariffs.

3.3 Study Site

The Greater Accra Regional Hospital (GARH) is under the administrative district of Osu-Klottey Sub-Metro and located at North Ridge of the Accra Metropolitan Assembly in the Greater Accra Region (GAR) of Ghana. In terms of total land area, it occupies about 15.65 acres with a catchment area population of over 4,671,363. In 1928, the facility was started by some european expatriates and became a District Hospital after Ghana's independence. In 1997, the facility was upgraded to a regional hospital and subsequently designated as Ridge Regional Hospital. The hospital has been successfully redeveloped and upgraded into an ultra-modern 420 bed capacity hospital with accompanying specialist services.Aside services for general cases at the Out-Patient Department, the facility renders specialized services such as neurosurgery, spine health, renal services, child health, ophthalmology, radiology, anaesthesia and pain, maxillofacial, specialized dental services, accident and emergency, mental health, and pharmaceutical services.

The governance structure of the facility entrusts the Medical Director with overall stewardship functions towards realization of the hospital's organizational aspirations in line with operationalization of MOH/GHS policies. Per governance structure, there are five main directorates of the hospital comprising of Heads of Clinical Care, Nursing Services, Pharmaceutical Services, Health Administration & Support Services (HASS) and Finance & Accounts Directorate. Alongside the heads of these five directorates and the Medical Director, they form the Core Hospital Management Committee (CHMC) and are directly responsible for the day-to-day administration of the hospital. However, the Medical Director exercises overall supervisory responsibility over the divisions of the hospital

3.4 Study Population

The study involved records of disease conditions managed at the inpatient department and healthcare managers at Greater Accra Regional Hospital.

3.4.1 Inclusion Criteria

The study included data on the top hundred (100) medical conditions recorded at Inpatient Departments as per the 2021 service utilization reported in the District Health Information System (DHIMS II) and submitted in the claim summaries to NHIA. Key informants were line managers in each specialty unit and core management members of the facility.

3.4.2 Exclusion Criteria

All services not captured under the benefit package and G-DRGs outside the top hundred (100) medical conditions of the 2021 service utilization report of Ridge Hospital were excluded.

3.5 Sampling Strategies

In this section, there is a presentation of the sample size determination and sampling method applied in this study.

3.5.1 Sample Size

The top hundred (100) medical conditions frequently reported at the inpatient department at the facility as captured in 2021 service utilization report in DHIMS II were purposefully selected. The qualitative method utilized fifteen (15) Key Informants.

3.5.2 Sampling Method

Ghana Health Service requires facilities to submit morbidity data unto the District Health Information Management Systems (DHIMS II) platform on a monthly basis. A census approach using aggregated 2021 service utilization report of the Greater Accra Regional Hospital was used to identify the top hundred (100) medical conditions at the inpatients department. The qualitative approach also utilized purposive sampling method to determine fifteen (15) Key Informants comprising eleven specialty heads and four (4) core management members namely, Medical Director, Head of Nursing, Head of Administration and Head of Finance.

3.6 Study Variables

The variables of interest for the quantitative part of the research were aligned to the main and specific objectives of the study (Table 2). The study variables were classified into dependent and independent variables.The study outcome was the financial implication of G-DRG tariff on service provision. The independent variables included the mean price differentials, rate of discharge and net financial effect.

Table 2: Study variables

Objective	Dependent Variable	Independent Variable	Scale of Measurement	Indicators	Data Collection Methods	Type of Statistical Analysis
To establish a relationship between price differentials and length of stay for inpatients	Average Length of Stay	Cost difference	Continuous	Scatter Plot Linear Regression P-value Confidence Interval	Data Extraction	Descriptive and Analytical
To determine the yearly price differentials between NHIS and Hospital Approved Tariffs	Price differentials	Cost Components Cost Difference Medical Inflation Frequency of Reviews	Continuous	Mean cost difference Percentage Increment	Data Extraction	Descriptive & Analytical

3.7 Data Collection

3.7.1 Data Extraction Techniques and Tools (Quantitative Approach)

The codes provided by the NHIA for G-DRGs, and the specialties were maintained as they uniquely identify the services provided. The price for each G-DRG at the current reimbursable rate were extracted and recorded. Data extraction was done with Microsoft Excel 365 using customized workbooks for the selected G-DRGs and that of the approved hospital charges for the hundred medical conditions. For the part of the study dealing with longitudinal design, the hospital approved charges, price for each G-DRG at the prevailing reimbursable rate and average monthly attendences of the top-ten inpatient conditions were extracted retrospectively for five years. The top-ten of the sampled medical conditions were used because of non-availability of data on hospital charges for other medical conditions in retrospective years. The three versions (2016, 2020 and 2022) of the NHIA G-DRG tariffs that covered the five year retrospective period were used in obtaining the approved tariffs. Records of hospital approved charges were obtained from the facility's software for capturing patient costs available at the Finance Department.

To establish association between the G-DRG Payment System and the length of stay, the 2022 half year data for the top 100 conditions were extracted from the client claims summaries. The corresponding number of admissions and their total days of admissions were recorded. As per the G-DRG classification, tariffs for adults were used for all disease conditions sampled except in child-specific diseases that the corresponding versions of paediatric tariffs were applied. For Neonatal Jaundice which had two tariffs based on the severity of the condition, the average of the two tariffs were used in the analysis.The baseline for both hospital charge and G-DRG tariff was total cost for admissions up to three days.

3.7.2 Data Collection Techniques and Tools (Qualitative Approach)

An interview guide was used to conduct interviews with key informants through face-to-face approach. Two respondents opted for a telephone interview which was successfully conducted.

3.7.2 Data Handling

Data collected was validated by the principal investigator on a daily basis for consistency. To reduce errors, two research assistants extracted and independently entered the data.

3.7.3 Data Analysis

3.7.3.1 Data Analysis - Quantitative

Data was entered and analysed using Microsoft Excel 365 and Stata version 16. The price differentials were obtained by substraction of the hospital approved fees from the corresponding NHIS price for a specific year.This was repeated for five consecutive years retrospectively for the top-ten frequently reported inpatient conditions to obtain a five year trend of price differentials.The mean price differential for each condition over the five-year period were calculated.

In obtaining the utilization costs, the yearly attendances for each condition were multiplied separately with the corresponding DRG tariff and hospital approved charge to obtain yearly utilization costs for NHIS and with hospital approved charge . The net effect of utilization cost was then calculated as the difference between the grand totals of NHIS utilization cost and utilization cost with hospital charges. This was expressed as a percentage over the grand total of NHIS Utilization cost.

To establish a relationship between the price differentials and the average length of stay for the medical conditions, data extracted from the client claims summaries were used. For each G-DRG, the submissions from January to June 2022 were merged. From the documented dates of admission and discharges for each patient, the length of stay was obtained through substraction. The average length of stay for each G-DRG was obtained by dividing the sum of the length of stays by number of patients. This procedure was repeated for all the top hundred medical conditions. A linear regression between the price differentials and the average length of stay was run using Stata version 16.

Table 3: Analytical Framework for Price Differentials

Table 3a. Analytical framework for establishing relationship between average length of stay and price differentials							
Variable	Operational Definition	Study Design	Measurement	Estimation	Period of Comparison	Sample size	Remarks
Length of Stay	The total period from admission to discharge for inpatients	Cross-sectional	Continuous	Date of discharge - Date of admission	Half year - 2022	Top 100 inpatients	_
Average Length of Stay	The average time a patient spends between admission and discharge per condition	Cross-sectional	Continuous	Sum total lengths of stays divided by total number of patients for that condition	Half year-2022	Top 100 inpatients	_
Price Differentials	Estimates the difference in prices between G-DRG tariff and hospital approved charges for same conditions	Cross-sectional	Continuous	G-DRG Tariff – Hospital approved Charge	2022	Top 100 inpatients	_

Table 3a. Analytical framework for establishing relationship between average length of stay and price differentials							
Relationship between average length of stay and price differentials	_	_	_	Linear regression of price differentials and average length of stay	2022	Top 100 inpatients	_
Table 3b. Analytical framework for net effect of G-DRG implementation							
Price Differentials	Estimates the difference in prices between G-DRG tariff and hospital approved charges for same conditions	Longitudinal	Continuous	G-DRG Tariff – Hospital approved Charge	2018 - 2022	Top 10 inpatients	Sample size reduced because of non-availability of price data for other years
G-DRG Utilization Cost	The product of attendance and the corresponding G-DRG tariff	Longitudinal	Continuous	Attendance * G-DRG Tariff	2018-2022	Top 10 inpatients	

Table 3a. Analytical framework for establishing relationship between average length of stay and price differentials							
Utilization Cost with hospital approved charge	The product of attendance and the corresponding hospital approved charge	Longitudinal	Continuous	Attendance * Hospital approved charge	2018-2022	Top 10 inpatients	
Net Utilization Cost	Estimates the overall gain/loss of service utilization billed with G-DRG tariff and hospital approved charges over a five-year period	Longitudinal	Continuous	Grand Total of G-DRG Utilization Cost – Grand Total Utilization Cost with hospital approved charge	2018 - 2022	Top 10 inpatients	

3.7.3.2 Data Analysis – Qualitative

The qualitative data was analysed using summarization and classification of recorded responses under themes. Audio recorder was used to record the interviews with key informants and later transcribed verbatim. Following review of the transcribed data, a codebook was developed to serve as a guide for the thematic analysis using various dimensions as portrayed in the conceptual framework and subsequently modified to include emerging themes. The codebook was to provide guidance as to the code name, definitions, detailed descriptions and the usage of the code. The transcribed data were imported into NVivo software version 20 and using the code names, nodes were formed in the NVivo. Individually, the transcripts were opened in the software for coding and reviewed until there was much generation of clear tree nodes from nodes and eventually regrouping into specific categories and theme.

3.8 Ethical Considerations

Ethical clearance for the study was sought from the Ghana Health Service Ethics Review Committee with reference GHS-ERC 027/11/22. Consent was sought from the Regional Director of Health Services, the Metropolitan Director of Health Service, the Medical Director of Greater Accra Regional Hospital and Heads of the various specialty units involved in the study. There were minimal ethical issues of the clients 'confidentiality since this study dealt with service cost in the health facilities and managers of the specialty units. The data collected ensured the anonymity of specialties and respondents. There were no presumed conflict of interest of the researcher, even though the principal investigator is a staff of the Ghana Health Service. Participants were voluntarily asked to be included in the study after they read and appended their signature to the consent form before interviews. Regarding the benefit of this survey to healthcare managers, there were no withdrawal of participants at any point during the survey.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

In this chapter is presented the results of the empirical (qualitative and quantitative data) evidence gathered to assess the financial implication of the Ghana-Diagnosis Related Grouping (G-DRG) payment on service delivery at Greater Accra Regional Hospital. The quantitative data is presented using descriptive statistical analytical technique (table and bar chart) whereas the qualitative data is presented under thematic areas. The presentation of the result was done based on the objectives of the study which included determining the yearly price differentials between NHIS and hospital approved tariffs, establishing a relationship between price differentials and average length of stay of inpatients, and to explore the challenges of the operationalization of the G-DRG on service delivery.

4.2 Background Characteristics

4.2.1 Qualitative Data

Fifteen (15) respondents were interviewed for the study at Greater Accra Regional Hospital. Out of the fifteen (15) selected respondents, 67% (10) were in management positions at the hospital, which ranges from the Medical Director, Medical Superintendent, Head of Nursing, Head of Clinical Nursing and Head of the Gynaecology Department among others whereas the remaining 33% (5) were practitioners such as E&T Nurse, Chief Physiotherapist, Paediatric Nurse, Dentist, and Family Nurse.

On average, the respondents who were in various management positions have been at post for the past 6 years; the minimum year was four months whereas the maximum year was 25 years. In terms of the practitioners, the average years they have been at post was 7 years; the minimum year was two months whereas the maximum year was 13 years.

4.2.2 Quantitative Results

The study focused on the top hundred (100) frequently reported medical conditions for inpatients department at the Greater Accra Regional Hospital. These medical conditions included pediatric medical conditions, adult medical conditions and surgical procedures. From the top-hundred inpatient conditions, majority (86%) of the reported conditions were medical conditions while few (14%) were G-DRG tariff for surgical procedures. Lastly, most (59%) of the medical conditions were G-DRGs for adults (Table 4.1).

Table 4.1: Background Characteristics of G-DRGs

PARAMETER	FREQUENCY(N=100)	PERCENTAGE
Pediatric medical conditions	27	27
Adult Medical conditions	59	59
Surgical Procedures	14	14
Medical Conditions	86	86
Inpatients	100	100

Source: Field Survey, 2022

4.2 Determining the yearly price differentials between NHIS and hospital approved tariffs

Generally, four (2018, 2019, 2020 and 2021) out of the five years recorded positive price differentials. Thus, for the years 2018, 2019, 2020 and 2021, positive price differentials were recorded on the top 10 frequently reported cases. However, in the year 2022, negative price differentials were recorded on most (8 in 10) of the top 10 frequently reported cases at the hospital (Table 4.2). Cumulatively, most (80%) of the conditions had positive price differentials for the

five-year trend. The highest positive mean price differential was recorded with Septicaemia (355.85, 218.77) while the condition with highest negative price differential was Gastroenteritis (-23.09, 196.86).

Table 5: Yearly price differentials between NHIS and Hospital Approved Tariffs

MDC	G-DRG	2022	2021	2020	2019	2018	Mean Price Difference	Standard Deviation
Neonatal Jaundice	PAED08C	-129.11	138.34	227.76	201.23	258.14	139.273	156.39
Other Preterm Infants	PAED10C	-479.33	221.13	325.04	277.38	308.68	283.0575	343.25
Gastroenteritis	MEDI23A	-374.91	51.98	71.36	62.06	74.06	-23.09	196.86
Birth Asphyxia	PAED12C	-407.86	20.26	89.54	83.8	127.9	-17.272	221.74
Cerebrovascular Accident	MEDI14A	-585.43	265.67	293.49	248.29	266.09	97.622	382.18
Bronchopneumonia	PAED14C	-365.88	39.34	108.62	99.7	143.8	5.116	210.77
Respiratory Distress Syndrome	PAED13C	163.22	309.45	441.05	381.3	447.37	348.478	117.55
Septicaemia	MEDI30A	-31.48	469.98	494.46	415.31	430.98	355.85	218.77
Appendicitis	ASUR18A	-938.36	26.13	299.86	518.79	461.57	73.598	597.12
Hypertension	MEDI32A	45.94	165.48	189.96	130.09	145.81	135.456	54.82

Source: Field Survey, 2022

4.2.1 Net Effect of G-DRG Tariff on Service Utilization

The outcome of the study established that Greater Accra Regional Hospital made the highest profit of about 62% on the treatment of Septicaemia conditions followed by Hypertension (52%), respiratory distress syndrome (41%), Other Preterm Infants (27%), and Neonatal Jaundice (25%) with the least profit being recorded on the treatment of Bronchopneumonia (1%) (Table 4.2.2).

However, the hospital recorded some loss in the treatment of some of the reported medical conditions for the five years under review. For instance, a loss of -16% was recorded for the treatment of Gastroenteritis conditions followed by a loss of -5% on the treatment of Birth Asphyxia. Generally, the hospital recorded a profit of 23% for the treatment of the top 10 reported medical conditions over a five year period. Ultimately, the hospital made a cumulative net gain on most (8 in 10) of the top ten inpatient conditions over a five year period (Table 4.2.2).

Table 4.2.2: Net Effect of G-DRG on Service Utilization

GDRG	Description	Utilization Cost NHIS	Utilization Cost HC	HC Gain/Loss	NHIA Gain/Loss
ASUR18A	Appendicitis	197,466.08	187,162.36	10,303.72	5%
MEDI14A	Cerebrovascular Accident	74,885.41	56,825.34	18,060.07	24%
MEDI23A	Gastroenteritis	30,707.46	35,556.36	(4,848.90)	-16%
MEDI30A	Septicaemia	80,740.24	30,921.24	49,819.00	62%
MEDI32A	Hypertension	35,247.42	16,960.86	18,286.56	52%
PAED08C	Neonatal Jaundice	275,208.99	206,965.22	68,243.77	25%
PAED10C	Other Preterm Infants	172,515.09	126,159.19	46,355.90	27%
PAED12C	Birth Asphyxia	71,795.10	75,335.86	(3,540.76)	-5%
PAED13C	Respiratory Distress Syndrome	140,065.20	82,566.33	57,498.87	41%
PAED14C	Bronchopneumonia	63,343.36	62,473.64	869.72	1%
Grand Total		**1,141,974.35**	**880,926.40**	**261,047.95**	**23%**

Source: Field Survey, 2022

As shown in Table 4.2.2, Septicaemia conditions recorded the highest profit margin of 61% followed by Hypertension conditions (52%), respiratory distress syndrome conditions (41%), Other Preterm Infants conditions (27%), Neonatal Jaundice conditions (25%), Cerebrovascular Accident (24%) with Bronchopneumonia conditions recording the least profit margin of 1%. Conversely, Gastroenteritis conditions recorded the highest loss of -16% followed by Birth Asphyxia (-5%).

4.2.2 Year On Year Mark-up on hospital charges and G-DRG tariff

From figure 4.2, NHIS tariff increment was 0% for the year 2019 but was increased to 17% in the year 2020. Similarly, in the year 2021, the NHIS tariff was increased by 16% but was not increased in the year 2022 (0%). In the case of hospital charges, they were increased by 25% in the year 2019 but reduced to 20% in the years 2020 and 2021. However, in the year 2022, hospital charges increased substantially by 58% from 20% (Figure 4.2).

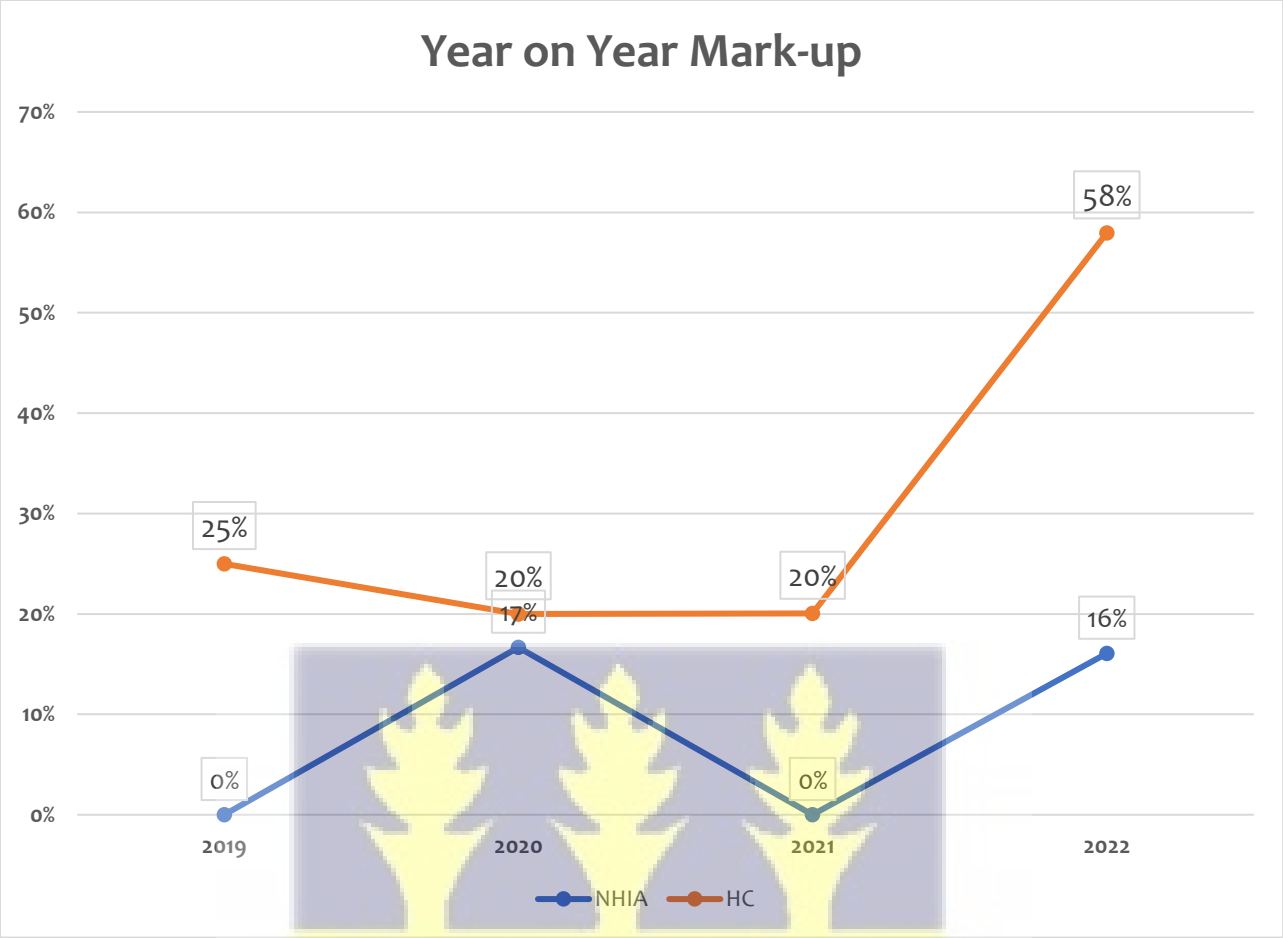

Figure 4.2: Linear Graph on the year-on-year mark-up for hospital cost and G-DRG tariffs
Source: Field Survey, 2022

4.3 Relationship between price difference and average length of stay of medical conditions

From the scatter plot (Figure 4.3) the cost differences between G-DRG tariff and the hospital approved charges were negative as seen in the negative direction of the graph. In determining the association between price difference from G-DRG tariff and the hospital approved charges, a linear regression of cost difference (independent variable) on average length of stay (dependent variable) of medical conditions was explored. From the results, there is a statistically significant association between cost difference and the average length of stay of medical conditions (p-value, <.01). On the average, a unit difference between the G-DRG tariff and the approved hospital charge leads to

a corresponding decrease of approximately six minutes (0.004 of a day) of the average length of stay for the sampled medical conditions (Table 4.3)

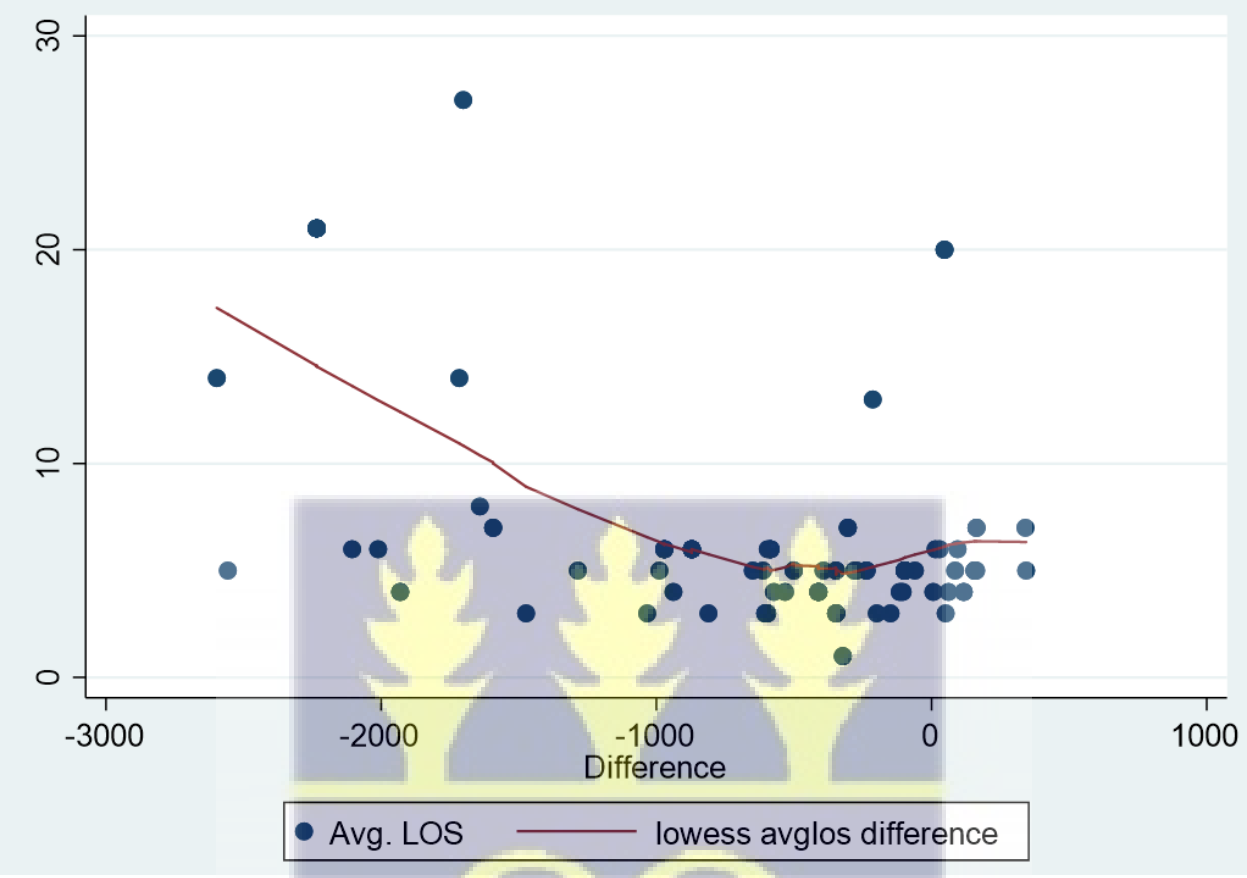

Figure 4.3: A scatter plot of average cost difference and average length of stay of medical conditions.

Table 4.3 : Linear regression of price diffference on average length of stay of medical conditions

Avg LOS	Coef.	Std. Error	t-value	p-value	[95% Conf	Interval]	Sig
Price difference	-.004	.001	-5.77	0	-.005	-.002	***
Constant	4.277	.598	7.15	0	3.09	5.464	***
Mean dependent var			6.580	SD dependent var		5.133	
R-squared			0.254	Number of observations		100	
F-test			33.307	Prob > F		0.000	

*** p<.01, ** p<.05, * p<.1*

4.4 Challenges of the G-DRG payment system by service providers

4.4.1 General understanding of G-DRG Payment System on Service Delivery

Most of the respondents had some idea about the Ghana-Diagnosis Related Groupings. For instance, most of the respondents stated the following;

> *"My understanding is that all the diagnosis is grouped about the areas. When we take the ENT, all the ear diagnosis is grouped together and then the nose are also grouped together and then the throat diagnosis is also grouped, so that is my understanding of the grouping diagnosis related".*
>
> (KII, ENT Nurse).

> *"My understanding is that National Health insurance uses this criterion of disease classification according to the international classification of diseases, so that is what they use and different protocol given by clinicians, and then they also consider other factors that they think the facility need to be reimbursed for. It is diagnostic related."*
>
> (KII, Head of Finance).

> *"Well, it's a system that NHIS uses to reimburse hospitals based on the way the diseases are grouped and what is done so that there is some form of uniformity and standardization in the payment so that they are not arbitrary outliers in trying to pay people who have rendered the service concerning that facility".*
>
> (KII, Head of Clinical Service).

Some of the respondents explained the concept (G-DRG) using examples. For instance, a respondent stated the following;

> *''So for example, the treatment for malaria is grouped such that irrespective of the severity of the malaria condition you present in a facility, a specific amount is given by the NHIS.*

So if I come to the hospital with simple malaria that requires artesunate or whatever to treat and someone else comes to the hospital with complicated malaria, the treatment we will both get is different''.

(KII, Dentist).

However, few of the respondents stated that they had no idea of the G-DRG. A respondent stated the following;

''Bundled payment system? No idea''.

(KII, H.O.D for Gynecology).

''My diagnosis is specific; that's why I can't relate to what you are saying. I don't know whether you get it''.

(KII, Head of Eye Clinic).

4.4.2 Reality of G-DRG in accounting for all cost under bundled services

All the respondent revealed that the G-DRG does not account for all cost for services delivered under the all-inclusive payment system. The respondents stated the following:

''No, it doesn't for consultations it's free and if you are a first timer, we let you do a bit of payment for the folder, but consultation is free, then you also do a bit of payment for the labs and if the medicines to the tariffs from the NHIA is less than the market price that we get or what we get from medical service, you also make a top up''.

(KII, H.O.D Internal Medicine).

''it does not, because most of the times they do not even include clinicians when they are determining these things. So it does not cover everything, and the fact that some people are sick and needed to be in the hospital for a longer number of days and the sicker the person,

the more input you need for the person and you say you are paying for the same amount of money?''.

(KII, Medical Director).

" I will say that in reality it is not reimbursing the facilities or they are under reimbursing the facilities. Because if facilities do costing, you will clearly see the disparities off what goes into the delivery of the service no matter the inefficiencies or wastages. What goes on into the service delivery in terms of disease classification will certainly be far more than what is reimbursed''.

(KII, Head of Finance).

So let's assume if somebody has come to my hospital and the person has hypertension or diabetic and I'm managing this patient, you know in managing such patients you are supposed to do other artillery tests, we know hypertension can affect the kidney the eyes, the nerves, so assuming a patient has come and I'm supposed to do a renal function test to know how the hypertension has affected the kidney, I'm supposed to do a lipid profile, all these things when I do it and you tell me it's a bundled service and I'm afraid the amount they are paying is not realistic. So I mean hypertensive is supposed to do ECG, all these things the kind of bundle service they pay for essential hypertension is woefully inadequate, it's not realistic.

(KII, Head of Peadiatrics).

4.4.3 Co-payment for Healthcare Services

All the respondents stated that patients who have subscribed to the NHIS when seeking various medical care pay for part of the services they receive, even when that service is under the benefit package. They stated the following;

''Okay, so when the clients come here with the NHIS card, they get the folder for free, but the rest of the service they have to pay for it''.

(KII, Head of Family Medicine).

''When the patient has been attended to, drugs written for the patient are in the system so they are being directed to the pharmacy for their medicines and then those that are not in the system are being printed out to the patient to buy them from a pharmacy outside''.

(KII, ENT Nurse).

"Patients pay an amount so that medical equipment can always be serviced".

(KII, Head of Gynaecology).

4.4.4 Financial Loss

Most of the respondents stated financial loss under the NHIS rather comes from claims preparation and submission claims as revealed by a respondent.

''You must make sure that all claims under NHIS who receive services have their claims processed and submitted on time so that they will not disallow or reject the bills that are submitted for non-compliance with the criteria for filing of claims, because when they disallow it is a financial loss to the facility''.

(KII, Head of Finance).

Another respondent also stated that software is used to capture, process, and submit claims promptly to prevent loss to the health facility.

''*We are fortunate that we now have the software that captures most of this information, if most of this information is not captured, definitely there will be a huge loss because you have nothing to be able to present to NHIA people for your reimbursement".*

(KII, Hospital Administrator).

"I think with the use of the hospital management system, for now, I can say there wouldn't be much loss as compared to when we were processing the hardcopies, you see with the hardcopies you need to put a claim form in a folder for the patient to go through all the points".

(KII, Internal Auditor).

4.4.5 Demand for alternative Payment System

Most of the respondents encouraged the introduction of co-payment, where patients pay part of their medical expenses alongside NHIS.

"So, I think that we should encourage copayments so that those who have the NHIS, should be able to top up and top up considerably".

(KII, Head of Gynaecology).

''For other payments, just as if the tariffs cannot suffice, the co-payment or top up will help to continue the NHIA''.

(KII, Medical Superintendent).

Some of the respondents preferred the reintroduction of the cash and carry system to replace the G-DRG system due to its challenges:

"OK so cash and carry is number one, it has been beneficial to the hospital because they come with the money and pay for the services rendered, and then someone also comes with corporate insurance and private insurance, and some also come with work insurance which is also beneficial to the hospital".

(KII, ENT Nurse).

"The hospital will benefit in the sense that if they are doing cash and carry system, once the patient leaves you to know you've gotten your revenue, so you can restock, you can go and pay your suppliers".

(KII, Head of Emergency Nursing).

"The cash and carry will be able to review frequently to reflect realistic charges. So those will be a little more realistic in terms of cost recovery than the NHIS".

(KII, Head of Finance).

4.4.6 Effect of G-DRG payment system on client satisfaction

Some of the respondents did not fully understand how the provider can determine satisfaction of clients. Their impressions were that it is up to the patient to decide whether to be satisfied with the healthcare service they have received or not. They explained as follows:

''The satisfaction is dependent on how the patient feels about it because it is up to the patient to know whether they are satisfied or not. It is left for the patient to say whether the service that was provided was satisfactory or not. I can give my best but if the patient is not satisfied I cannot force the patient to say that he or she is satisfied with it''.

(KII, Dentist).

However, most of the respondents stated that for the client or patient to be satisfied, they need to receive all the medical care they are entitled to once they are in the health facility to seek medical attention. For example, some explained as follows:

"For satisfaction, the client has to get all the comprehensive treatment when the patient comes to the hospital, so when the patient can go through the consultation covered by the NHIS, the drugs given to them covered by the NHIS, and then some of the labs rendered to

them, patients are satisfied with the NHIS that he or she is using, so that is how the patient gets satisfied".

(KII, ENT Nurse).

"We just make sure that whatever they want they get. As far as we are concerned, they aim to feel better so we make sure that they get those things".

(KII, Head of Gynaecology).

''Well, we try and do our best from the OPD to the IPD to make sure that at least whatever the patient comes with, whether it's pain, a swelling or a medical problem, whether it's pregnancy, we try and make sure that the problem is solved so that they don't go back to the community in a sick or an ill state so that is the minimum that is required of us in the healthcare''.

(KII, Head of Clinical Service).

Few respondents also stated that by treating all the patients equally irrespective of their background, they will be satisfied.

"All clients are treated the same, so when you come, whether you are NHIS subscriber or nonsubscriber, everybody is treated, it is first come first serve and we give everybody equal treatment so there is no discrimination amongst the patients, there is no point they will say that because you are NHIS, bypass, we treat everybody same and if it is an emergency it is treated as emergency".

(KII, Hospital Administrator).

Finally, some of the respondents stated that clients or patients would be satisfied when the health facility has all the needed equipment and human resource to render all the services required by patients.

''Satisfaction, if the health facility has all the things in place to be able to attend to the patient from consultation to the pharmacy lab, everything if the facility has and a patient goes to do; we make sure the patient is satisfied''.

(KII, Pediatric).

4.4.7 Improving G-DRG Challenges

In expressing their views on how to improve pertinent challenges with the Ghana Diagnosis-Related Groupings, most respondents indicated that it should be based on the expertise available at a particular health facility including the type of services the facility is providing:

"Instead of tagging facilities with it being primary, secondary, or tertiary, we should go down to available expertise. That is why I mentioned earlier that you may have a primary facility that is quoted as primary because of its location and districts, but you can have personnel who are specialists, consultants, and providing the tertiary service. So instead, G-DRD only focusing that this is being provided based on the facility, we should look at who is providing the service".

(KII, Dentist)

Other respondents intimated that the NHIS premium needs to be reviewed upwards from its current rate to a higher rate to cater for the needed healthcare cost through annual review of the tariffs:

''Increase premiums for NHIS, let us strengthen the NHIS, let us increase the premium, get many people paying''.

(KII, Head of Emergency Nursing).

''NHIS should adjust their tariffs from time to time, they should not even wait for the whole year, two years or three years''.

(KII, Medical Superintendent).

CHAPTER FIVE

DISCUSSION

5.1 Introduction

In the previous chapter, there was a presentation of the results of the empirical evidence gathered to undertake an assessment of the financial implication of the Ghana-Diagnosis Related Grouping (G-DRG) payment on service delivery at the Greater Accra Regional Hospital.

This chapter discusses the results along the objectives of the study. The first section discusses the effect of the G-DRG payment system on service delivery which is followed by explanations to the relationship between G-DRG cost differences and the average length of stay of sampled medical conditions. Finally, the perceptions of health staff on the challenges and recommendations for the G-DRG payment system is discussed under thematic areas of institutional methodology of pricing health services, general knowledge of G-DRG payment system, co-payment, alternative payment system, prevention of financial loss and ways for improving the G-DRG payment system.

5.2 Relationship between G-DRG tariff differentials and average length of stay of in-patients

In many healthcare systems, a critical measure of efficiency and proxy for quality healthcare service delivery is the average length of stay. It measures the average number of days an inpatient spends in the hospital until discharge. A decreased length of stay could potentially reduce the risk of opportunistic infections, medication side effects, lower mortality outcomes and improvement in health outcomes. However, from the healthcare providers point of view, upon stabilizing all other factors, a shorter average length of stay reduces the cost per discharge and shift ancillary healing cost to the patients for home management. Ultimately, there are several fctors documented to affect the average length of stay of inpatients. Already, a study using electronic health records for analysis of length of hospital stay in South Korea found factors such as transfer, frequency of diagnosis,

frequency of discharge, bed grade, discharge delay time, operation frequency, severity and insurance type to be significantly associated with the length of stay (Baek et al., 2018).

This study established a linear relationship of the cost difference resulting from differentials between G-DRG tariffs with hospital approved charges and the average length of stay of medical conditions (Fig. 4.3). From the results, a unit difference between the G-DRG tariff and the approved hospital charge leads to a statistically significant decrease of approximately six minutes (0.004 of a day) of the average length of stay (p-value, <.01) for the sampled medical conditions (Table 4.3). This finding of reduced average length of stay with implementation of DRG tariff is consistent with several other research works from the global space.

In Germany and Switzerland, identified as few countries with many years of implementation of the DRG payment system, evidence on the impact of G-DRG introduction concluded that there is a decrease in length of hospital stays (Koné et al., 2019). Similarly, another study on DRG based payment mechanism on quality of care and efficiency also found that the DRG payment system have different outcomes depending on the healthcare system but overall the payment mechanism reduces the intensity of the service and length of hospital stay (Barouni et al., 2020a). Additionally, aligning with the findings of this study is a systematic review of the effect of DRG based payment system compared with cost based payment system which also documented that DRG payment was associated with not only a higher readmission rates but a reduced LOS and could have cost-saving implications for providers but the readmission rates should be monitored by policy makers (Meng et al., 2020).

The DRG payment system portrays the characteristics of a prospective payment methodology which incorporates the setting of limits on the number of reimbursable days in coming out with corresponding tariff for a case mix. Thus if the rates are set above the marginal cost for service

delivery, the hospital earn a net revenue. On the contrary, if the marginal cost is exceeded by surpassing the days' set limit on reimbursement the facility incurs cost for the additional days the patient stays on the ward. Invariably, the effect of this payment method on length of stay is therefore not limited to only the tariff allocated but also on the ceiling set for the days. Being a standardized methodology, the DRGs aspect of incorporating a predetermined length of stay might not vary between countries and that provides justification for the consistencies in a reduced length of stay following the implementation of the G-DRG payment system in many countries.

Additionally, the DRG payment system have as part of the many attributes, the opportunity for providers to have internal cost reductions in service provision through mostly changes in practices in service areas, coordinated work environment by medical staff, the use of laboratory and pharmaceutical products and mainly adequate sharing for supplies and other medical equipment. According to a study on medicare's bundled payment initiative for hospital-initiated episode, some healthcare providers under health insurance policy with the bundled payment methodology reduced internal service delivery costs per episode by shortening length of stay for inpatient admissions (A N D A U S T I N F R A K T, 2020). Moreover, under Ghana's health insurance scheme, the tariff operations manual version 22 reveals that an inpatient is classified and paid with admission tariff after spending above twenty-four hours on the ward. Further stays in the ward irrespective of disease progression and expenditure does not attract subsequent fees under the G-DRG payment mechanism. This situation may influence practice of some providers in quickly discharging patients for cost savings. Again, clinical experts for tariff reviews have consistently maintained the conceptual framework and principles of the tariff development as issued in 2008 but have been revising the enlisted medical conditions and tariffs in consultation with stakeholders to obtain a refined tariff. Therefore, for conditions where the regimen of treatment may not be

specific or conditions among the vulnerable populations such as the elderly, children and disabled there could be fluctuations in the expected average length of stay of some conditions especially as the base data is over a decade old, which could undermine realistic tariff issued by the NHIA for quality care delivery.

Already, provider behaviours are generally known to change following the implementation of DRG tariffs. A systemetic review in China concluded that DRGs payment may marginally improve the efficiency but impede the equity and quality of healthcare with a risk to cause up-coding of medical records (Zou et al., 2020c).The response to such payment system may be varied depending on the institutional ownership and aspirations. For instance, a public institution such as Greater Accra Regional Hospital who are not for profit are not expected to be more responsive to incentives for cost savings and other issues that may improve quality healthcare delivered to patients. However, as a referral facility, the patient volumes may be on the high side coupled with their ability to manage complicated medical conditions using well resourced personnel facilitated by technology. Consistently, there have been frequently reported instances of no bed syndrome which has become hanging health problem around the necks of healthcare managers and therefore interventions to reduce unnecessary delays in the care pathway of patients are being prioritized and that could all explain the reduced average length of hospital stay especially as the prospectively fixed rate of the DRG to be reimbursed is not affected by the extra days spent at the ward.

5.3 Effect of G-DRG Payment System on Service Delivery

The specific characteristics of the healthcare markets in deviating from the interplay of the principles of demand and supply in directly regulating prices require government intervention in negotiating healthcare prices and implementing various payment systems towards improving

financial access to quality health services. Similar to other payment systems, the G-DRG payment provides incentives from the perspective of the healthcare provider to deliver quality services. However, that incentive is highly dependent on whether the prices are set too low or too high in comparison with contemporary hospital charges (Barber SL, 2019). The study established that for most parts (4 out of 5 years) of the period reviewed, the NHIS tariff produced positive price differentials in comparison with hospital approved charges for all the top-ten causes of in-patient admissions. The positive mean price differential was highest in septicemia cases (355.85) while the negative mean price differential was highest in gastroenteritis cases (-23.09). The results of the positive price differentials depicting a lower hospital charge in comparison with the NHIA tariffs and a cost covering for the provider is in tandem with similar findings in a study conducted on the operationalization of Indonesia's case based groups payment system which showed that unit cost in mild head injury patients obtained lower real cost than the case based group tariff (Kurniawan & Pribadi, 2018). Moreover, an earlier study that compared hospital inpatient cost and the Indonesia's case based groups tariff rates for inpatient care confirmed the results of this study in concluding that average hospital inpatient expenditure was lower than the average case based groups tariff (Rahayuningrum & Suryono, 2016)

Management of sepsis pose major clinical challenge for healthcare systems globally in the areas of logistic requirement. In the United State, a study to review incidence, mortality and cost of sepsis revealed that, there is a relatively longer average length of stay (LOS) for sepsis patients than for most other conditions and the cost of treating sepsis is high and exceeds the cost of treating patients with conditions such as congestive heart failure (Hajj et al., 2018). In Ghana, since the determination of the DRG tariff is dependent on the average length of stay of the disease condition, the document evidence of longer length of stay for sepsis could have scientifically informed the

relatively higher reimbursable tariff issued by the NHIA and the explanation of a higher positive mean price differential as revealed by this study.

Again, in exploring the cost differences in the area of cancer management, a study also agreed with the findings of this study in producing statistically significant difference based on the real cost and the case based group tariff in which the costs were lower for the real cost (Satibi et al., 2019). However, the findings of this study is inconsistent with a retrospective study in Iran that compared hospital bills with fixed annual tariff by health insurance companies for surgery cases that concluded that actual hospital bills were much higher than the fixed annual tariffs approved for global surgeries (Aboutorabi et al., 2020).

In the Ghanaian healthcare system, the government uses legislation to control determination of hospital charges to manage extortion by providers especially as the issue of information asymmetry dominates the healthcare market which could incentivize higher hospital fees at the expense of the patient. Legislations such as the Fees and Charges Act, 2018 (Aswir & Misbah, 2018) empowers the Finance Minister to determine charges for services rendered in public health facilities and provide for their annual adjustment in line with prevailing economic conditions. The portions of the Fees and Charges Act specific to health is operationalized through the Ministry of Health structures with supervision at various levels of the health delivery systems to keep hospital fees in check to ensure access to affordable healthcare services. Accordingly, the lower approved hospital charges in comparison with the DRG tariffs evident in this study could be explained by the robustness of the implementation of the legislative framework and strict supervision to adherence of the approved charges by providers.

Moreover, the NHIA tariff development processes which comprise of the engagement of groups of independent consultants to undertake costing of services to be used for reviewing G-DRG tariff.

The comprehensive nature of the methodology in reviewing tariffs which collate feedback from varied stakeholders and incorporation in the recalculation of the tariffs in some cases with expert representatives from the healthcare facilities credentialed to attend to subscribers of the NHIS. This methodology and approach provide the needed platform for the development of realistic tariffs for providers especially as external factors such as inflation of medical products are also fully incorporated in the final determination. According to the NHIA Tariff Operations Manual (2015) the review of the 2014 tariff was occasioned by the need to have tariff rates that are adequate and reflect medical price inflation. Therefore, it is not surprising that the findings of this survey is consistent with a robust G-DRG tariff that overshadowed the approved hospital charges for the period under review.

Again, the mandatory yearly review of the tariffs as enshrined in the Legislative Instrument 1809 that operationalized the National Health Insurance Act seem to provide the maximum duration after which fluctuations in economic indicators that could impact on value of tariffs issued is expected. Therefore, the overly positive differentials with NHIS approved tariff evident in this study could be explained by the constant review of tariffs to match up with prevailing economic trends. Meanwhile, a stakeholder in a qualitative study to explore stakeholders ideas on positioning the National Health Insurance for Financial Sustainability and Universal Health Coverage had recommended that tariffs should also be reviewed yearly to factor inflations as per the act but that has always not been done (Aikins et al., 2021). This was realized with the availability of three versions of the tariff (2016,2020,2022) for the five-year period which fully completed the stages of tariff development processes. However, the Executive Management of the NHIA issues an upward fixed percentage on tariff for all G-DRGs to cushion providers on ravaging effect of prevailing economic situations for the years that fully developed tariffs are not released.

Furthermore, the effect of macro-economic indicators on stability of tariffs through good government economic policies cannot be overemphasized. Already, Pakdaman et al. (2019) have shown that economic factors including Per Capita Gross Domestic Product (PGDP), Tax Revenue, Inflation, Liquidity Rate, and Trade (exports plus imports) affect stabilization of reviewed tariffs for health and an improvement in these macroeconomic indicators, particularly inflation, is essential for ensuring access to comprehensive healthcare through price stabilization which is essential for financial access and maintaining population health (Tajudeen et al. 2018). Given that for four (4) out of the five (5) years of the survey period, Ghana recorded consistently a single digit inflation (7.81%, 7.14%, 9.89% and 9.97% respectively between 2018 to 2022), the sharp increase in inflation rate to 31.7% and 50.3% respectively in July and November, 2022 (Macrotrends, 2022) could justify the findings of this study in the overly negative price differentials recorded on almost all the tariffs for the medical conditions surveyed. Invariably, the findings of this survey showed a year-on-year mark-up of 16% for G-DRG tariff compared to 58% (Fig. 4.2.2) of hospital charges for 2022. The cumulative fluctuations in hospital charges possibly impacted by a high inflation rate and the marginal increment in G-DRG tariff depicts how quickly the revised and current NHIA tariff could become obsolete following its release in July 2022.

Plausible explanation for the astronomically increase in hospital tariff in the year 2022 can be attributed to the macroeconomic factors predominantly inflation. This is because inflation affects the prices of goods and services including the cost of health-related materials. In many hospital budgets, healthcare supplies and commodities account for 20-30% of the total sum, making them the second highest healthcare expenses behind human resource (Dowling, 2011; Mathew et al., 2013). In Ghana, because there is importation of over 80% of hospital commodities into the

country (Mathew et al., 2013) the rapid deprecation of the Ghanaian currency provided a worsened state in 2022 (1USD=GHS14.00 as of the time of the data collection) (The World Bank, 2022). Also, the World Bank (2022) estimates show that the overall GDP increased by 3.3 percent year-over-year, however, in the first quarter of 2022, it came down from 3.6 percent during the same period in 2021. Altogether, the depreciation of the cedi, which has already lost 24 percent of its value against the dollar in 2022, coupled with effects of rising global commodity prices possibly from the aftermath of the Russian-Ukraine War and economic effects of Covid-19 pandemics add to the explanation of negative price differentials of the G-DRG tariffs. This finding resonates with observations from a study by Eghan et al. (2015) who established that macroeconomic indicator such as Gross Domestic Products (GDP), inflation, depreciation of the local currencies against major foreign currencies and exchange rate could substantially increase the price of imported commodities used in delivering healthcare in the country and an eventual impact on reimbursement tariffs.

Drawing lessons from the general spirit of health insurance policies in allowing healthcare providers to share financial impact across a spectrum of patients over time, it was not surprising that this study produced a cumulative financial gain of 23% (Table 4.2.2) over the five-year period in terms of utilization although independently some years recorded significant financial losses. This finding is in tandem with the finding of Hdfcergo (2022), apart from health insurance providing financial support and reduces uncertainties that individuals face with their health well-being, health facilities benefit in the long-term by generating profits from unused tariffs that are paid for millions of policyholders. In an earlier report, authors of a paper that showed the benefits of palliative care to hospitals concluded that the introduction of DRGs shifted payment for a hospital to fixed rate which makes patients with even longer length of stay or receiving more

services. Therefore, patient expenses in the hospital will be lower and the revenue will be unchanged and invariably, the contribution margin (revenue minus variable costs) will be improved with anticipation of quality care provision (Spragens, 2013).

Moreover, according to Barber et al. (2019), a review of countries in central and eastern Europe and central Asia, concluded that the introduction of DRGs was associated with decreasing costs per discharge and an increase in total hospital spending as a results of increasing volumes of patients treated. Thus, the net gain by the hospital during negative price differentials for some years could be due to variations in attendances for the various conditions resulting in difference in utilization costs.

5.4 Implementation of the G-DRG on Service Delivery

5.4.1 General understanding and reality of G-DRG in covering patient cost

Under the overall framework for financing health system and purchasing methods for benefits package covered under an insurance scheme, the cost of health services is a crucial consideration. The purchasing tools of pricing and payment options encourages healthcare providers to deliver high-quality care (Murray & Berenson, 2015). The incentives in payment mechanisms may be easily overshadowed if the price set is unreasonably high or low. In general, pricing should account for the actual costs of service delivery and also factor the broader objectives and results of the health system. A study asserts that the limit to which prices are set for capitation payments, may lead to low quality care and the choice of healthier patients by providers, or the frequent referral of complicated cases that call for a higher level of service intensity to another service provider (Reinhardt, 2006). Prices that are too low or too high encourage over- or under-utilization, respectively. This encourages buyers to make price estimates that account for the true costs of the specified service across a range of providers.

The principles of demand and supply decides pricing for the majority of health commodities. Contrary to other commodities, there is information asymmetry for purchasers and consumers of healthcare than the "seller" (i.e., the healthcare provider), who offers advice on which treatments or best options for medicines while also having a financial interst in the final decision on which option to use (Beard et al., 2019). Undeniably, the value of health services is challenging to evaluate as a result of inadequate cost data and its technical quality. In contrast, during acute care services and medical emergencies, demand for hospital visits is less responsive to price. In classifying patients under the DRG system, patients are grouped into DRGs with similar clinical symptoms and resource consumption with the assumption that patients tied to a DRG are deemed to be medically and economically similar in terms of management.

This study revealed that most of the respondents were able to describe the G-DRG payment system, where related diagnosis are grouped together. The respondents established that the DRG payments group patients with similar clinical characteristics and use cost information to determine. This assertion is consistent with the findings of another study that compared Private Health Insurance for low income adults (Allen et al., 2021). The G-DRG payment system has been in operation for over ten years and therefore not surprising that most respondents have a general understanding of it. Moreover, the fact that most respondents are senior officers with adequate level of experience could account for the good understanding of the payment system. The diagnosis related grouping payment system is well known to be characterized by the use of determinants for resource consumption that factors cost of resources use for managing a disease condition. According to a study on G-DRG payment system, even clients with same diagnosis and similar treatments, a G-DRG payment system may be inadequate to capture case complexities and provide differences in actual cost, length of stay and resource utilization (Hopfe et al., 2018b)

Similarly, a study on financial risk perspective of a G-DRG system design explains that the DRG payment departs from the Fee-for-Service model which directly links the amount reimbursed to a proportionate one used for rendering services provided to each patient and highlights the inadequacy of the G-DRG payment system in catering for the full cost of expenses on patients (Lüthi & Widmer, 2017). However, it is known that when prices are unilaterally set or collectively negotiated, price adjustments and add-on payments are frequently used to ensure that specific services or caring for specific populations are covered, especially where there are additional costs associated with providing care or it is deemed unprofitable (Allen et al., 2021). The study found that G-DRG tariff does not realistically cover for all cost used in service delivery. Plausible explanations are that most of the logistics that are used in delivering services, laboratory tests, accommodation, feeding, etc. are blocked items that goes into determining charges of patients who access services at the hospital but the G-DRG tariff may not cover the full range of these materials. However, the net financial gain to the facility in five years revealed by this study coupled with the finding on reduction of average length of stay of patients depicts a long held misconception on the inability of G-DRGs in accounting for all cost, hence, influences decision for early discharge on the basis of cost saving under the payment system.

Already, factors identified for contributing to determining price levels include service delivery costs, wages for specialists, as well as the complexities and burden of diseases (Allen et al., 2021).Therefore, in order to ensure broader public health objectives like equity and access, prices for hospital services are frequently set with stakeholder engagements. This resonates with the practices for developing tariffs under Ghana's NHIS system which encourages efficiency and transparency.

5.4.2 Co-payment for Healthcare Services

Over the years, the health financiers have implemented some changes to their services that have had a negative impact on the ways in which some medical facilities operate. These healthcare facilities have turned to co-payment to supplement the services provided in order to ensure smooth operation. Since co-payments help users who have already pre-financed their health care through premiums and taxes shoulder some of the cost, they are a viable alternative for service providers to continue operating (Shung-King, 2011). Co-payment is illegal under the current operations of health insurance in Ghana. However, it is not uncommon to see patients being asked to make additional payments on services covered under the benefit package of the health insurance in facilities. Already, a study conducted at Akuse Government Hospital, found that co-payments increased the cost of health care access, made it more difficult for the poor to afford it, and placed a financial and emotional burden on people with chronic illnesses. The study however asserted that, healthcare professionals indicated that co-payment system had enabled the hospital to raise more money to cover operating expenses and provide clients with high-quality care (Andoh-Adjei et al., 2019b).

The findings of this study indicates that G-DRG payment system results in co-payment practices in the health facility. The inability of the G-DRG tariff in accounting for some administrative costs, laboratory and some logistical costs especially for chronically ill patients have been the reasons for this. Moreover, the fluctuating economic trends of the country which results in the G-DRG tariffs becoming obsolete as quickly as they are set could account for the persistent practice of co-payment practices in the facilities. Already, a study has stated that one of the many reasons for co-payment in Ghanaian health facilities have been delayed reimbursement of claims. In that study, the trajectories of delayence in claims payment were traced not only to NHIA systemic issues but

ancillary factors such as irregularly paid government subsidies and delayed release of NHIA funds from Ministry of Finance (Amo et al., 2013).

In some countries, co-payment systems augment other payments under the health insurance implementation processes. For instance, the Republic of South Korea is documented to be utilizing co-payment system to reduce demand. In its operationalization, depending on the system level, from primary to tertiary, copayments for outpatient care could be perked as high up to 60%. This ensures compliance to the gatekeeper system and to control utilization costs from private hospital services (Allen et al., 2021). However, under Ghana's social health insurance scheme, the relatively politicized nature may impede commitments from governments for introduction of co-payment although facilities continue to find reasons for its operationalization, a situation that can derail efforts at achieving Universal Health Coverage.

5.4.4 Client Satisfaction with Healthcare Service

Patient satisfaction has been defined as the measure of the extent to which a patient is content with the healthcare they received from their healthcare provider (Manzoor et al., 2019). This is a crucial determinant of the quality of healthcare delivery, and as a globally recognized indicator, it must constantly be incorporated into training and institution standards. Being patient-focused is essential for healthcare providers because patient satisfaction is crucial to the delivery of healthcare and the implementation of quality care reforms. Already, there is documented evidence of a positive association between services rendered by medical professionals and patient satisfaction which eventually translates into loyalty of patients to specific facilities and better services (Addo et al., 2020)

Generally, hospital management strategically improve and strengthen the service quality dimensions, which concentrate on a patient-centered environment and an effective service delivery

system, in order to increase patient satisfaction. Accordingly, the general recommendation is that healthcare managers must ensure that systems are improved for better health care because key characteristics and factors related to the health system are linked to patient satisfaction with the delivery of health services (Mohammed et al., 2014). A good feedback system from other healthcare facilities is important because it helps to improve the quality of the care provided, the provider's effectiveness and efficiency, and overall patient satisfaction (Thornton et al., 2017). Accordingly, it is anticipated that healthcare providers would eliminate dissatisfaction drivers and concentrate on patient satisfaction. This study revealed that from the providers perspective, clients would be satisfied when they receive all the medical care they are entitled to once they are in the health facility to seek medical attention as well as treating all the patients equally irrespective of their background. Thus, patients would be satisfied when the health facility has all the needed equipment and human resource to render all the services required by patients. This means that service delivered by providers confirms the perception of its patients who sought for healthcare service at the facility.

This resonates with documented perception that variety of factors, such as adequate service and desired service contribute to patient expectations (Walker et al., 2019). Moreover, the G-DRG payment system feature of prospectively managing patients with the issuance of a fixed tariff may be underpinning the gaps in managing patients to control cost. For example, a provider might initiate treatment based on symptomatic judgement rather than full laboratory investigations for mild to moderate conditions as part of expenditure control. In Ghana, the persistent delay of claims reimbursement for services provided coupled with this G-DRG feature may increase the practice of symptomatic management contrary to investigation-informed treatment which increases the potential of revisits to healthcare facilities due to incomplete care. Ultimately, these practices

crepping into the healthcare system affects client satisfaction. As providers deliver services, it is crucial for the services to be comprehensive to improve outcomes and assure the needed level of quality. The benefits of ensuring comprehensive and quality healthcare delivery would not only save cost on readmissions but keep satisfied clients to a facility.

5.4.5 Ways of Improving G-DRG

Following the operationalization of Ghana's NHIS in 2004, tariffs for reimbursement have gone through trajectories of Fee-for-Service for both medicines and services to G-DRG payment system and itemized billing for medicines. The tariff development and review processes have been judged as comprehensive and incorporates feedback from multiple stakeholders following validation of costing data for clinical services by healthcare providers. The G-DRG purchasing mechanism being utilized by the National Health Insurance Authority is seen as a strategic way of aligning services and medicines in the benefit package of the scheme to efficiency and provides periodic and transparent review process (Wu et al., 2021). Similarly, factors such as the development of standad care pathways, multidisciplinary coordination, and empowerment of patients have been identified for succesful implementation of DRGs (Dietz et al., 2019).

Findings from this study revealed that the Ghana-Diagnosis Related Groupings should be based on the expertise available at a particular health facility including the type of services the facility is providing instead of categorizing the facility as primary, secondary, or tertiary based on other indicators. However, the NHIA credentialing tools for facilities incorporates availability of a given set of expertise in addition to standards for other service areas to categorize facilities into various levels of care with corresponding tariffs development. Ultimately, this ensures quality standard of healthcare for subscribers as the ability of a facility to render quality healthcare services is not only dependent on human resources or availability of a particular skill set.Undoubtedly, the pertinent

challenges of the G-DRG payment system demand comprehensive redress to fully realize its benefits in accounting for cost on service provision. Suggestions such as the options of blended payment system to augment the G-DRG have been identified as cost control strategy towards financial sustainability of the NHIS (Wu et al., 2021).

Moreover, although illegal, the co-payment of services under NHIS banefit package is not uncommon to be seen in many credentialed facilities. Therefore, to relieve patient from catastrophic cost and provide a level of assurance for providers in offsetting expenditures on services rendered, the NHIA could consider formalizing the co-payment purchasing method especially for relatively costly services while reconciling differentiation in premiums. In a study on Out-of-Pocket Payments for health services in Sub-Saharan Africa, it was found out that insured clients paid out-of-pocket for services covered by insurance policies and the reasons for the payments were identified as ranging from multifactorial with conflicting health sector policy objectives and resource challenges (Derkyi-Kwarteng et al., 2021).

In summary, the overall impact of health insurance scheme in providing financial risk protection for the citizenry hinges on appropriate purchasing mechanisms which might require blending of the G-DRG and co-payment for selected conditions under the benefit package.

CHAPTER SIX

6.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

In this chapter is summarized the outcome of the study conducted following which some recommendations have been suggested. The chapter is structured into three sections. The first section covers the summary of findings, the second covers the conclusion and the final section covers the recommendations of the study.

6.2 Summary of Findings

6.2.1 Background Characteristics

Out of the fifteen (15) selected respondents, most (67%) were line managers at the specialty units selected and have been there on the average for seven years. However, few (33%) were in management positions at the facility for averagely 6 years. In terms of the practitioners, the average years they have been at the post was 7 years.

Among the G-DRG sampled, majority (86%) were in the category of adult medical conditions per the classification of NHIA's tariff operations manual.

6.2.2 Effect of the G-DRG Payment System on Service Delivery

There is a cummulative net gain of 23% on most (8 in 10) of the top ten inpatient conditions under the G-DRG reimbursement system of the health insurance scheme over a five year period.

6.2.3 Relationship between G-DRG price differentials and average length of hospital stay

There is a statistically significant linear relationship between cost difference and the average length of stay of medical conditions (p-value, <.01). On the average, a unit difference between the G-DRG tariff and the approved hospital charge leads to a corresponding decrease of approximately six minutes (0.004 of a day) of the average length of stay for the sampled medical conditions

6.2.4 Challenges of implementation of the G-DRG on Service Delivery

Most of the respondents had a fair knowledge about the G-DRG system of payment and are aware that pricing of healthcare services is dependent on input for services rendered. However, most asserted that implementation of the G-DRG payment system have led to co-payment and a feeling that clients are not satisfied with services rendered. Generally, most recommended the re-introduction of the cash and carry system or adherence to the yearly review of tariffs to reflect economic fluctuations.

6.3 Limitations of the Study

The study focused on the effects of the implementation of the G-DRG tariff system on cost of healthcare provision from the provider's end, therefore the implications of the payment system on the operations of the payer were not assessed. Again, the challenges encountered by the provider at the primary level of care were not fully explored as the study site is that of a secondary facility.

6.4 Recommendations

Short Term

1. The National Health Insurance Authority should adhere to yearly and consistent review of the G-DRG tariffs as per the provisions in the NHIA ACT, 2012.

2. The National Health Insurance Authority should organize workshops to educate providers on the G-DRG tariff operations.
3. The National Health Insurance Authority should apply the recommended sanctions under the NHIA ACT (2012) to providers engaged in co-payment practices.
4. Providers should officially engage NHIA on the effects of their G-DRG reimbursement prices on their operations and reach agreement on realistic prices for quality service delivery.

Medium Term

5. MOH should strictly regulate mark-ups on approved hospital charges that would allow uniform pricing for healthcare services in healthcare facilities
6. The National Health Insurance Authority need to develop a G-DRG reimbursement formula that would factor exchange rate for a defined period in order to limit effect of fluctuations in economic indicators
7. There is the need for further research to cover a lot more G-DRGs on the NHIS benefit package and in more health facilities to obtain the full influence of NHIA reimbursement prices on providers and patients.

Long Term

8. The National Health Insurance Authority should pilot other strategic payment methods such as co-payment for some services beyond a certain ceiling in order to amerelioate the financial implication of the G-DRG tariff implementation.
9. NHIA should commission a study to realistically determine an updated average length of stay of medical conditions to be factored in tariff reviews.

6.3 Conclusion

The National Health Insurance Authority's G-DRG payment system has varying financial implications such as net gain on services rendered, an associated reduction in length of patients hospital stay, perceived non-satisfaction of clients and co-payment practices for healthcare provision at Greater Accra Regional Hospital.

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APPENDICES

APPENDIX A: CONSENT FORM

UNIVERSITY OF GHANA/SCHOOL OF PUBLIC HEALTH/DEPARTMENT OF HEALTH POLICY, PLANNING & ECONOMICS

CONSENT FORM FOR PARTICIPATION IN RESEARCH STUDY

Topic: *Financial implication of the implementation of the Ghana-Diagnosis Related Grouping (G-DRG) payment on services rendered by Greater Accra Regional Hospital, Ghana.*

Description of the research and your participation

You are invited to participate in a research study conducted by Peter Darkwa Gyasi.

The purpose of this research is to is to assess the effect of the Ghana-Diagnosis Related Grouping (G-DRG) payment system on services rendered by Greater Accra Regional Hospital. It will also solicit recommended ways for improving the G-DRG payment system for health providers.

Your participation will involve providing the researcher with information on approved hospital charges for some disease conditions, records of average monthly attendance for disease conditions and suggestions on how to improve the G-DRG payment system.

The researcher will conduct an interview with you and may require that the interview be recorded with a voice recorder to facilitate easy transcription and save you much time. The application of the study tools will require only 20 minutes of your time.

Risks and Discomforts

There are no known risks associated with this research to you. The study will however take few minutes of your time.

Potential Benefits

This study will serve as baseline material on recommendations to NHIA for further analysis of reimbursement methodology and the importance of adhering to periodic and regular reviews of tariffs to reflect economic trends in the healthcare industry. It would also help health managers and other stakeholders to understand the plight of providers; the frequently reported cases of co-payment for services, non-availability of medicines and the extended difficult role of clients search for services allowable at prescribed levels of care. A copy of the final report will be made available to your facility.

Organization and Funding of the Research

The research is being undertaken by a Master of Health Economics student at the University of Ghana under the supervision of an academic lecturer. The student is funding this research.

Protection of Confidentiality

I will do everything to protect your privacy. Data collection sheets and recorder will be kept under lock and key for up to five years after completion of this project. Data obtained from reviewing your records will be limited to discussion of this survey. Your identity and that of your institution will not be revealed in any publication resulting from this study

Voluntary Participation

Your participation in this research study is voluntary. You may choose not to participate and you may withdraw your consent to participate at any time. You will not be penalized in any way should you decide not to participate or to withdraw at any time from this study.

Compensation

You will not be paid as compensation for your participation in this study

Data Usage and Storage

The information you provide will only be used for the purpose of this study. Data gathered from records in your institution will also be used for purposes of analysis of this study. The data collection documents will be kept under lock and key and destroyed five years after completion of the final report.

Dissemination of Study Report

Copies of the final report will be made available to your institution, the Regional Health Directorate and the School of Public Health, University of Ghana, Legon.

Potential Conflict of Interest

The researcher is a staff of the Ghana Health Service. However, this will not affect processing, analysis and discussion of results of finding in this research work.

Contact information

If you have any questions or concerns about this study or if any problems arise, please contact Peter Darkwa Gyasi at University of Ghana, Legon, School of Public Health on 024-3088324, email: dkjaci@yahoo.com.

Consent

I have read and I understand the content of this consent form and have been given the opportunity to ask questions for which I have been adequately answered. I voluntarily give my consent to participate in this study.

Participant's signature_____

Date: _____

Researcher's signature_____

Date: _____

A copy of this consent form should be given to you.

APPENDIX B: QUESTIONNAIRE

UNIVERSITY OF GHANA/SCHOOL OF PUBLIC HEALTH/DEPARTMENT OF HEALTH POLICY, PLANNING & MANAGEMENT

Research Title: Financial implication of the implementation of the Ghana-Diagnosis Related Grouping (G-DRG) payment on services rendered by Greater Accra Regional Hospital, Ghana.

SECTION A: DATA EXTRACTION FORM FOR FINANCIAL BURDEN OF G-DRG

Dear respondent (s)

I am Peter Gyasi Darkwa, working on a postgraduate research topic: "*Financial implication of the implementation of the Ghana-Diagnosis Related Grouping (G-DRG) payment on services rendered by Greater Accra Regional Hospital, Ghana.*

The study seeks to provide useful inputs to improve G-DRG tariff implementation of the NHIS for quality healthcare delivery.

I humbly request your assistance by taking some time to answer these questions and be assured that all information you provide would be treated with high degree of confidentiality.

SECTION B: PRICE DIFFERENTIALS OF NHIA AND HOSPITAL APPROVED TARIFFS													
				2022		2021		2020		2019		2018	
SN	G-DRG	DESCRIPTION	Average Monthly Attendance	HC	DRG	HC	DRG	HC	DRG	HC	DRG	HC	DRG
1		Neonatal jaundice			PAED09C		PAED09C		PAED09C		PAED09C		PAED09C
2		Other Preterm infants			PAED10C		PAED10C		PAED10C		PAED10C		PAED10C
3		Gastroenteritis			MEDI23A		MEDI23A		MEDI23A		MEDI23A		MEDI23A
4		Birth Asphyxia			PAED12C		PAED12C		PAED12C		PAED12C		PAED12C
5		Cerebrovascular Accident (CVA)			MEDI14A		MEDI14A		MEDI14A		MEDI14A		MEDI14A
6		Bronchopneumonia			MEDI31A		MEDI31A		MEDI31A		MEDI31A		MEDI31A
7		Respiratory Distress syndrome			PAED13C		PAED13C		PAED13C		PAED13C		PAED13C
8		Septicaemia			MEDI30A		MEDI30A		MEDI30A		MEDI30A		MEDI30A
9		Cerebrovascular Accident			MEDI14A		MEDI14A		MEDI14A		MEDI14A		MEDI14A
10		Hypertension			MEDI32A		MEDI32A		MEDI32A		MEDI32A		MEDI32A
11		Simple appendicitis			ASUR34A								
12		Severe Malaria			MEDI28A								
13		Diabetes			MEDI02A								
14		Fracture (Unspecified)			ORTH08A								
15		Fever(Unspecified)			MEDI30A								
16		Pneumonia			MEDI31A								
17		Enteric Fever			MEDI30A								
18		Fracture of Femur			ORTH17A								
19		Inguinal Hernia			ASUR20A								

20		Septicaemia In Newborn			PAED14C								
100		Hydrocelle			ASUR22A								

- **HC = HOSPITAL CHARGE**
- **DRG = G-DRG TARIFF**

UNIVERSITY OF GHANA/SCHOOL OF PUBLIC HEALTH/DEPARTMENT OF HEALTH POLICY, PLANNING & MANAGEMENT

Research Title: Financial implication of the implementation of the Ghana-Diagnosis Related Grouping (G-DRG) payment on services rendered by Greater Accra Regional Hospital, Ghana.

SECTION C: INTERVIEW GUIDE FOR RECOMMENDATION TOWARDS IMPROVING G-DRG PAYMENT SYSTEM

Dear respondent (s)

I am Peter Gyasi Darkwa, working on a postgraduate research topic: "*Financial implication of the implementation of the Ghana-Diagnosis Related Grouping (G-DRG) payment on services rendered by Greater Accra Regional Hospital, Ghana.*

The study seeks to provide useful inputs to improve G-DRG tariff implementation of the NHIS for quality healthcare delivery.

I humbly request your assistance by taking some time to answer these questions and be assured that all information you provide would be treated with high degree of confidentiality.

General Information

1. Job position ……...
2. How long have you been in this position ……...

Interview Guide on improving G-DRG Payment System

1. What goes into determining the hospital charge of a service?

2. What is your understanding of a Diagnosis Related Grouping or Bundled payment system?
3. Could you practically explain how the all-inclusive service system under the NHIS is operationalized in the facility?
4. In your view, does the G-DRG payment system realistically account for all service areas for subscribers?
5. How do you prevent financial loss from service delivery under NHIS operations?
6. What would make the facility fail to render comprehensive package of a given service to NHIS subscriber?
7. How do clients receive services that the facility is unable to render?
8. How do you satisfy clients registered with NHIS on service delivery?
9. How would any other payment system be beneficial to the facility?
10. In what ways do you want the G-DRG payment system improved?

APPENDIX C: ETHICAL APPROVAL LETTER FROM GHANA HEALTH SERVICE

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Digital Address: GA-050-3303
Mob: +233-50-3539896
Tel: +233-302-681109
Email: ethics.research@ghs.gov.gh

My Ref. GHS/RDD/ERC/Admin/App 22/558
Your Ref. No.

30th November, 2022

Peter Darkwa Gyasi
Ghana Health Service Headquarters
PMB, Ministries – Accra

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC: 027/11/22**
Study Title	Assessment of the Financial Implication of the Ghana-Diagnosis Related Grouping (G-DRG) Payment on Service Delivery at Greater Accra Regional Hospital, Ghana
Approval Date	30th November, 2022
Expiry Date	29th November, 2023
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of a yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

You are kindly advised to adhere to the national guidelines or protocols on the prevention of COVID -19

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
Dr. Naa-Korkor Allotey
(Ag. Head, Ethics & Research Management Department)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra